Motor Fuel & Distillate In Oregon Quantity, Sources & Distribution

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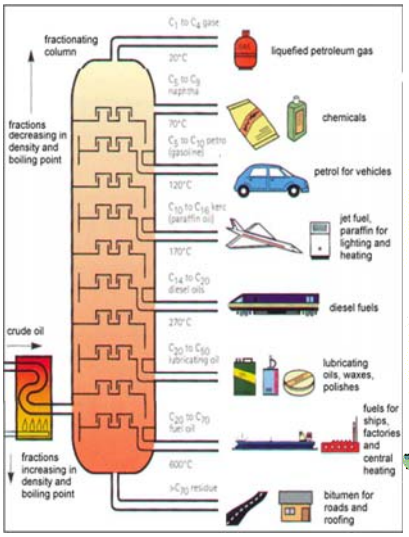
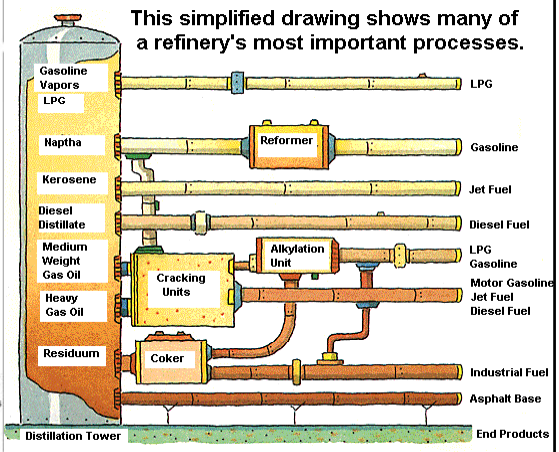
Low Carbon Fuel Standard Advisory Committee Nov. 03, 2009

Fuel Definitions

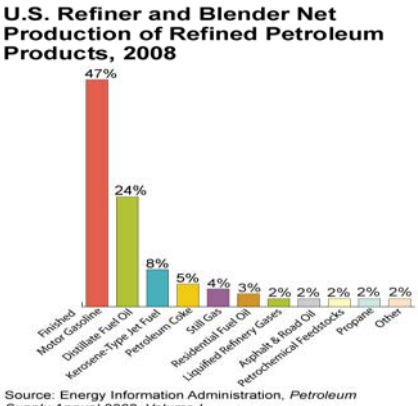
- Motor Fuel:
  Gasoline, premium, mid-grade, regular
- Distillate:
  A general classification for one of the petroleum fractions produced in conventional distillation operations. It includes diesel fuels and fuel oils. Products known as No. 1, No. 2, and No. 4 diesel fuel are used in on-highway diesel engines, such as those in trucks and automobiles, as well as off-highway engines, such as those in railroad locomotives and agricultural machinery. Products known as No. 1, No. 2, and No. 4 fuel oils are used primarily for space heating and electric power generation.

Refinery Processing



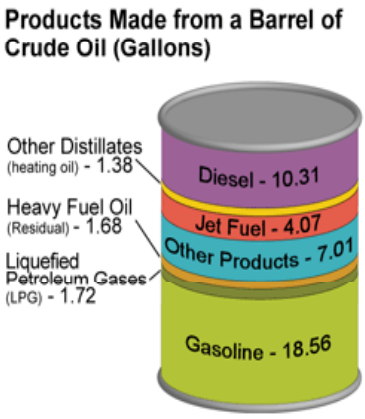


Refinery Outputs and Quantities from 42 gallon Crude Input



Source: Energy Information Administration, *Petroleum Supply Annual 2008, Volume I.*

Distillate Fuel Oil includes heating oil and diesel fuel. Liquid Refinery Gases include ethane/ethylene, propylene, butane/butylene, and isobutane/isobutylene.



Oregon Motor Fuel Consumption

- 1.507 Billion Gallons of Motor Fuel 2008 (ODOT)
- Fuel tracked primarily for tax purposes

  Taxed fuel data collected by ODOT

  EIA collects data by a annual mandatory industry survey form
- Some discrepancies between data

ODOT 2007 Motor Fuel Taxable Distribution – 1,563,847,970 gal

EIA 2007 Oregon Motor Fuel Total Consumption – 1,587,600,000 gal

- Almost a 24 Million gallon difference or 1.5%

Oregon Distillate Consumption (EIA)

- 773 Million Gallons Distillate Total 2007 (EIA)

Residential –	22,453,000 gallons
Commercial –	18,965,000 gallons
Industrial –	18,191,000 gallons
Farm –	26,846,000 gallons
Electric Power –	1,400,000 gallons
Railroad –	80,362,000 gallons
Vessel Bunkering –	20,003,000 gallons
On-Highway –	**560,598,000 gallons**
Military –	1,977,000 gallons
Off-Highway –	22,367,000 gallons

Oregon Diesel Fuel Consumption (ODOT)

- Fuel Tax Group

  Vehicles under 26,000 lbs pay a tax at the pump

  Use Fuel: includes all types of diesel, biodiesel, CNG, LNG and LPG

  2007 Use Fuel = 157,392,691 gallons

- Motor Carrier Transport

  Vehicles operating over 26,000 lbs are subject to various taxes. A registered carrier will pay Oregon's Weight-Mile tax or a Road Use Assessment Fee (RUAF) when operating in Oregon.

