

Clean Fuel Briefing

Progress report from California LCFS



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How to measure LCFS success in CA?

It should drive positive outcomes:

1. Reduction of carbon intensity for fuel mix.
2. Foster solid growth of alternative fuel supplies to petroleum.
3. Over compliance in carbon trading program in early years.

And avoid negative ones.....

1. Lower economic growth measured by GDP.
2. Slower growth in jobs as measured by unemployment rate.
3. Clear evidence that a CFS doesn't spike fuel prices.

What historical data suggests

It should drive positive outcomes:

- ✓ 1. Reduction of carbon intensity for fuel mix.
- ✓ 2. Foster solid growth of alternative fuel supplies to petroleum.
- ✓ 3. Over compliance in carbon trading program in early years.

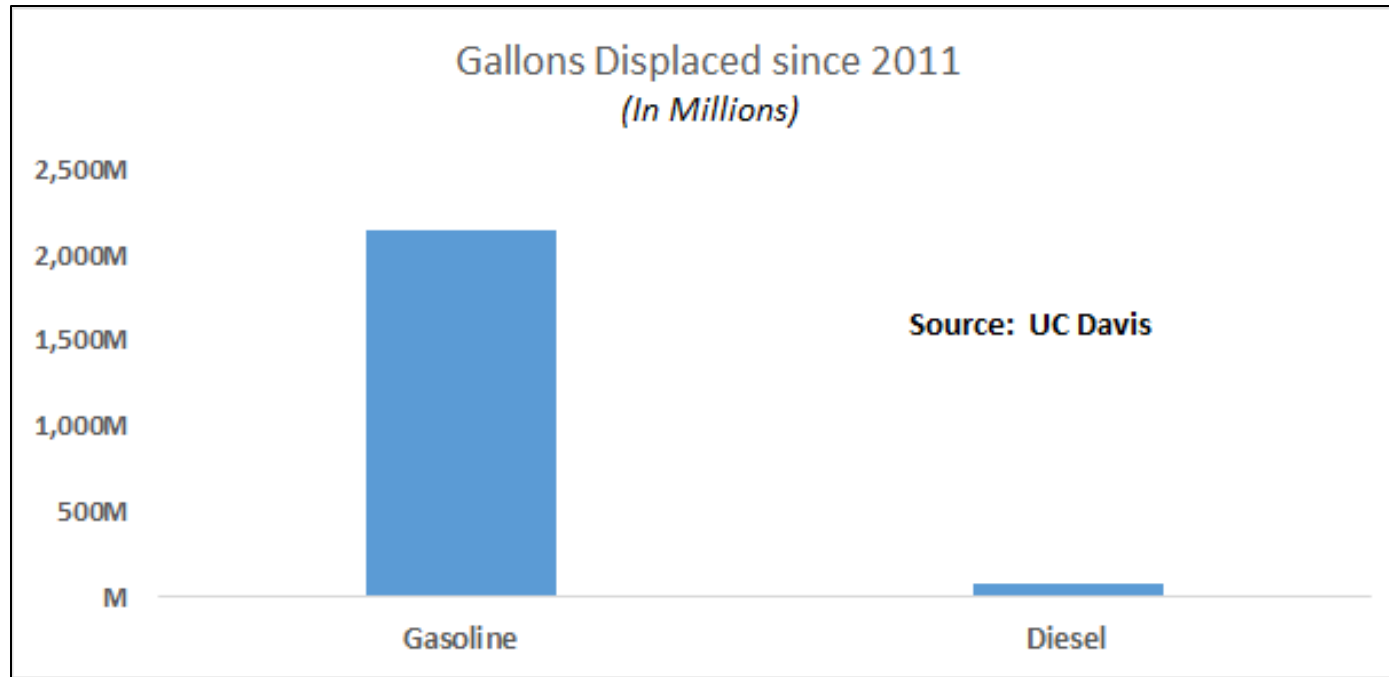
And avoid negative ones.....

- ✗ 1. Lower economic growth measured by GDP.
- ✗ 2. Slower growth in jobs as measured by unemployment rate.
- ✗ 3. Clear evidence that CFS doesn't spike fuel prices.

Reduction in CI for CA fuels

Summary:

- Since the California LCFS began in 2011, over **2B G** of gasoline and **77M** of Diesel have been displaced.
- This in effect removed over **2.8M metric tons of Carbon** or 500K vehicles from the road.



