Petroleum Fuel Import and Pipeline Export Forecasts

Joint Transportation and IEPR Committee Workshop

Transportation Fuel Forecasts and Analyses

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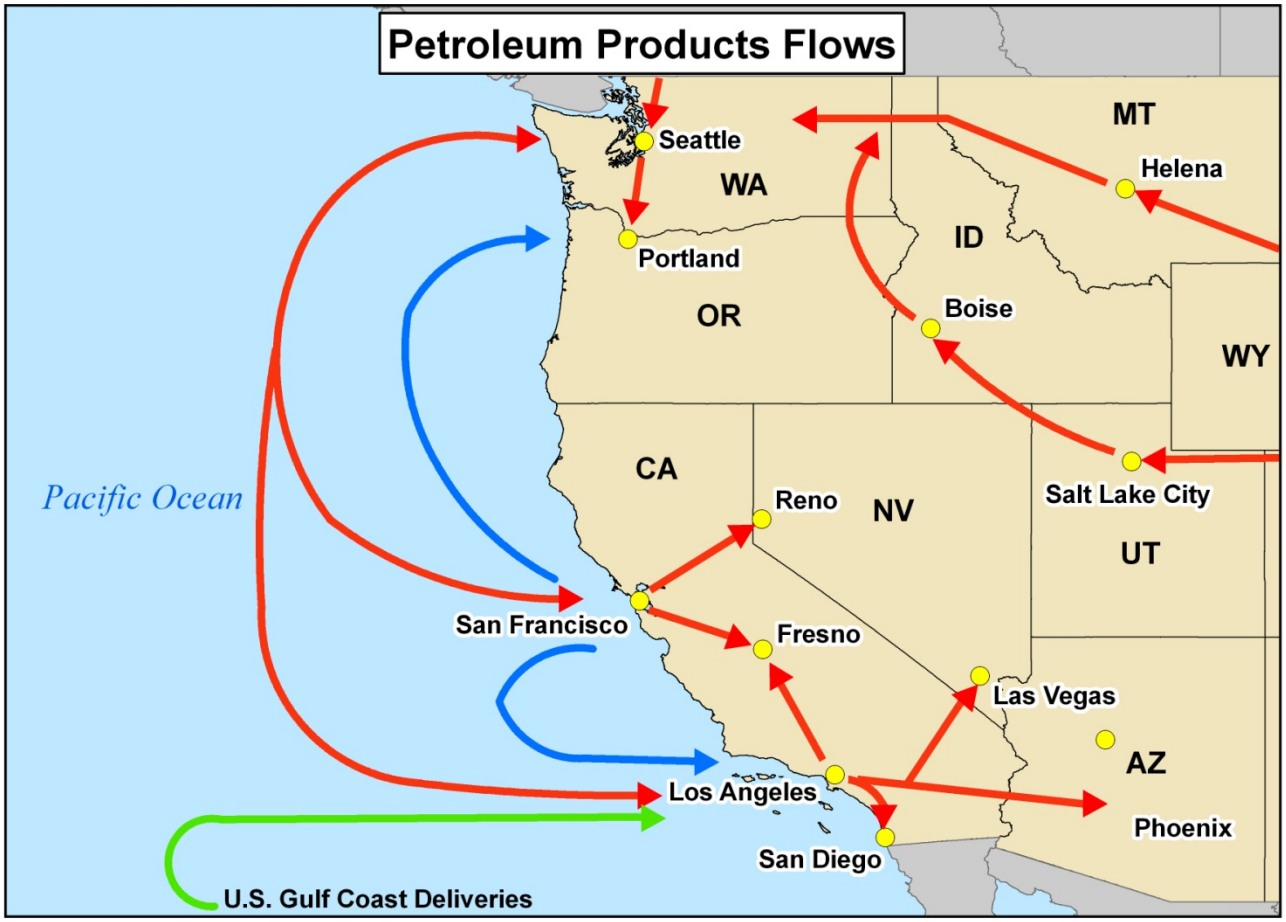
Interstate Dependence for Transportation Fuel Supply



