DOCKETED	
Docket Number:	23-SB-02
Project Title:	SB X1-2 Implementation
TN #:	256724
Document Title:	Summer Outlook Workshop Presentation
Description:	N/A
Filer:	Donnie Cox
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	6/6/2024 11:15:13 AM
Docketed Date:	6/6/2024

Gasoline Summer Outlook

Jeremy Smith, Deputy Director, Energy Assessments Division
Dr. Gigi Moreno, PhD, Chief Economist, Division of Petroleum Market Oversight

June 6, 2024

Housekeeping

Meeting is being recorded.

Attendees may participate today by:

- Making comments during public comment period
- Submitting written comments, **due by 5 p.m. June 20**.

Purpose of Today's Workshop

- Provide an overview of supply, demand, and price trends observed in the data collected under SB X1-2.
- Present new data analysis tools developed to better understand the factors that cause price spikes.
- Present the gasoline supply outlook for Summer 2024.
- Present observations on the relationship between refinery maintenance and gasoline prices.

Agenda

- Welcome
- Opening Comments from the Dais
- Staff Presentations
  - Jeremy Smith, Energy Assessments Division
  - Dr. Gigi Moreno, Division of Petroleum Market Oversight
- Comments from the Dais
- Public Comment
- Adjourn

Comments from the Dais

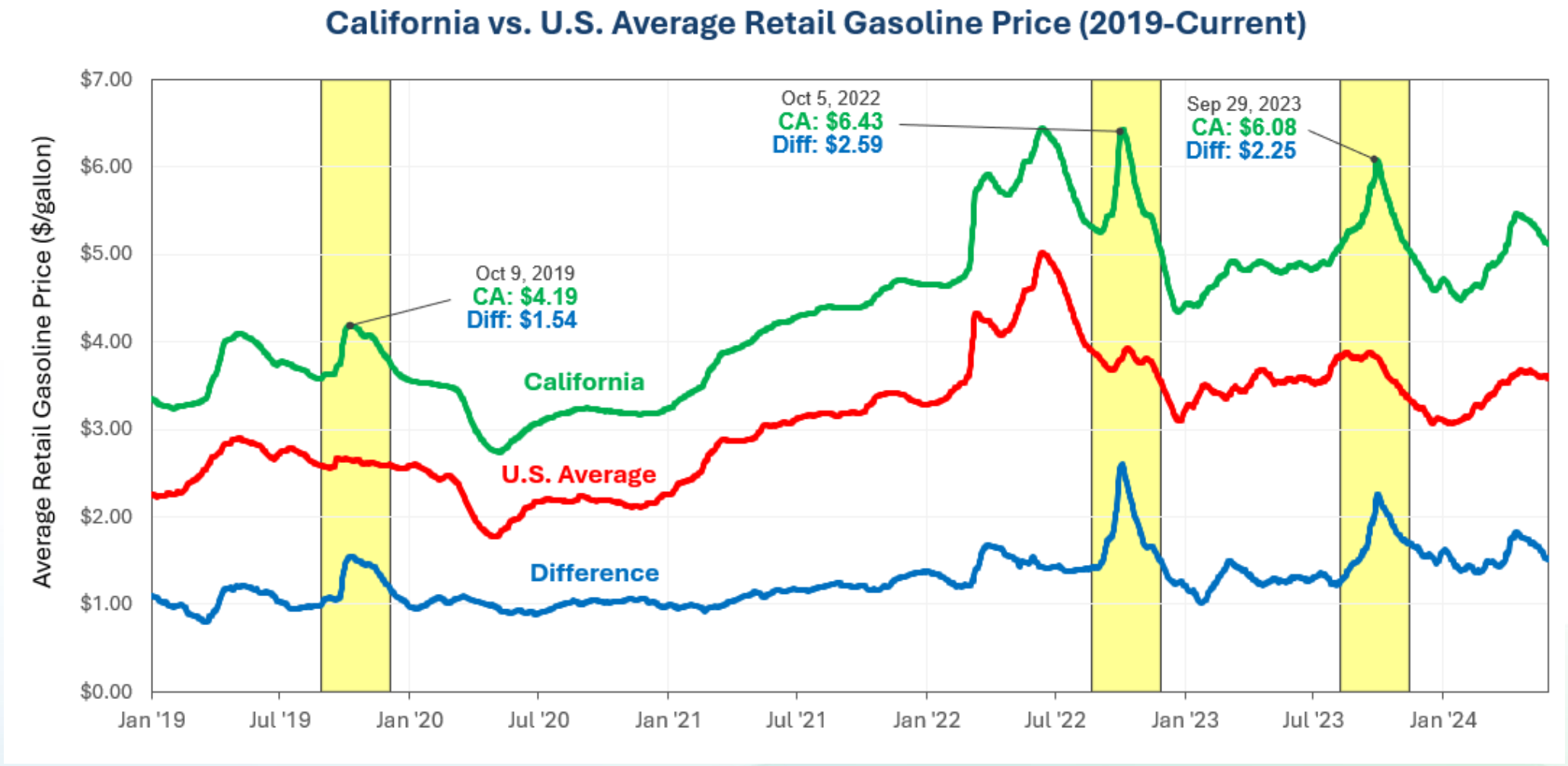
Data Collection & Monitoring

Jeremy Smith
Deputy Director, Energy Assessments Division

Data Collection & Monitoring

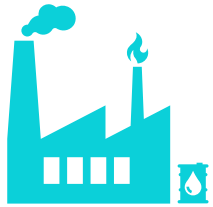
Requirements	Progress
Collect new data from petroleum industry.	**Nine new data streams** • Spot market, marine imports, refinery maintenance, refiner margins, etc.
Analyze data to inform: • Refiner max margin + penalty • Market oversight • Minimum inventory/resupply	**10,000+ data submissions** processed and analyzed.
Increase transparency through reporting.	**Refiner Margins** (monthly) and **Gasoline Price Breakdown** (weekly) webpages