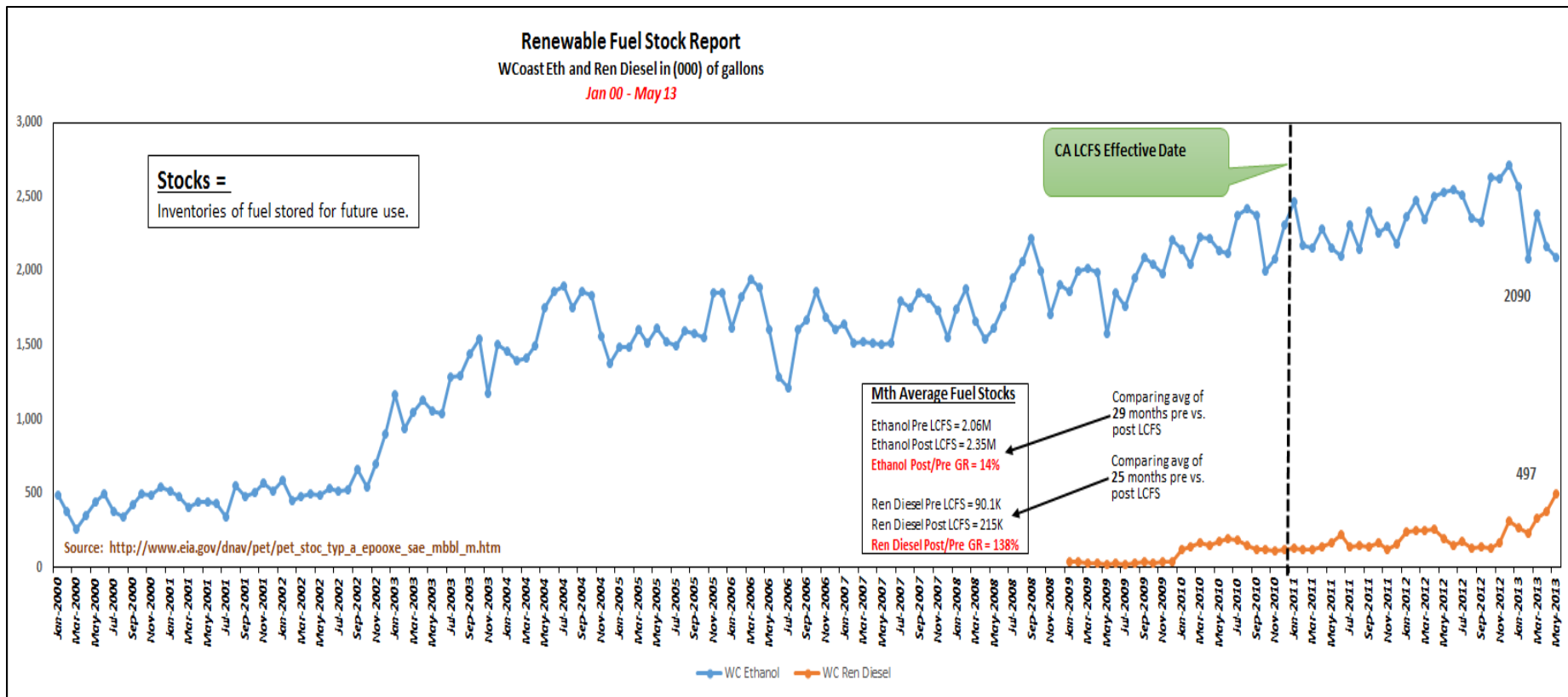
Observations/Conclusions

- So far the California LCFS is working as intended by lowering CI in the fuel mix resulting in a lowering of carbon emissions.
- Companies must either lower the CI in their fuel mix or buy credits from other companies that do. This is happening.

Growth in Alternative Fuel Supply

Conclusions

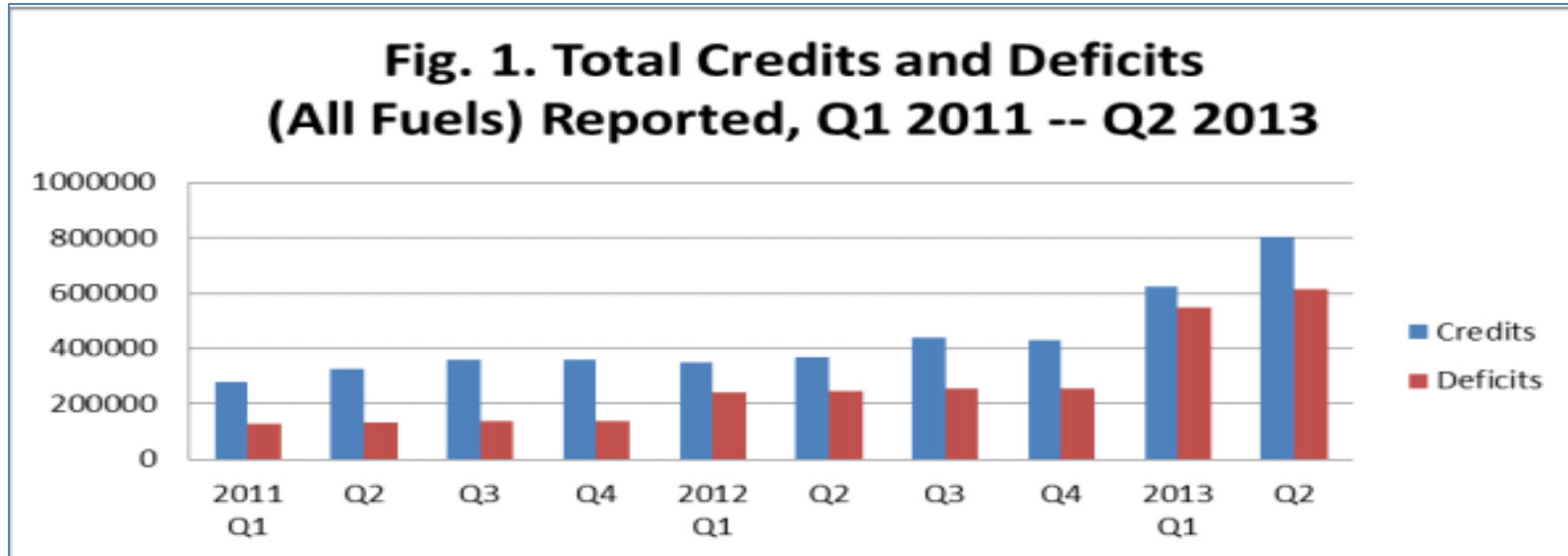
- California Ethanol stocks experienced a 14% growth rate in the 29 months after CA LCFS versus the prior 29 months.
- **Renewable Diesel** stocks experienced a **138% growth rate in the 25 months** after CA LCFS versus the prior 25 months.



