

Clean Fuels Program Clean Tech Alliance

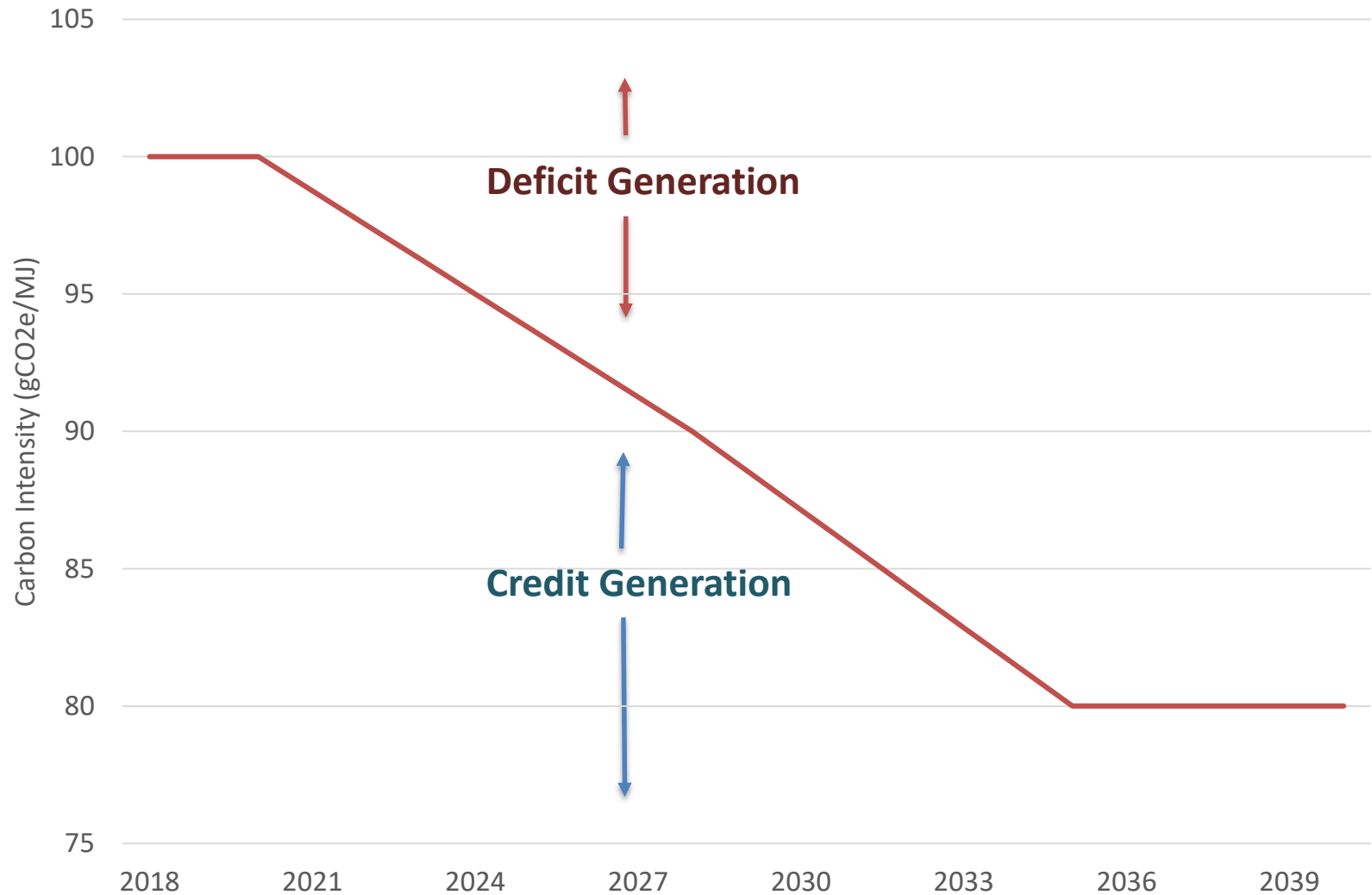
9/19/2019



Climate Solutions.



How it works



For example...

- In 2025, the Clean Fuels Program requires an average carbon intensity of 95 gCO₂/MJ
- A petroleum refinery:
 - Produces 100,000 MJ worth of gasoline at an intensity of 100 gCO₂/MJ.
 - This produces a deficit 500,000 gCO₂.
 - It must acquire an equivalent number of credits (tons).