Source: Argonne National Laboratory

Factors Impacting California Fuel Imports

- Trends in consumer demand, California refinery output, and exports of petroleum products to neighboring states determine the rate at which California's imports of transportation fuels will increase during the forecast period
- Demand growth projections first developed for AZ & NV
- Second, pipeline exports from California estimated
- Third, amount of additional refinery production calculated based on specific refinery expansion assumptions
- Finally, both of these trends are compared to forecasted demand (both Low and High Cases) to quantify the change in volumes of transportation fuel imports

Southwest Regional Fuel Market

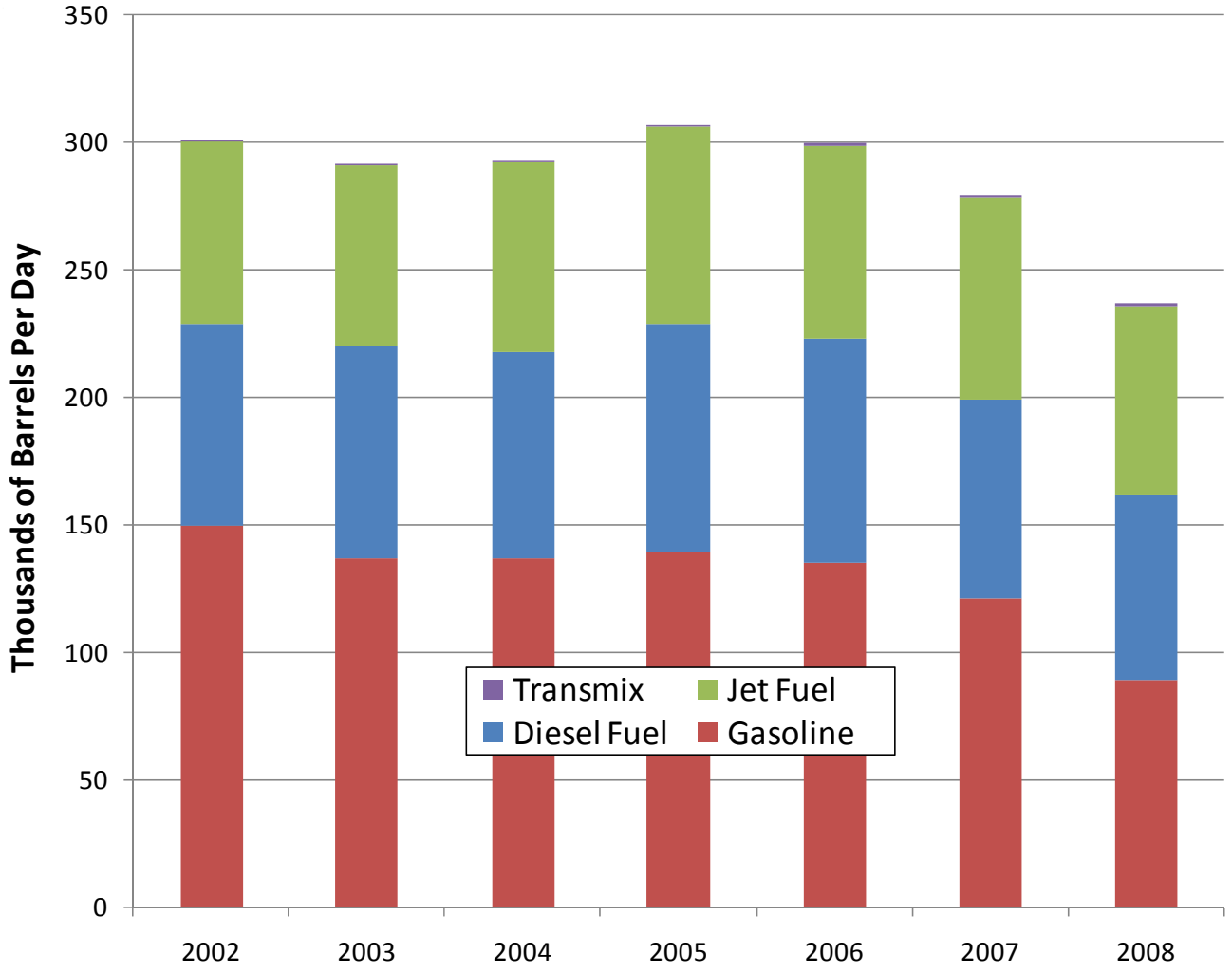
Growth of Pipeline Exports

- Future demand resurgence and growth in AZ and NV will be achieved primarily through increased quantities of pipeline exports
- The quantity of additional pipeline exports of transportation fuels will vary for Arizona depending on the portion of incremental supplies that originate from refineries in West Texas
- The construction of a new petroleum product pipeline from Utah to Las Vegas was assessed as an alternative scenario – reduces pipeline exports from California and reduces marine imports into Southern California

AZ & NV Dependence on Pipeline Supplies

- Nevada receives nearly 100 percent of its fuel via petroleum product pipelines originating in California
- In 2006, approximately 55 percent of Arizona's demand was met by products exported from California
- However, that percentage dropped to just 35 percent by 2008 as refiners and other marketers shifted source of supply away from California and over to Texas and New Mexico
- Regional drop in transportation fuel demand has resulted in lower pipeline export volumes – a source of indirect supply for California