Over compliance in Carbon Trading

Summary:

- Thru Q213, there have been a total of about **4.34M MT of credits**.
- Thru Q213, there have been a total of **2.7M MT of deficits** for net of **1.64MT of credits**



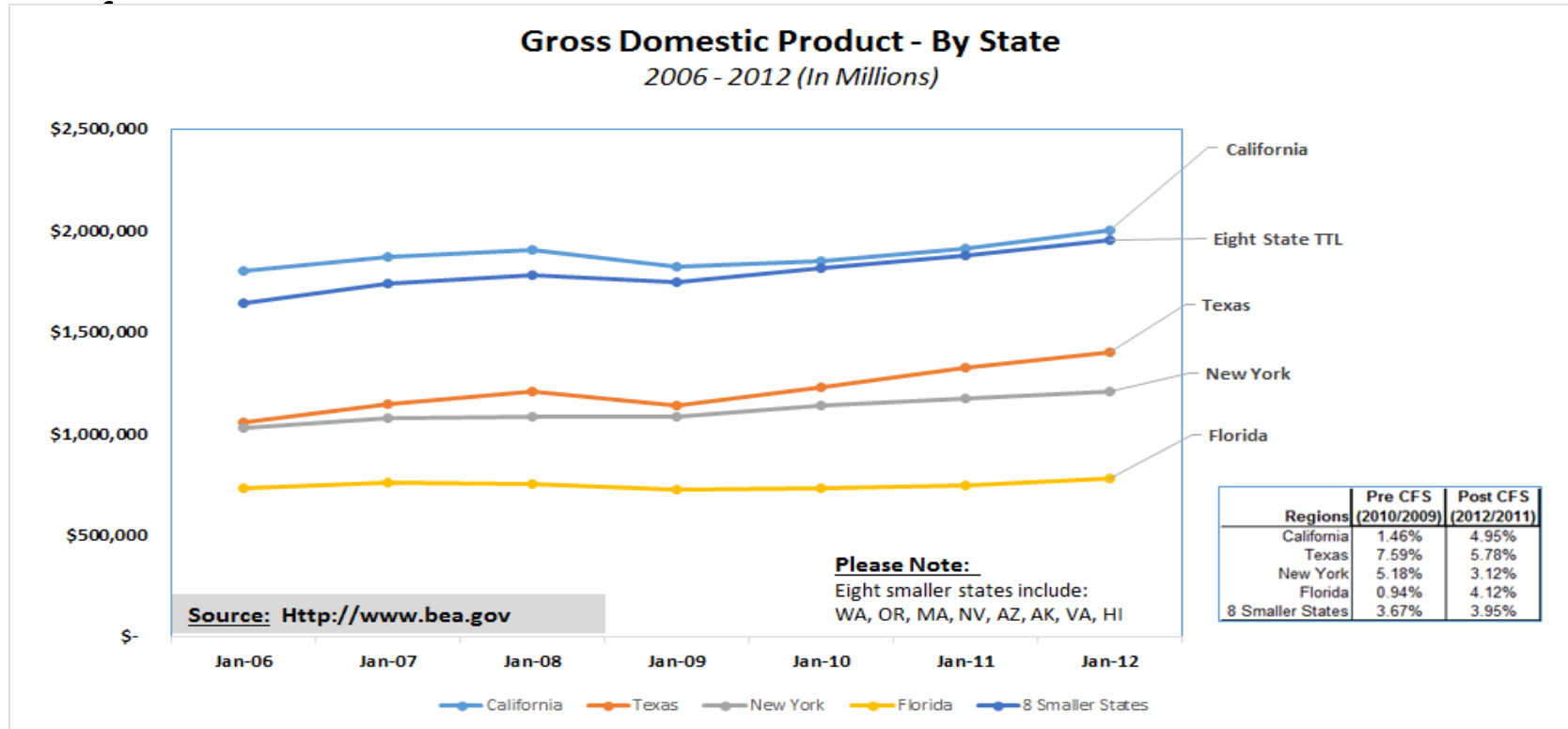
Observations/Conclusions

- Credits are fungible....diesel credits can be used to make the gasoline compliance curve and vice versa.
- Net excess of credits in early years eases the pain once compliance ramp gets steeper.
- Credits from lower CI ethanol and alternative transportation fuels continue to rise and make up more than half of the credits being generated.