Compliance options

- It can:
 - Improve efficiency or other parts of its operation to reduce emissions by 500,000 gCO₂.
 - Blend ~10,000 MJ of a biofuel with a score of 45 gCO₂/MJ.
 - Purchase credits from producers of clean fuels equivalent to 500,000 gCO₂.
- Why is this good?
 - Reduced emissions. Pollution reduction that benefits climate *and* local air quality.
 - Created demand for a low carbon biofuel.
 - Created a new revenue stream for a low carbon fuel producer.



Credit generators

- For the week of June 11th 2018, the average LCFS credit price in California was \$151.78/metric ton

LCFS Weekly Snapshot	11 th June 2018 – 17 th June 2018
Average Price [3] (\$/MT)	\$151.78
Price Range (\$/MT)	\$110.00 - \$183.00
Total Volume (MT)	189,493
Total Value (\$)	28,762,148

- King County's Cedar Hills landfill produces RNG that is scored at 30.79 gCO₂/MJ Value for King County:
 - \$0.746/gasoline gallon equivalent
 - \$0.742/diesel gallon equivalent



Credit Generators

- Electricity and hydrogen:
 - Fleet owners, charging suppliers, and utilities to aggregate everyone else
 - Typically the state will aggregate anything uncovered
- Benefits
 - California transit agencies generate ~\$10,000/electric bus/year via clean fuels credit sales
 - CA utilities provide customer rebates for EV purchases for amounts between \$450-599/car



LCFS stimulates investments at refineries

- WSPA members have identified 28 projects at CA refineries to reduce emissions that will require on-site investments and upgrades
- Refinery owners make these investments on the understanding that they will continue operating in the long-term -- these are the refineries that thrive in a low-carbon future

Table 1 - Anticipated Total Count of Projects by Year

GHG Emission Reduction	Year Submitted (or Projected to be Submitted) to ARB for Approval							
	2019	2020	2021	2022	2023	2024	2025	>2025
10,000-19,999 MT	3	2	0	3	0	1	1	1
20,000-39,999 MT	4	1	2	0	1	0	0	0
40,000-99,999 MT	2	0	1	1	0	0	0	1
≥100,000 MT	2	1	0	1	0	0	0	0

**Table 2 - Total GHG Emission Reduction Project Credits
Anticipated Average Credits for Year of Application**

GHG Emission Reduction	Year Submitted (or Projected to be Submitted) to ARB for Approval							
	2019	2020	2021	2022	2023	2024	2025	>2025
10,000-19,999 MT	45,000	30,000	0	45,000	0	15,000	15,000	15,000
20,000-39,999 MT	120,000	30,000	60,000	0	30,000	0	0	0
40,000-99,999 MT	140,000	0	70,000	70,000	0	0	0	70,000
≥100,000 MT	700,000	350,000	0	350,000	0	0	0	0