Increased Indirect Supply for California



AZ & NV Demand Forecasts

- The April 2009 forecasted growth of commercial passenger jet activity by the FAA was used to obtain an estimate for jet fuel demand for Arizona and Nevada
- Diesel fuel demand for the neighboring states was estimated using specific cases from the 2009 Annual Energy Outlook (AEO) forecast by the U.S. EIA for the Mountain census region
- Gasoline demand forecasts used the same approach as that employed for diesel fuel - these initial forecasts had to be revised to reflect the additional use of renewable fuel (mainly ethanol) that is mandated by RFS2
- Ethanol blend limit assumed to be 10 percent (E10)

Arizona Transportation Fuel Demand

Historical and Forecast (Thousands of Barrels per Day)

	Gasoline		E85		Diesel Fuel		Jet	Totals	
Year	Low	High	Low	High	Low	High	Fuel	Low	High
2006	177.0	177.0	0.0	0.0	58.0	58.0	33.8	268.9	268.9
2007	184.5	184.5	0.0	0.0	57.9	57.9	35.5	277.9	277.9
2008	177.1	177.1	0.0	0.0	60.2	60.2	33.1	270.4	270.4
2010	186.9	187.4	0.0	0.0	59.5	62.1	28.5	274.8	278.0
2020	177.3	210.6	23.3	21.4	74.0	79.2	36.9	311.5	348.1
2030	175.7	233.6	33.5	30.6	90.9	101.6	51.9	351.9	417.6

Incremental Demand Versus 2008 (Thousands of Barrels per Day)

2010	9.8	10.3	0.0	0.0	-0.7	1.9	-4.6	4.5	7.6
2020	0.2	33.5	23.3	21.4	13.7	19.0	3.9	41.2	77.7
2030	-1.4	56.5	33.5	30.6	30.6	41.4	18.8	81.5	147.2

Percentage Change Compared to 2008

2010	5.5%	5.8%	NA	NA	-1.2%	3.1%	-13.9%	1.7%	2.8%
2020	0.1%	18.9%	NA	NA	22.8%	31.5%	11.7%	15.2%	28.7%
2030	-0.8%	31.9%	NA	NA	50.8%	68.7%	56.9%	30.1%	54.5%

Gasoline demand flat in Low Case

Demand growth for total fuels of 15 to 28 percent by 2020 – compared to 2008

Nevada Transportation Fuel Demand

Historical and Forecast (Thousands of Barrels per Day)

