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Alternative Energy Private Equity Investments: Project Finance

Sigma Capital Group, Inc.
Bruce Woodry, Chairman and CEO

Sigma Capital Group, Inc.

Who we are:

- Sigma Capital is a boutique investment bank, providing advisory and representative investment banking services on $5-300M transactions
- Primarily in energy and renewable energy project finance.

My focus:

- Project finance (private equity and debt) for advanced biofuels and integrated technology projects

Today, primer on Renewable Energy Project finance:

- Comparison to Growth Funding
- Some things to consider when reviewing a renewable energy project finance transaction

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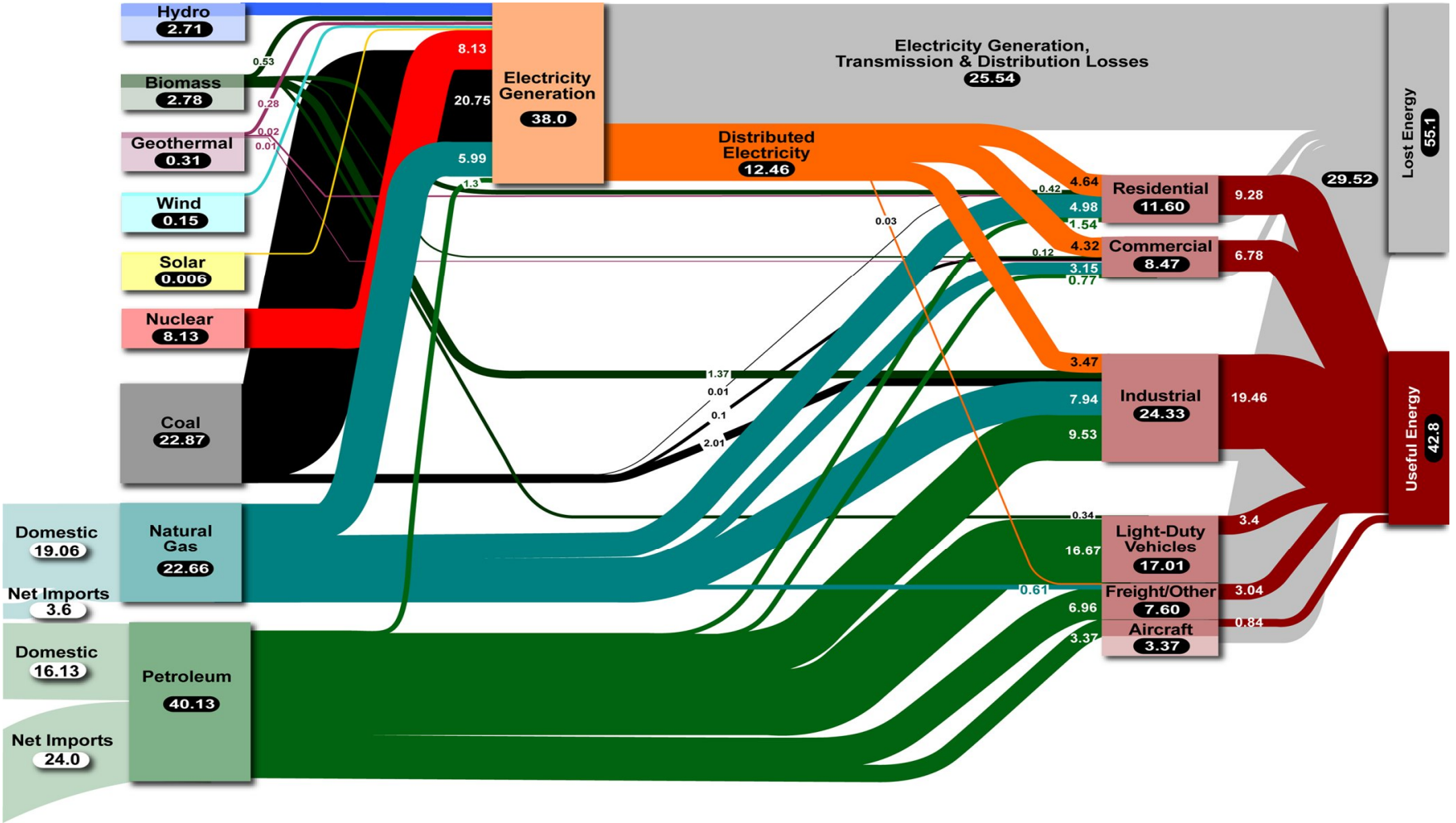
US Energy Flow



Massive and complex

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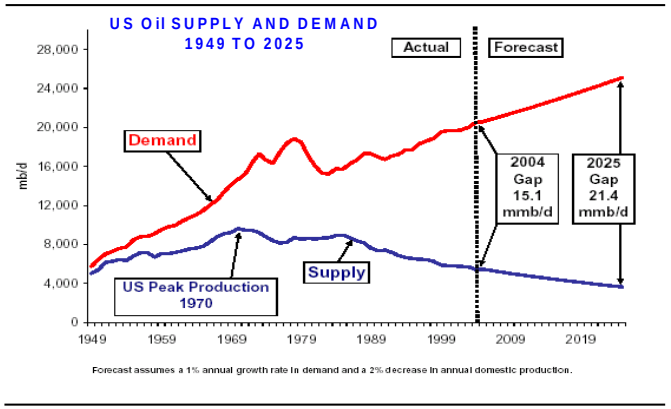
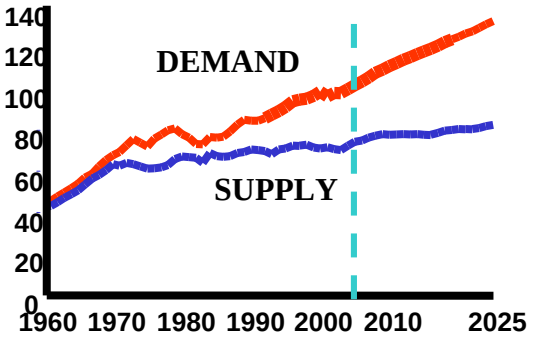
Energy: Changing industry

US OIL

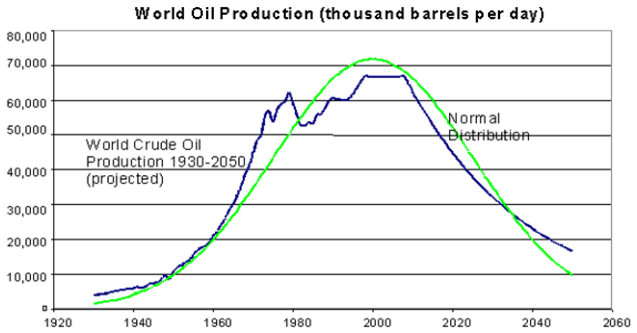


Sources: EIA and RJ Research estimates and analysis

US NATURAL GAS



WORLD OIL



- World oil peaked circa 2000, no major discoveries, existing wells on decline curve
- U.S. Oil
  - Production peak in 1970
  - Today, United States consumes 20 MBBL/day, 76 % imported (2004) going to 25 MBBL/day, (86%) imported (2025)
  - China, #2 at 9MBBL/Day is growing at 9%, competing for scarce supplies
- US Natural Gas
  - Price from $1.5 to $14 MCF over past several years
  - Summer/winter shortage
- Concerns over price, supply

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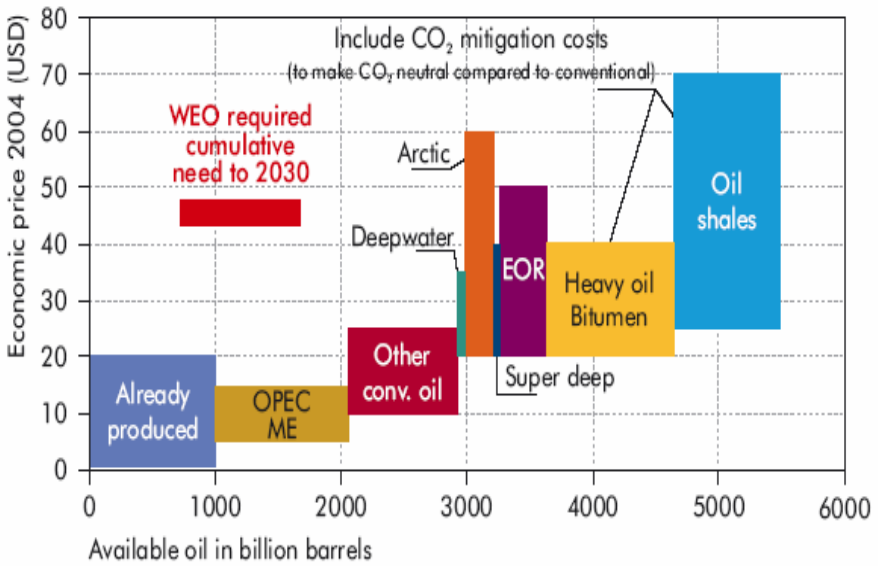
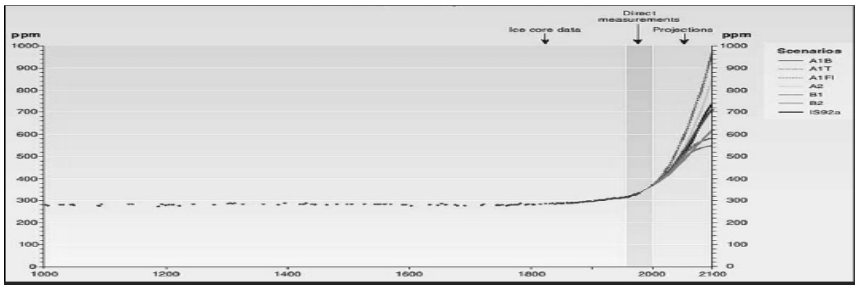
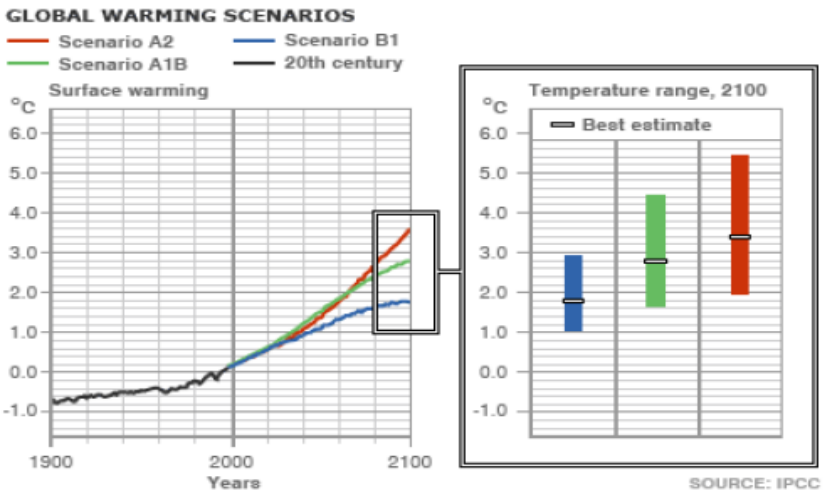
Future of oil …vs. Climate

Figure 7.1 • *Oil cost curve, including technological progress: availability of oil resources as a function of economic price*



Source: IEA.