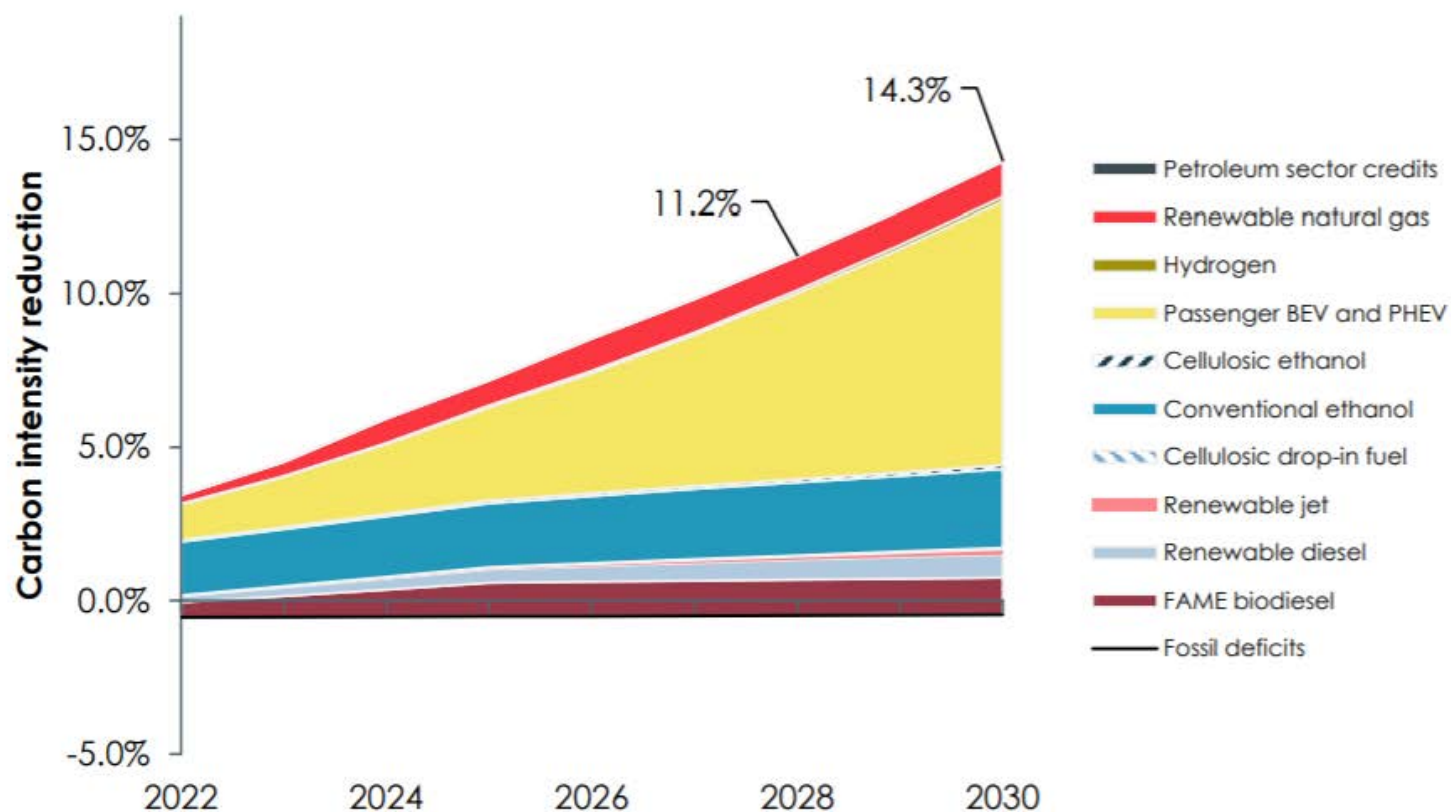


Opt-in

- Alternative Jet Fuel
 - Alternative jet fuels producers that opt-in would create credits for low carbon intensity fuels; conventional jet fuel would *not* generate deficits

