



Evaluating Supply Concerns: Regions, Batching, 15 ppm Kerosene

A Presentation by

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to the

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Regional Characteristics

PADD 4, Mountain

- ✳️ Market tiny but growing; infrastructure sized to fit
- ✳️ Distances long, infrastructure thin, terrain steep
- ✳️ Few products (LSD only, e.g.); tanks optimized

PADD 2, Midwest

- ✳️ Infrastructure rich, but logistics strained
- ✳️ Contrast agricultural west (sparse) with industrial east (dense)
- ✳️ Receives ~30% of inter-reg'l pipeline product; sends 8%; much intra-reg'l flow

PADD 1, East Coast

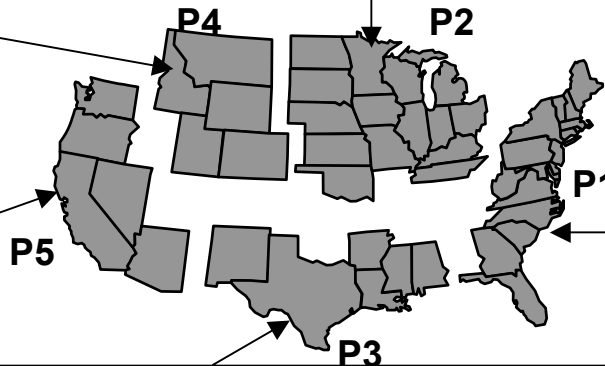
- ✳️ Receives ~60% of all inter-reg'l product pipeline movements; 90% of all high sulfur distillate movements
- ✳️ Largest concentration of oil-heated homes (N'east)
- ✳️ Only area where ~all pipelines carry high sulfur distillate

PADD 3, Gulf Coast

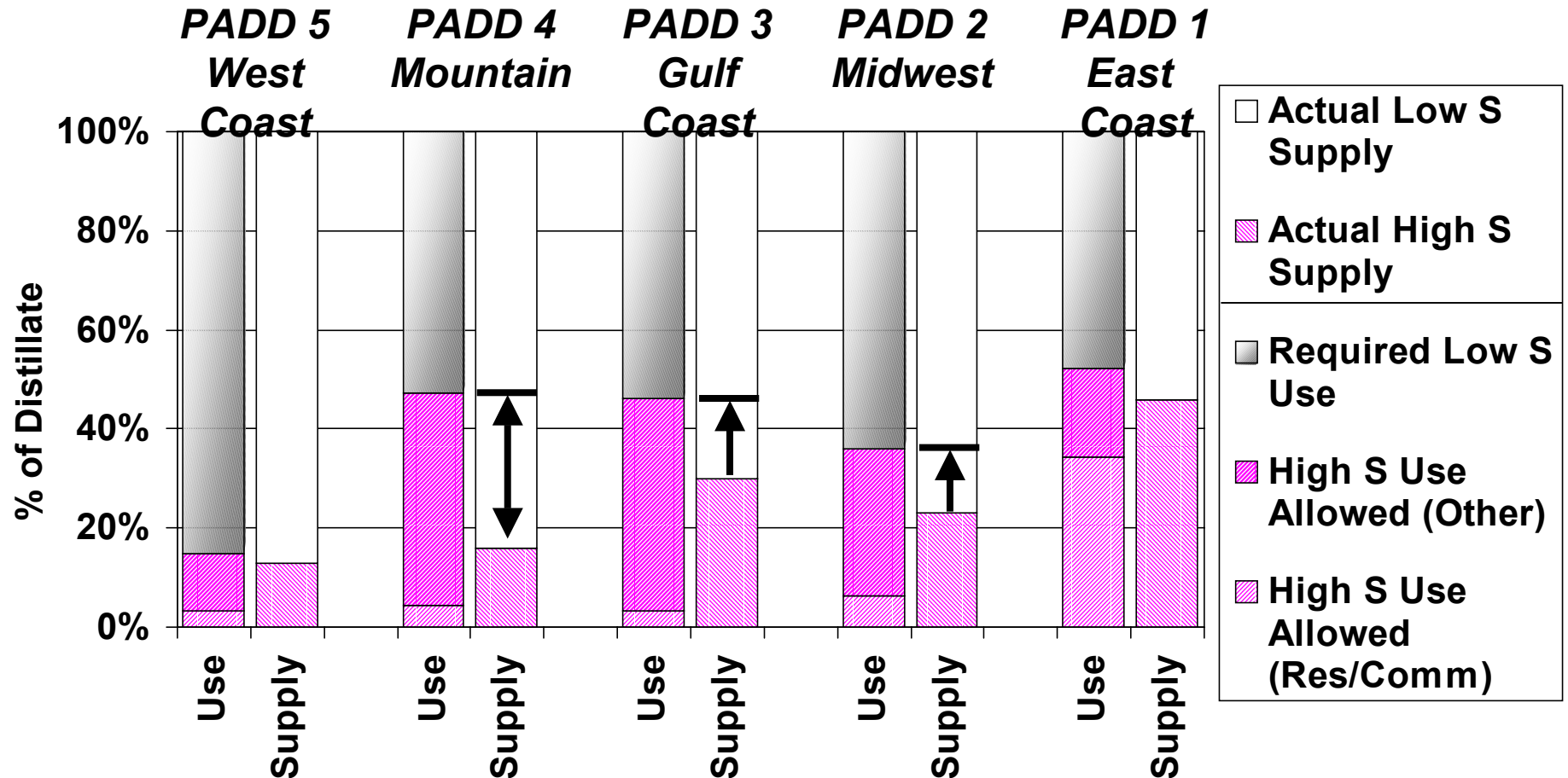
- ✳️ Largest supply region: No foreign nation has higher refined product output
- ✳️ Sends 80% of all inter-reg'l pipeline product, 83% of the low sulfur distillate and 94% of the high sulfur distillate

