

# PETROLEUM WATCH

CALIFORNIA ENERGY COMMISSION

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## REFINERY NEWS

### Valero Wilmington:

On July 16, a sulfur recovery unit tripped causing unplanned flaring ([Cal OES](#)).

### Chevron Richmond:

On July 25, a power loss at the refinery led to multiple unplanned flaring events ([Cal OES](#)).

## CALIFORNIA GASOLINE RETAIL PRICES BY BRAND

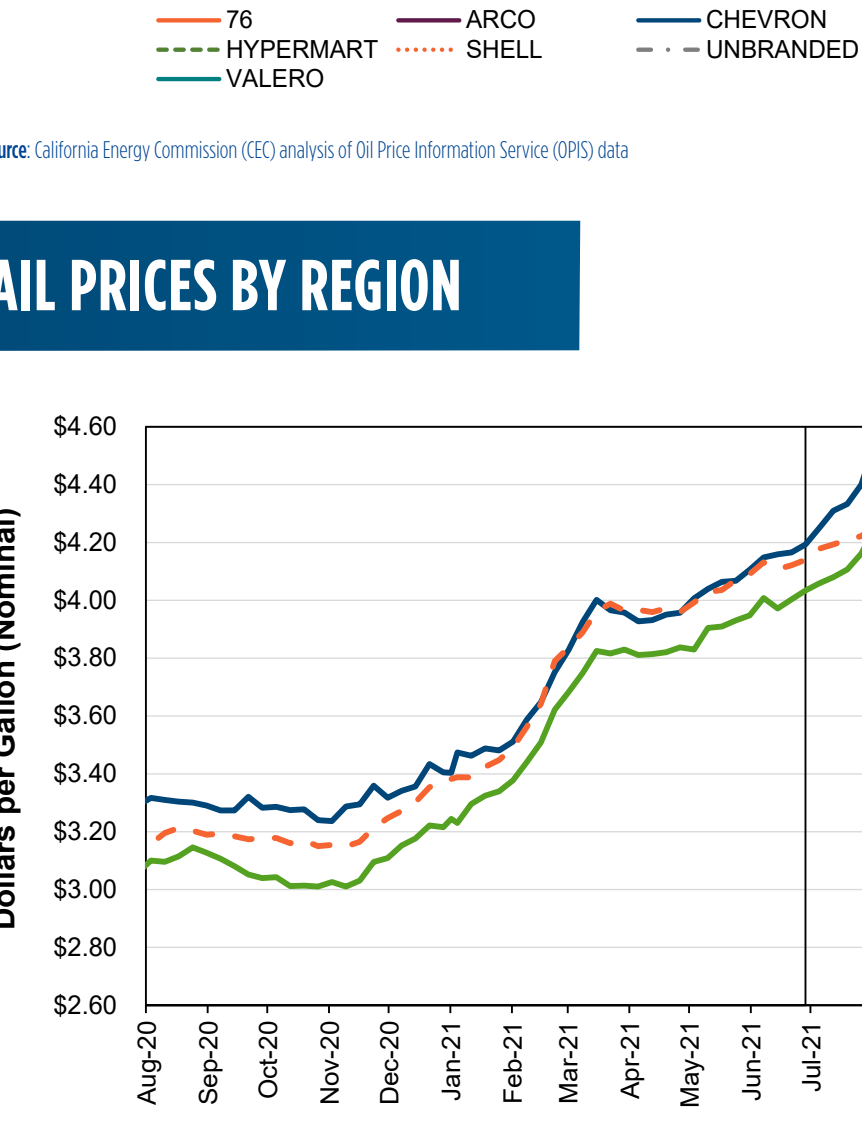
### July 2021 vs. 2020

(Percentage Change)

76	38% higher
ARCO	40% higher
Chevron	37% higher
Hypermart	40% higher
Shell	37% higher
Unbranded	38% higher
Valero	38% higher

### July 2021 Averages

76	\$4.39
ARCO	\$4.13
Chevron	\$4.52
Hypermart	\$4.00
Shell	\$4.45
Unbranded	\$4.17
Valero	\$4.30