California vs. U.S. Retail Gasoline Prices



CA vs. U.S. Price Drivers

1 Gasoline Demand

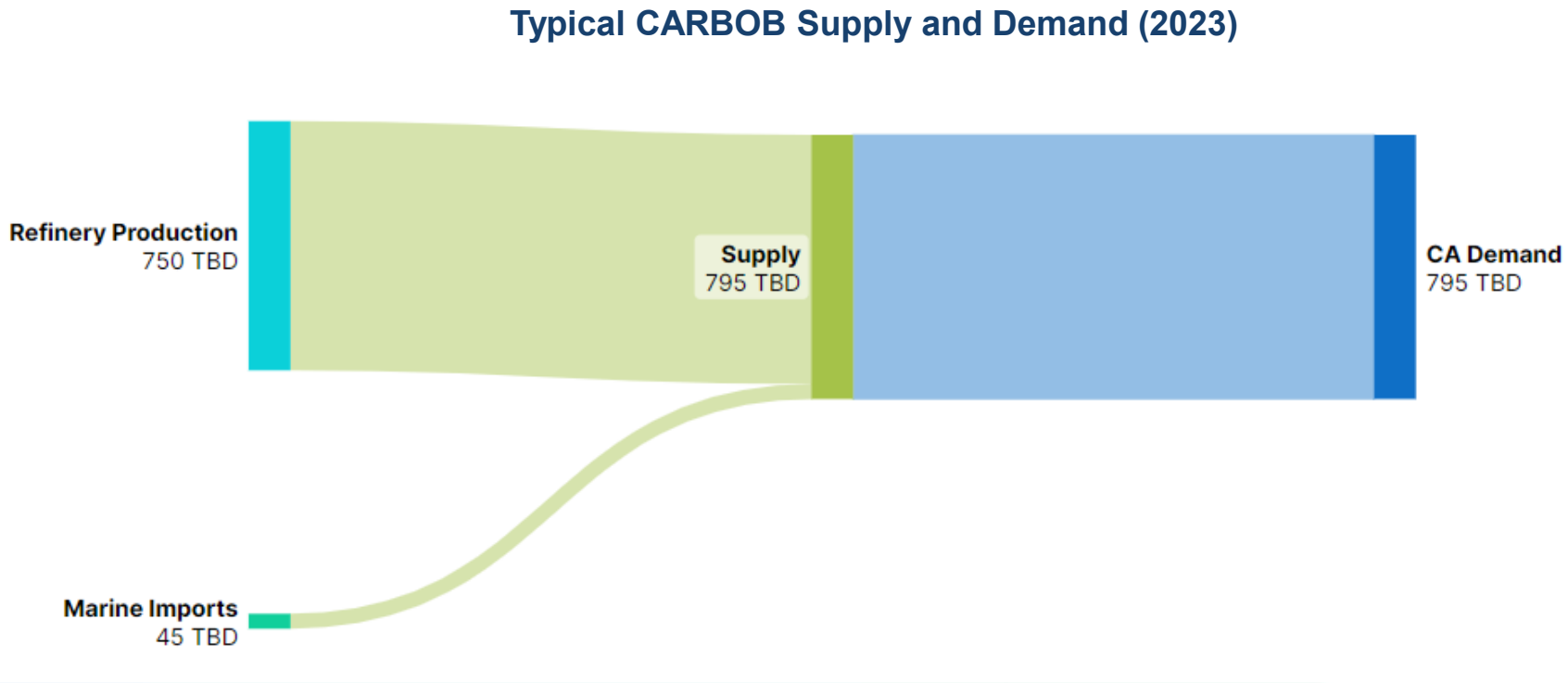


2 Refinery Production

3 Marine Imports

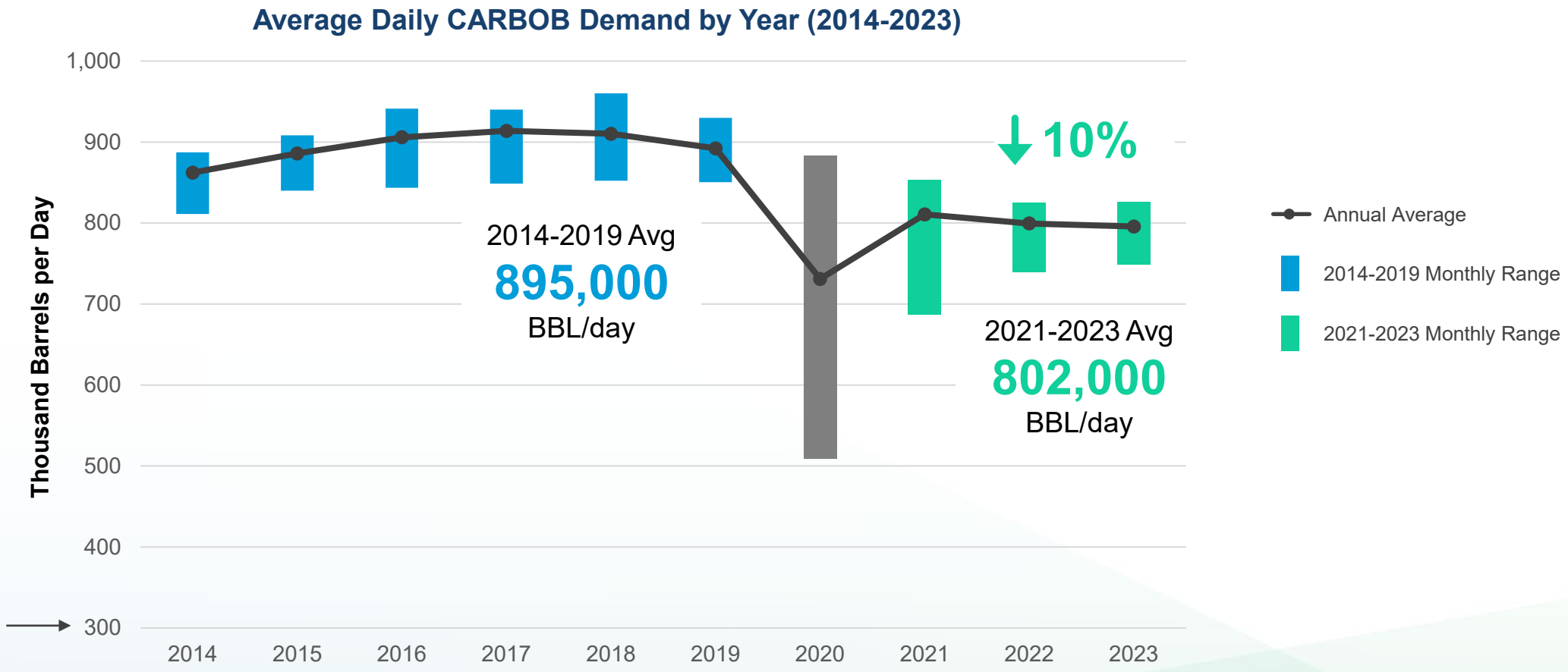
4 Gasoline Inventories

California's Gasoline Flows



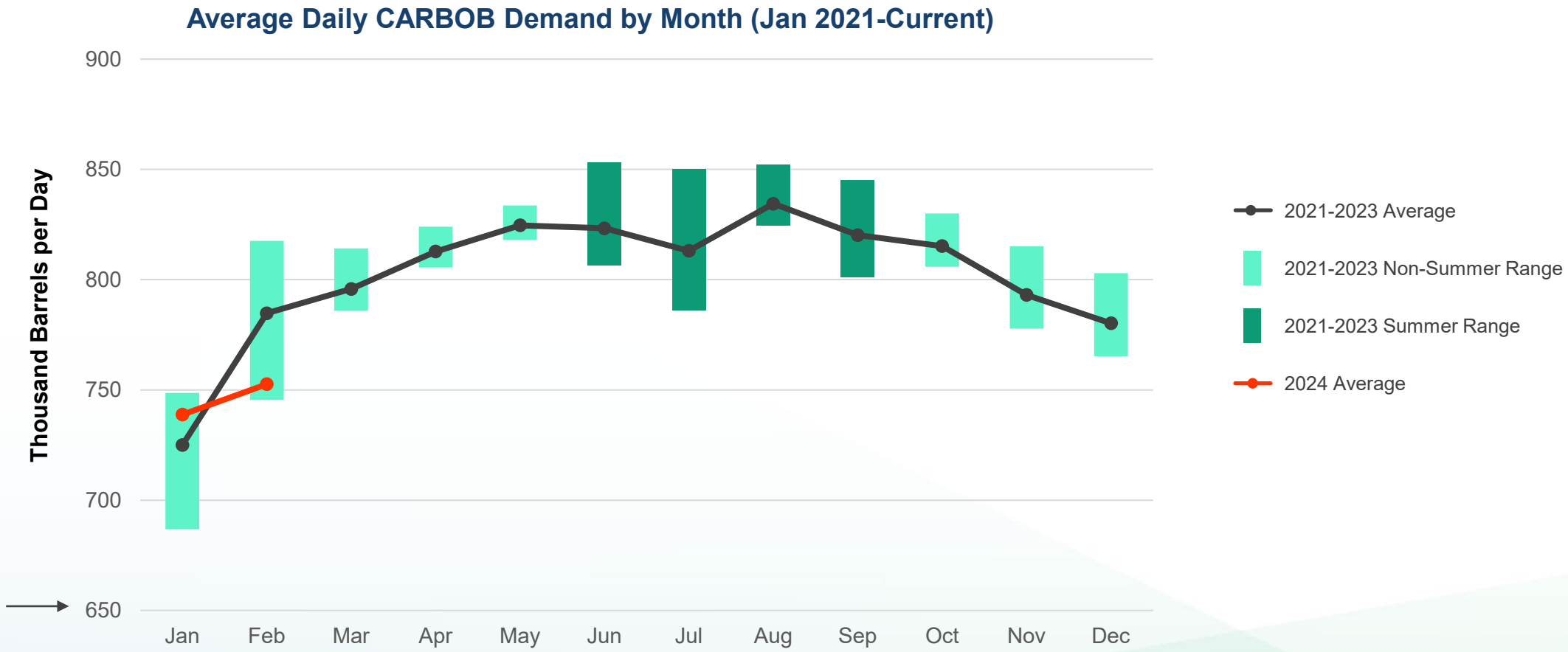
Note: Units are in thousand barrels per day (TBD).
Sources: Production from CEC Weekly Fuels Watch Dashboard.
Marine imports from CEC Form 700 data.
CA demand from California Department of Tax and Fee Administration (CDTFA) Fuel Taxes and Statistics Report

California CARBOB Demand



Source: California Department of Tax and Fee Administration (CDTFA) Fuel Taxes and Statistics Report
Note: Inferred CARBOB is an estimate of CARBOB using 90% of total gasoline (without Aviation Gasoline).

California CARBOB Demand



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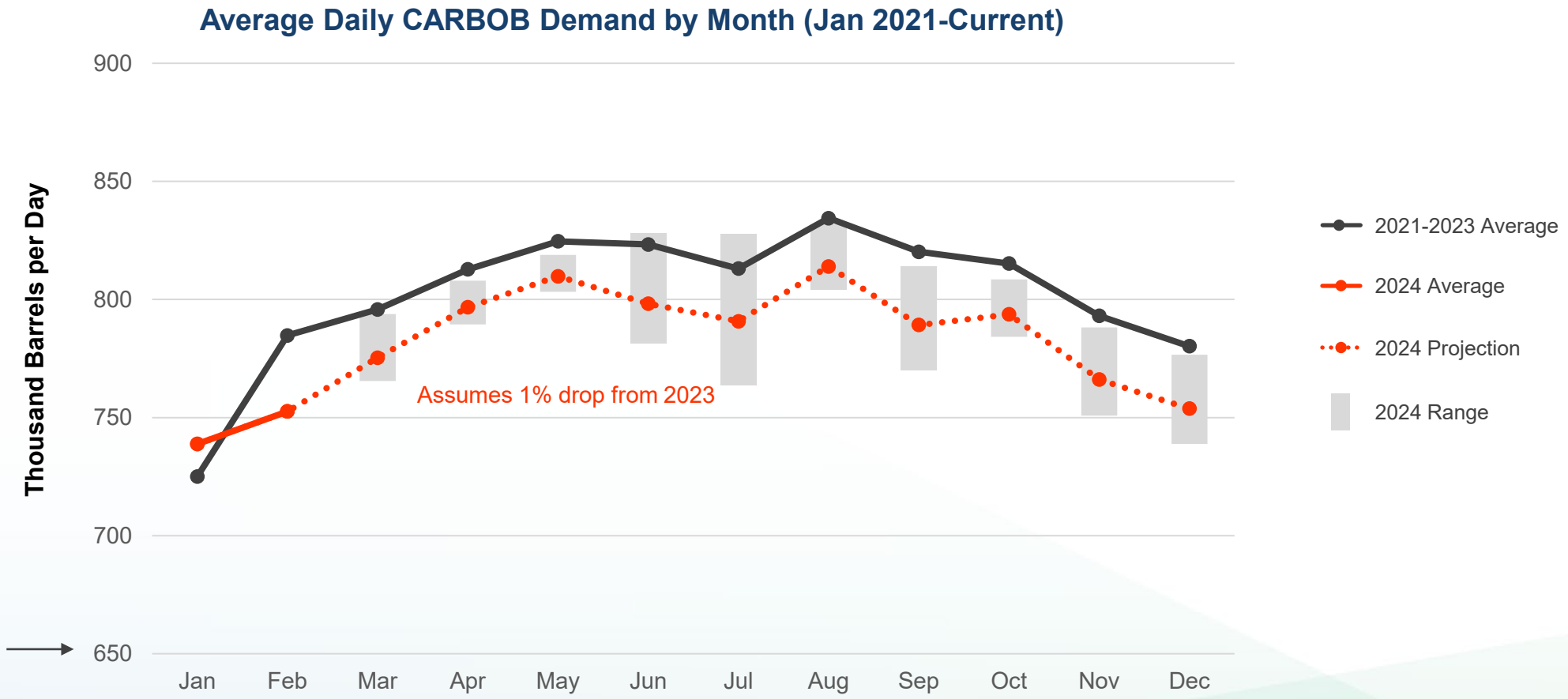
California CARBOB Demand