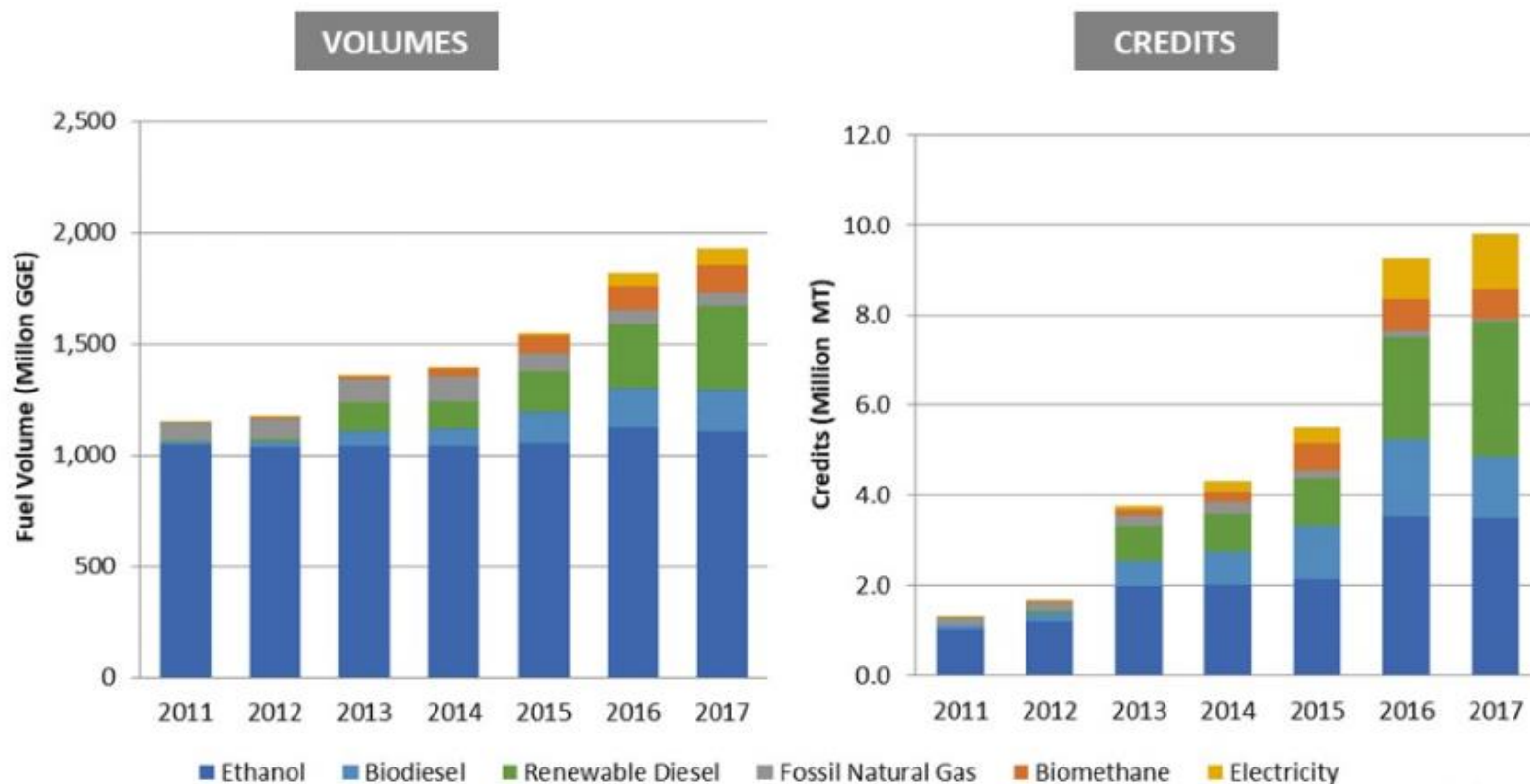


Compliance Pathway - Washington



Clean Fuels Programs Work

Alternative Fuel Volumes and Credit Generation



Last Updated 04/25/2018



IMPACTS



CARBON REDUCTIONS

From 2011 through Q1 2018, the LCFS has helped result in:

38,000,000

tons of carbon pollution avoided...and growing



PETROLEUM

13.7 billion
gallons avoided



CLEAN FUELS

74% increase
in use



MARKET VALUE

\$2.8 billion invested in
clean fuels production

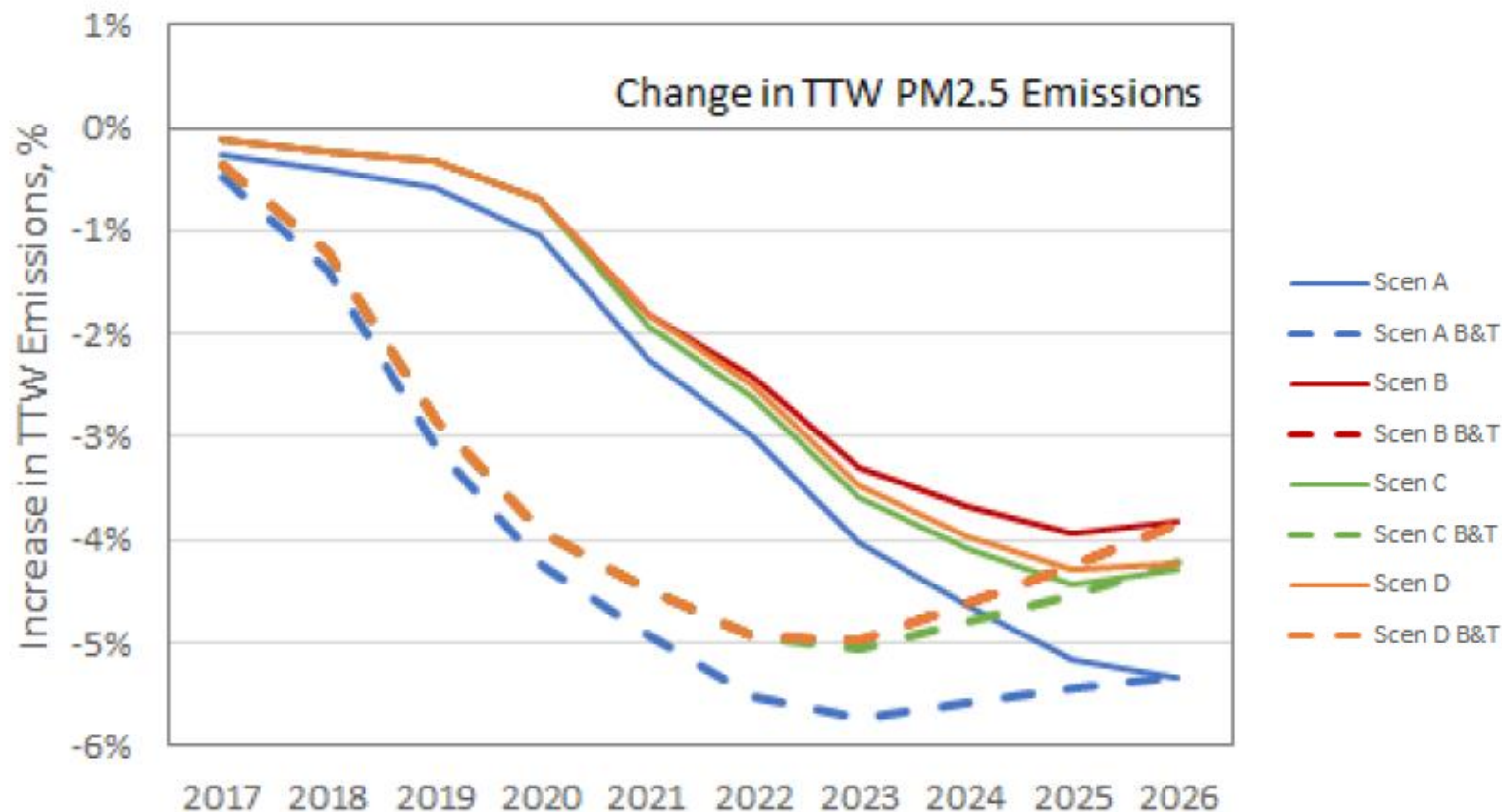


HEALTH

\$1.84 million in avoided
public health impacts



Improved Air Quality

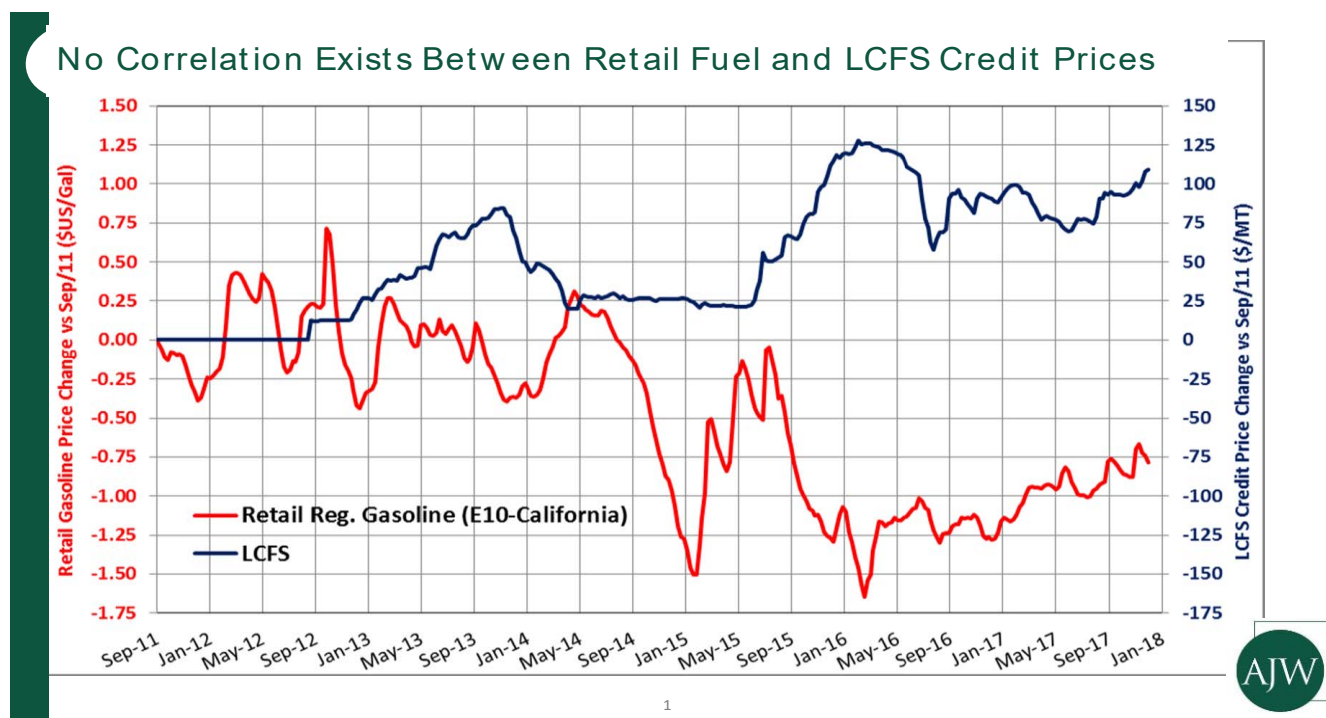


- A 2015 analysis from Puget Sound Clean Air Agency found substantial likely air quality pollutant reductions