PADD 5, West Coast

- ✳️ 2-3 distinct refined product markets
- ✳️ California separate; no HSD



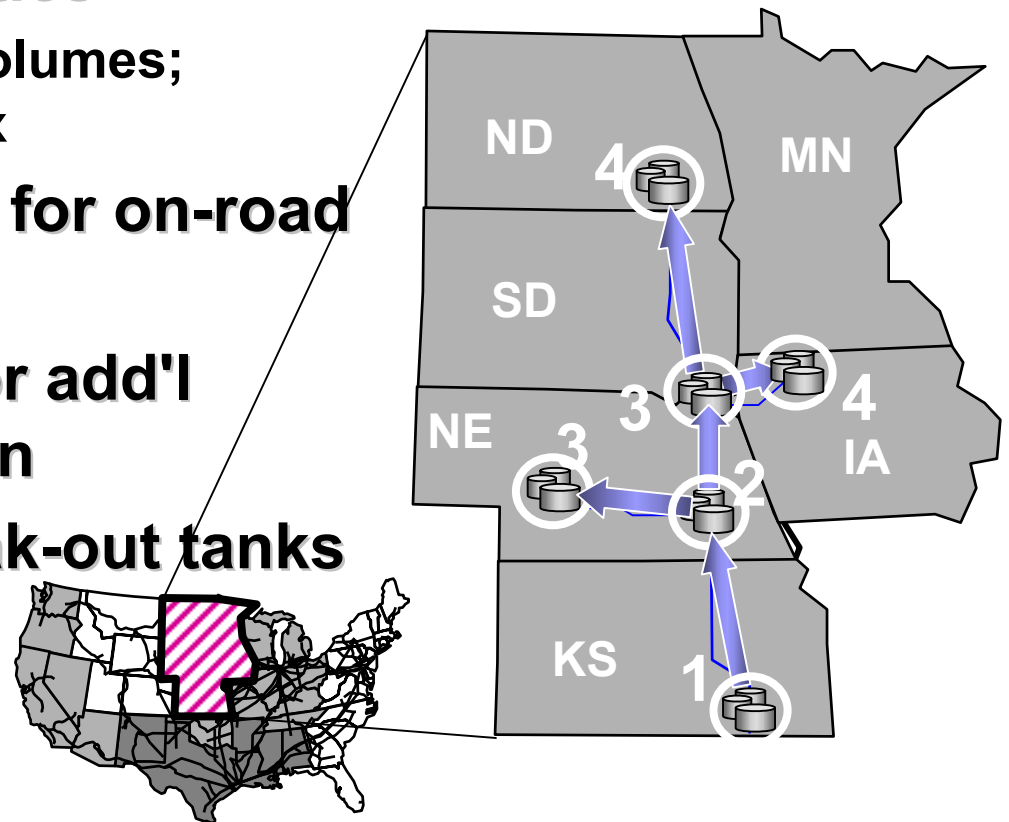
E.g., Minimizing Products to Optimize Infrastructure (Current)



Source: EIA, *Sales of Fuel Oil and Kerosene and Petroleum Supply Annual*. Data are for 2000, latest sectoral/regional consumption available. PADD 5 use adjusted for California's low sulfur requirement.