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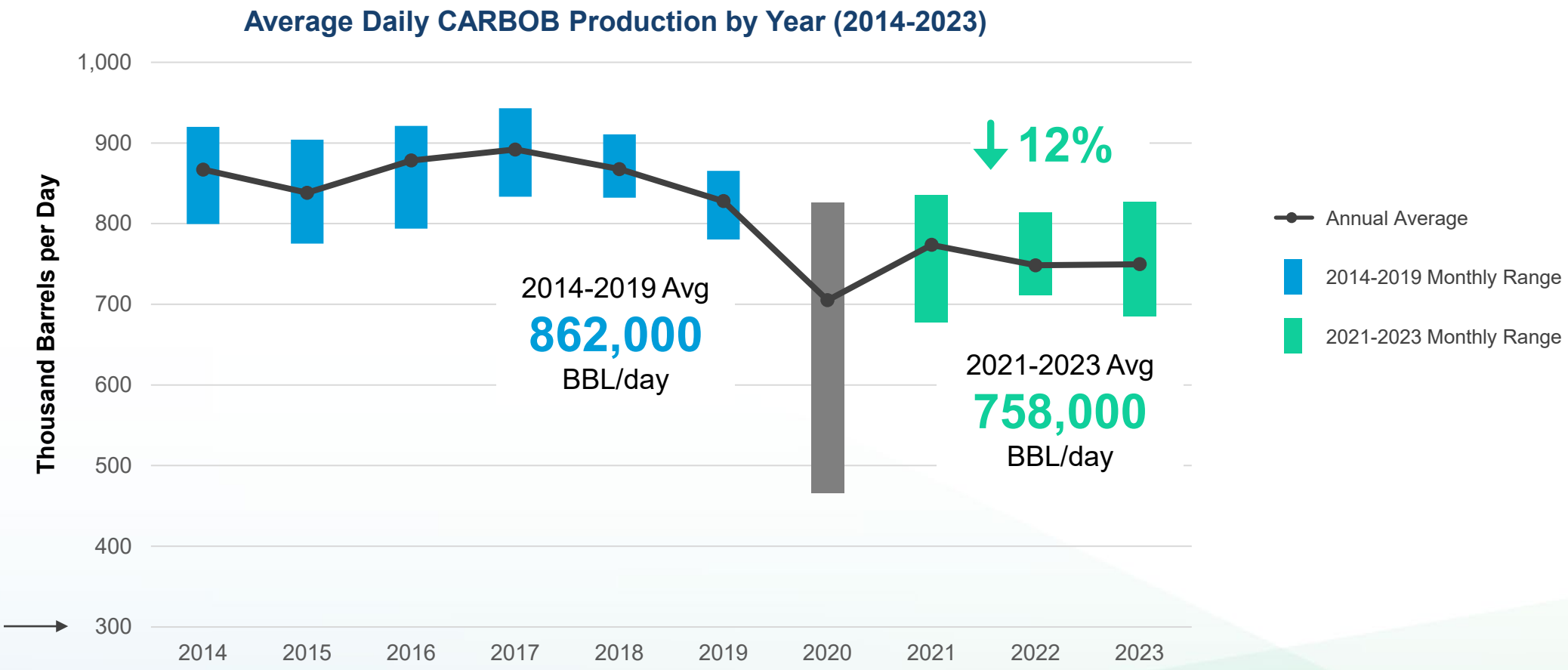
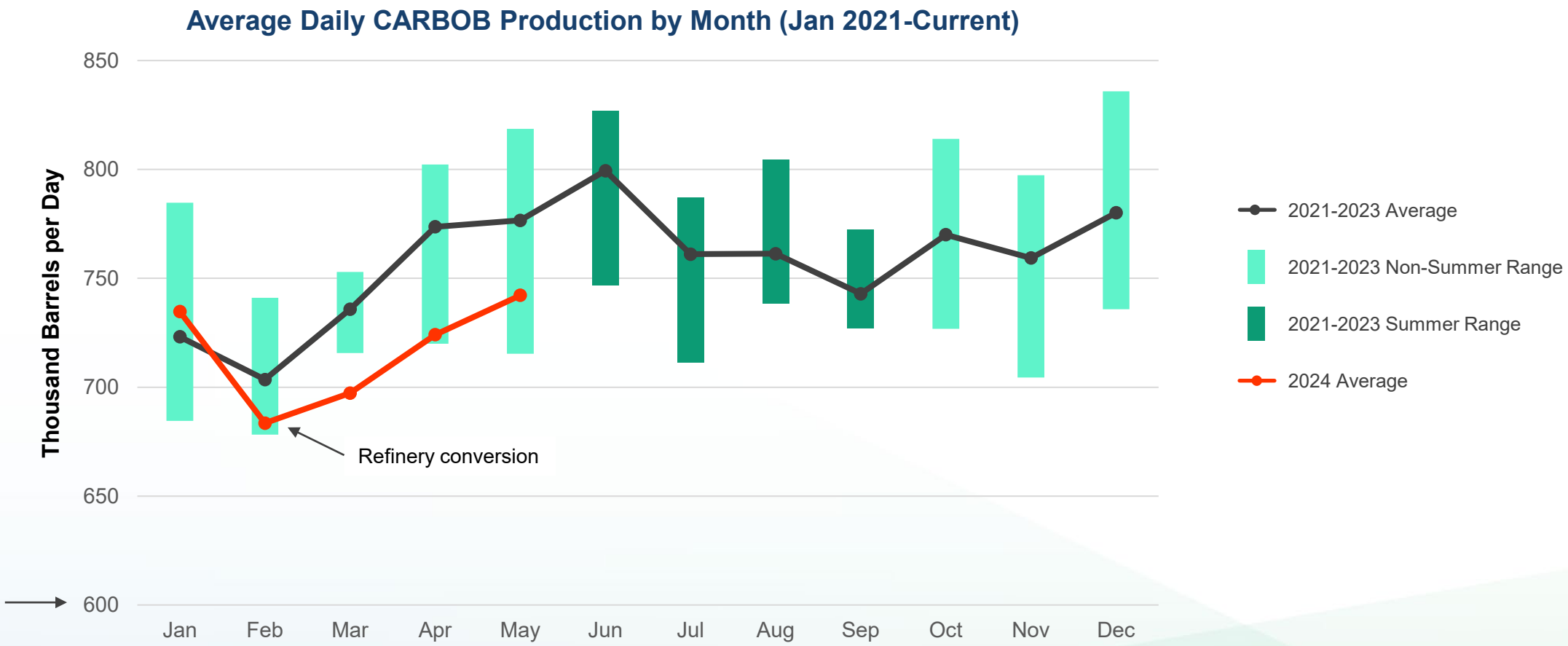
CA Refinery CARBOB Production



Source: Production from CEC Weekly Fuels Watch Dashboard.
Note: Inferred CARBOB is an estimate of CARBOB using 90% of total gasoline.

CA Refinery CARBOB Production



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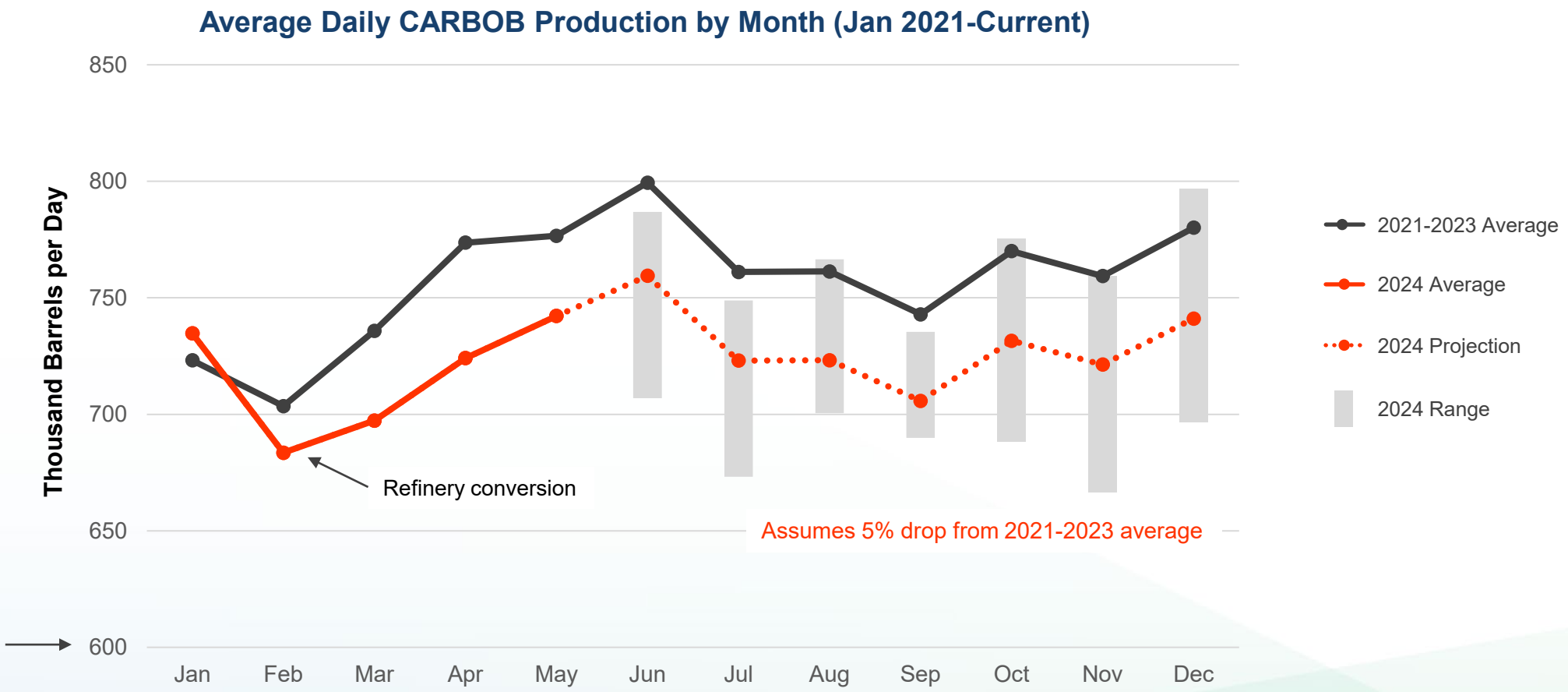
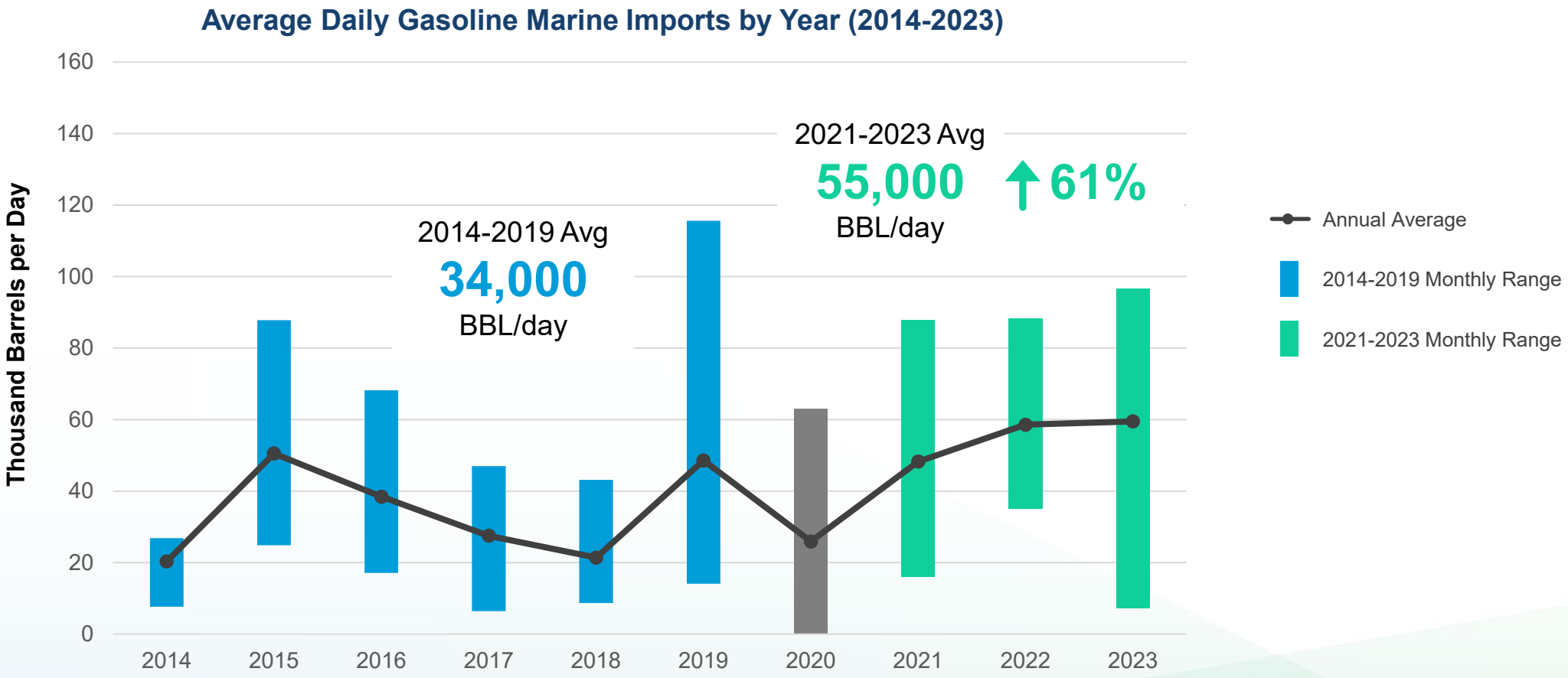
CA Refinery CARBOB Production