	Gasoline		E85		Diesel Fuel		Jet	Totals	
Year	Low	High	Low	High	Low	High	Fuel	Low	High
2006	76.1	76.1	0.0	0.0	49.0	49.0	34.7	159.8	159.8
2007	73.5	73.5	0.0	0.0	47.7	47.7	35.2	156.4	156.4
2008	70.0	70.0	0.0	0.0	47.7	47.7	34.2	151.8	151.8
2010	73.8	74.0	0.0	0.0	47.1	49.1	29.1	150.0	152.3
2020	70.1	83.2	9.2	8.4	58.5	62.7	39.9	177.7	194.2
2030	69.4	92.3	13.2	12.1	71.9	80.4	61.1	215.6	245.8

Incremental Demand Versus 2008 (Thousands of Barrels per Day)

2010	3.9	4.1	0.0	0.0	-0.6	1.5	-5.1	-1.8	0.5
2020	0.1	13.2	9.2	8.4	10.9	15.0	5.7	25.9	42.4
2030	-0.6	22.3	13.2	12.1	24.2	32.7	26.9	63.8	94.0

Percentage Change Compared to 2008

2010	5.5%	5.8%	NA	NA	-1.2%	3.1%	-14.9%	-1.2%	0.3%
2020	0.1%	18.9%	NA	NA	22.8%	31.5%	16.8%	17.1%	27.9%
2030	-0.8%	31.9%	NA	NA	50.8%	68.7%	78.5%	42.0%	61.9%

Similar to AZ results, but higher jet fuel demand growth
Demand growth for total fuels of 17 to 28 percent by 2020 – compared to 2008

Pipeline Exports from California - **Low** Case

Historical and Forecast (Thousands of Barrels per Day)

	Gasoline		Diesel Fuel		Jet Fuel		Totals	
Year	AZ	NV	AZ	NV	AZ	NV	AZ	NV
2006	63.2	71.7	38.7	49.0	31.2	34.7	133.1	155.4
2007	50.3	70.9	30.0	47.7	32.4	35.2	112.7	153.8
2008	21.8	67.4	25.0	47.7	29.2	34.2	75.9	149.3
2010	21.4	66.4	24.6	47.1	25.2	29.1	71.2	138.7
2020	20.8	64.4	30.7	58.5	32.6	39.9	84.1	155.5
2030	20.8	64.4	37.6	71.9	45.9	61.1	104.2	182.2

Incremental Exports Versus 2008 (Thousands of Barrels per Day)

2010	-0.4	-1.0	-0.4	-0.6	-4.0	-5.1	-4.7	-10.6
2020	-1.0	-3.0	5.7	10.9	3.4	5.7	8.1	6.3
2030	-1.0	-3.0	12.6	24.2	16.7	26.9	28.3	32.9

Percentage Change Compared to 2008

2010	-1.8%	-1.5%	-1.5%	-1.2%	-13.6%	-14.9%	-6.2%	-7.1%
2020	-4.5%	-4.5%	22.8%	22.8%	11.7%	16.8%	10.7%	4.2%
2030	-4.8%	-4.4%	50.4%	50.8%	57.3%	78.5%	37.2%	22.1%

Low Export Case assumes low fuel demand forecasts in AZ & NV in conjunction with the East Line supplying barrels into AZ preferentially over barrels being supplied from California

Pipeline Exports from California - **High** Case

Historical and Forecast (Thousands of Barrels per Day)

	Gasoline		Diesel Fuel		Jet Fuel		Totals	
Year	AZ	NV	AZ	NV	AZ	NV	AZ	NV
2006	63.2	71.7	38.7	49.0	31.2	34.7	133.1	155.4
2007	50.3	70.9	30.0	47.7	32.4	35.2	112.7	153.8
2008	21.8	67.4	25.0	47.7	29.2	34.2	75.9	149.3
2010	21.5	66.6	25.7	49.1	25.2	29.1	72.3	141.0
2020	34.7	76.1	35.6	62.7	32.6	39.9	102.8	171.4
2030	58.9	84.9	51.9	80.4	45.9	61.1	156.7	211.2

Incremental Exports Versus 2008 (Thousands of Barrels per Day)

2010	-0.3	-0.8	0.7	1.5	-4.0	-5.1	-3.6	-8.3
2020	12.9	8.7	10.6	15.0	3.4	5.7	26.9	22.1
2030	37.1	17.4	26.9	32.7	16.7	26.9	80.7	61.9