- The data is available it is only a matter of accessing it.

California Petroleum Reporting Requirements

- Fuels watch report dates back to 1992
- Since 2005 information has been available on a weekly basis
- Information consists of:
  - Refinery input
  - Refinery production
  - Refinery stocks

California Requires Motor Fuel to be Processed to a Cleaner Specification

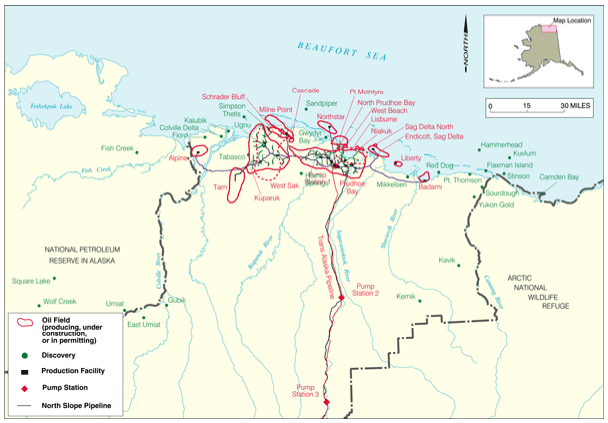
- The California Clean Air Act requires the ARB to adopt regulations that produce the most cost-effective combinations of control measures on motor vehicles and motor vehicle fuels.
- Limits and caps include: (CaRFG)

Reid Vapor Pressure, psi, max	Benzene, vol% max
Sulfur, ppmw max	Aromatic HC, vol% max
Olefins, vol% max	Oxygen, wt%
T50 (temp at 50% distilled) °F, max	
T90 (temp at 90% distilled) °F, max	

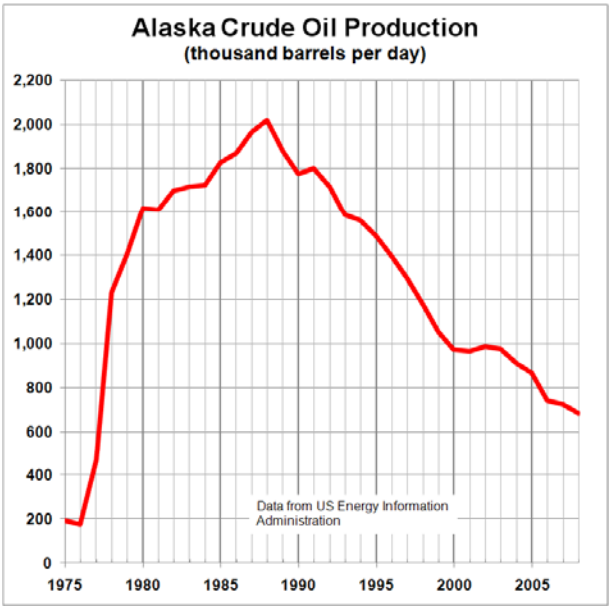
About 90% of Oregon's Petroleum is Processed at Four Washington Refineries

- BP Cherry Point (Ferndale) 234 TBD
- ConocoPhillips (Ferndale) 105.5 TBD
- Shell (Anacortes) 147.5 TBD
- Tesoro (Anacortes) 120 TBD
- All of Oregon's petroleum demand must be satisfied with imports

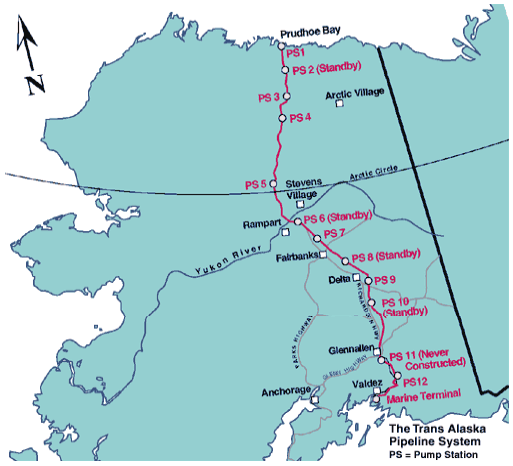
Historically the largest percentage (80 to 90%) of petroleum product has come from the Alaskan North Slope