CO_2 Levels are growing dangerously high

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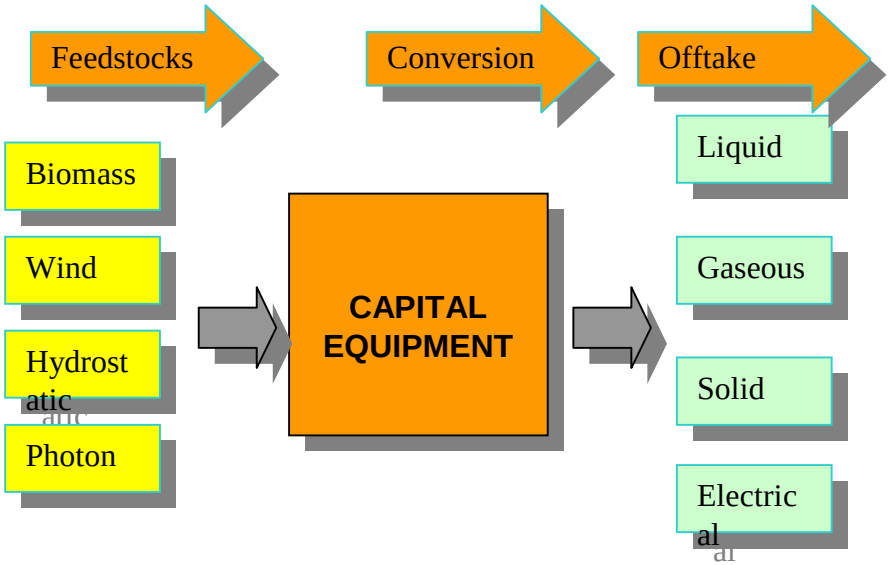
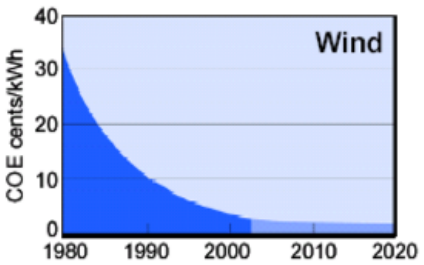
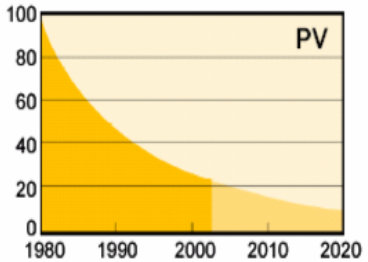
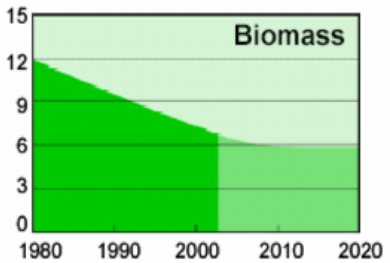
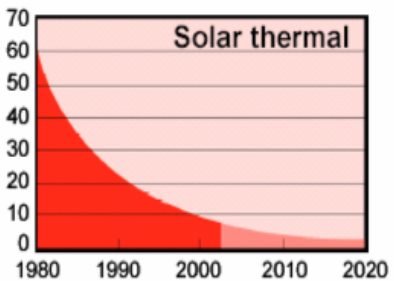
Renewable Energy Industry











- Renewable energy takes one form of energy (biomass, wind, hydro, sunlight) and converts to another, more usable form (liquid, solid, gaseous, electrical)
- Capex intensive
- Dynamic of the conversion: must relate local supply to local need

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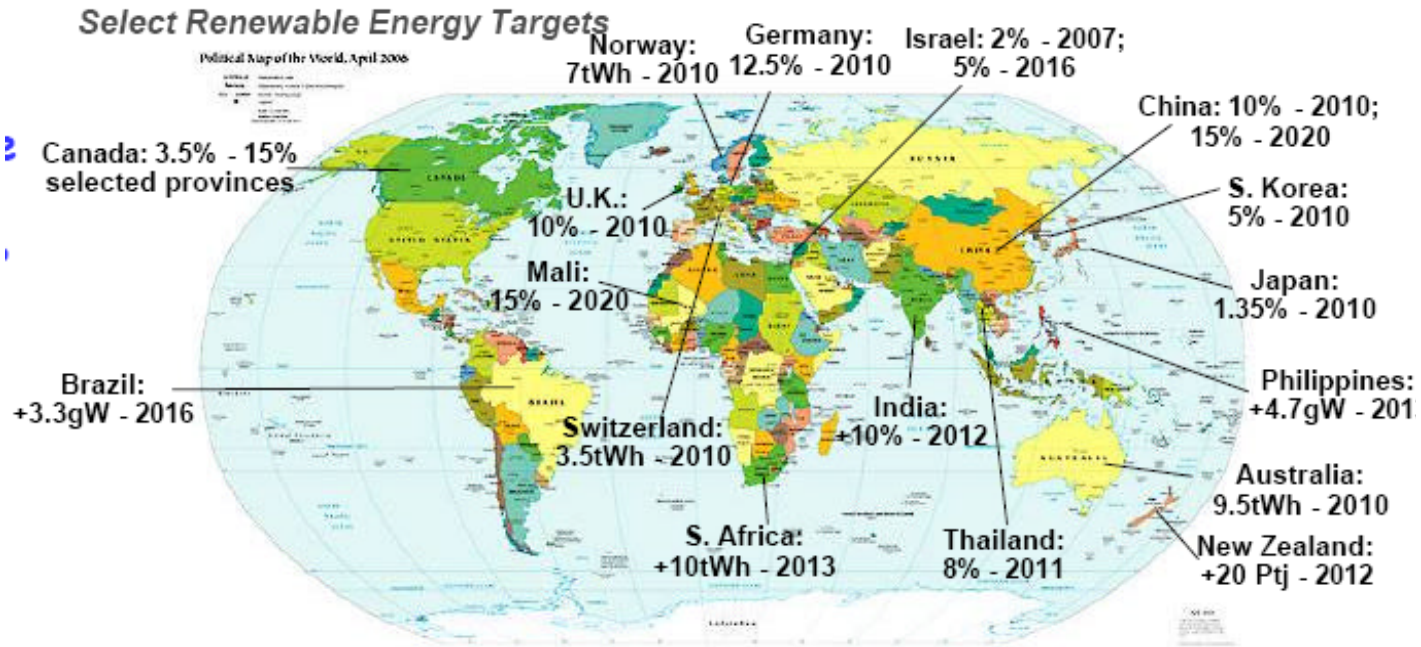
Select renewable energy targets



- The European Union has targeted to double the share of renewable energy to 12% sign by 2010
- Canada targeting 3% -15%, Provence by Provence
- The United States has plans to achieve 35 billion gallons (15%) gasoline consumption by 2017

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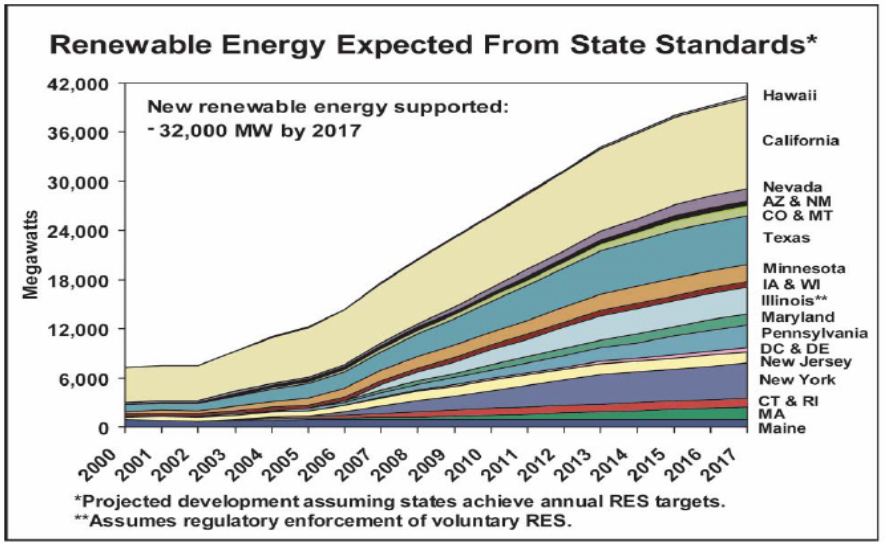
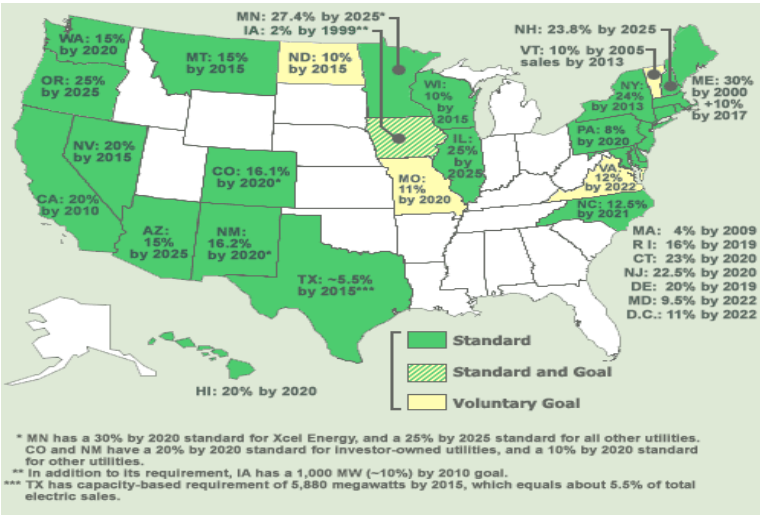
Energy, Intertwined With State and Federal Drivers





- Energy policy act of 2005
  - PTCs By Technology: 1.9 cents/kwh for 10-year period beginning on date facility is placed in service for Wind, Closed-loop biomass, Geothermal, Solar
  - Generally must be put in service between 2007 and 2008

- State policies augment federal policies
  - Renewable portfolio standards in 21 states & District of Columbia
  - Requires 2%-24% of electricity to be generated by renewables