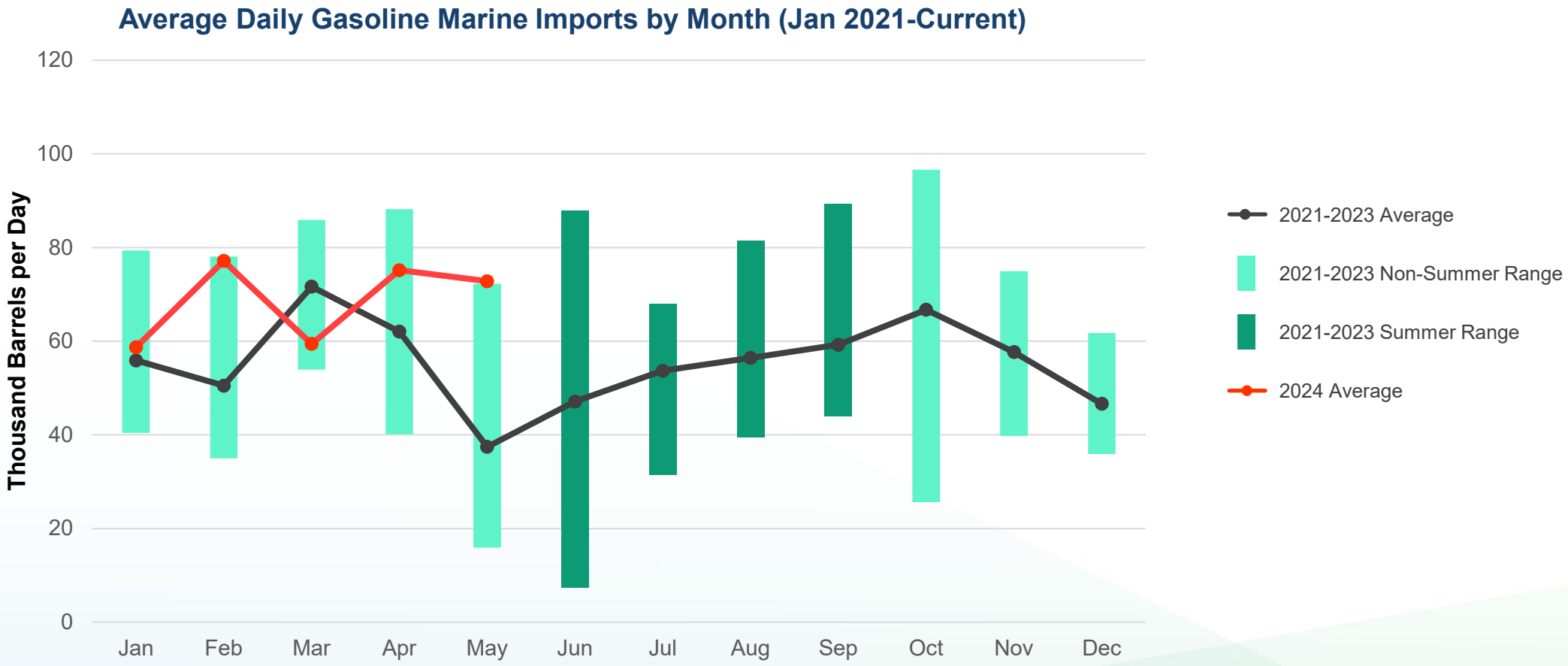
Source: Production from CEC Weekly Fuels Watch Dashboard.
Note: Inferred CARBOB is an estimate of CARBOB using 90% of total gasoline.

California Gasoline Marine Imports



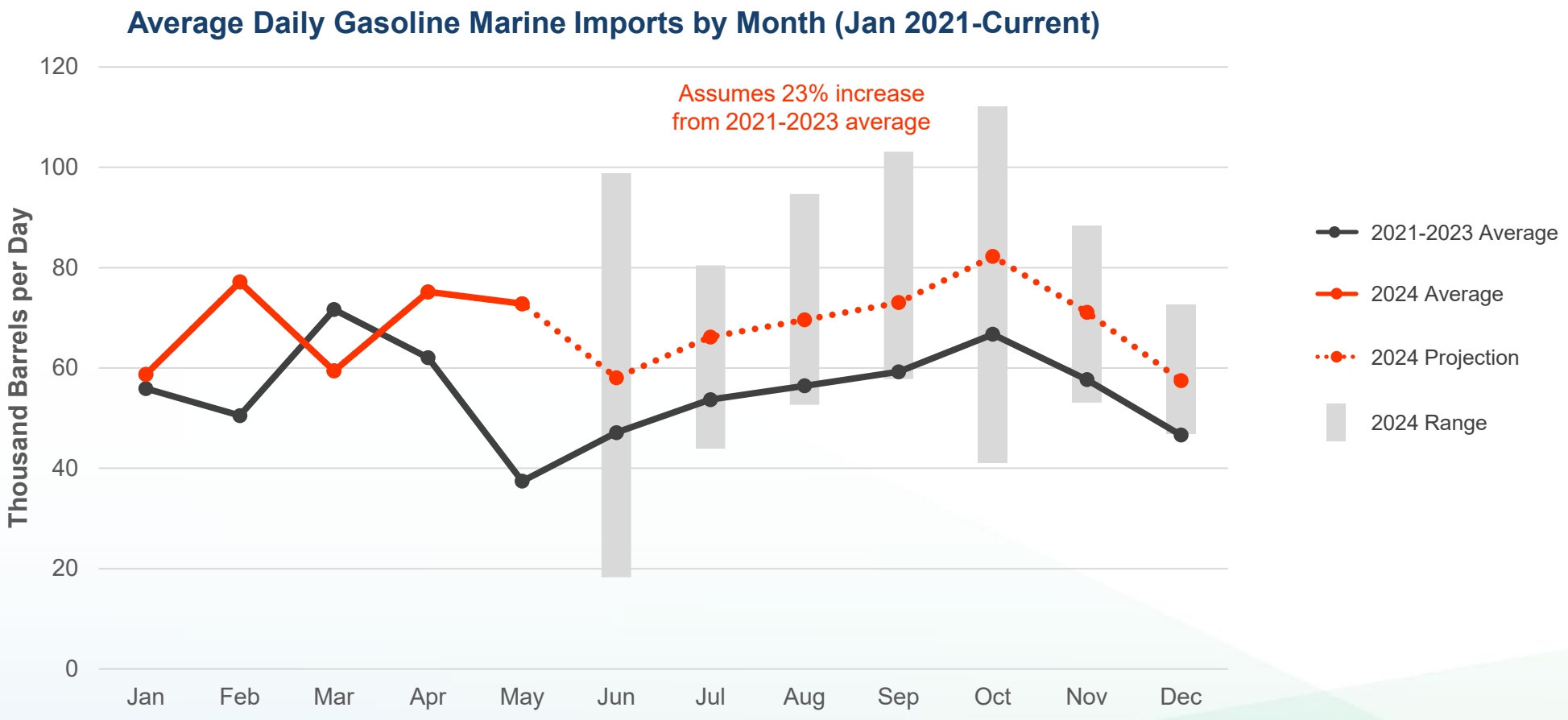
Source: Marine imports from CEC Form 700 data.

California Gasoline Marine Imports



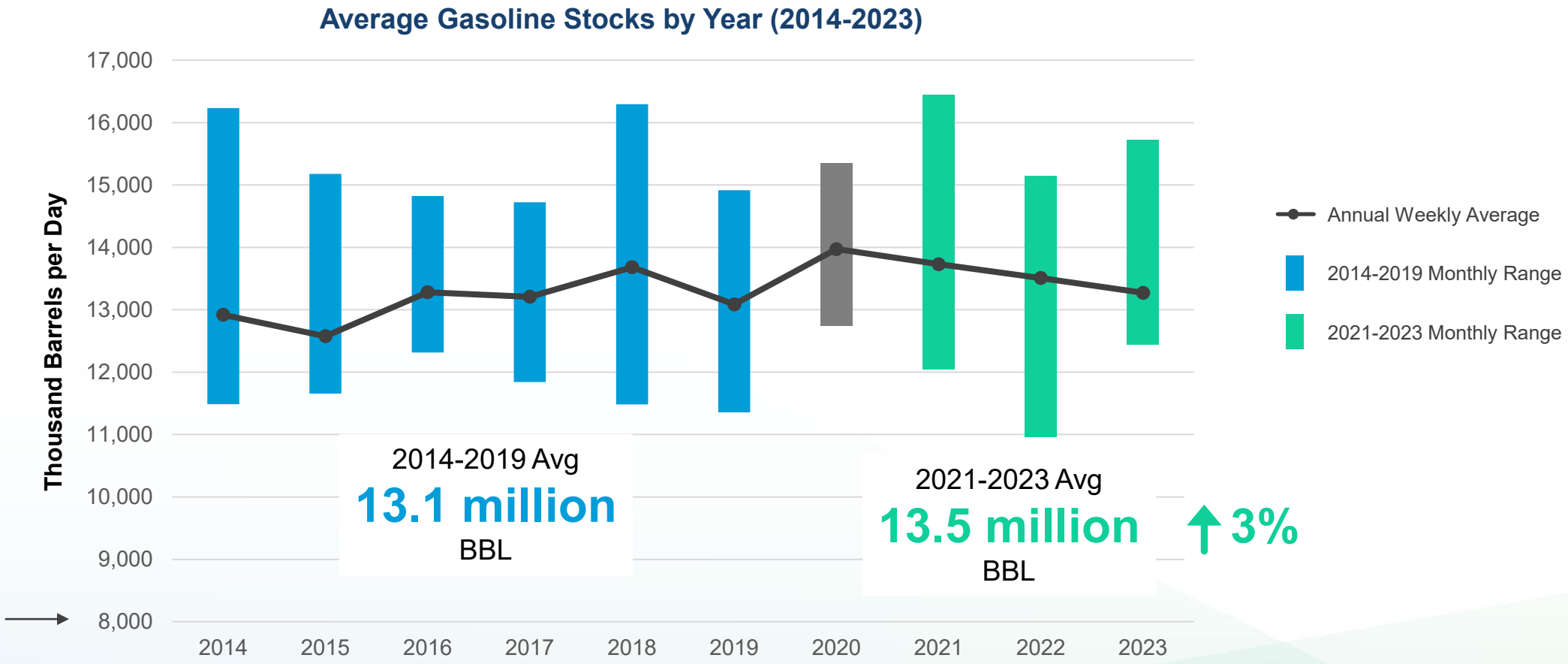
Source: Marine imports from CEC Form 700 data.

California Gasoline Marine Imports



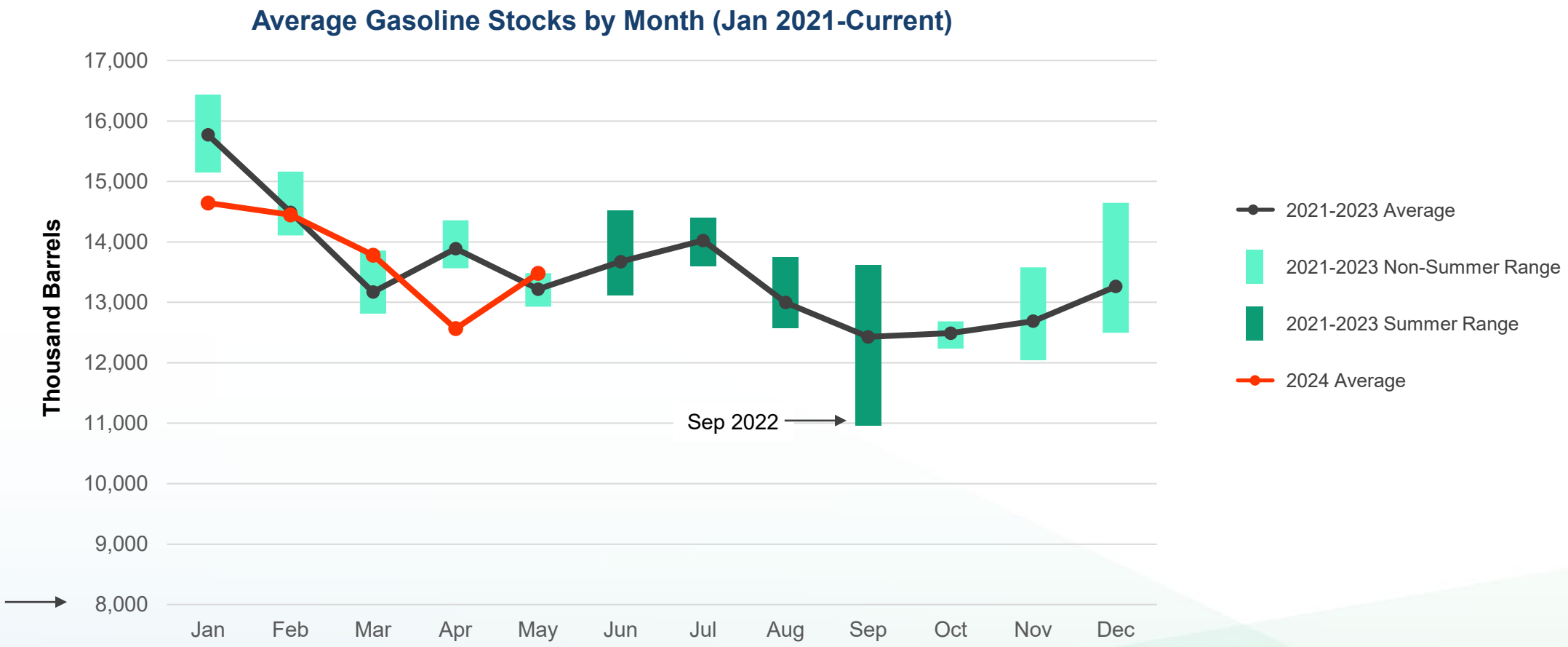
Source: Marine imports from CEC Form 700 data.