Percentage Change Compared to 2008

2010	-1.5%	-1.2%	2.9%	3.1%	-13.6%	-14.9%	-4.7%	-5.6%
2020	59.0%	12.9%	42.5%	31.5%	11.7%	16.8%	35.4%	14.8%
2030	170.1%	25.9%	107.9%	68.7%	57.3%	78.5%	106.3%	41.4%

High Export Case assumes high fuel demand forecasts in AZ & NV in conjunction with the East Line supplying barrels into AZ preferentially over barrels being supplied from California

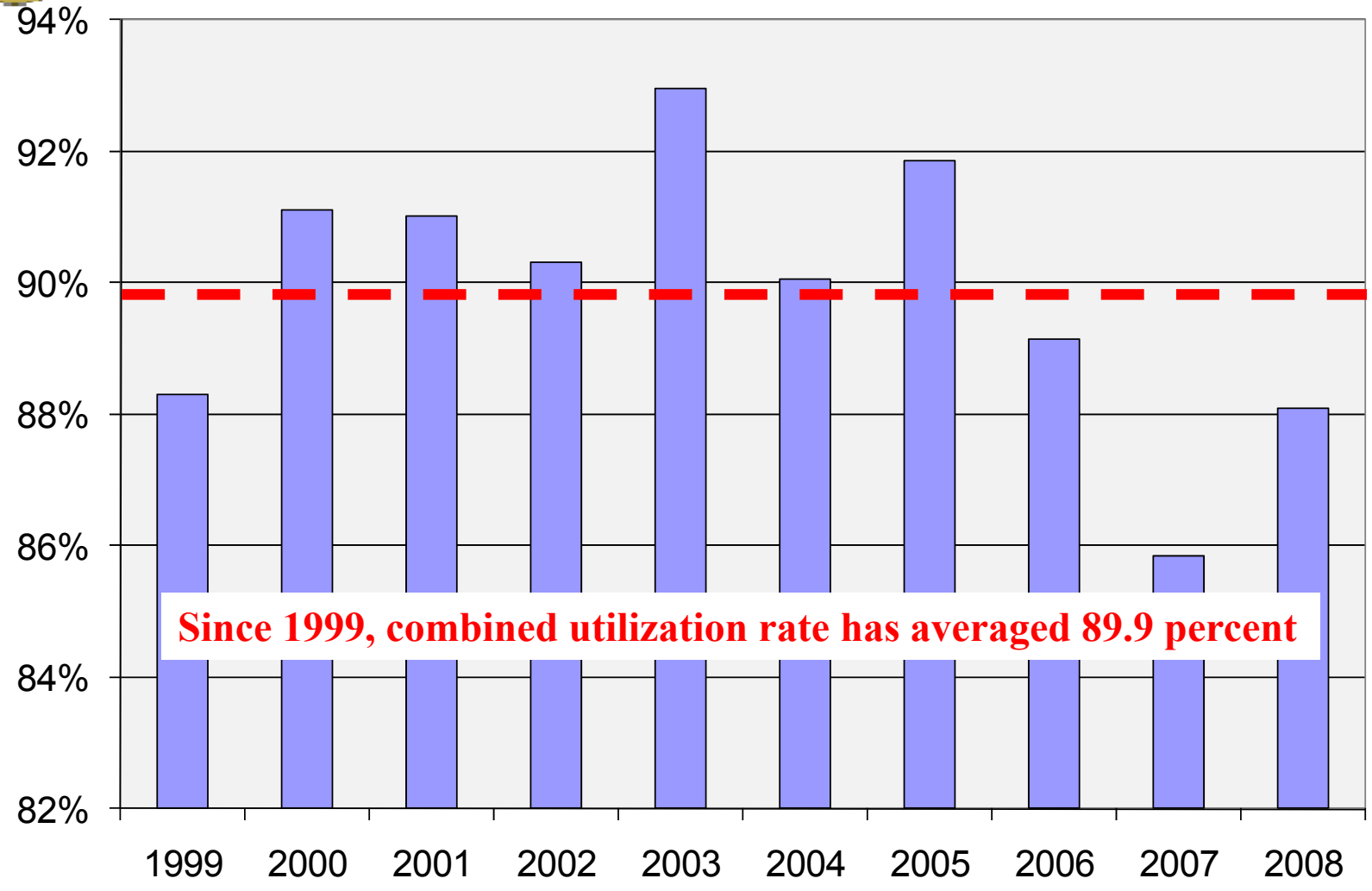
Product Pipelines – Maximum Capacity Timing

