

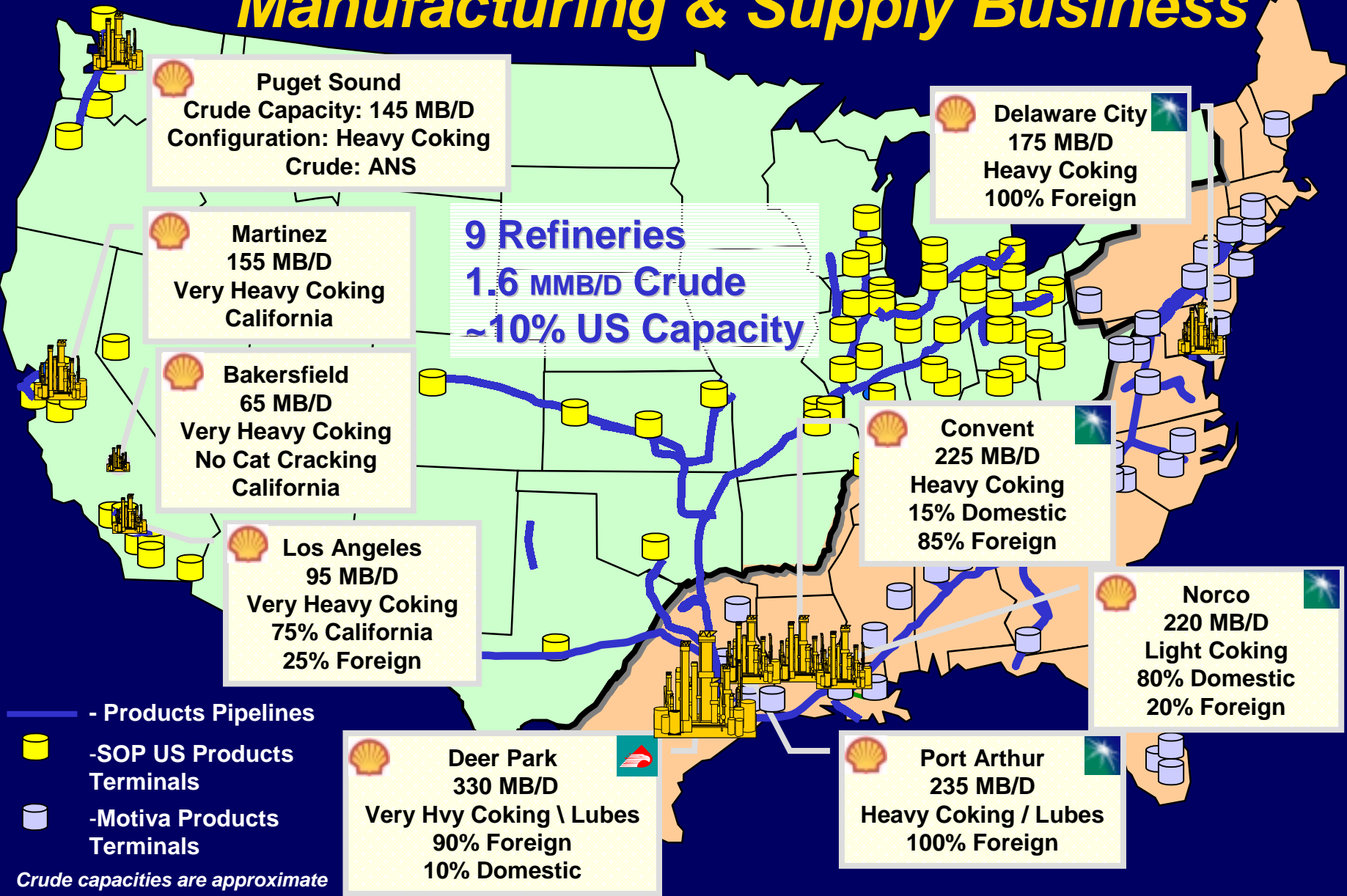
Impact Of Clean Air Regulations On the Refining Industry