West Coast Gasoline Inventories



Source: EIA West Coast (PADD 5) Stocks of Crude Oil and Petroleum Products (eia.gov)
Total stocks includes RBOB and gasoline blending components.

Gasoline Inventories



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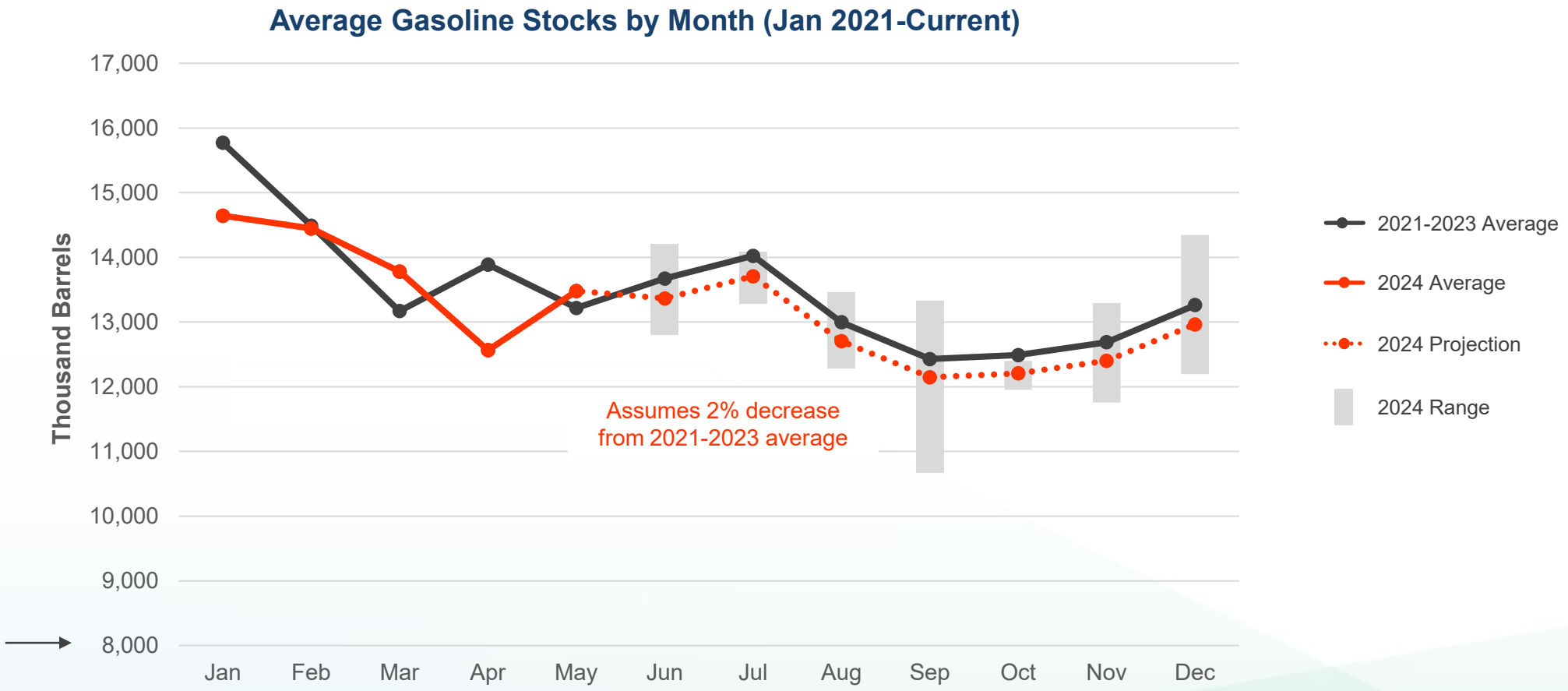
Gasoline Inventories Projection



Source: EIA West Coast (PADD 5) Stocks of Crude Oil and Petroleum Products (eia.gov)
Total stocks includes RBOB and gasoline blending components.

CARBOB Supply Trends (2014-2023)

Price Metric	2014-2019	2021-2023	Change
Refinery Production (+)	862	758	-104
Marine Imports (+)	34	55	+21
Demand (-)	895	802	-93
Balance (+/-)	**+1**	**+11**	**+10**

Note: Values are in thousand barrels per day.

September CARBOB Supply Trends (2021-2024)

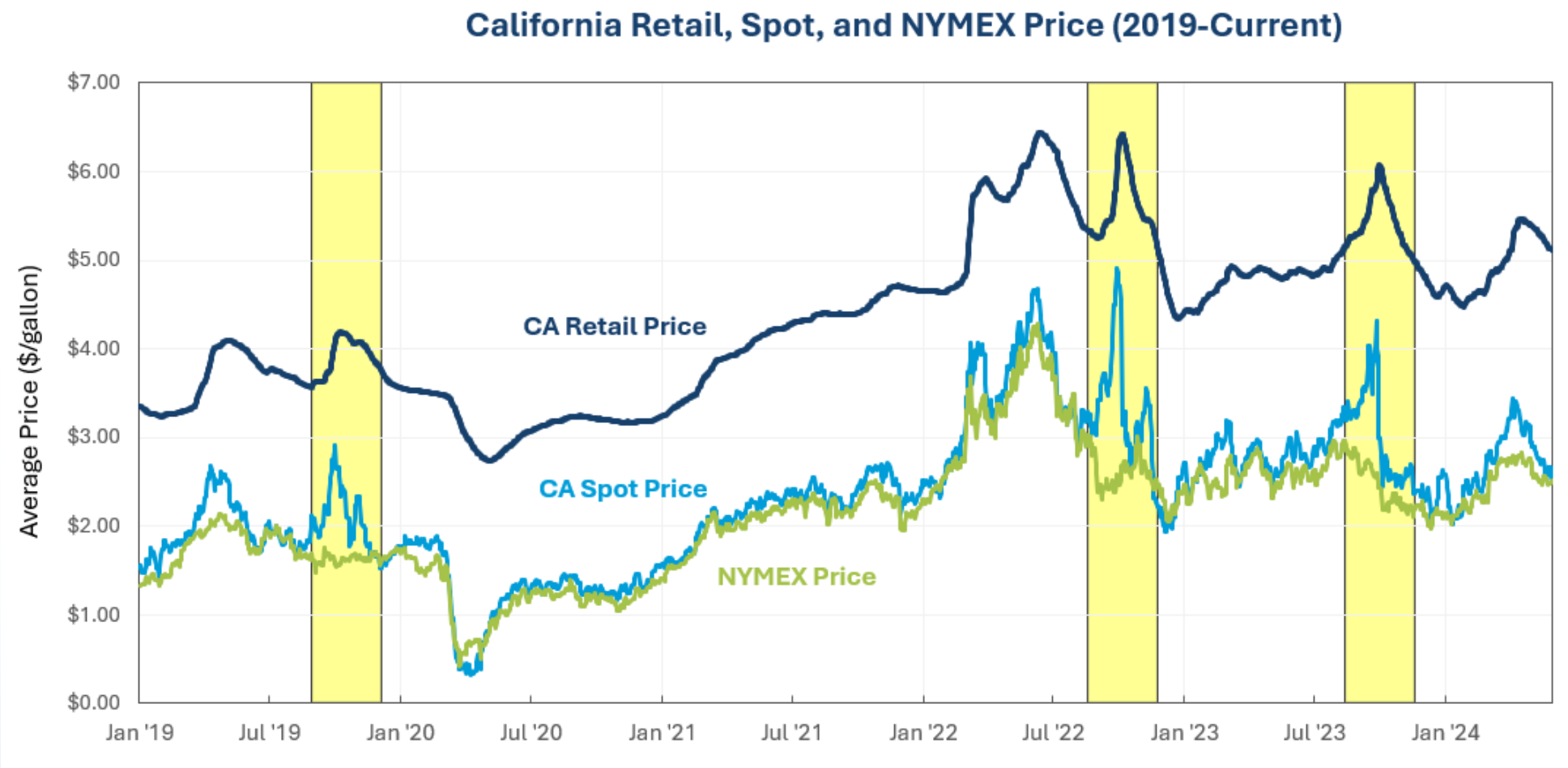
Price Metric	2021-2023 Sep	2024 Sep Projection*	Change
Refinery Production (+)	743	706	-37
Marine Imports (+)	59	73	+14
Demand (-)	820	789	-31
Balance (+/-)	**-18**	**-10**	**+8**

Note: Values are in thousand barrels per day.
2024 Sep projections are based on recent observed supply and demand trends and 2021-2023 variability.

Gasoline Price Modeling

Jeremy Smith
Deputy Director, Energy Assessments Division

Retail Price vs. Spot Price



Gasoline Spot Price Drivers

Supply & Demand

Gasoline prices are primarily driven by supply and demand fundamentals: in-state refinery production, foreign and domestic imports, and retail sales (demand).

Inventories

Imbalances in gasoline supply and demand are typically managed through inventory changes—inventory increases during supply surpluses and is drawn down during supply deficits.

Price Impacts

When inventories are drawn down too far, there is little room to manage supply deficits. During these periods, market participants that are short fuel bid up to the price of available supply to keep their customers supplied causing price escalations.