Source: California Energy Commission (CEC) analysis of Oil Price Information Service (OPIS) data

## CALIFORNIA DIESEL RETAIL PRICES BY REGION

### July 2021 vs. 2020

(Percentage Change)

Northern CA	32% higher
Central CA	33% higher
Southern CA	33% higher

### July 2021 Averages

Northern CA	\$4.31
Central CA	\$4.09
Southern CA	\$4.20



Source: CEC analysis of OPIS data

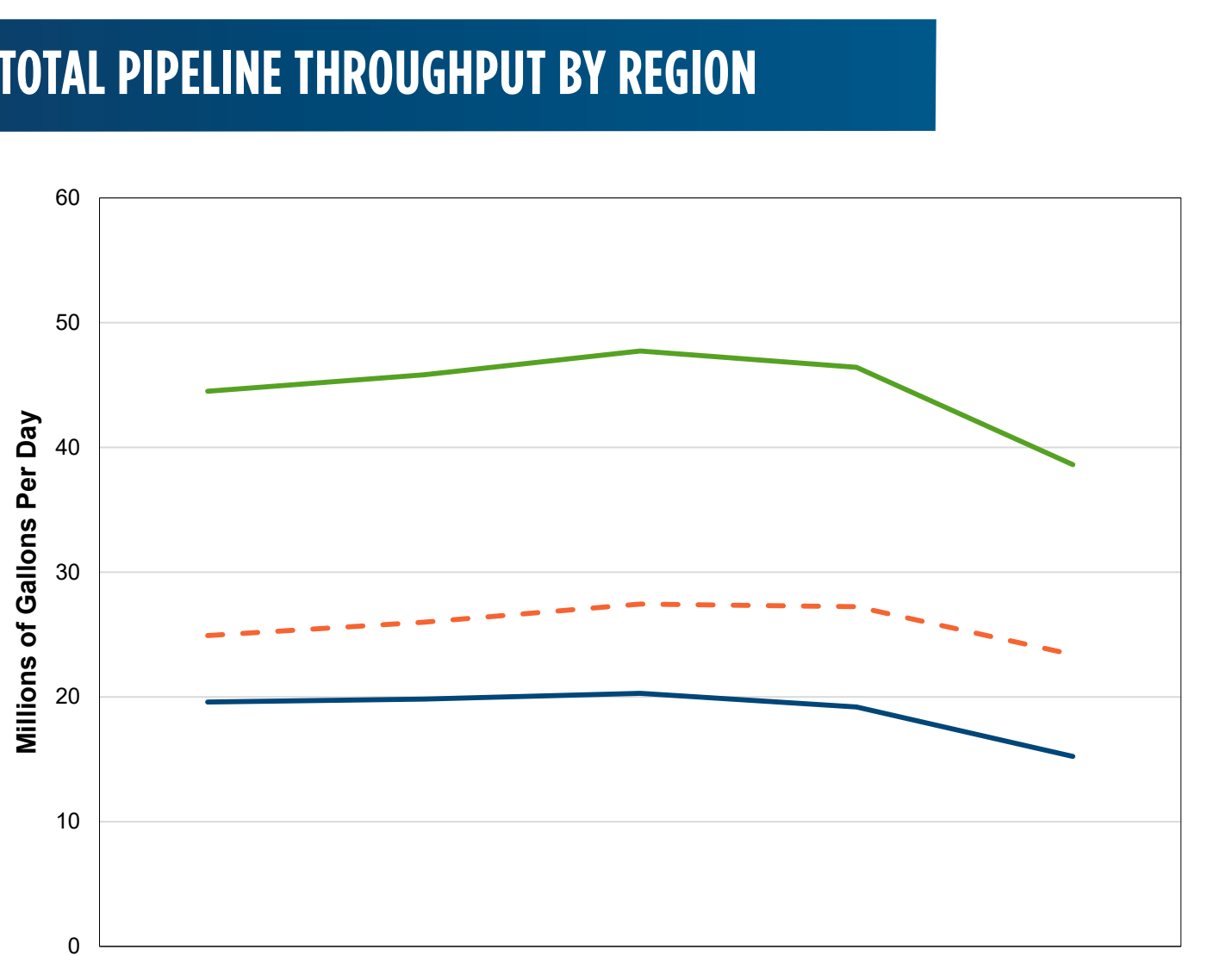
### NORTHERN CALIFORNIA

#### Northern Region Systems Map



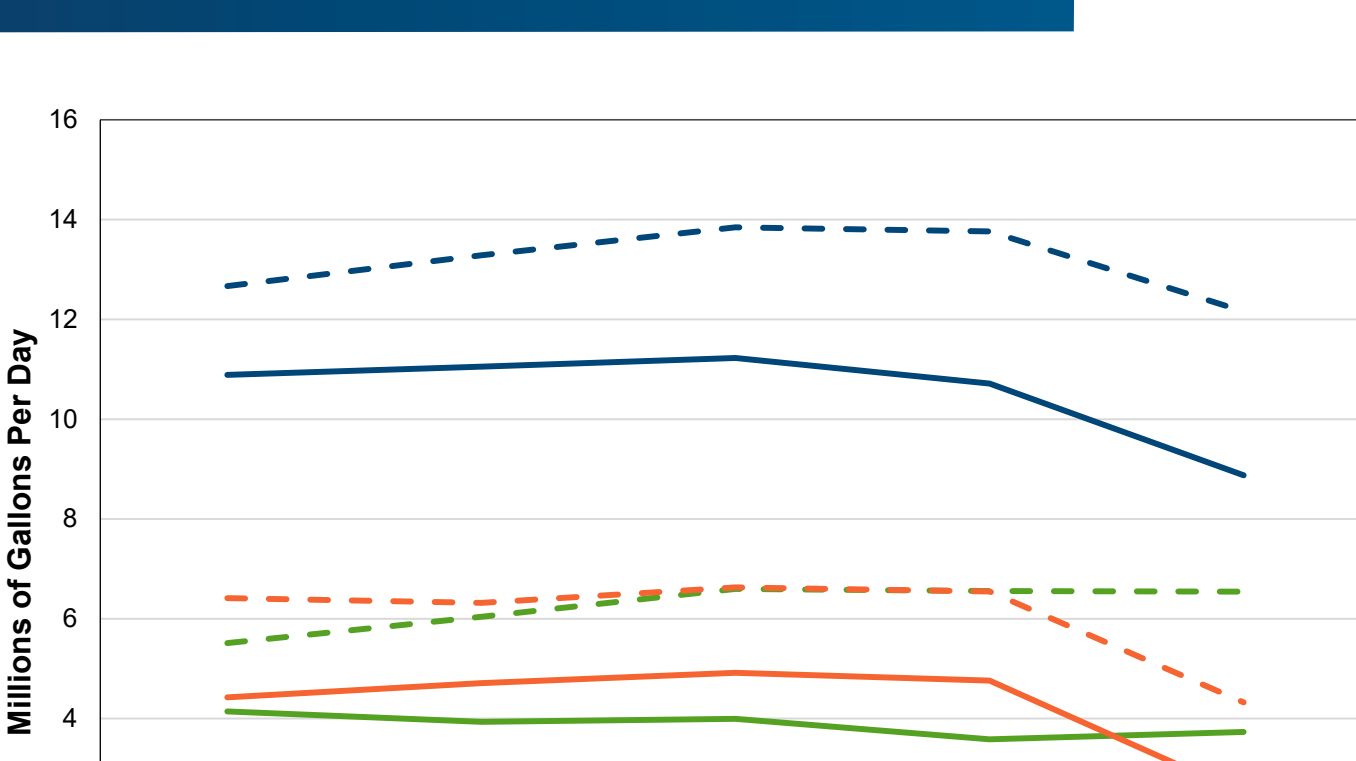