Expected to be 32,000 MW by 2017, California, New York, Texas will lead

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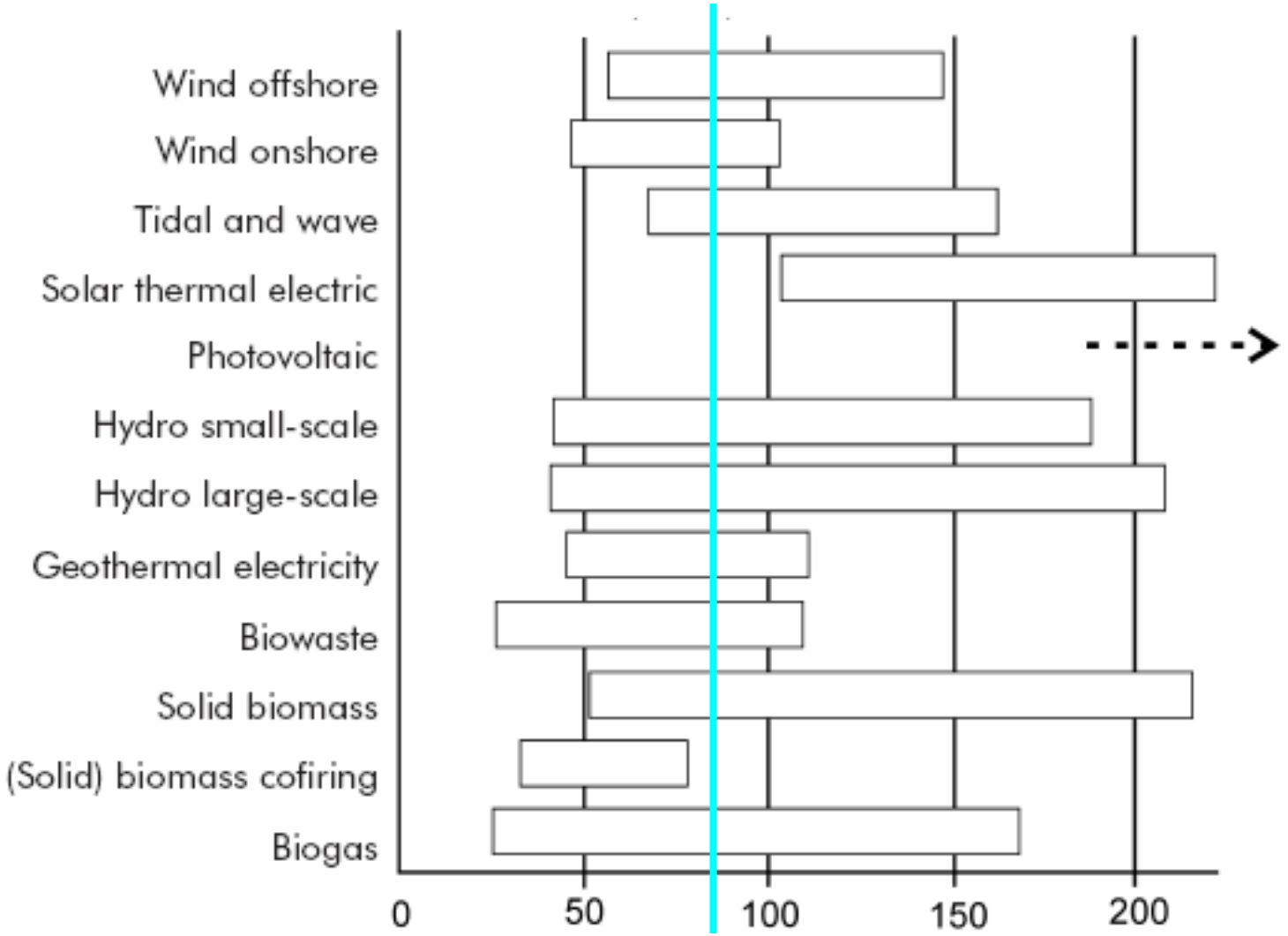
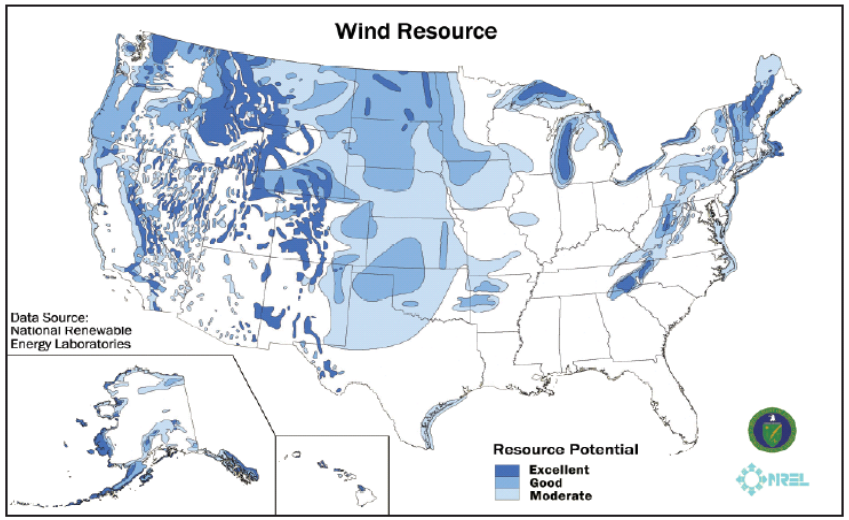
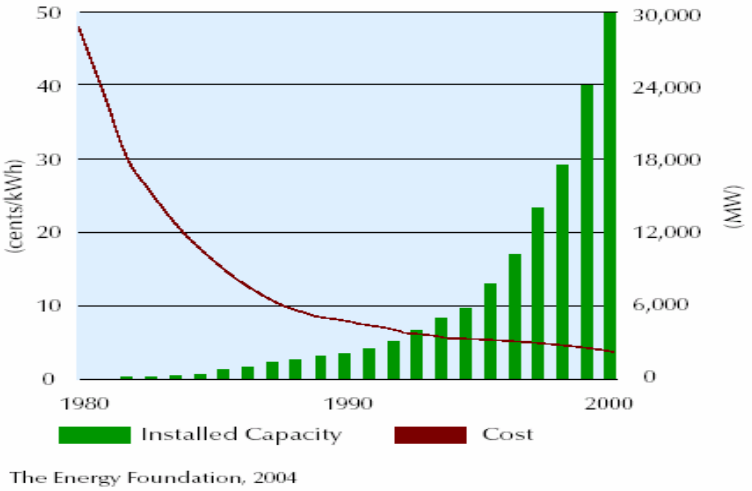
The cost of electricity by technology



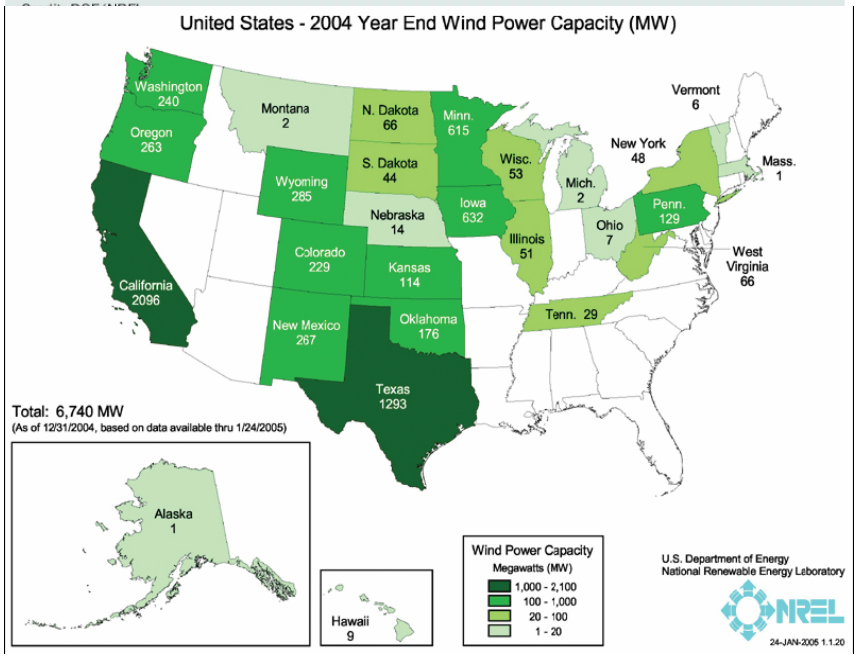
Wind potential in US

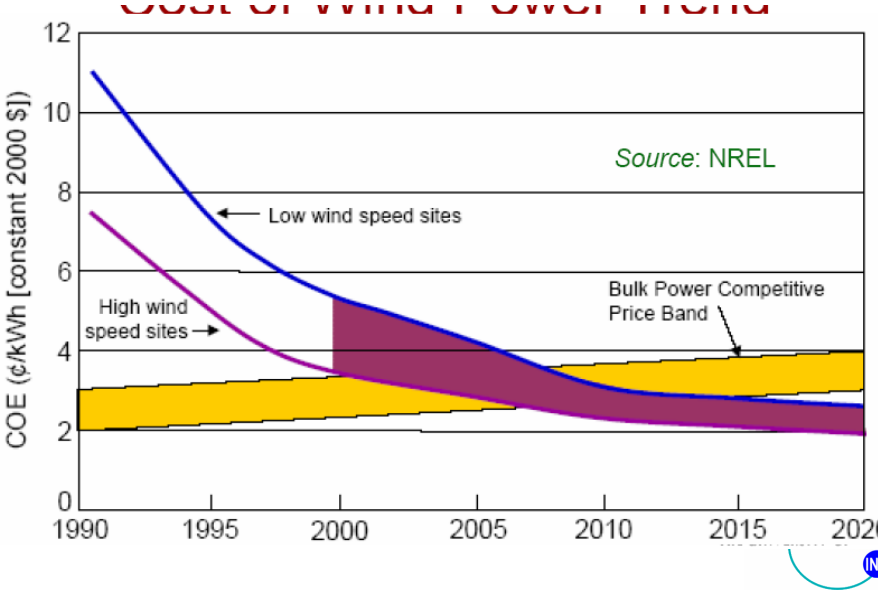


Map shows major U.S. land-based wind power reservoirs on the Great Plains and in mountainous regions.