“Forward” Days of Supply Metric

Stocks at beginning of week

Expected build or drawdown in stocks in current and next two weeks

$$DOS_{t=0} = \frac{Stocks_{t=-1} + \sum Exp.Supply\ Balance_{t=0,1,2}}{Demand_{daily}}$$

Common metric to measure market tightness

Avg. daily motor gasoline sales in month * 90%

Expected Supply Balance

$$\boldsymbol{Expected\ Supply\ Balance}_{t=0,1,2} =$$

Supply/Demand balance over past 3 weeks

$$Avg.\,Refinery\ Production_{t=-1,-2,-3}$$
$$- Avg.\,Gasoline\ Demand_{t=-1,-2,-3}$$

Expected Supply/Demand in current and next 2 weeks

$$- Planned\ Supply\ Outage_{t=0,1,2}$$
$$+ Planned\ Supply\ Addition_{t=0,1,2}$$

Input: *expected refinery outages, refinery restarts and increase or decreases in imports*

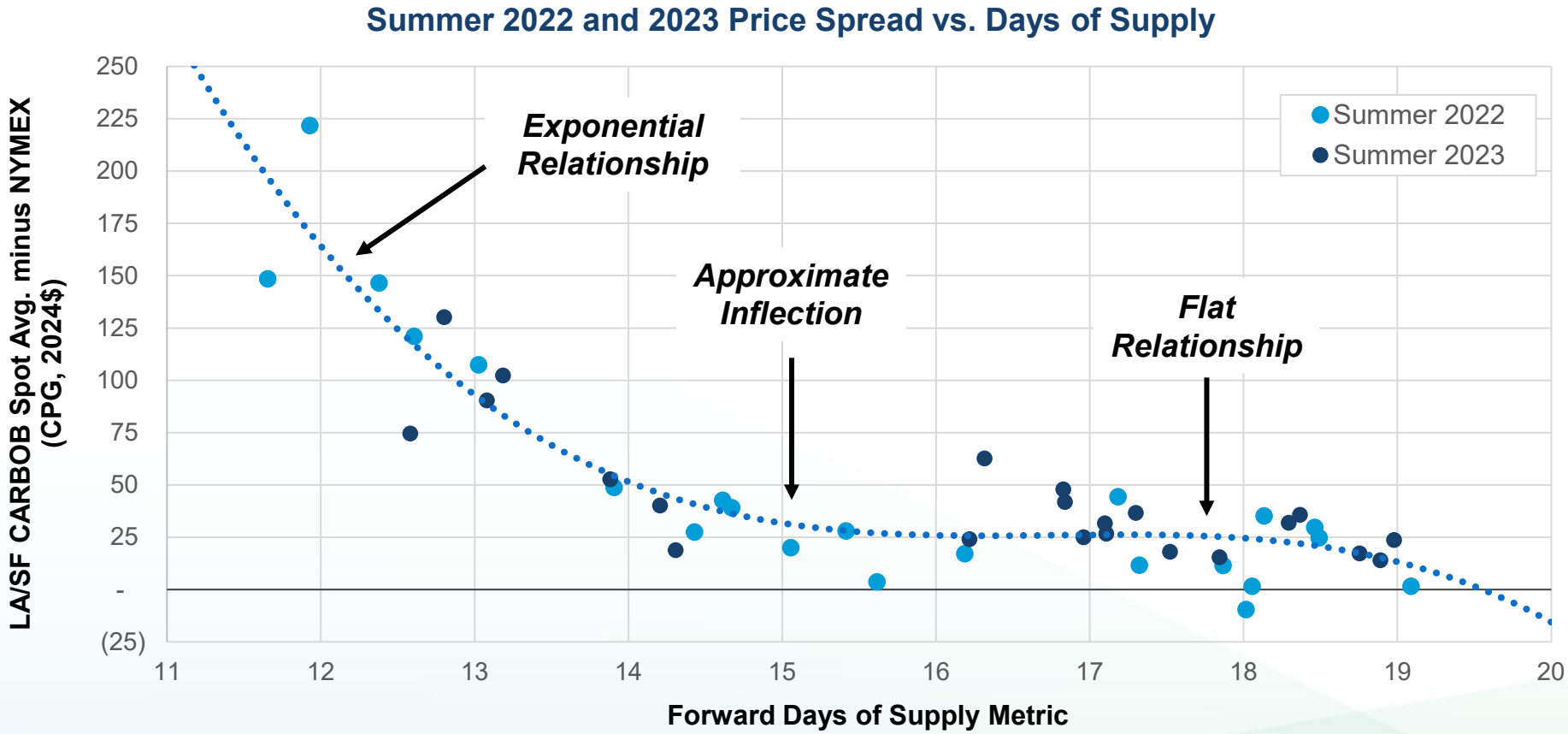
Key Data Sources

Data Item	Description	Source
Stocks	EIA PADD 5 RBOB Stocks at refineries, terminals, and pipelines (90% are CARBOB)	EIA Weekly Petroleum Status Report
Demand	Retail gasoline sales (minus ethanol content)	CDTFA
Refinery Production	Refinery CARBOB production (from refining and blending operations)	CEC Weekly Survey
Expected Supply Change	Expected gain or loss in gasoline supply based on known refinery outages, restarts, or import cargoes	Trade press, CEC data
California Price	Average of CARBOB spot prices in Los Angeles and San Francisco, adjusted to constant 2024$	Argus, BLS, OPIS
Benchmark Price	Front-month RBOB futures for delivery in New York Harbor	NYMEX

Note: The model and results presented are preliminary.