Northwest Construction
Consumer Council
12 November 2002
Seattle, WA



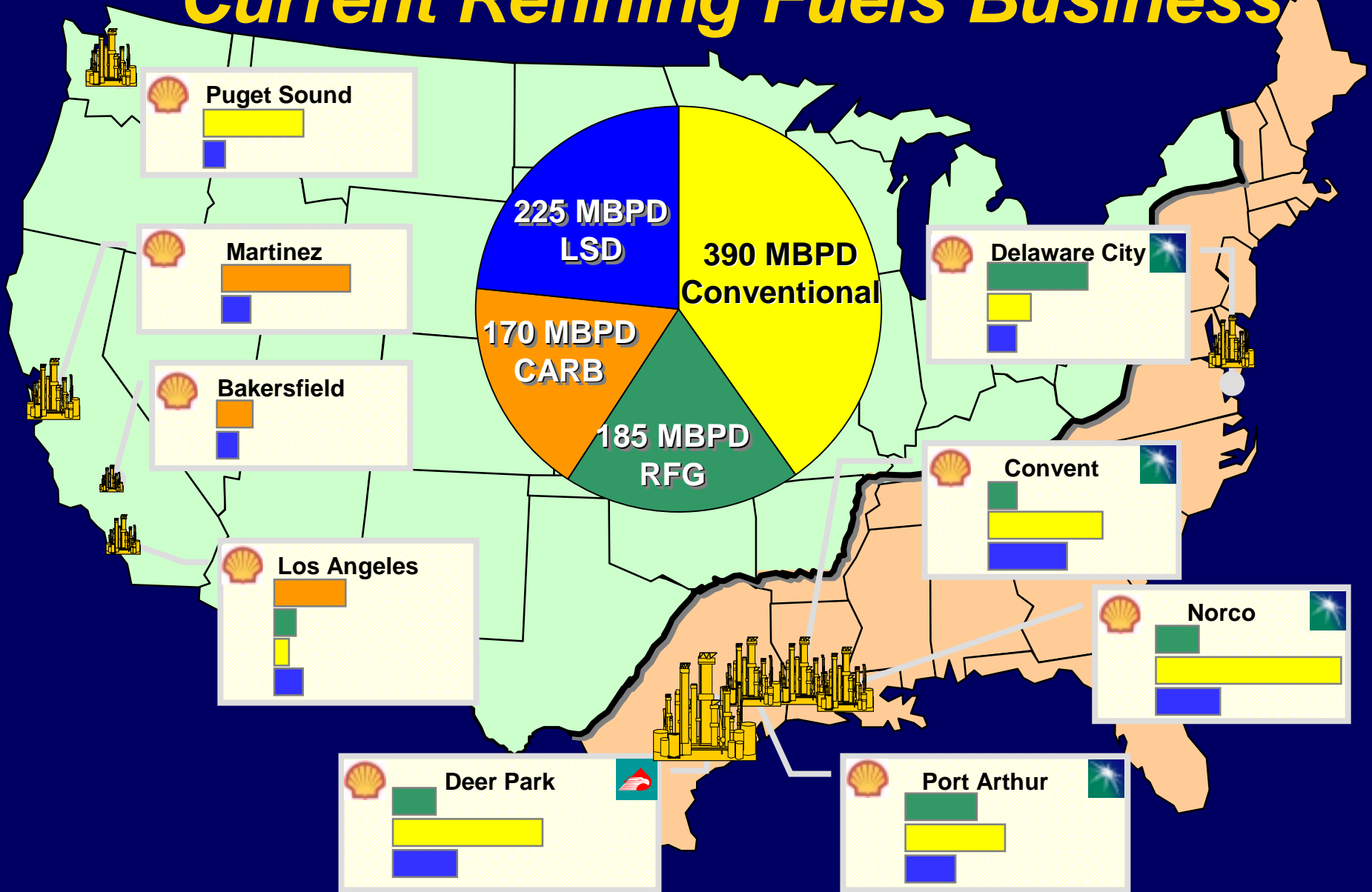
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Manufacturing & Supply Business



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Current Refining Fuels Business



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What's rock'in our boat?