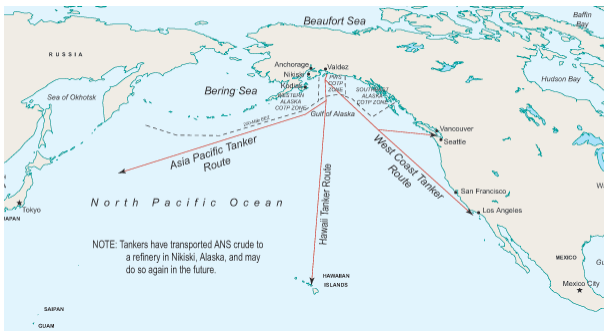
Production of North Slope oil peaked in 1988 and since has been in a steady state of decline



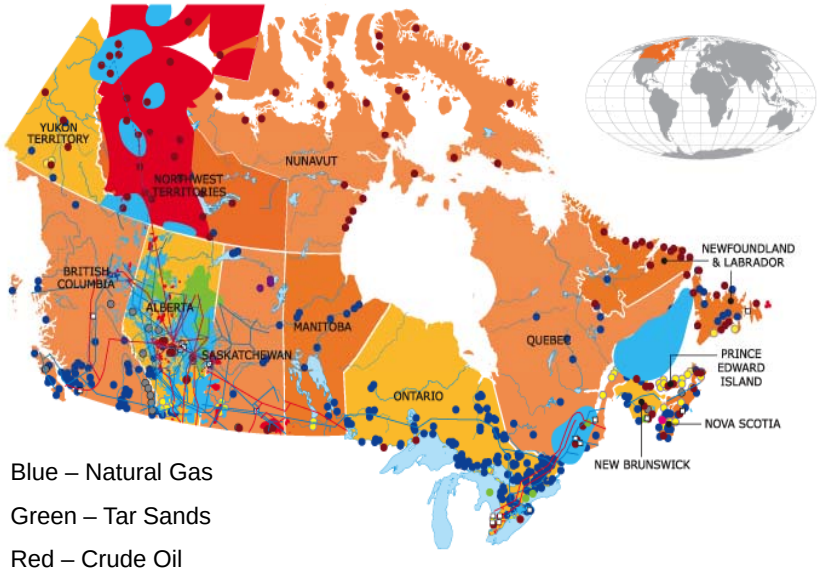
Oil from the North Slope is transferred South by the Trans Alaskan Pipeline System



Tankers transport the biggest share of the ANS crude to refineries on the West Coast



Canadian Oil Sources



Blue – Natural Gas

Green – Tar Sands

Red – Crude Oil

The Trans Mountain Pipeline delivers crude directly to the four WA refineries

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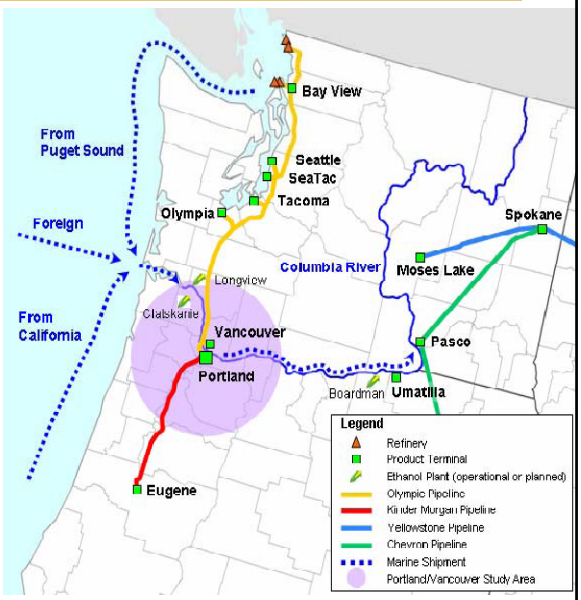
Olympic Pipeline - 300 TBD Capacity
130 to 132 TBD is shipped into Portland
Portland /Vancouver region has a demand of about 200-210 TBD
70 to 80 TBD come by barge
The demands on the Portland/Vancouver terminal include about 45 TBD shipped to the Tri-Cities area as well as 45 TBD that moves to Eugene via the Kinder Morgan Pipeline