- This study focused on 10% reductions—half of what HB1110 will yield



Cost Impacts

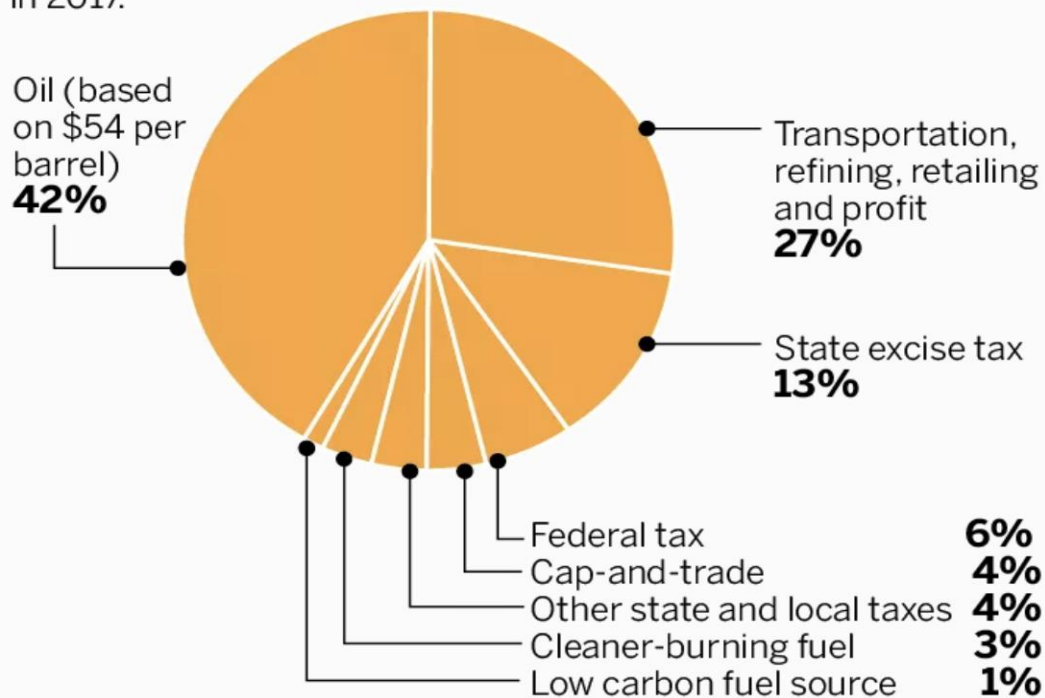
Fuel market swamps the price impact of a clean fuels program. CA gas prices have actually *declined* since the beginning of the program



Cost Impacts

BREAKDOWN ON THE COST FOR GASOLINE

What goes into the price of a gallon of gasoline in California in 2017.