EPA New Source Stds

**RFG Phase II &
Air Toxics Limits**

CARB 3 Specs

- *Lower S*
- *Lower Bz*

Low Sulfur Gasoline

- *Federal Low Sulfur Std*
- *State sulfur rules*

Sure glad we're in a
simple Commodity
Business!



On-road Diesel

- *Federal Low Sulfur Std*
- *Texas Low-Emission*

Off-road Diesel

- *Proposed Fed Rule 2Q'03*
- *Texas Low-Emission*

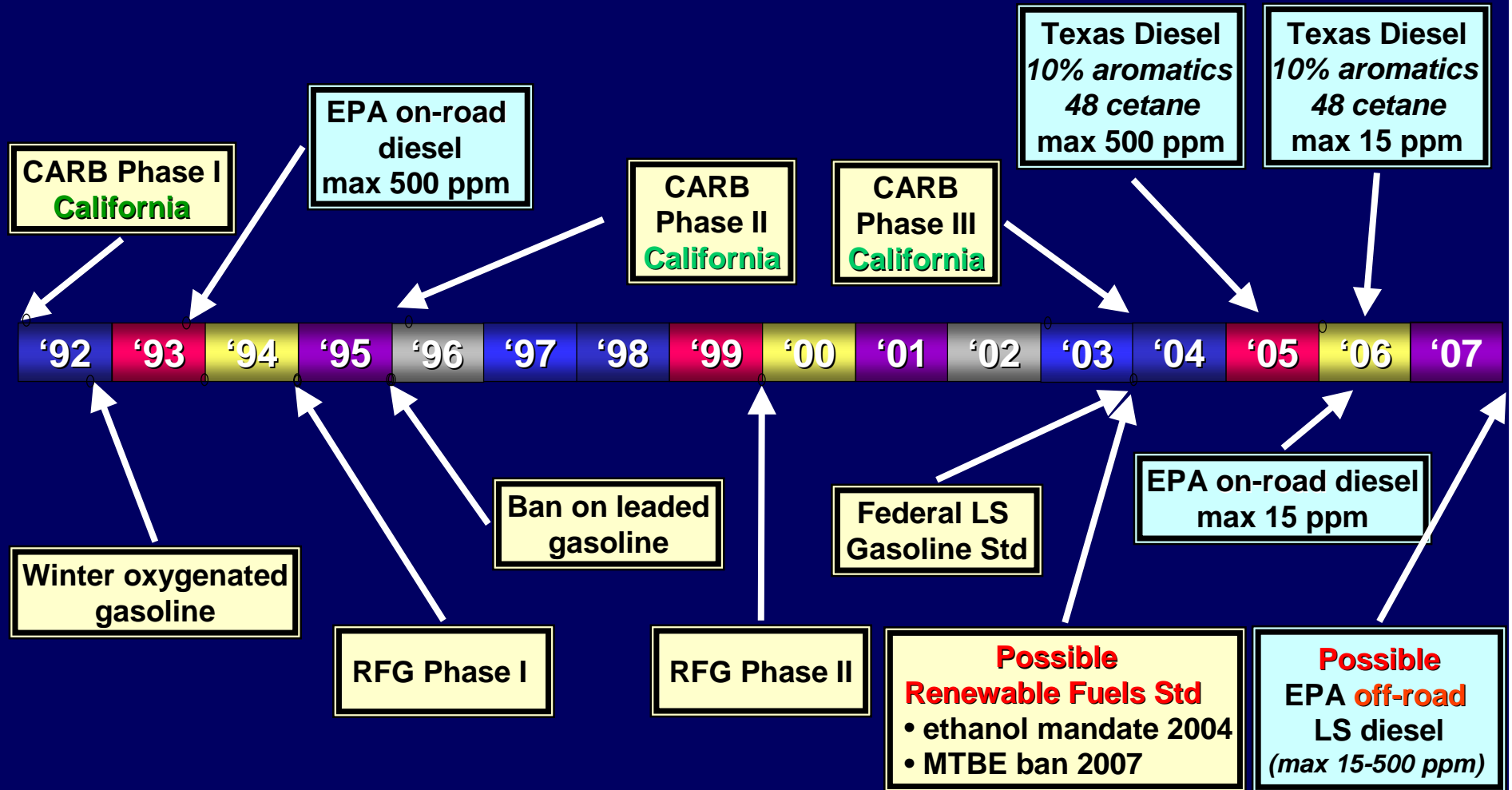
Renewable Fuels Std?