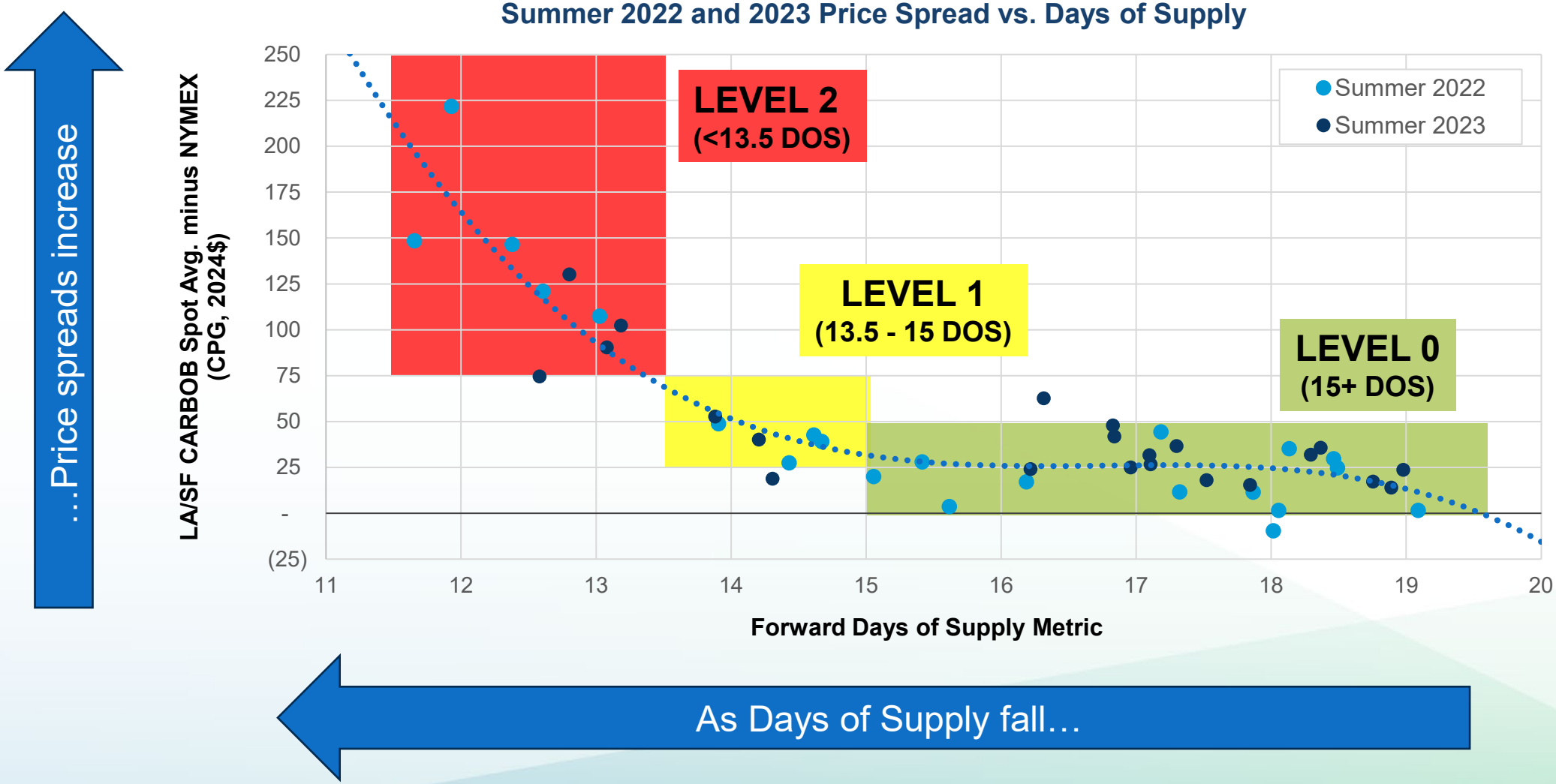
Fitting a Relationship

…Price spreads increase

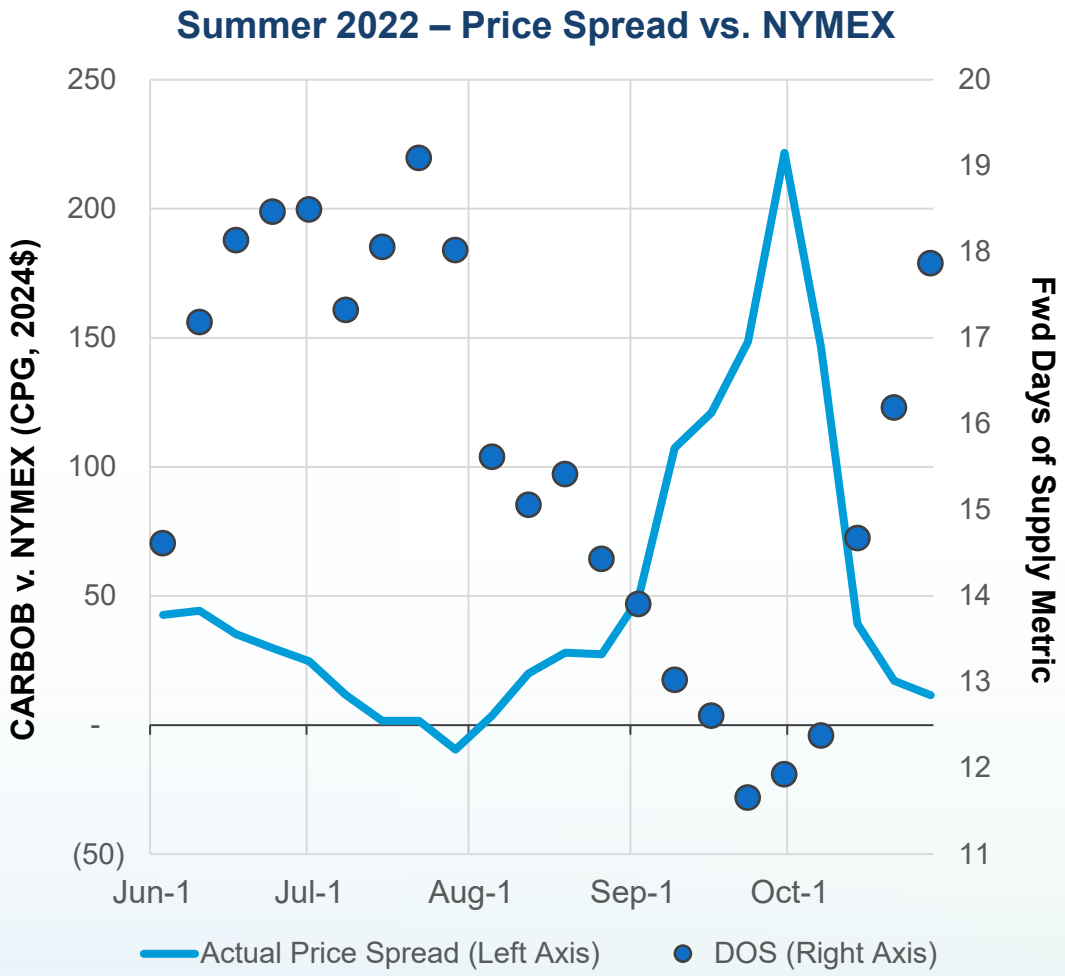


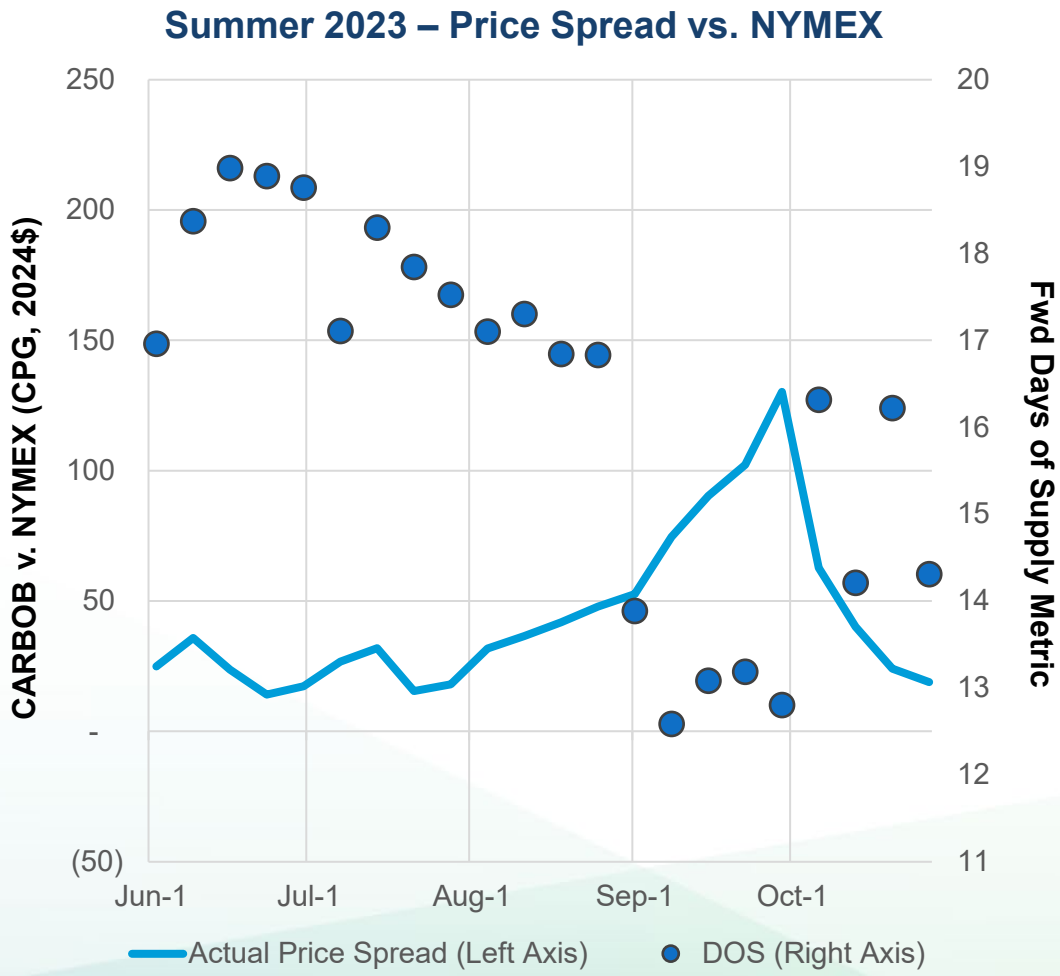
As Days of Supply fall…

Establishing Price Risk Levels

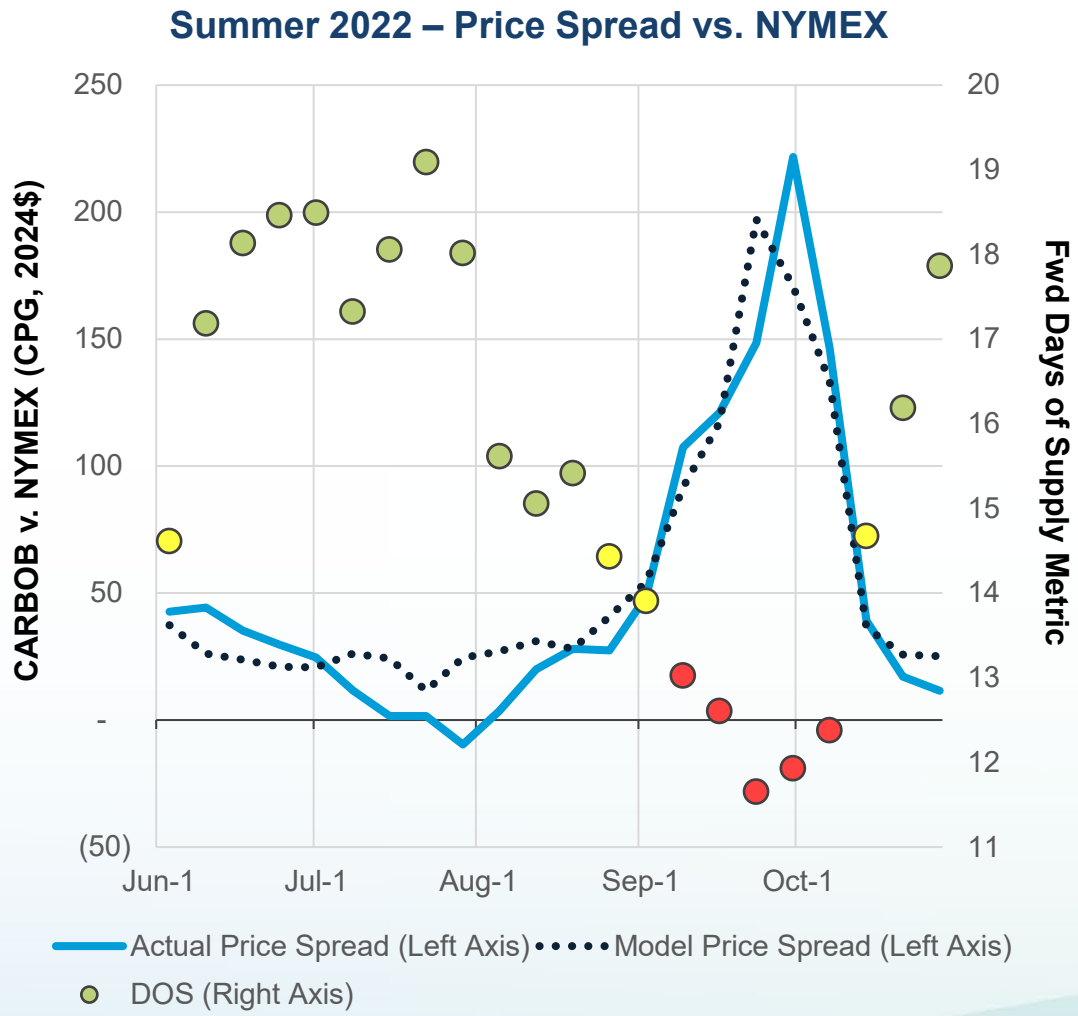


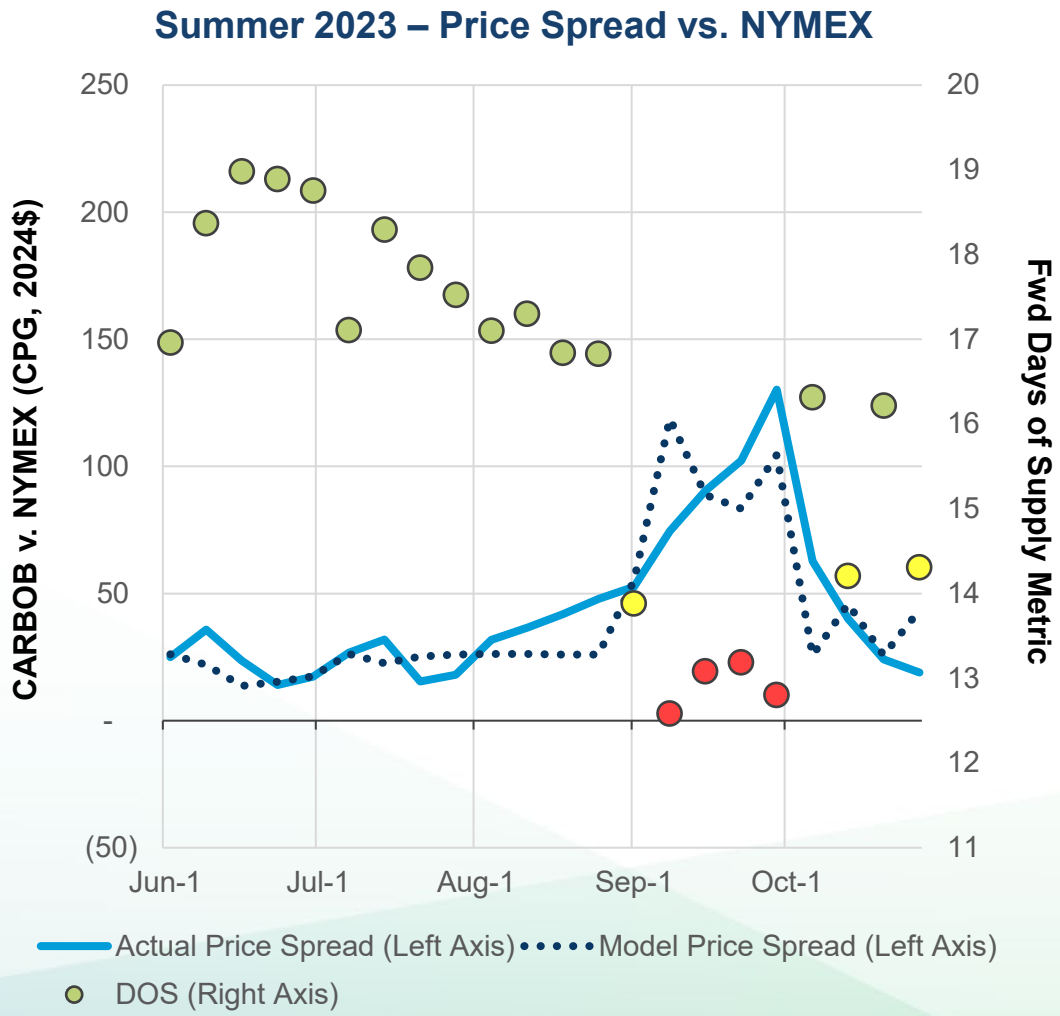
Gasoline Price and Days of Supply Behavior: Summers 2022 and 2023