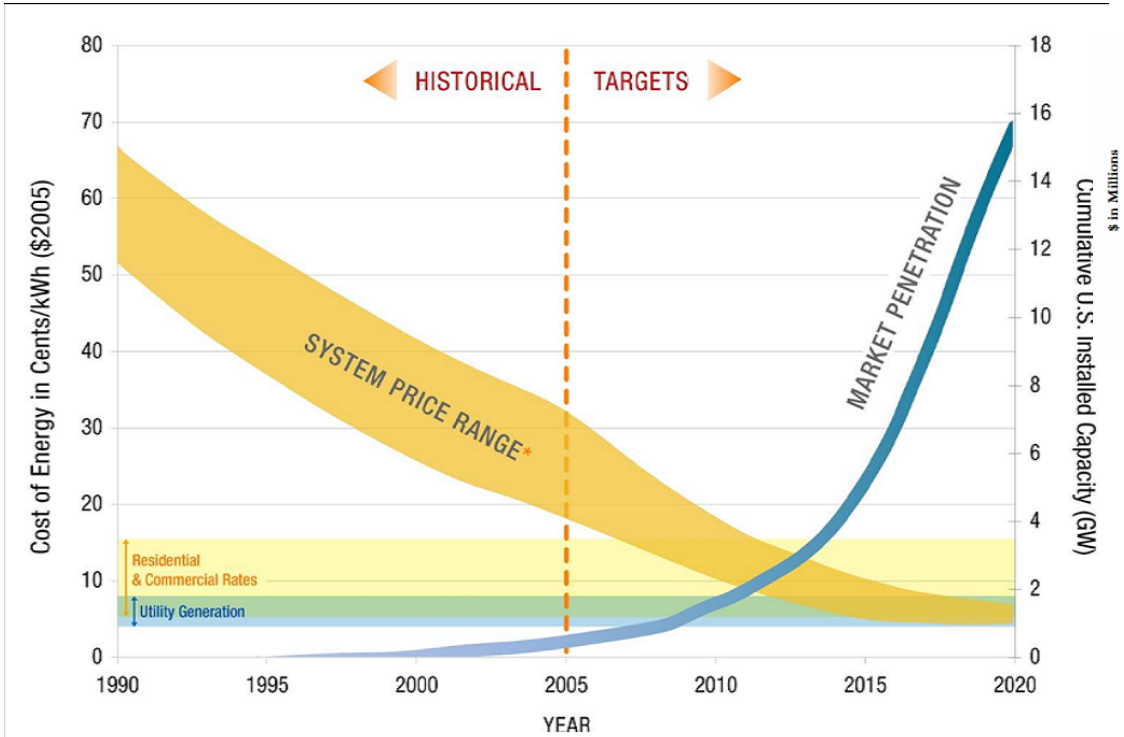


The Energy Foundation, 2004

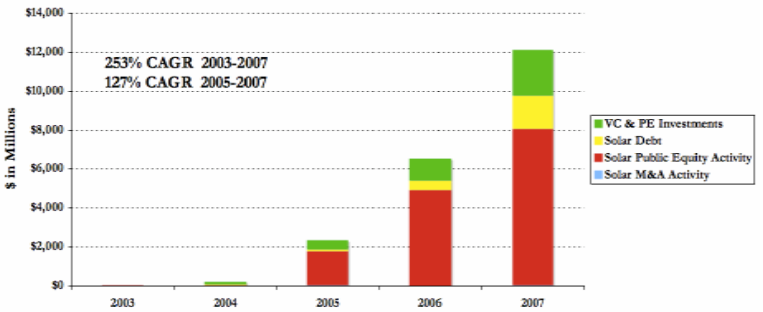




Solar Boom



Market Sector	Current U.S. Market Price Range (¢/kWh)	Cost (¢/kWh) Benchmark 2005	Cost (¢/kWh) Target 2010	Cost (¢/kWh) Target 2015
Residential	5.8-16.7	23-32	13-18	8-10
Commercial	5.4-15.0	16-22	9-12	6-8
Utility	4.0-7.6	13-22	10-15	5-7



2007: 8,000 MW Worldwide

- 2,500+ MW/yr
- $12+ Billion ($10B projects, $2b in VC)
- 127 CAGR 2005-2007

•Limitations for rapid deployment

- o Grid (Utility scale)
- o Cost…offset by
  - State RECs
  - Net Metering
  - Feed in tariffs
  - •New technologies

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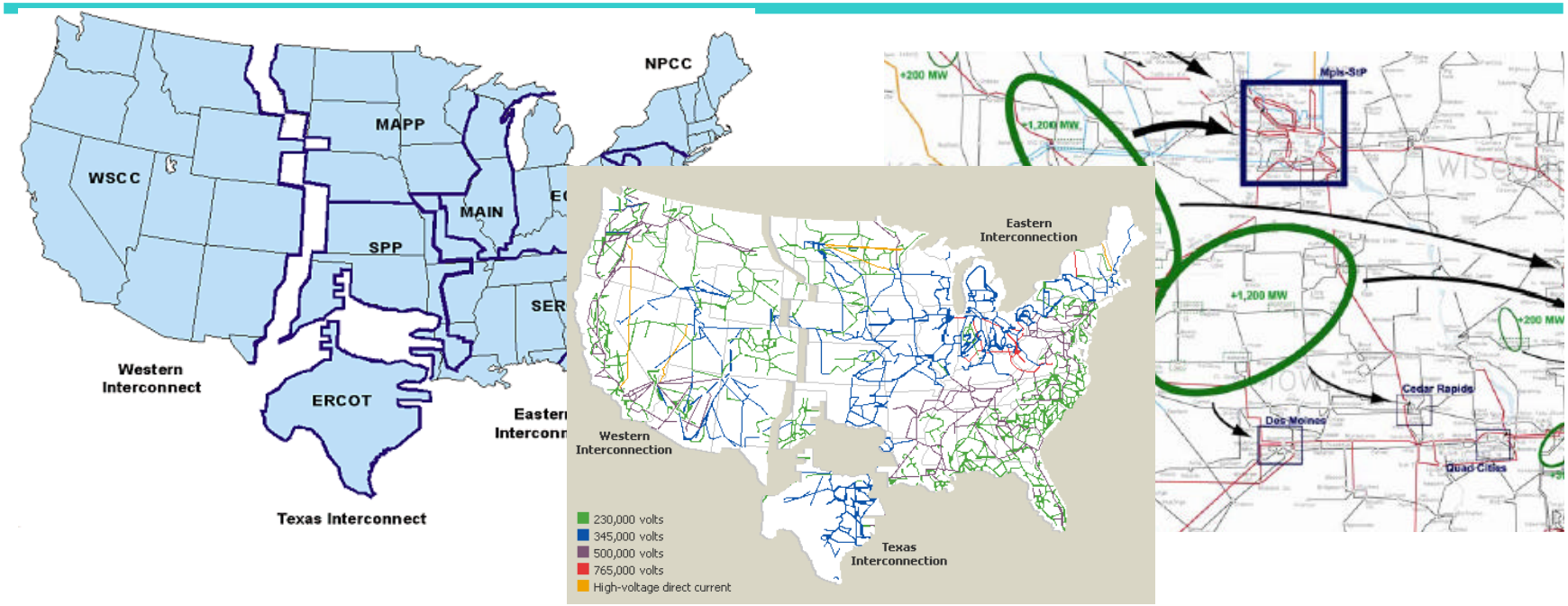
Limitation: Transmission Gridlock



- Designed in 1890's for station power, did not contemplate Distributed Generation
- $70-100B of grid required, smart grid requirements
- 7-10 years to build, at current rates
- For instance:
  - MISO 78.6 GW in que, mostly wind, Compare to MI at 22 GW
  - May be able to accept 3-5% without major investment

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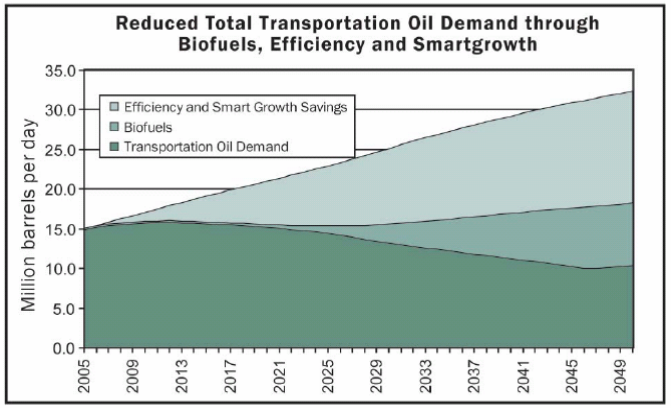
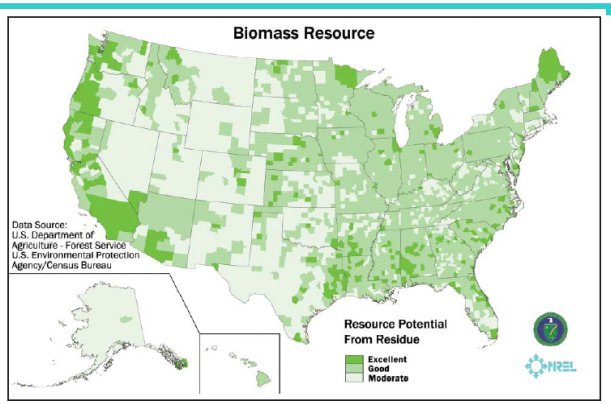
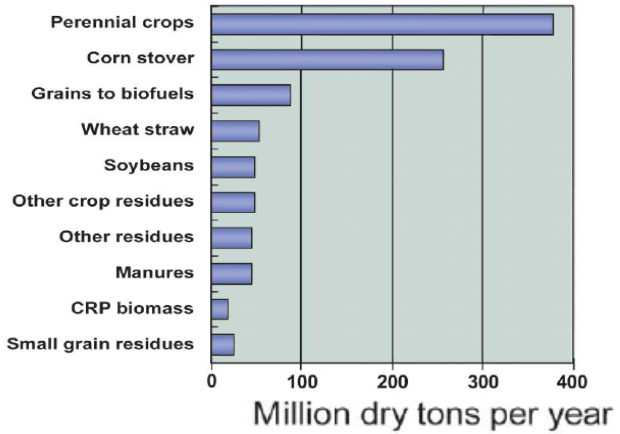
Biofuels







- Today:
  - Ethanol (liquid)
  - Biodiesel (Liquid)
  - Ag-Gas (gaseous)
  - Biomass (electrical power)
- Future
  - Cellulosic Ethanol (thermal and enzymatic conversion)
  - Mixed Alcohols
  - Missive and portable

Feedstock:

- Current:
  - Starches: corn, sorghum, sugarcane
  - Fats: soybeans & canola oil, animal fats
- Future
  - Organic (wood, manure, MSW, Corn Stover, etc.)
- Waste avoids Food vs. Fuel controversy

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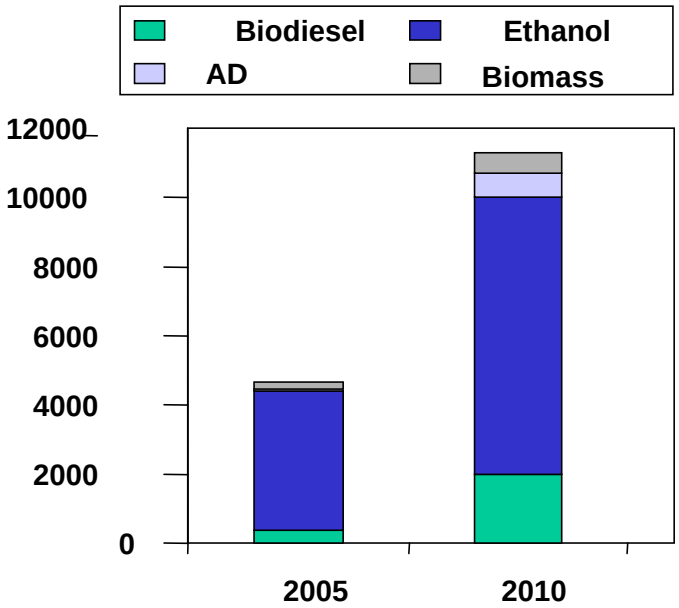
Investment Prospects: Biofuels



Biodiesel Market:

- Oil feedstock thin margins
- Waste oil/fat generally profitable

Ethanol Market:

- Buildout complete
- Plants crashing
- Asset purchase at discounts

• Analogous to the Dot.Com days…"frothy" market,,,Everyone rushed to "get in" without skill, market overshot, correcting

•2009/2010 will be good asset purchase time IF assets can be purchase and cost reduced, feedstock/offtakes can be appropriately hedged

• Biodiesel is directly missive, ethanol is not,

•Good stepping stone to more advanced Fischer Trosphe type fuels

•It is STILL a process chemical plant and should be treated as such

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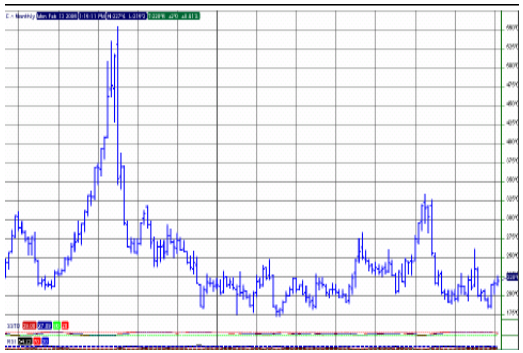
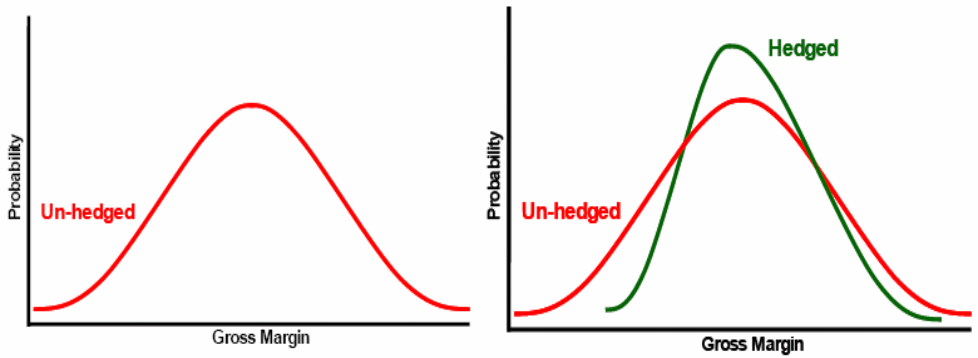
Must Minimize Commodity Risk

Monthly Corn Futures 1994-2006

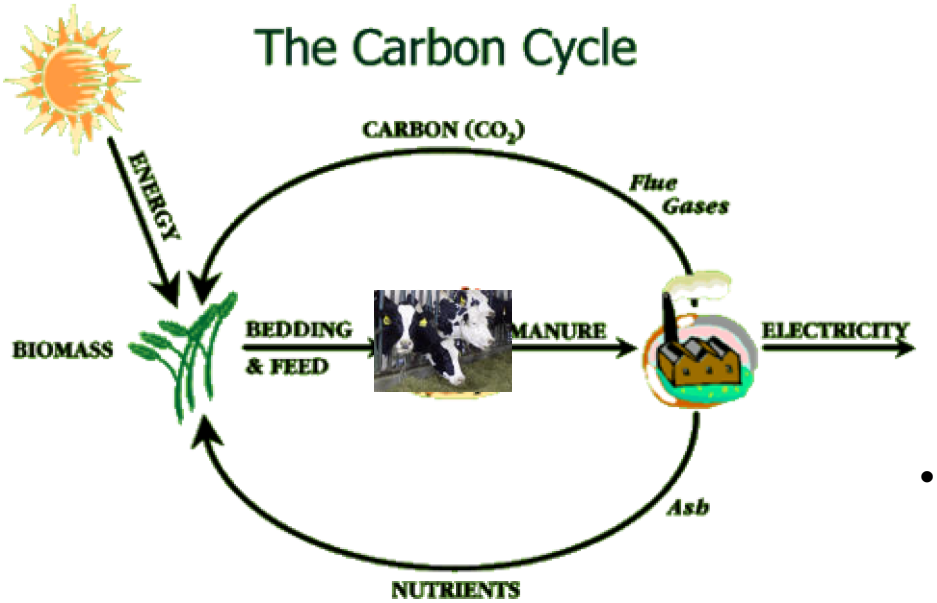


Monthly Unleaded Futures 1994-2006



- Systematic and integrated approach to address risk components
  - Ethanol, Corn, Natural Gas, Distiller's Grains, CO2
  - Soy oil, glycerine
- Long term commodity price uncertainty
  - Cash vs. Futures strategy
- Different technologies and projects have very different financing characteristics
  - Fuel commodity risk, Market price risk, Performance risk
- Regulatory risk
  - Production tax credits, Biofuels blenders tax credit, State RPS and incentives

Biomass: AD and Small Gasification



- Anaerobic digestion
  - Wet process
  - Converts biomass (MSW, agricultural waste, etc.) into Bio-gas (low quality, low BTU natural gas)
- Small gasification
  - Dry process
  - “Smolders” dried biomass (MSW, agricultural waste, sawdust/wood chips, etc.) in specialized combustion systems to make a synthetic gas
  - Creates heat/electricity

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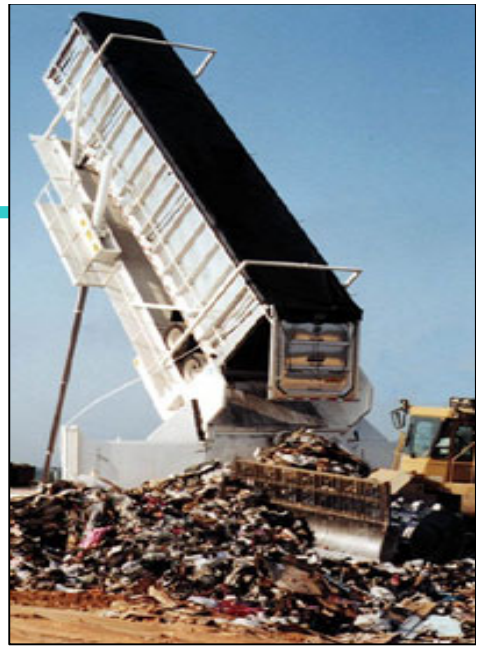
Environmental Waste Conversions



Municipal Solid Waste

CA MSW TOTAL				6,172,200	100.00%
Breakdown for Waste Procesing:					
Total suitable for RDF					68.51%
Metal					6.64%
Inerts for construction bedding					19.23%
Landfill disposal					5.46%
Batteries					0.15%

Farm/AG Manufacturing Waste

Raw material	dm %	odm % dm	average gas yiel l/kg of odm	Biogas m^3/t of substrate
Apple pulp	3	95	500	17
Apple marc	25	86	700	151
Brewing dregs	25	65	700	116
Biological waste	40	50	615	123
Blood meal	90	80	900	648
Grease trap residues	30	95	1000	285
Vegetable waste	15	76	615	70
Chicken manure	15	77	465	54

Considerations

- Optimal Sizing
- Optimal Technology
- Optimal Products
- Optimal Hauling Radius
- CapEx per Ton=?

Need to understand relationship between capex and energy density to offset and hauling (fuel shed radius)?

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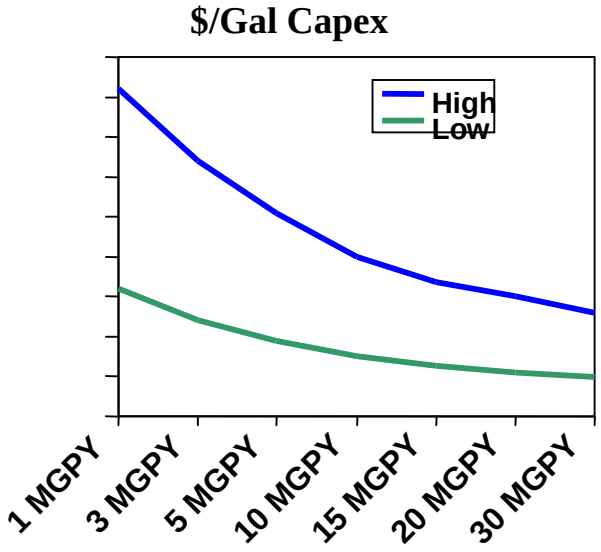
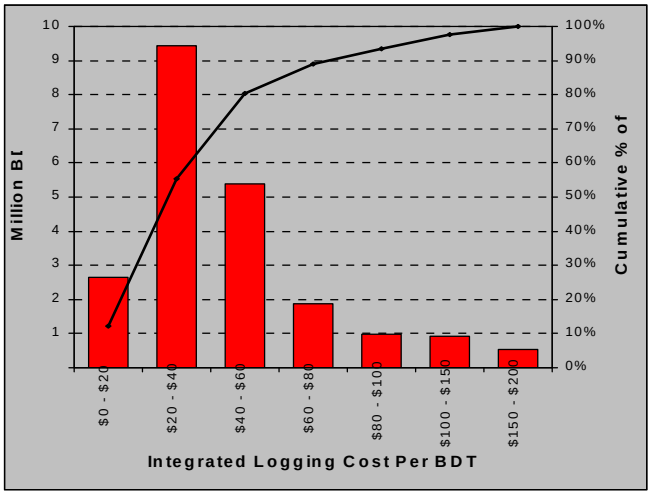
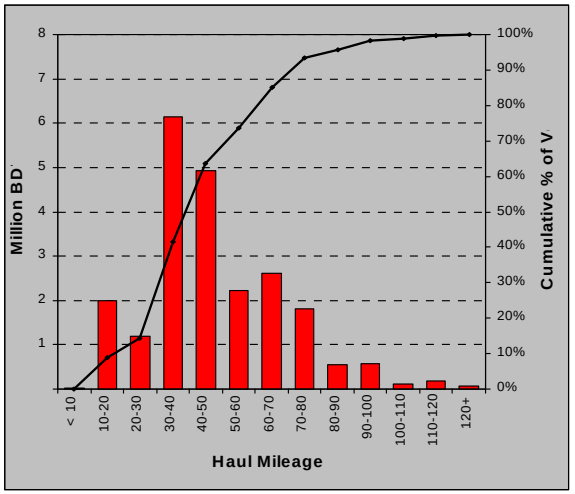
Size matters

Economy of Scale VS. Logistics and Hedging







MSU Study

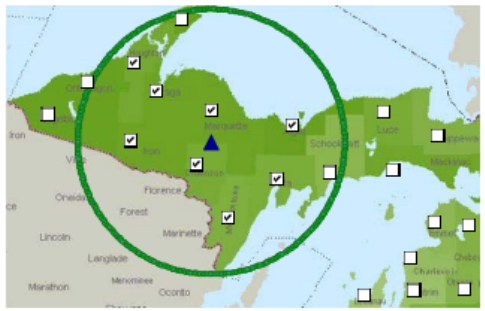


Figure 25. Catchment Area for Hypothetical Forest Products Biorefinery

?