Lower Economic Growth?

Summary:

- Gross Domestic Product or “GDP” measures economic output for a region or a country.
- We looked at GDP growth across 4 major states & 8 smaller ones to compare



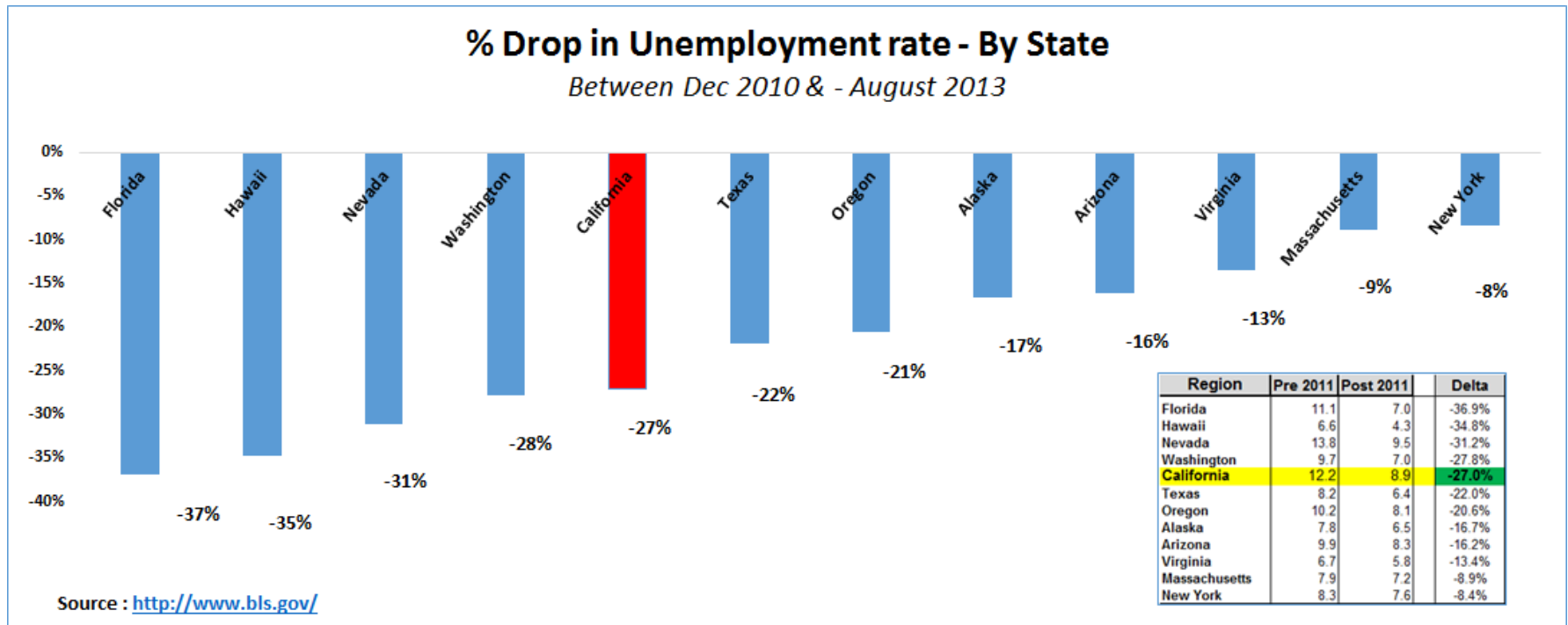
Observations/Conclusions

- California is a massive state with a huge economy but still grew GDP by 4.95% in 2012.
- This 4.95% GDP growth is one of the highest surveyed only bested by Texas.

Slower growth in Jobs?

Summary:

- Unemployment rates are closely watched to determine the health of a regional economy.
- We looked at Unemployment rates across 12 states to compare performance post LCFS.



Observations/Conclusions

- All states surveyed enjoyed drops in unemployment as we moved away from recession.
- California held it's own with a 27% drop which is better then 7 of the other 12 states.

Impact on Fuel Prices?

Let's take a closer look...

1. The next series of slides look at Retail Gas & Diesel in California vs. other regions.
2. Fuel prices were dissected to isolate important drivers like crude costs, Crack Spread, and distribution, marketing and taxes.
3. Feedback confirms that any LCFS impacts will be felt in the Crack Spread portion of the pricing model.
4. Lastly, we look at the volume & price of RIN Deficits purchased to reveal true cost of California LCFS on regulated parties.