- *Ethanol mandate*
- *MTBE Ban*



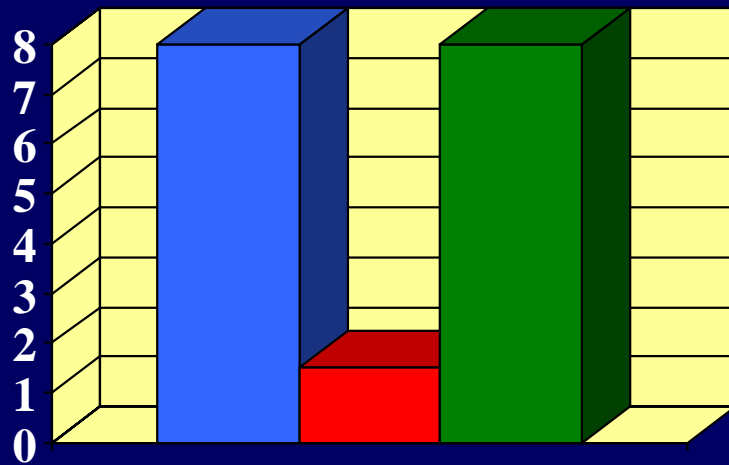
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Clean Fuels Timeline



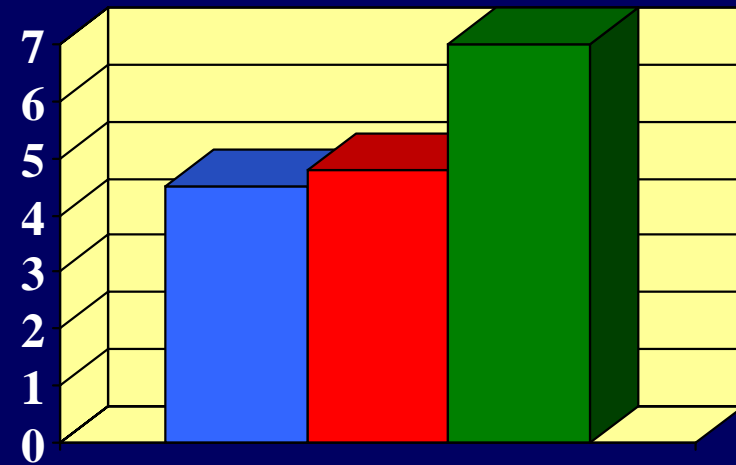
Cost of Compliance (Industry)

CAPITAL (Billion \$\$'s)



■ LSG ■ Ethanol ■ ULSD

CAPITAL + OPERATING (cpg)



■ LSG ■ Ethanol ■ ULSD

Based on National Petroleum Council (NPC) Refining Study, "U.S. Petroleum Refining - Assuring the Adequacy and Affordability of Cleaner Fuels", June 20, 2000 and DOE estimates



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What Are The Longer-Term Fuel Premises?

Low
Cost

Reliable

Run
Length?

Hydrogen
Supply?

MOGAS
Oxygenate?

HELP!

MOGAS/Diesel
Sulfur Specs
15? 10? 5?
ppm S

Diesel
Cetane?
Aromatics?
Density?

Off-road
Diesel
Specs?