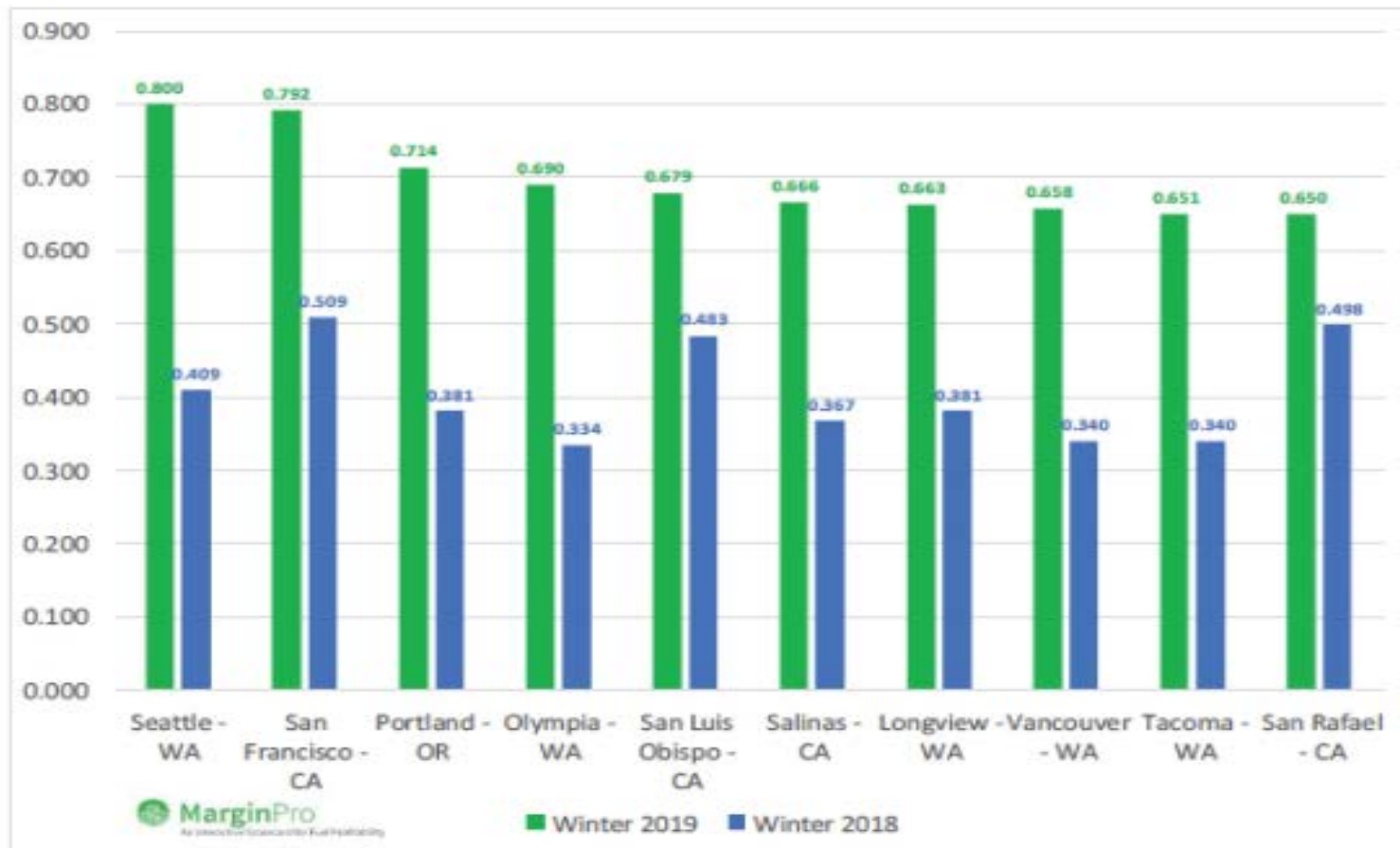
Source: UC Berkeley Professor Severin Borenstein,
AAA and the American Petroleum Institute

ERIN BALDASSARI/BAY AREA NEWS GROUP



Cost impacts

Top 10 Most Profitable Rack-to-Retail Markets in Winter 2019



Next steps



Thank you!
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