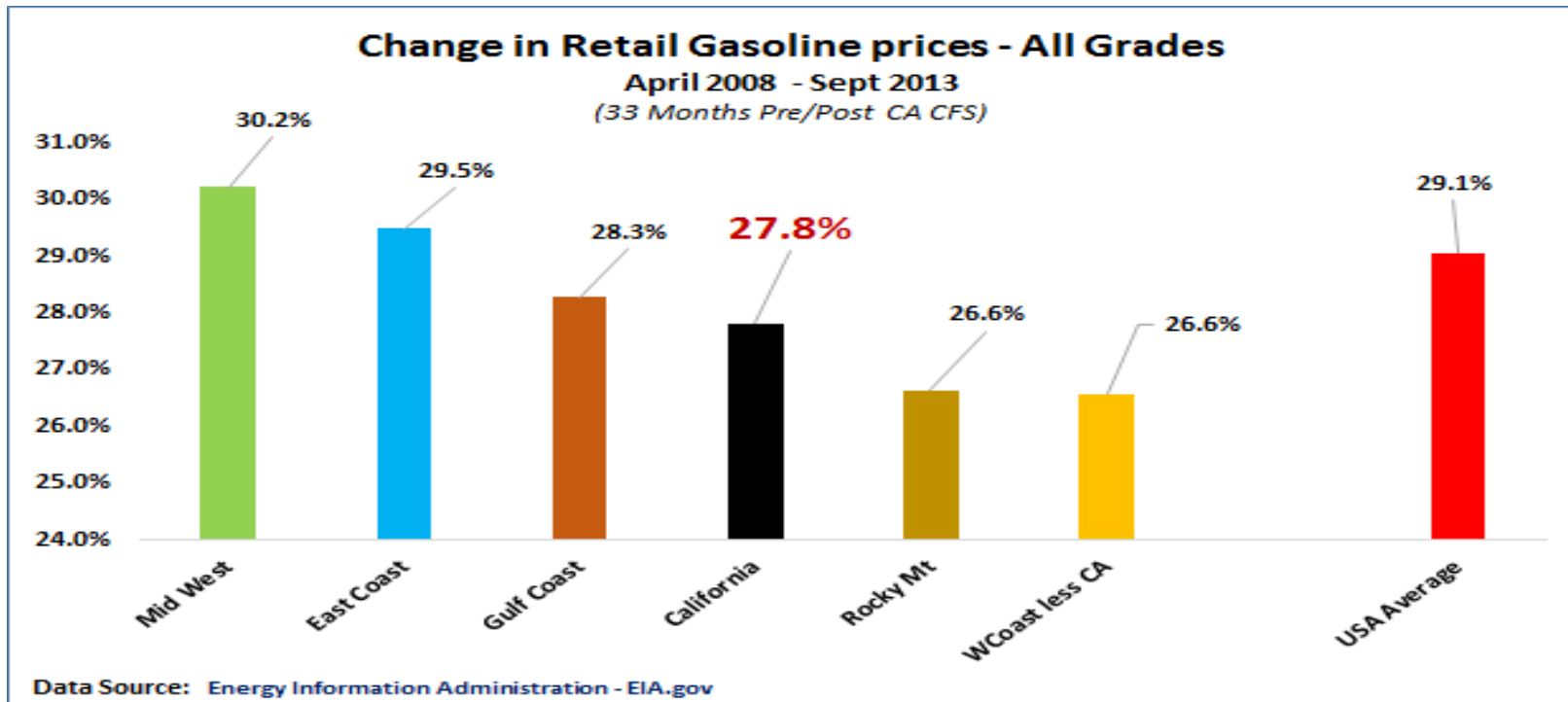
Bottom Line:

- Fuel prices were analyzed in multiple ways but all data pointed towards 1 conclusion.....
.....**No clear evidence** that California's LCFS has spiked retail fuel prices after almost 3 years.

CA Retail Gas vs. other regions.