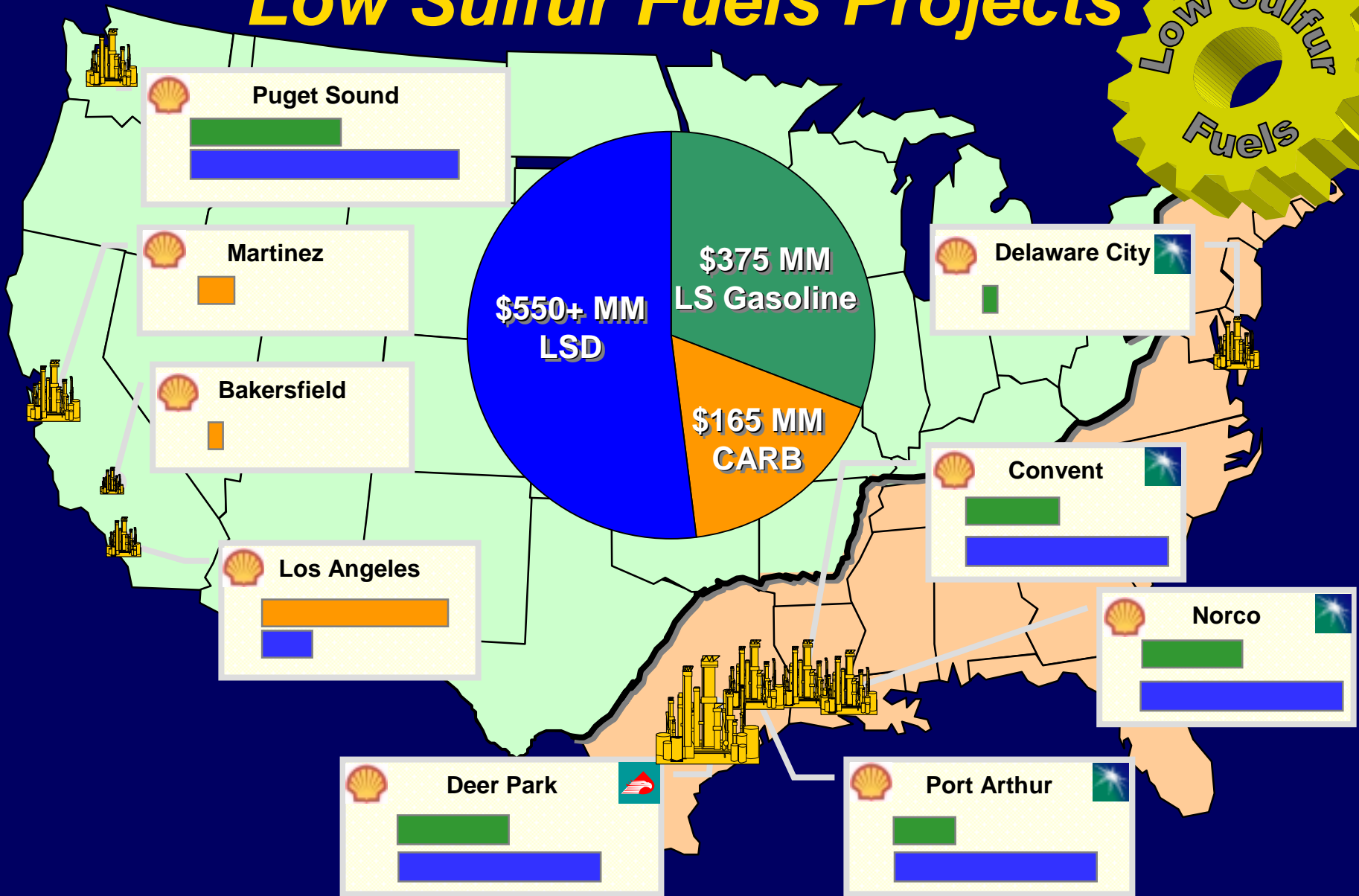
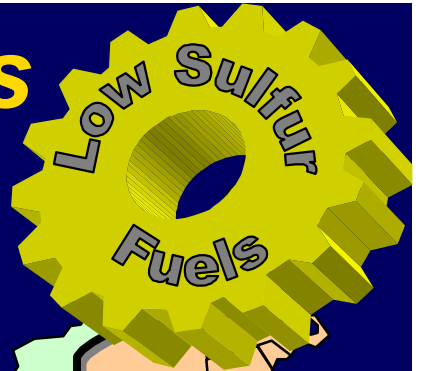