Backcasting Spot Price Spreads





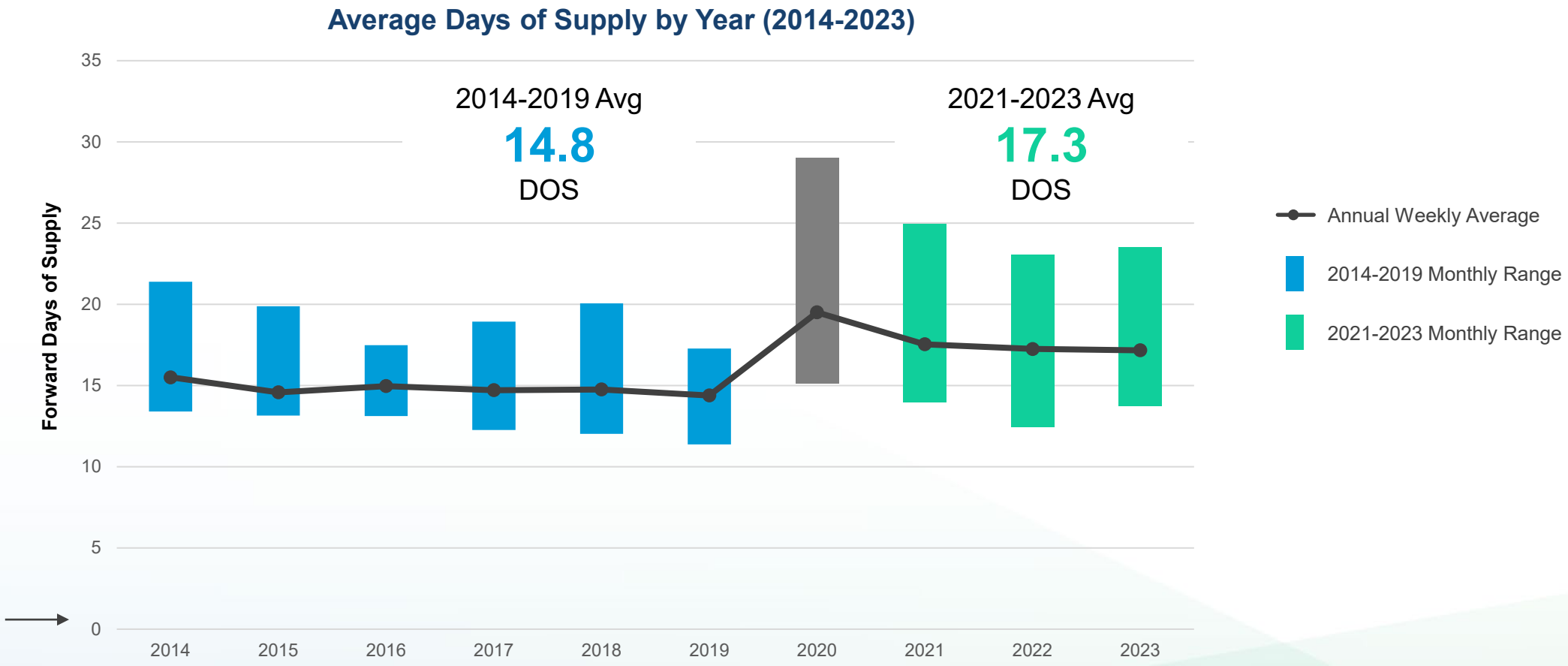
Gasoline Price Model Next Steps

- Replace PADD 5 gasoline stocks data (EIA) with weekly **California refinery and terminal storage inventories**
- Incorporate **new marine imports data** (more future visibility)
- Incorporate **weekly "apparent demand"** for more granular demand data and less delay in reporting
- Develop separate models for **Northern and Southern California**
- Develop separate models for **summer and non-summer months**

Summer Supply Outlook

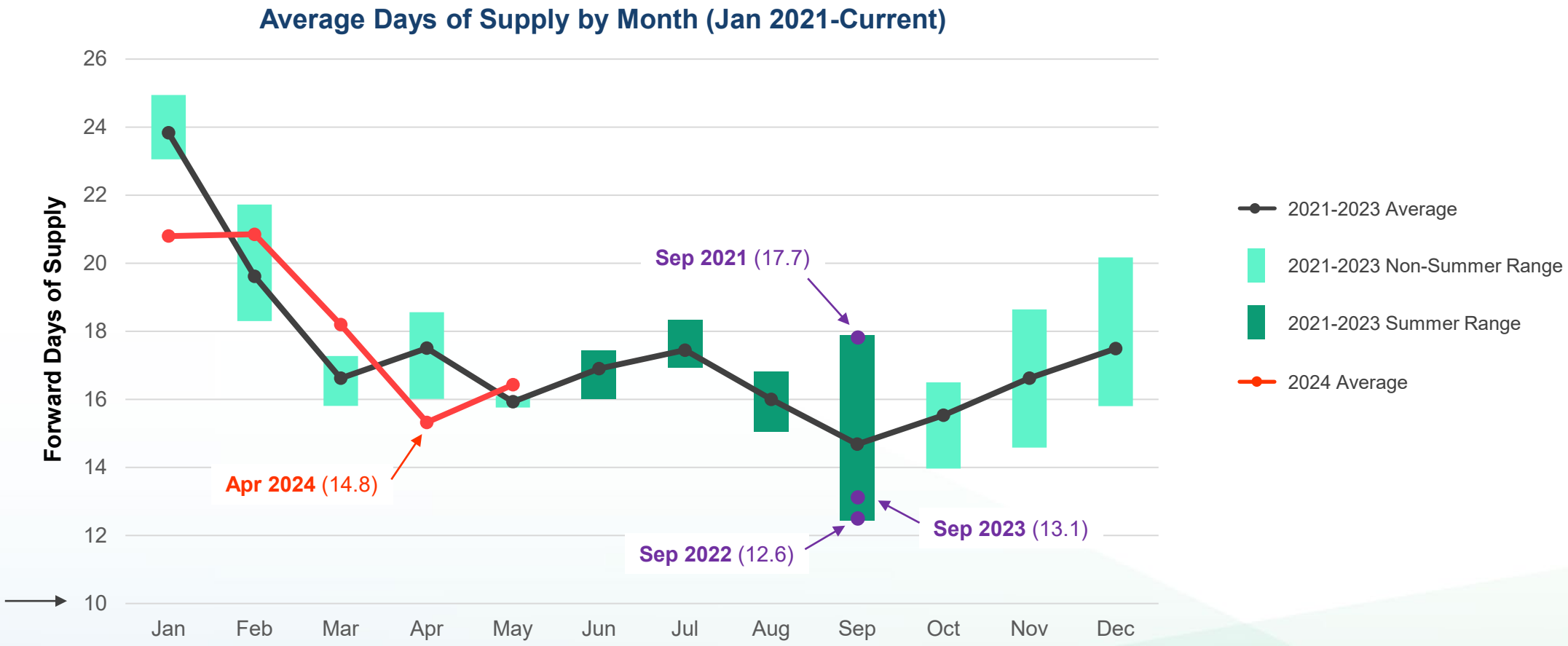
Jeremy Smith
Deputy Director, Energy Assessments Division

Days of Supply Annual Trend



Source: Production from CEC Weekly Fuels Watch Dashboard.
Gasoline stocks from EIA West Coast (PADD 5) Stocks of Crude Oil and Petroleum Products (eia.gov)

Days of Supply Monthly Trend



Source: Production from CEC Weekly Fuels Watch Dashboard.
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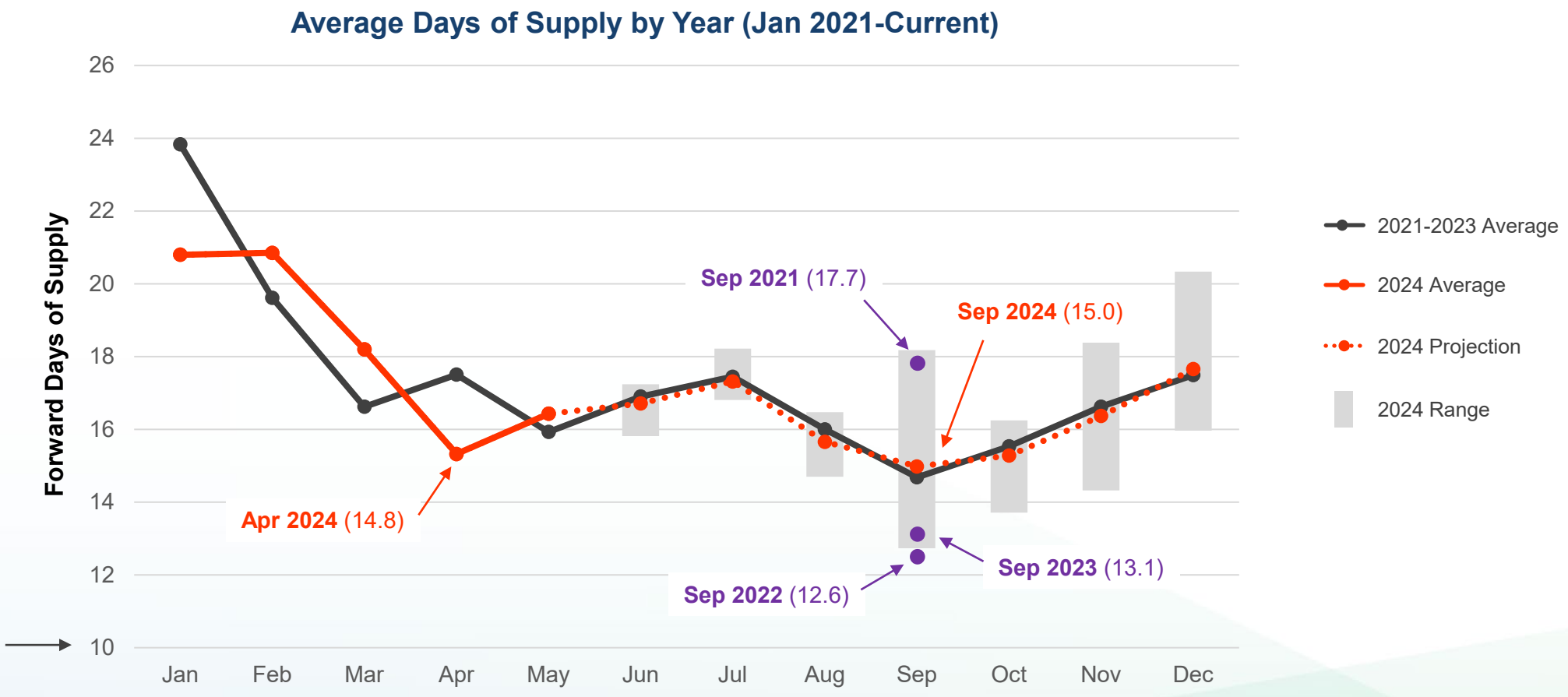
Days of Supply Projection



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Gasoline stocks from EIA West Coast (PADD 5) Stocks of Crude Oil and Petroleum Products (eia.gov)

Gasoline Inventory Programs

Jeremy Smith
Deputy Director, Energy Assessments Division

EU Inventory Programs

- EU countries must maintain emergency stocks of crude oil and petroleum products equal to at least 90 days of net imports or 61 days of consumption, whichever is higher.
- The EU member countries are given the flexibility to store crude or finished products.
    - Germany: Petroleum Stockpiling Association keeps reserves of 15 million tons of crude and 9.5 million tons of finished petroleum products.
- The UK requires that a minimum of 22 days of supply be held.
    - The UK does not have a nation-owned storage entity; the UK, instead, fulfils its inventory obligations by imposing inventory requirements on commercial entities.

Thank you

Jeremy Smith
Deputy Director, Energy Assessments Division

Comments from the Dais

Written Comments

Submit written comments to:

- Docket No. **23-SB-02**
- Due by **5:00 PM** on **Thursday, June 20**.

Public Comments

Zoom:

- Use the “raise hand” feature.

Telephone:

- Dial *9 to raise your hand.
- Dial *6 to mute/unmute your phone line. You may also use the mute feature on your phone.

Zoom/phone participants, when called upon:

- Your microphone will be opened.
- Unmute your line.
- State and spell your name for the record, and then begin speaking.

Limited to one representative per organization.

Three-Minute Timer

Jeremy Smith
Deputy Director
Energy Assessments Division
California Energy Commission

Gigi Moreno, PhD
Chief Economist
Division of Petroleum Market Oversight

Thank You