Summary

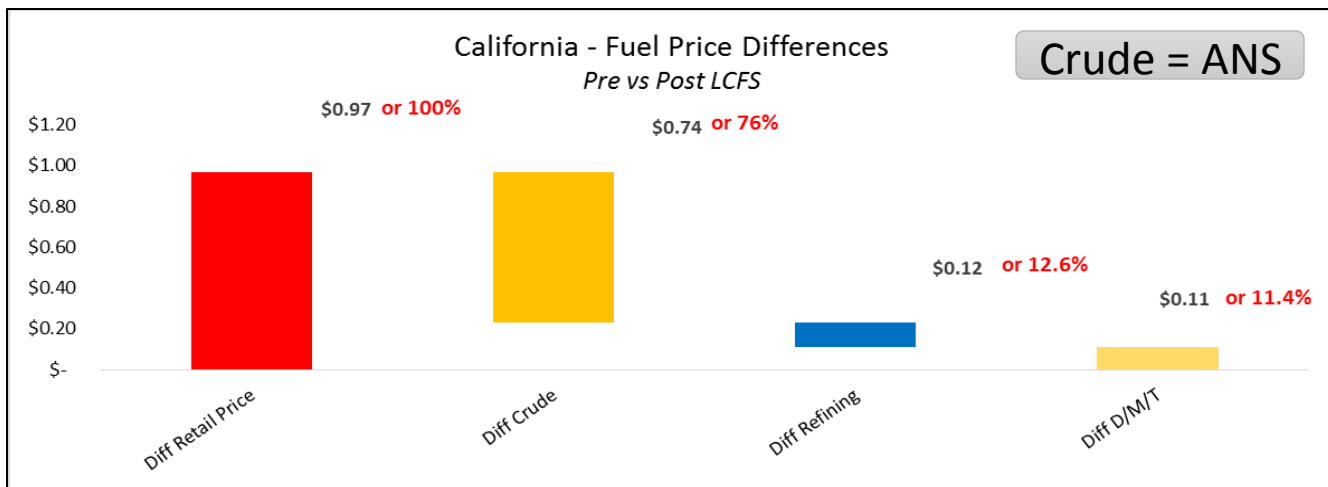
- Perhaps the simplest way to view this is to just focus on retail prices which is what consumers will see as the pump.
- We looked at changes in retail gasoline pre/post CFS to see if California really stood out.



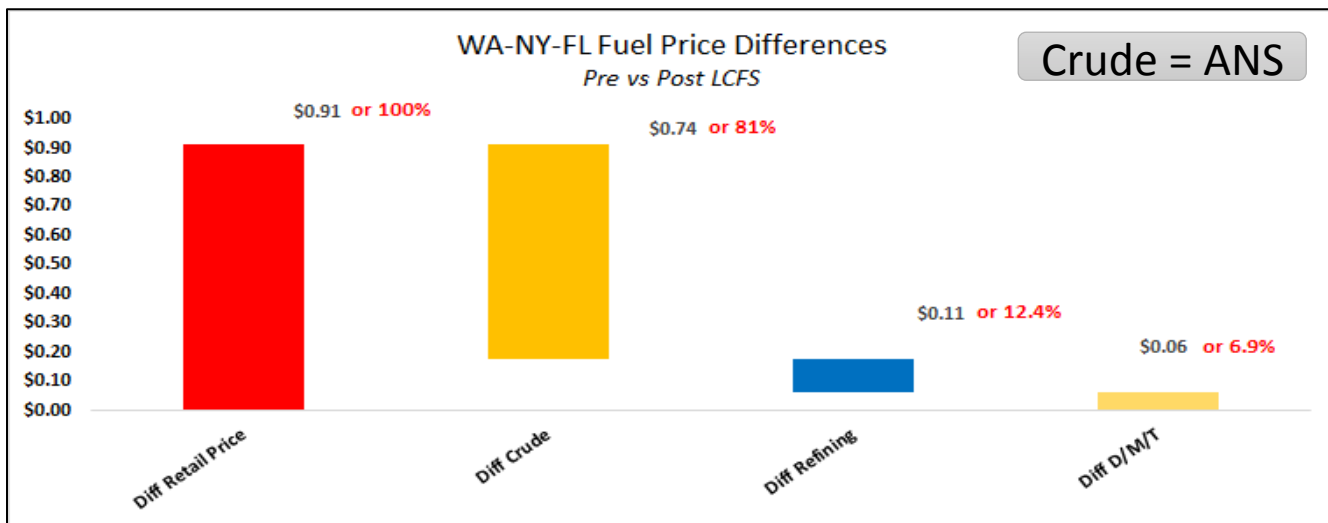
Observations/Conclusions

- As this chart illustrates clearly, California retail prices actually grew less than most other PADD regions in the USA and is about 1.5 points lower than the USA average.

Examination of Gas Price changes



Pre/Post CA with WTS		
Retail	\$ 0.97	100.0%
DMT	\$ 0.11	11.4%
RCP	\$ 0.36	37.1%
WTS	\$ 0.50	51.5%