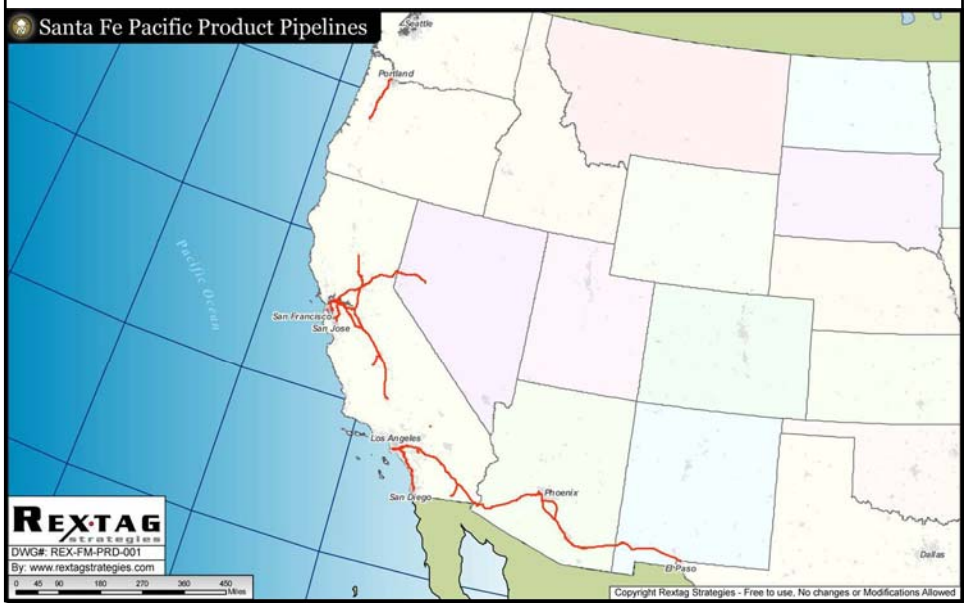


TBD = Thousand Barrels a Day

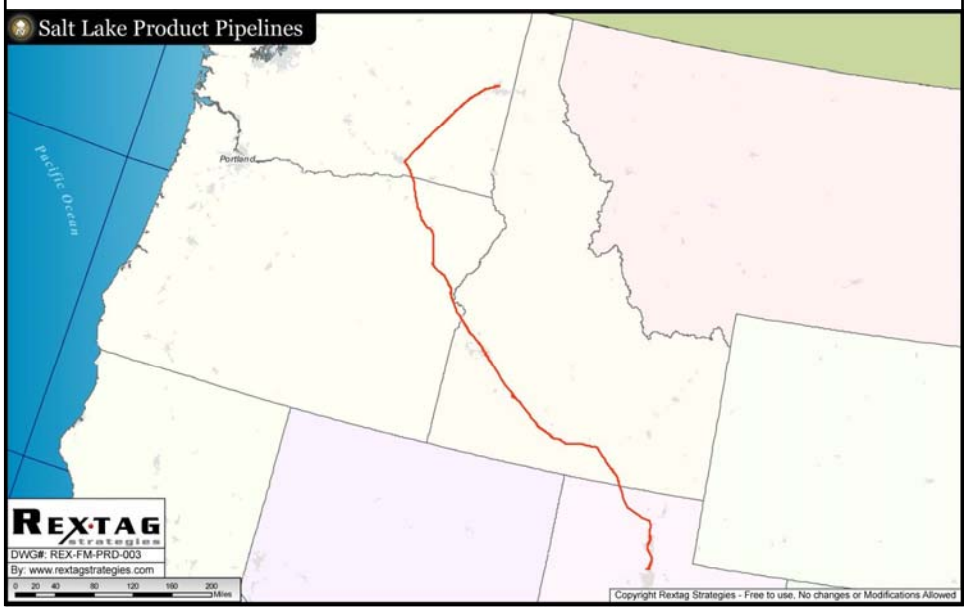
Terminals and Distribution

- Oregon Dept. of Agriculture categorizes petroleum businesses by the size of their measurement meters
- Terminal (type 33 or H) 91 businesses
- Jobber (type 32 or G) 428 businesses
- Retail (type 31 or F) over 1,600 businesses
- 110 to 120 TBD are distributed primarily by truck daily from Portland/Vancouver terminals.
- 45 TBD are distributed primarily by truck from Eugene terminals.
- 45 TBD are distributed primarily by truck from Pasco

Some product is trucked up into S. Oregon from pipeline terminals in Nevada that originate from the CA Bay area



Some product is trucked into Eastern Oregon from pipeline terminals in Idaho that originate from a refinery in Utah



Ethanol Consumption in Oregon

- The state RFS requires 10 percent ethanol in all regular and mid-grade product. Retailers now have the option of offering clear premium. Most will not opt in.
- Estimated use is 151 MG/yr.
- Sales of higher blends of ethanol (E85) are not tracked, gallons are rolled into the Motor Fuels number.

Biodiesel Consumption in Oregon

- The state RFS requires 2 percent biodiesel in all diesel product.
- Estimated use is 11.7 MG/yr
- Sales of higher blends are not tracked, gallons are rolled into the distillate or diesel numbers.

CNG, LNG, LPG, Hydrogen & Electricity

- About 5 fleets currently use CNG
- No known use of LNG in the state
- Two known fleets are currently using LPG
- No hydrogen in the state
- Over 400 EV's are registered in Oregon

Questions

www.oregon.gov/ENERGY

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OREGON DEPARTMENT OF ENERGY