Need rigorous qualification optimize scale for community system

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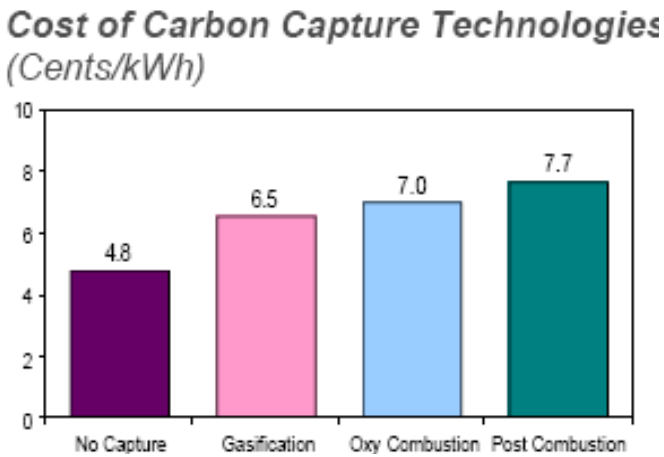
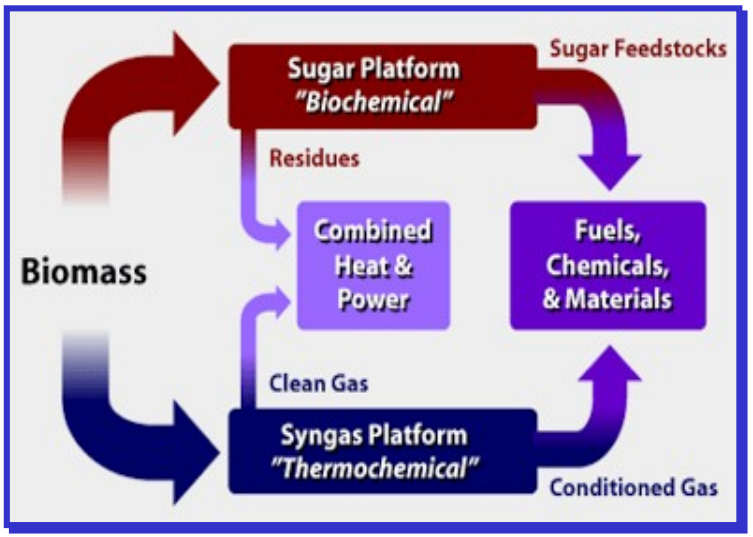
Breakthroughs…what is the best path??

Sustainability vs. Climate Impact Vs. National Security????

Coal-to-Liquid Breakthrough Could Cut Oil Imports

Carbon Capture and biomass generation through Algae is in experimental stage





Need to understand what is real, where it fits, costs, timing, etc…

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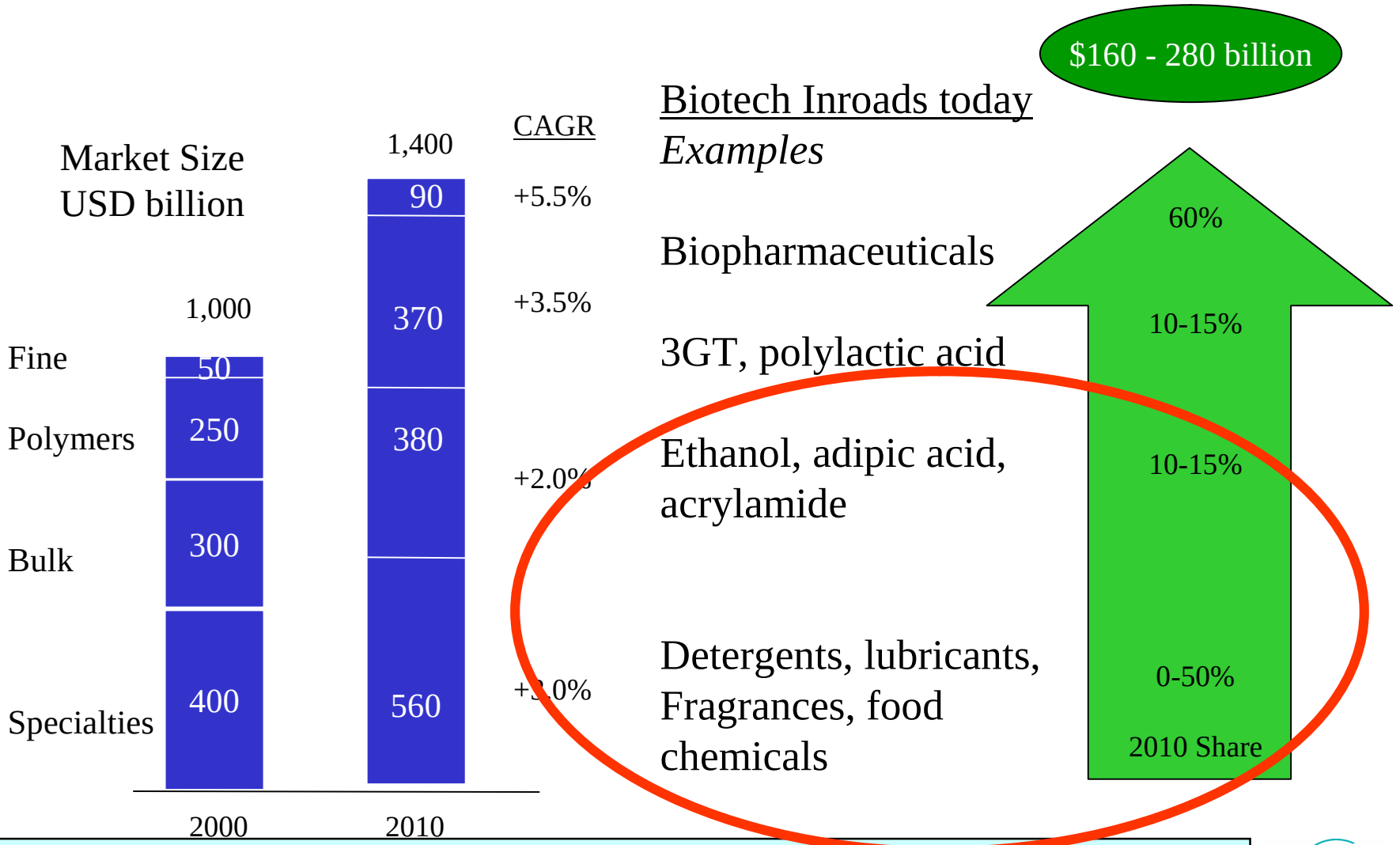
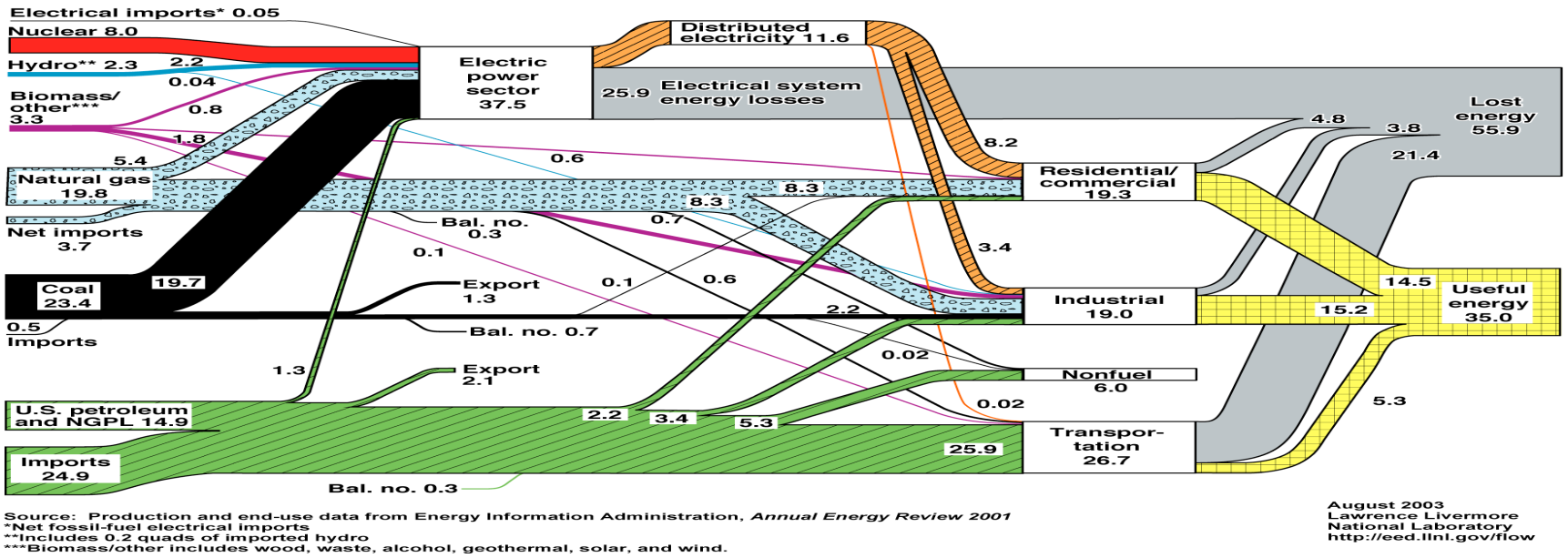
Goal: Replace petroleum derived products with community biomass “high value niches”



Need to understand which products fit…how to get up the niche value chain

Source: McKinsey and Company, 2003

Energy Savings Potential ….
best ROE highest near term impact



- Salvaging Energy Wasted (2001), the REAL generation:
  - Value: 55.9 quads/90.9 quads= 62.11% potential
- ESCO areas developing a “build – own – operate” model with off-balance sheet production of electricity, heat and gas from industrial and agricultural waste
- Development funding for these projects has and will continue to be required