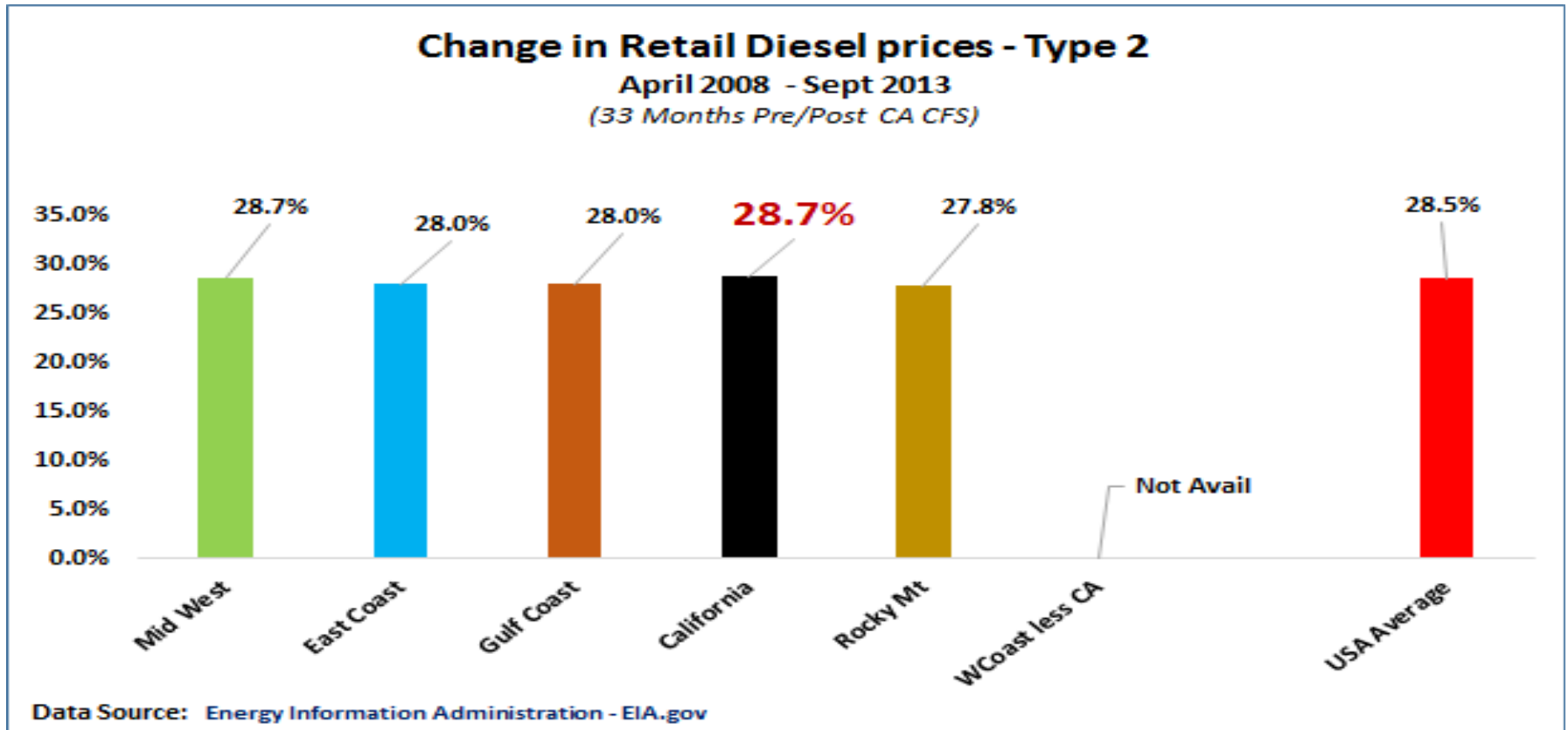


Pre/Post WA/NY/FL with WTS		
Retail	\$ 0.91	100.0%
DMT	\$ 0.06	6.9%
RCP	\$ 0.35	38.4%
WTS	\$ 0.50	54.7%

Observations/Conclusions

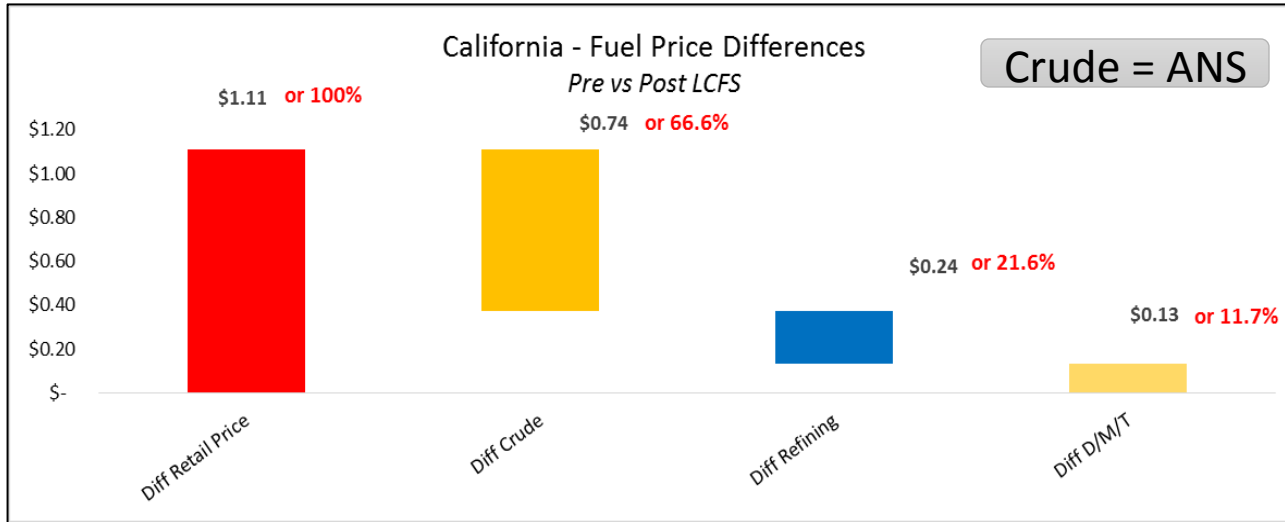
- Waterfall chart shows how each fuel price component changed post versus pre LCFS.
- We see that Crack Spread is statistically identical in CA versus 3 other comparable states.