Strategic Issues - Fuels

- **Future Fuel Specifications**
 - MOGAS and Diesel sulfur - 10 ppm S? 5 ppm S?
 - Diesel - aromatics? cetane? density?
- **Design**
 - Revamp or grass roots
 - Commercially proven
 - Design “no-regrets” case
- **Lowest total cost of ownership (TCO)**
 - Refinery gross margin impact
 - Capital investment (and unit downtime)
 - Operating and maintenance costs
 - Unit run length, reliability
- **Engineering/Construction**
 - Replicate designs where possible
 - Secure Eng/Proc/Constr early



Low Sulfur Fuels Projects


























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EPA Enforcement Initiative

- **Leak Detection and Benzene controls**
- **Focus on significant reductions**
 - SO₂
 - NO_x
 - Particulates
- **Flaring focus**
 - Sulfur Plant reliability
 - Sour Water Strippers
 - Compressors or monitoring on post '73 flares
- **Clean Slate on Nearly All Significant Issues from States and EPA**



EPA Enforcement Initiative - Industry

Status Unknown	Understand Discussions Underway??	Signed
 <p>       </p>	 <p>       </p>	 <p>         </p>



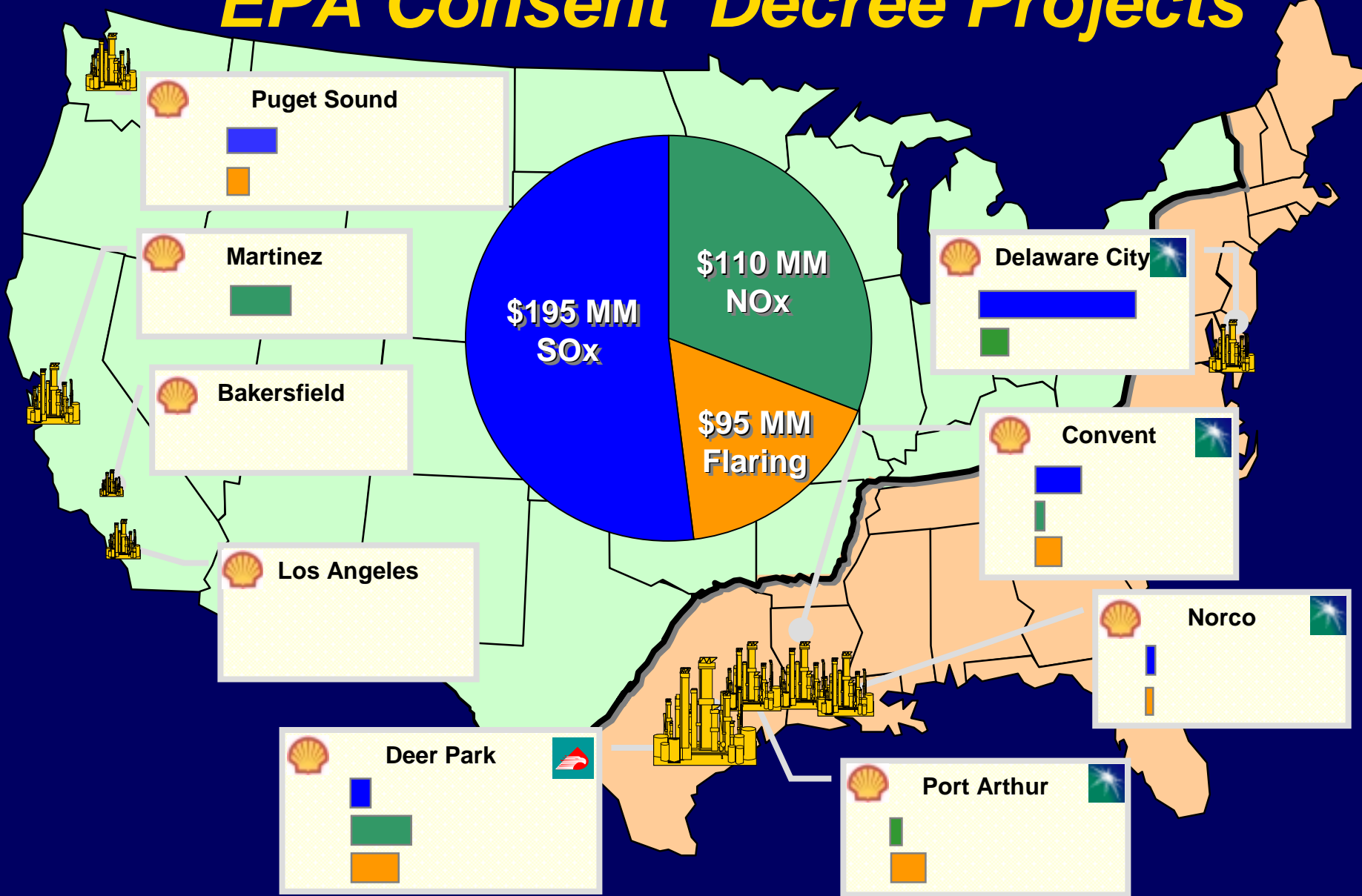
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EPA Consent Decree - Implications