Pipeline Section From California	2009 Capacity TBD	Year that Maximum Capacity Of Pipeline is Reached	
		Low Case	High Case
Sacramento to Reno	45	Beyond 2030	2025
Colton to Las Vegas	156	2026	2021
Colton to Phoenix	204	Beyond 2030	Beyond 2030
Pipeline Section From Western Texas			
El Paso to Tucson	170	Beyond 2030	Beyond 2030
Tucson to Phoenix	155	Beyond 2030	Beyond 2030

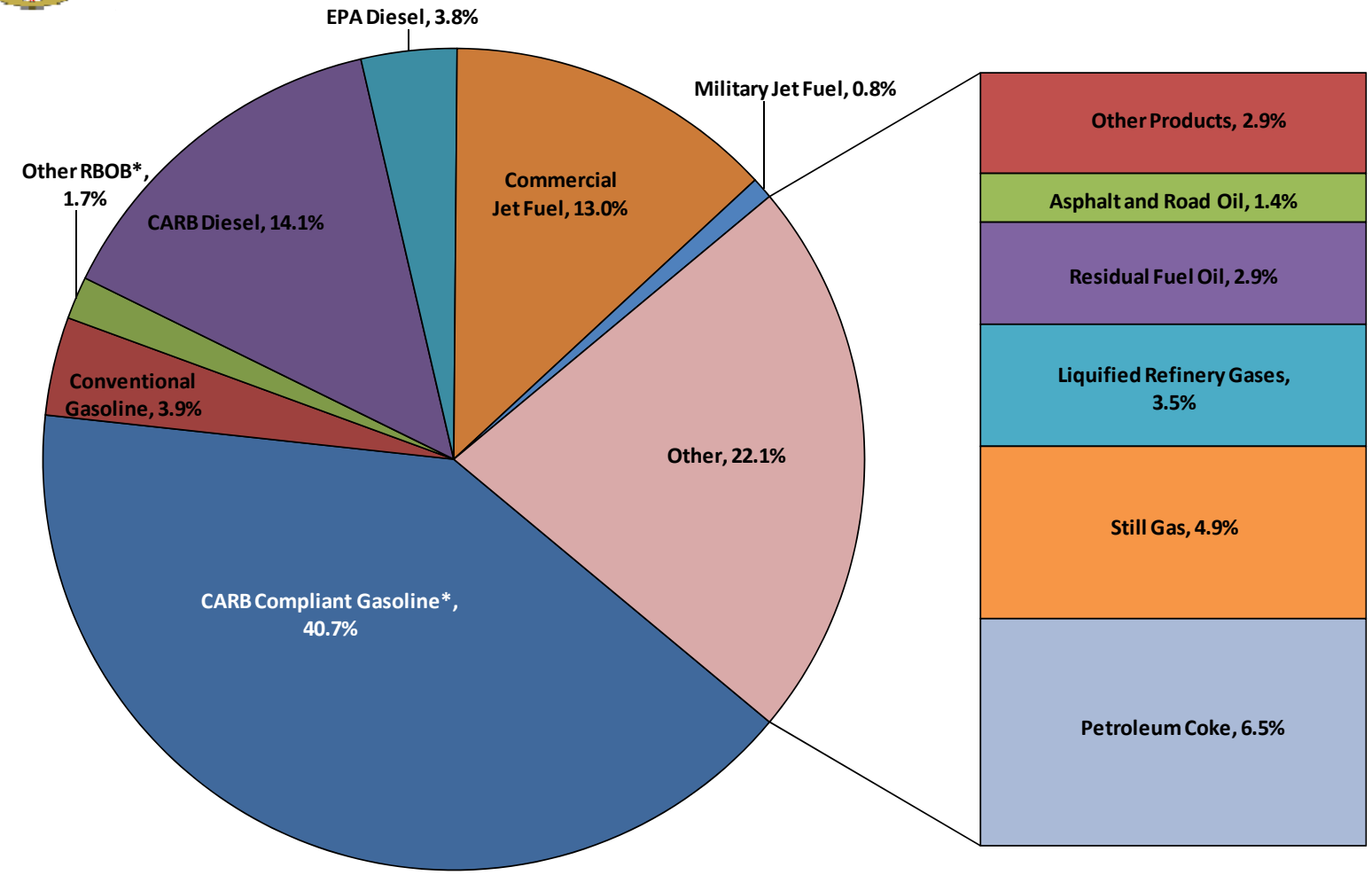
Most segments of the Kinder Morgan Southwest system are not expected to exceed maximum pumping capacity over the forecast period due to the recent, significant drop in transportation fuel demand and lower demand outlooks linked to increased use of renewable fuels and improved fuel economy standards for motor vehicles