CA Retail Diesel vs. other regions.

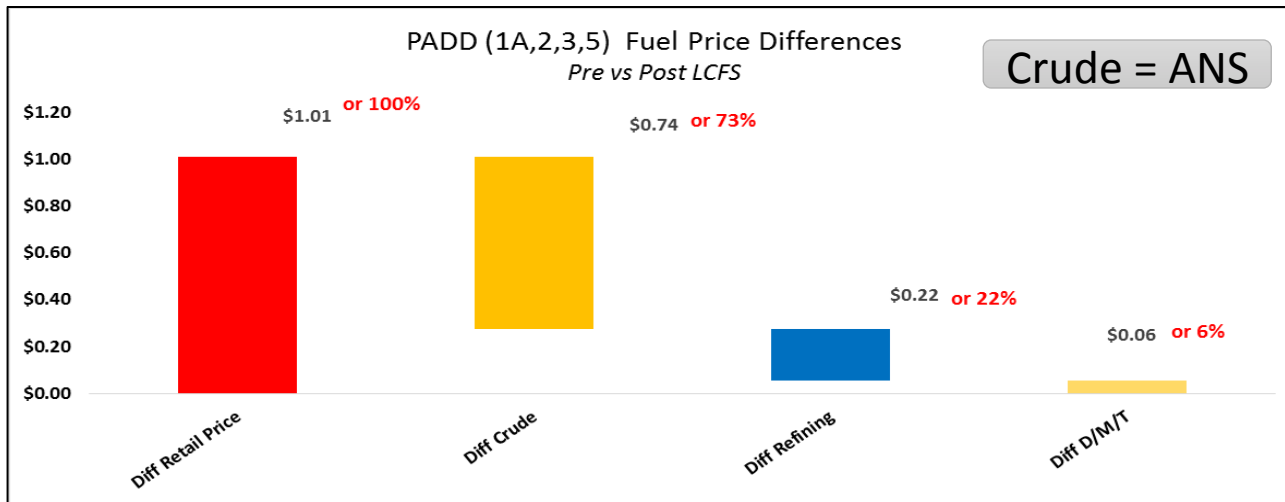


- This chart looks at CA Retail Diesel price changes versus other regions.
- No significant differences between CA and the rest of the regions.

Examination of Diesel Price changes



Pre/Post CA with WTS		
Retail	\$ 1.11	100.0%
DMT	\$ 0.13	11.9%
RCP	\$ 0.48	43.2%
WTS	\$ 0.50	44.9%



Pre/Post WA/NY/FL with WTS		
Retail	\$ 1.01	100.0%
DMT	\$ 0.06	5.5%
RCP	\$ 0.46	45.2%
WTS	\$ 0.50	49.3%

Observations/Conclusions

- Waterfall chart shows how each fuel price component changed post versus pre LCFS.
- We see that Crack Spread is statistically identical in CA versus other regions.

Paying off Deficits

Summary

- Another way to see if California's LCFS has had a material impact on prices is to look at it from the perspective of credits and deficits.
- California Reformulated Gasoline Blend stock for Oxygenate Blending (CARBOB) generated about **373,000 deficits in 2011 and 724,000 in 2012**.
- For fuel sales we had 13.9 and 13.75 billion gallons of gas sold in 2011/2012 respectively.

	Price/G impact based on Avg. RIN Prices	
	2011	2012
Deficits	373,000	724,000
Real RIN Price	\$ 16	\$ 16
	\$ 5,968,000	\$ 11,584,000
Gas volume	13,900,000,000	13,750,000,000
Price/Gallon	\$ 0.0004	\$ 0.0008



- As this table indicates, with an average RIN price of \$16 or less in 2011/12, the Price/G impact is < 1/15th of 1 cent!

- For regulated parties to experience a \$.01/G impact for LCFS RIN prices would've had to be between \$190 & \$386 in 2011 and 2012.



	Price/G impact based on Hypothetical RIN Prices	
	2011	2012
Deficits	373,000	724,000
Hypth. RIN Price	\$ 386	\$ 190
	\$ 143,978,000	\$ 137,560,000
Gas volume	13,900,000,000	13,750,000,000
Price/Gallon	\$ 0.010	\$ 0.010

Conclusions

1. We are almost 3 years in for California's LCFS and evidence clearly show it's generating the kinds of demand for alternative fuels needed to drive scale in this industry.
 - i. This directly drives the scale needed for advanced fuels for aviation and other sectors.
2. So far there are **zero indications** that California's LCFS has created fuel price spikes and negatively impacted economic growth or jobs in the state.
3. California's economy has been through turmoil over the last several years like other states but not due to the rollout of the LCFS in 2011.