- **EPA commitment to “level playing field”**
 - 35% of industry currently covered
- **What do future regulations look like?**
 - State Implementation Plans (SIP’s), NSR Reform
 - Design “no-regrets” case
- **Technology**
 - In development, especially NOx control
 - Low risk tolerance for compliance projects
- **Strategic Implications**
 - Community relationships
 - Lower emissions can allow growth
 - Controlled units increase feed flexibility
 - Synergy opportunities
- **A different relationship with EPA**



EPA Consent Decree Projects



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Puget Sound Refinery Projects

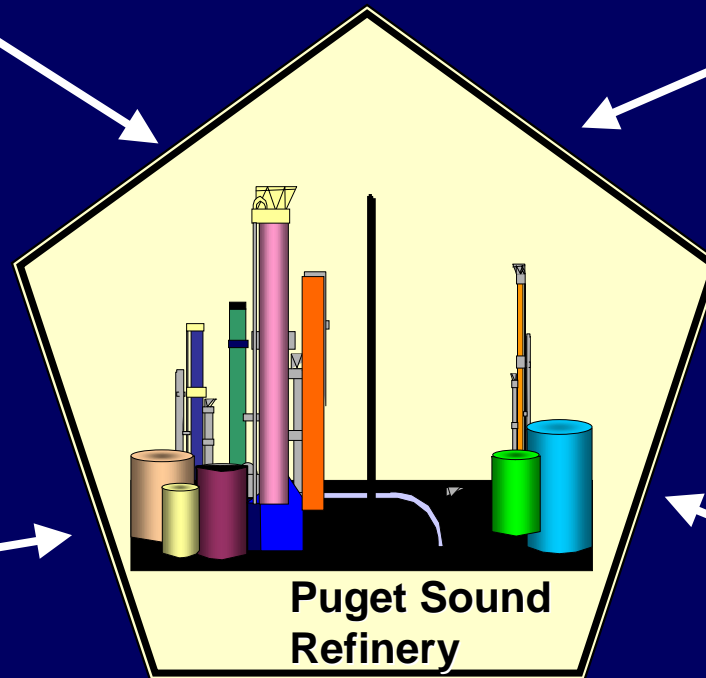
\$325 MM Capital

Low Sulfur
Gasoline

Ultra Low Sulfur
Diesel

FCCU SO_x
Scrubber

Sulfur Plant
& Flaring



3rd Party H₂ Generation



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The Reality

- **Cleaner fuels are here to stay**
- **Continued pressure to reduce emissions**
- **Other demands to excel**
 - **safety**
 - **environmental compliance**
 - **reliability**
- **In-time Permits/Engineering/
Procurement/Construction are critical**
- **“No regrets” investment philosophy**
- **Must weigh technologies risk/rewards**