### SOUTHERN CALIFORNIA

#### Southern Region Systems Map



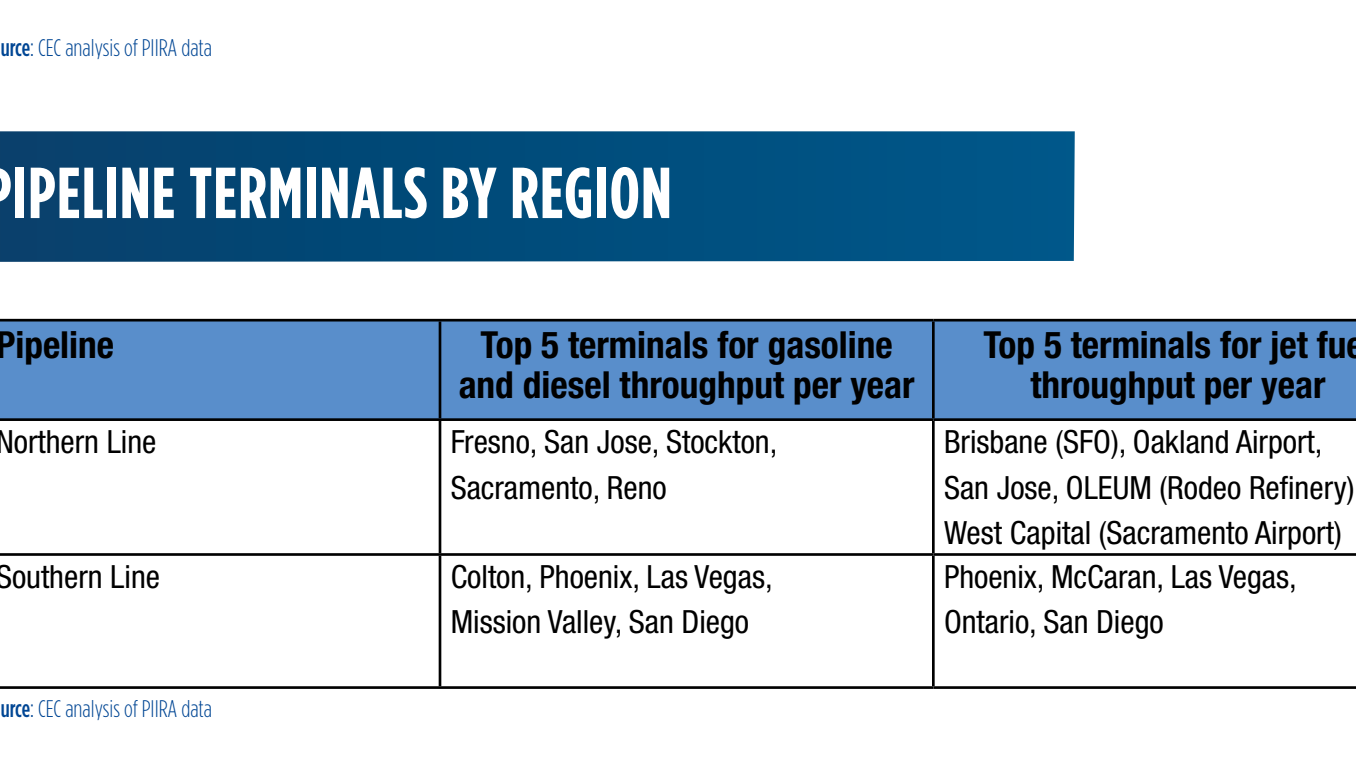
Source: Kinder Morgan

## TOTAL PIPELINE THROUGHPUT BY REGION



Source: CEC analysis of Petroleum Industry Information Reporting Act (PIIRA) data