Special Concerns in the Mountain and Plains States

- ✱ **Infrastructure sized to fit market's characteristics**
 - ➔ Terrain; Distances; Volumes; Sources; Demand mix
- ✱ **Transport one diesel for on-road and off-road**
- ✱ **No tanks or piping for add'l grade during phase-in**
- ✱ **Systems dictate break-out tanks**



California's Special Challenges

✱ Currently, all LSD

- California reg applies 500 ppm to all uses, not just highway
- Jet interface goes to LSD
- Transmix tanks must have space: used for transmix and to meet DOT requirement for pressure relief capacity

✱ Then, all ULSD

- ULSD cannot accept jet interface
- Must wrap ULSD in gasoline, transmix will double
- No home for any accidental downgrade **LOCKOUT**

✱ Transmix issues

- More customer/shipper truck trips to haul transmix
- Increased truck traffic coincides with truck increase for ethanol shipments
- If customers/shippers miss schedule, not enough space to meet DOT pressure relief requirement. **LOCKOUT**



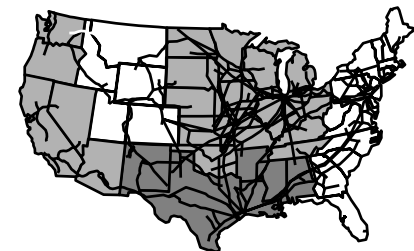
Kero for Winterizing Diesel: An Issue in the North

- ✱ **Kerosene for "winterizing" diesel**
 - Keep product flowing in cold weather
 - Common in cold climates
 - Must be 15 ppm in 15 ppm diesel
- ✱ **Currently, can use jet fuel or K1 (heating kero)**
 - Share (optimize) tanks/piping
- ✱ **New requirement will require segregation (unless jet also at 15 ppm)**
 - Reduce flexibility
 - Increase cost of handling small volumes