California Refinery Operations - Outlook

Calif. Refineries – Crude Oil Utilization Rates



California Refinery Output in 2008



*Note: Does not include ethanol.

California Incremental Refinery Production

(Thousands of Barrels per Day)

	Low Import Case			High Import Case		
Transportation Fuel	2015	2020	2025	2015	2020	2025
California Gasoline	36.4	55.7	71.5	0.0	0.0	0.0
Export Gasoline	5.0	7.6	9.8	0.0	0.0	0.0
California Diesel Fuel	12.6	19.3	24.8	0.0	0.0	0.0
EPA Diesel Fuel	3.4	5.2	6.6	0.0	0.0	0.0
Jet Fuel	11.6	17.8	22.8	0.0	0.0	0.0
Totals	69.0	105.6	135.4	0.0	0.0	0.0

California refinery production is forecast to continue growing for the Low Import Case scenario only – purpose is to minimize additional imports

Continued refinery creep will yield additional refinery blendstocks that can be converted to transportation fuels for use in California and for export to neighboring states and other locations

California Marine Imports & Exports - Outlook

California Marine Imports - Forecast

- Under the Low Import Case scenario, the growing imbalances between gasoline and the other transportation fuels are extreme, resulting in a net decline of imports of at least a 250,000 barrels per day by 2015
- This latter type of outcome is unlikely to materialize as refiners will adjust operations to decrease the ratio of gasoline components that are produced for each barrel of crude oil processed
- Such measures could include:
  - Elimination of gasoline blendstock imports
  - Reduction of unfinished oil purchases

California Imports of Transportation Fuels

Net Change (Thousands of Barrels per Day)

		Low Import Case			High Import Case		
Transportation Fuel	2008	2015	2020	2025	2015	2020	2025
Gasoline	51.3	-191.8	-328.0	-386.6	43.3	-19.3	-66.2
Diesel Fuel	-65.9	-71.0	-59.1	-42.4	-33.6	-8.0	20.0
Jet Fuel	-6.9	11.5	45.6	88.3	29.1	77.7	136.8
Totals	-21.6	-251.3	-341.5	-340.6	38.9	50.5	90.6