Source: American Society of Energy Engineers

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PROJECT FINANCE

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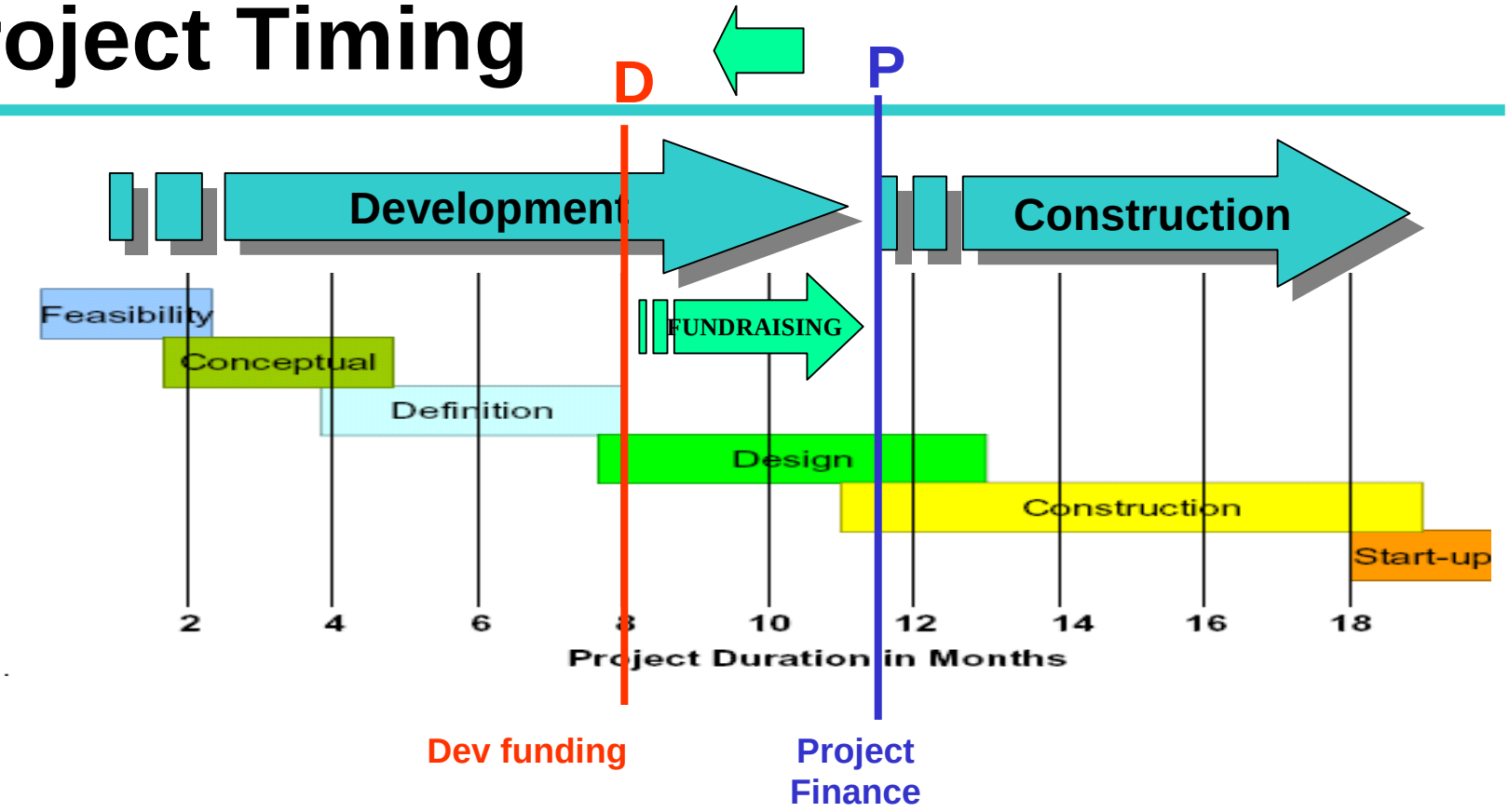
Project Timing



- Timing varies widely, but typically 18-24 months from project inception
- Development funding should be sufficient to last through the development.
- Fundraising may take 4-6 months after finalized “package”, depending on complexity and structure

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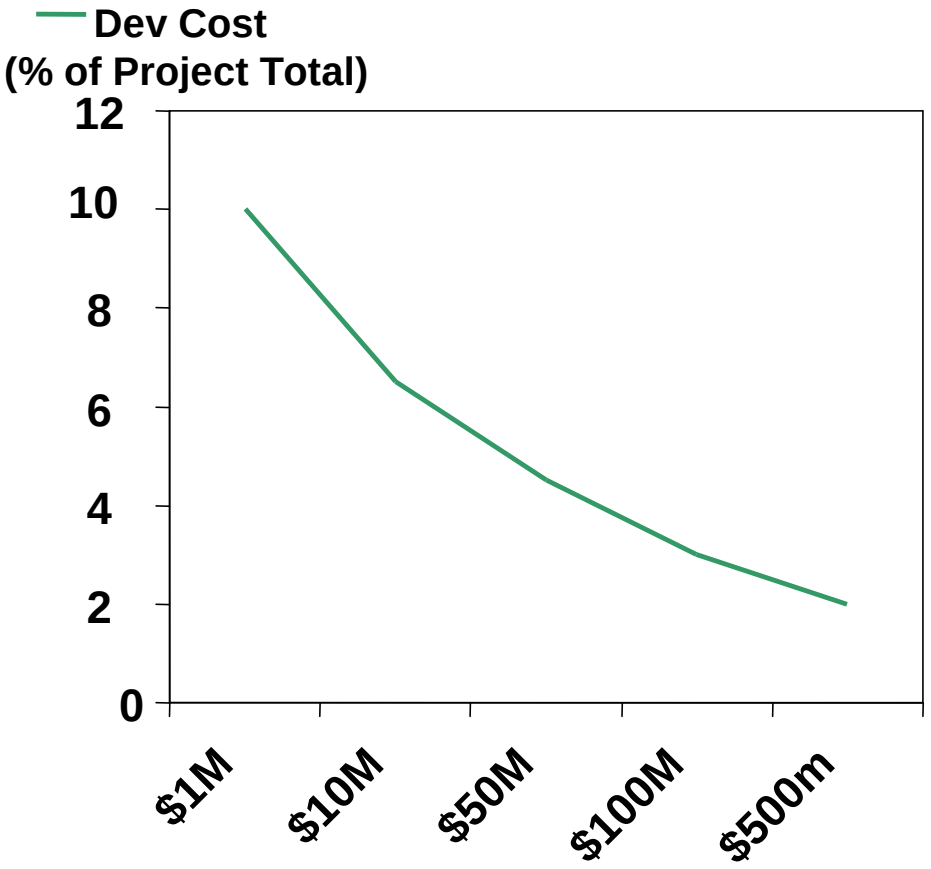
Development finance



- Depending on size, development costs range from 2-10% of total project,
- Highest risk funding
- Highest rate of return money (30%-50%++)
- Development funding may be complimented with grants, loans

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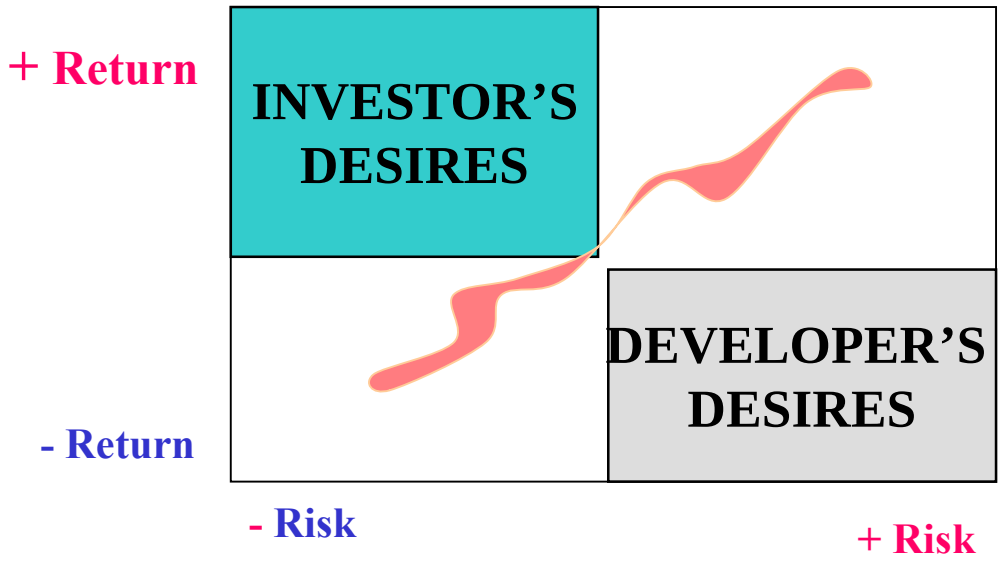
Renewable Energy Project Finance Gap



(unsophisticated?)Investor/ Lender

- I want 40% ++ with no risk
- Get me out next year with an IPO
- I will give you $ 3 million Pre-money valuation

(unsophisticated?) Developer

- Investors should invest in my project because it is the socially responsible thing to do
- Let's get going, will fill in the details later
- Don't look over my shoulder, I want a "silent partner"
- I give you slightly better than prime rate, so I can keep the majority of "my project"
- I'll offer you 5% of the project for $80 million

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Project Finance

Proper structuring to balance debt and equity can reduce risk & improve returns

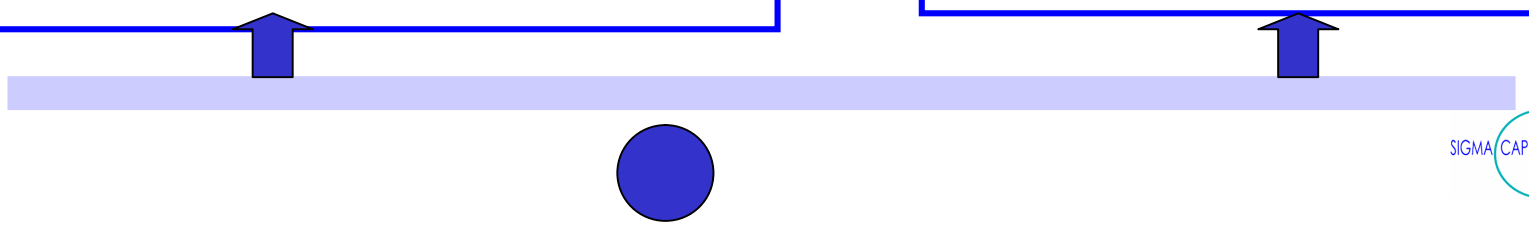
The larger the project, the more complexity & possibilities of improvement through structuring

Debt

- Construction
- Permanent Finance
- Bonds (taxable and exempt)
- Equipment / Operational Lease
- Mezzanine (limited)
- Grants & government loans

Equity

- Private-accredited
- Institutional
- Socially Responsible Investors
- Strategic & Vender Finances
- Tax investors



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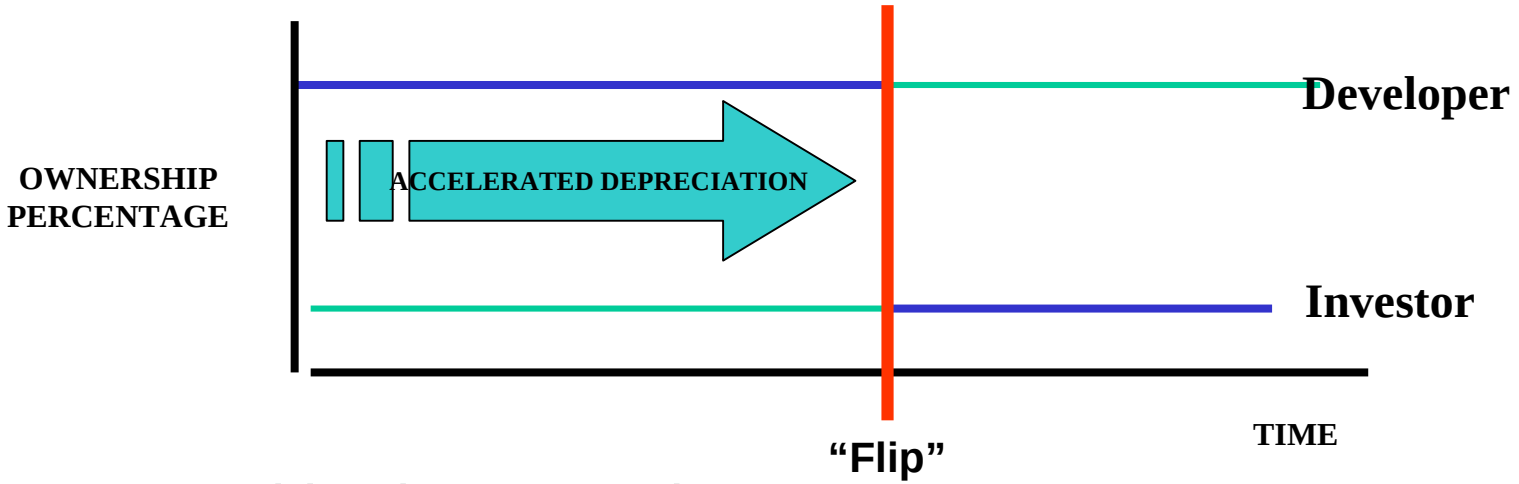
Tax investment