## PIPELINE REFINED PRODUCTS BY REGION



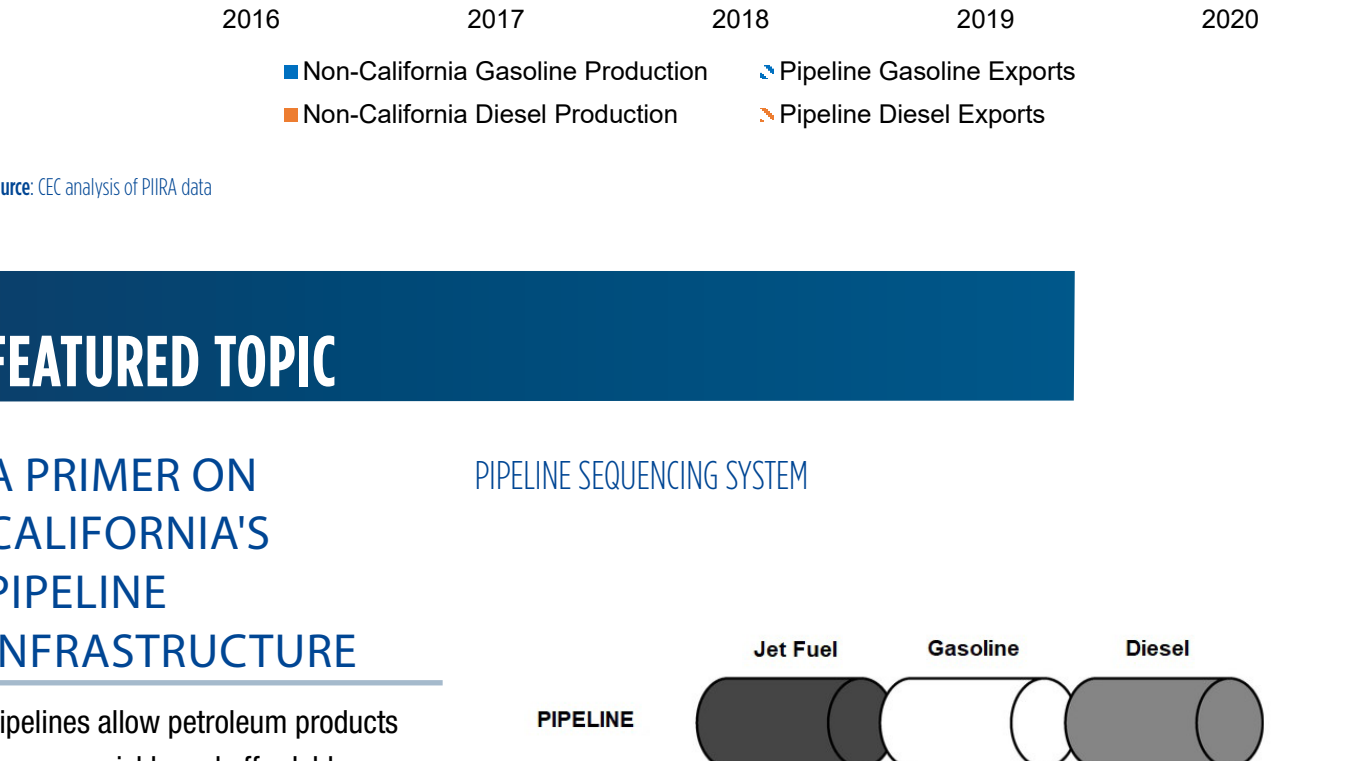
Source: CEC analysis of PIIRA data

## PIPELINE TERMINALS BY REGION

Pipeline	Top 5 terminals for gasoline and diesel throughput per year	Top 5 terminals for jet fuel throughput per year
Northern Line	Fresno, San Jose, Stockton, Sacramento, Reno	Brisbane (SFO), Oakland Airport, San Jose, OLEUM (Rodeo Refinery), West Capital (Sacramento Airport)
Southern Line	Colton, Phoenix, Las Vegas, Mission Valley, San Diego	Phoenix, McCarran, Las Vegas, Ontario, San Diego