Reduced Imports of Gasoline Blendstocks

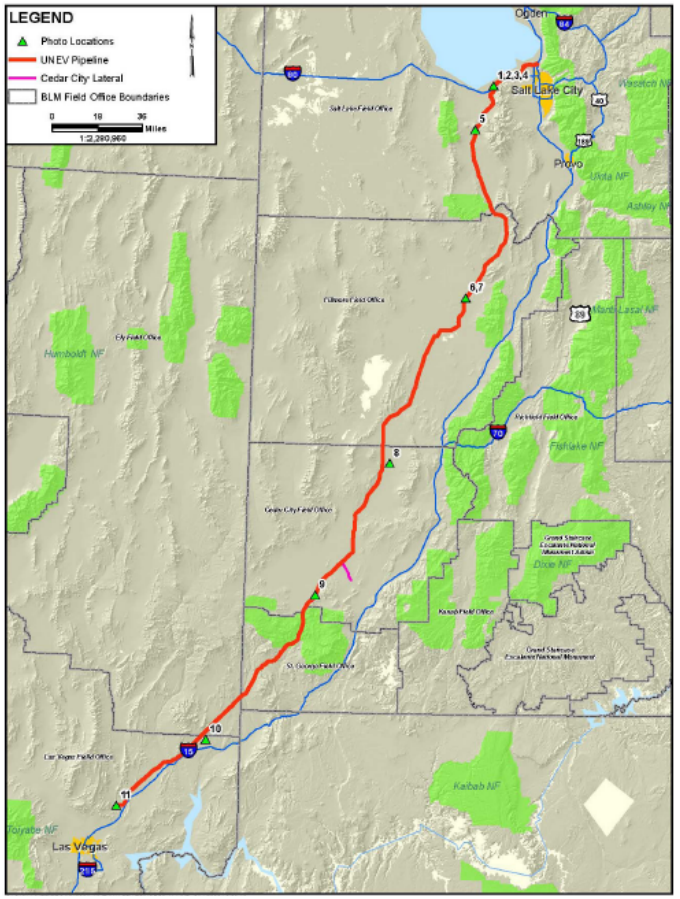
		Low Import Case			High Import Case		
Transportation Fuel	2008	2015	2020	2025	2015	2020	2025
Gasoline	51.3	***-138.0***	***-274.2***	***-332.8***	43.3	***0.0***	***-12.4***
Diesel Fuel	-65.9	-71.0	-59.1	-42.4	-33.6	-8.0	20.0
Jet Fuel	-6.9	11.5	45.6	88.3	29.1	77.7	136.8
Totals	-21.6	-197.5	-287.7	-286.8	38.9	69.7	144.4
Gasoline Blendstocks	53.8	0.0	0.0	0.0	53.8	34.5	0.0

Reduced Receipts of Unfinished Refinery Feedstocks

		Low Import Case			High Import Case		
Transportation Fuel	2008	2015	2020	2025	2015	2020	2025
Gasoline	51.3	***0.0***	***-120.4***	***-178.9***	43.3	***0.0***	***0.0***
Diesel Fuel	-65.9	***-62.4***	***-49.5***	***-32.7***	-33.6	-8.0	**20.7**
Jet Fuel	-6.9	11.5	45.6	88.3	29.1	77.7	136.8
Totals	-21.6	-50.8	-124.3	-123.4	38.9	69.7	157.6
Gasoline Blendstocks	53.8	0.0	0.0	0.0	53.8	34.5	0.0
Refinery Feedstocks	192.3	19.8	0.0	0.0	192.3	192.3	176.8

New Petroleum Product Pipeline Project

- UNEV pipeline could become operational as early as the fall of 2010 with an initial pumping capacity of 62,000 BPD
- Over time, the pipeline system could be expanded to a maximum pumping capacity of up to 118,000 BPD
- Could displace approximately 50 percent of the forecasted pipeline deliveries to Las Vegas from California by 2015



Summary of Import Forecast & Additional Factors

Incremental Imports of Transportation Fuels (Thousands of BPD)

	Low Case			High Case		
	2015	2020	2025	2015	2020	2025
Transportation Fuels Forecast Results	-251.3	-341.5	-340.6	38.9	50.5	90.6
Refinery Projects and Operations						
New UNEV Pipeline (CalNev Line Only)	-313.3	-403.5	-458.6	-23.1	-11.5	-27.4
No California Refinery Creep	-182.3	-235.9	-205.2	38.9	50.5	90.6

There are no refinery expansion projects examined as alternative scenarios during this IEPR cycle

UNEV project could significantly increase the California refinery imbalance under the Low Import Case

Elimination of refinery creep could decrease the California refinery imbalance under the Low Import Case