- Initial (5-7 years)
  - 5 years MACRs depreciation
  - ITCs
- "Sell" the majority of the project to investor who can tax losses against passive gains
- "Flip" back to the developer (ratio reversed) after investor returns are realized
- Complex structures, requiring legal and accounting professionals skilled in the issues

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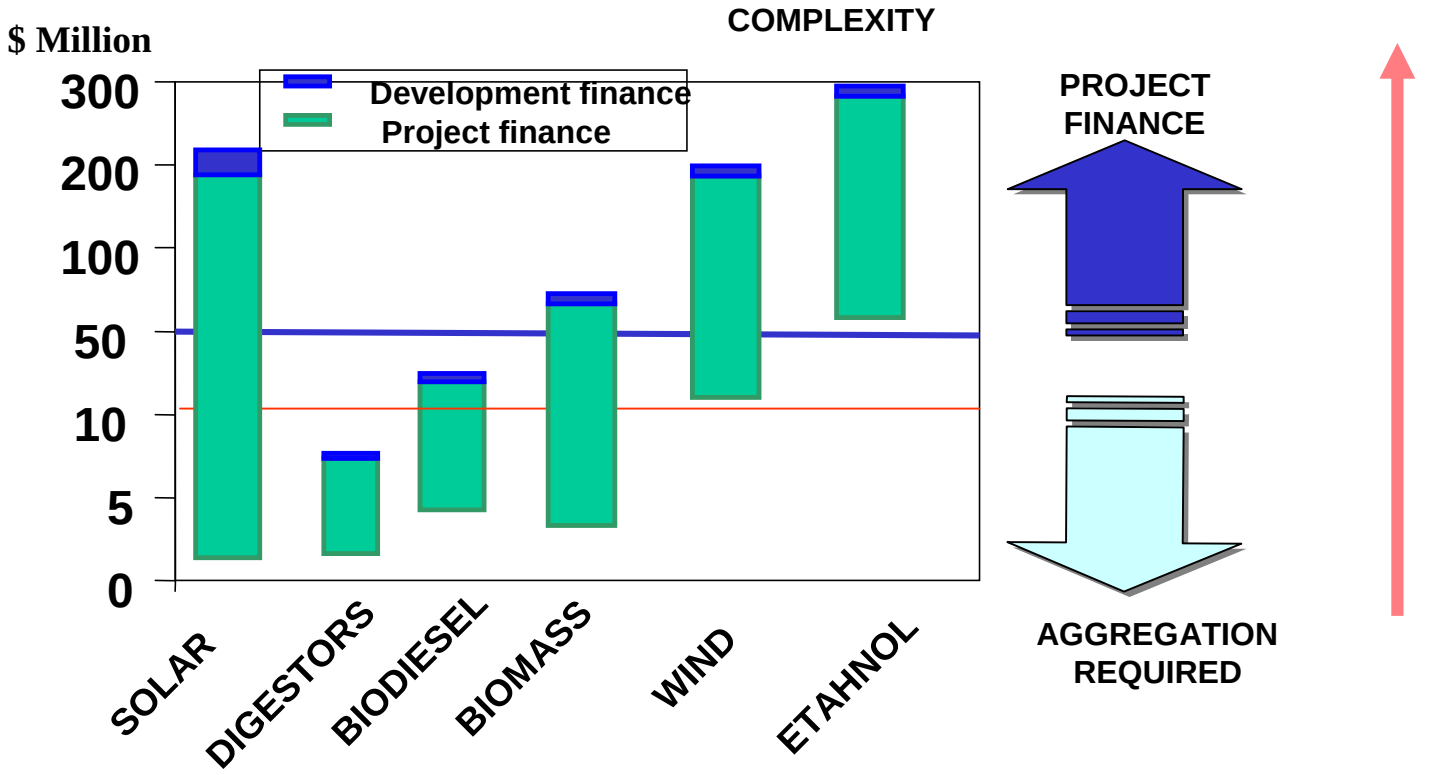
Economy of Scale: Size vs complexity



- Larger transactions: (ethanol, wind, biomass power generation, solar grid connect) more complex, require substantial structuring
- Smaller transactions: (solar rooftop, bio diesel, anaerobic digesters) less complex, require little or no structuring
- Investment banking generally required to structure larger transactions
- Investment in smaller transactions better suited to aggregation

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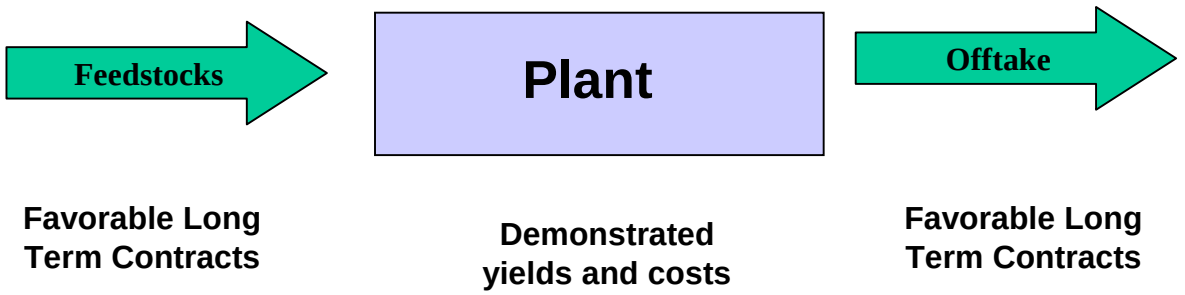
Project Finance, what to look for…

- The risk/return profile and valuation are consistent with the financial markets and company expectations
- Management team has the experience and capability for the project undertaken
- The project is realistic and major risks are mitigated
    - Feedstock agreements
    - Offtake agreements (Merchant vs. contract)
    - Creditworthiness of Offtake purchasers
    - Technology risk/obsolescence
    - Performance bonding/ Construction risk



Project finance looks through the project to the value and balance sheet of the offtake agreement

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Typical Pre-Tax Retuns (tax equity)

Type	Size of investmet	Pre Tax Returns	Holding period
Wind, small	$.5m-$25m	6-18%	7+ years
Wind, Utility	$25M++	6-15%	10+ years
Solar, rooftop	$.5-$5M	6-15%	7 years typical
Solar, utility	$50M +	6-18%	10-20 years

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Typical Pre-Tax Retuns (Project Finance)

Type	Size of investmet	Pre Tax Returns	Holding period
Biomass to power (BTP), small	**$3-30M**	**15-25%**	**5-7 years**
BTP, Utility	**$50M+**	**10-15%**	**20 years**
Biomass to Liquid, small	**<$50M**	**20-35%**	**7 years typical**
BTL, Medium	**$50-300M**	**20-30%**	**7-20 years**
Coal to Liquid	**$100M+**	**20-30%**	**10-20 years**

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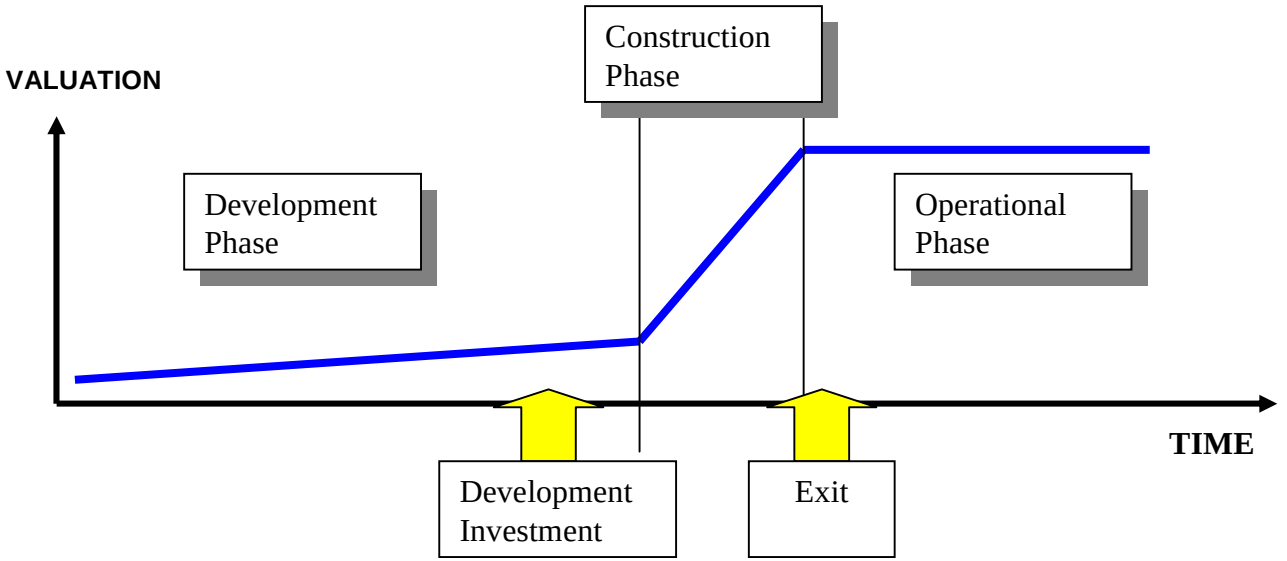
Example: Sustainable Energy Development Fund



- Late-Stage Development Projects
  - Construction must commence within [6-9] months from funding
  - Proven technology
  - Significant Ownership in Return for Investment
  - Higher returns than project finance phase (20%++ target)

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In the End…an uphill battle

- Extremely Exciting Time for Alternative Energy Industry
  - High Product Interest
  - Strong Governmental Support
  - Bright Future
- Alternative Energy is Still a Business
  - Subject to the Laws of Supply & Demand
  - Regulation
  - Expectations of Shareholders
- Alternative Energy Businesses need to be Sited, Built, Organized and Managed to be Sustainable and Effective in the Long Run

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TURNING RENEWABLES INTO SHAREHOLDER VALUE

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