Source: CEC analysis of PIIRA data

## NON-CALIFORNIA FUEL PRODUCTION VS OUT-OF-STATE FUEL EXPORTS



Source: CEC analysis of PIIRA data

## FEATURED TOPIC

### A PRIMER ON CALIFORNIA'S PIPELINE INFRASTRUCTURE

Pipelines allow petroleum products to move quickly and affordably across California. Raw products like crude oil, natural gas, as well as refined products such as gasoline, diesel, and jet fuel are moved by pipelines. This Petroleum Watch details how products move through the pipeline, the quantity of products moved, and the locations served. The article focuses solely on the Kinder Morgan pipeline infrastructure serving California and its connected markets. Kinder Morgan is one of the largest energy infrastructure companies in North America, owning and operating approximately [83,000 miles of pipelines and 144 terminals](#), and is the largest product pipeline operator in the Western United States. In California, Kinder Morgan pipelines carry only refined products, so this discussion focuses on refined products and omits crude oil pipelines, which are a separate system.

#### HOW DO PIPELINES WORK?

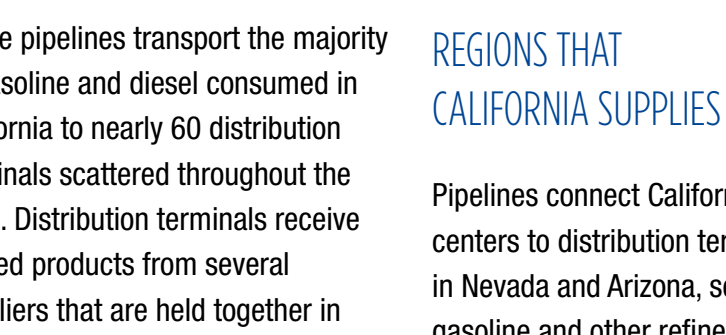
In California, pipelines are generally buried beneath the ground, but some segments may be above ground. Pipelines are pressurized to move products. Since pipelines follow the terrain, moving uphill reduces the pressure due to gravity. Pumping stations are used at strategic locations to maintain pressure in the pipelines to keep the products moving.

Multiple types of refined products are pumped through the same pipeline via a sequencing system known as batching. Batching keeps a steady pressure within the pipeline and lessens the mixing of products. Using one pipeline saves on the cost of building separate pipelines for each product. [Pipeline Sequencing System](#) shows an example of batching products into a pipeline. The products are put in a specific order to minimize mixing because they have different densities. Some product mixing is expected and is called transmix. Transmix is removed from the pipeline at terminals and separated back into the original products.

A pipeline operator, like Kinder Morgan, is paid by how much volume is moved through the pipeline. This financial incentive encourages the pipeline operator to keep the pipelines as full as possible. This is also why pipelines generally flow in one direction. More money is made when large volumes of products move from production centers to terminals that serve a large consumer base. Pipeline schedules follow a system which sells large volumes of products one month in advance through a bidding process. Before a product enters the pipeline, it is tested to ensure quality so that it doesn't taint the pipeline sequence or damage the pipeline. For example, ethanol is not transported via a refined product pipeline because it is corrosive and causes damage. Once scheduling is done and the product passes quality check, it is loaded into the pipeline where it takes roughly one week to travel from the San Francisco Bay area to Reno or from Los Angeles to Phoenix.

Most of California's pipeline distribution capacity is owned and operated by Kinder Morgan. They do not own any of the refined products but charge a fee on a per barrel basis based on rates approved by state and federal government, along with storage and terminal costs.

#### PIPELINE SEQUENCING SYSTEM



Source: Emergence Services

These pipelines transport the majority of gasoline and diesel consumed in California to nearly 60 distribution terminals scattered throughout the state. Distribution terminals receive refined products from several suppliers that are held together in community storage tanks for like types of fuel. This is another reason why fuel standards are strictly enforced, as lower quality products could contaminate other deliveries held in storage. Terminals are also the point where renewable fuels (ethanol, biodiesel, and renewable diesel fuel) are combined with gasoline and diesel when tanker trucks are filled. These tanker trucks deliver the finished products to their final destinations: wholesale facilities, private distribution sites (card-locks), and retail stations (truck stops and service stations).