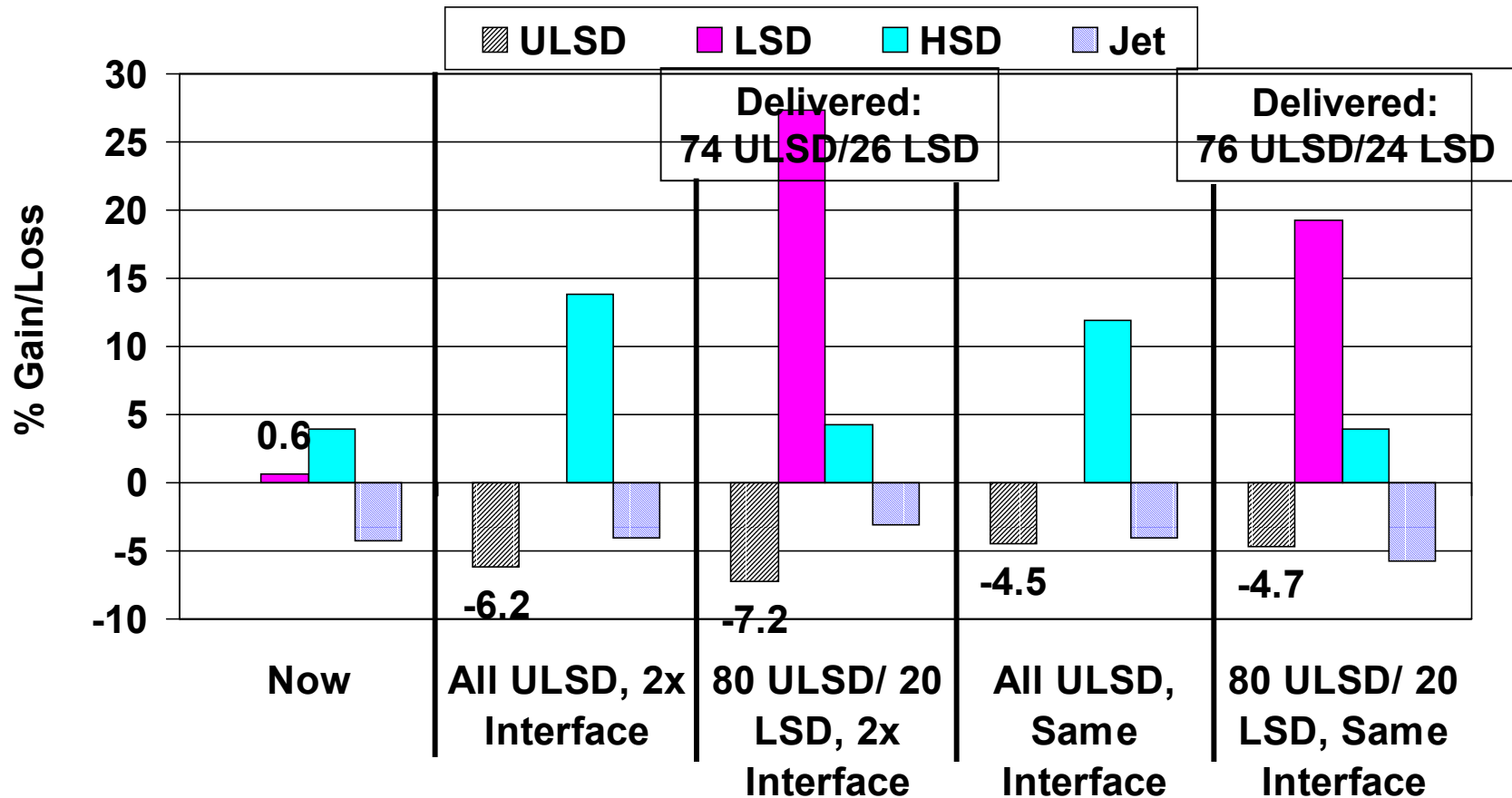


Sequencing and Interfaces: Nationwide Impact

- ✱ **If/while LSD or HSD market available, use to buffer jet and ULSD**
 - ➔ Impacts sequencing/cycles, but little impact on infrastructure
 - ➔ LSD (smaller market) will have larger % gain from downgrade
- ✱ **If sequence jet with ULSD, must remove interface to transmix**
 - ➔ 2x interfaces creating transmix (old + new), so double volume
 - ➔ Tanks required at new locations?
- ✱ **If no LSD or HSD market available, buffer jet and ULSD w/gasoline**
 - ➔ Increases gasoline cycles, but decreases vol. to market
 - ➔ Increases transmix, and its infrastructure
- ✱ **If jet fuel spec reduced to 15 ppm**
 - ➔ What of lubricity and other quality issues?

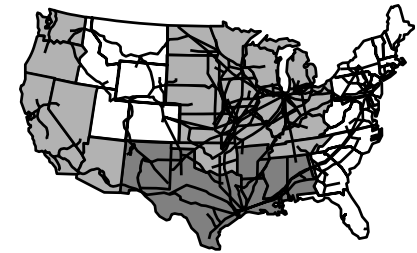


Downgrade Volume Larger, Even If Interface The Same



Excludes transmix and terminal tanks/piping.

A Home for Downgrade: An Uncertainty Nationwide



- ✱ **May not ship it, but may create it**
 - ➔ Enough to merit a tank?
- ✱ **Will customers/shippers want LSD? HSD?**
- ✱ **More downgrade further downstream (%)**
- ✱ **Need a home for downgrade at line's end every time**
 - ➔ "Last" (most downstream) customer for LSD/HSD must take all
 - ➔ Stop line for slower delivery speed (cf. Atlanta's gasoline)



Uncertainties Now

- ✱ **What will refiners produce?**
- ✱ **What will marketers want?**
- ✱ **Will tankage be adequate?**
- ✱ **Will transmix infrastructure/processing be avail.?**
- ✱ **What will the S content of the rest of dist. be?**
- ✱ **What will the S content of jet be?**
- ✱ **Will a new testing mechanism limit losses from protective cuts?**

Uncertainties Later

- ✱ **Every system and region has special issues**
- ✱ **Universal: operations protocols more stringent; impact of error greater**
- ✱ **Infrastructure – refining, transportation, distribution – stretched further**
- ✱ **Flexibility and hence capacity decreased**
- ✱ **Duration and severity of a price spike following a market imbalance increased**