Kinder Morgan's pipeline system is illustrated in [Kinder Morgan Refined Products Pipelines](#) detailing the Northern California Region and the Southern California Region. Notably, there is no connection point between the Northern and Southern Regions. Instead, marine vessels are used to transfer products between Northern and Southern California. The Southern Region branches off to Las Vegas via the Cal/Nev line, while the SFP Southern Region line ends in Phoenix. The Southern California map shows a pipeline continuing east into Texas from Phoenix, however this pipeline flows from Texas into Arizona and is effectively a separate system.

#### QUANTITY OF PRODUCTS MOVED

To determine how much product is transported through a pipeline, monthly data is aggregated for the year and averaged to get the amount in gallons per day. [Total Pipeline Throughput by Region](#) shows that California regularly had over 44 million gallons in its pipeline systems on any given day. The Southern Region accounted for 55 percent or more of total product from 2016 to 2020. [Pipeline Refined Products by Region](#) shows the type of products traveling through the pipeline. Gasoline is the most-moved product averaging 10.5 million gallons in the Northern Region and 13.1 million gallons in the Southern Region. Diesel and jet fuel are roughly equal, splitting the remaining volume of products. From 2016 to 2020 in the Northern Region, diesel and jet fuels daily rates averaged 3.8 million gallons and 4.3 million gallons moved, respectively. In the Southern Region, diesel and jet fuel average daily rates averaged 6.2 million gallons and 6.0 million gallons, respectively.

Products are distributed throughout the pipeline system at various terminal locations. [Pipeline Terminals by Region](#) lists the locations that receive the most product.

#### REGIONS THAT CALIFORNIA SUPPLIES

Pipelines connect California refining centers to distribution terminals in Nevada and Arizona, sending gasoline and other refined products to these neighboring states. The Northern California pipeline exports to Northern Nevada, supplying Reno and its surrounding communities. The Southern California pipeline supplies both the Southern Nevada and Western Arizona markets.

[Non-California Fuel Production Vs. Out-of-State Exports](#) shows production of non-California refined products compared to refined products exported out of state via pipeline. This graph shows gasoline and diesel production because those fuels are broken into California and non-California types. Nevada and Arizona have their own gasoline and diesel emission performance standards that may differ from [California's standards](#). Jet fuel is standardized internationally and harder to separate. From 2016 to 2020, out-of-state pipeline exports averaged 79 percent of non-California gasoline production and 63 percent of non-California diesel production. Pipeline exports are always lower than production because a portion of that production is shipped via marine vessel to foreign markets. From 2016-2020, non-California gasoline production averaged 45.5 million barrels per year, or 5.2 million gallons per day. From 2016-2020, non-California diesel production averaged 43.4 million barrels per year, or 5 million gallons per day.

Nevada and Arizona are connected to California via pipelines, and dependent on its refining and petroleum infrastructure. A majority of refined products move to these states via pipelines, which are essential components of the western states' energy supply infrastructure.

#### CONCLUSION

There are many advantages to pipeline transportation: reliability, cost effectiveness, and efficiency. Pipelines are a critical part of the western states' energy infrastructure, leaving energy supply vulnerable if they were to reduce capacity or shut down (such as the case with the [Colonial Pipeline ransomware attack](#) on the east coast). Without pipelines or access to marine vessels, tanker trucks are the only option for transportation. If a tanker truck was filled to its maximum capacity of 11,600 gallons, it would take 3,794 trucks to transport the daily amount of refined products that flow through Kinder Morgan's pipelines. A disruption in pipeline operations would significantly affect fuel supply and prices.

Visit our website for more information about [California's Petroleum Market](#).

Gavin Newsom  
Governor

David Hochschild  
Chair

Drew Bohan  
Executive Director

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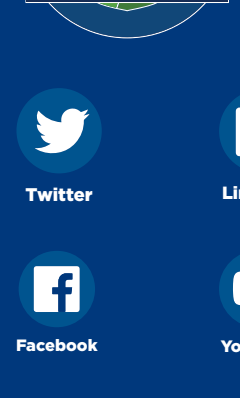
SPECIAL THANKS

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