



Renewable Dairy Fuels Project

Amp Americas Overview



- Formed in 2011 in partnership with Fair Oaks Farms
- EIV Capital-backed



Renewable Dairy Fuels 

Produces Renewable Natural Gas (RNG)



Markets RNG & Manages Risk



Distributes RNG/CNG at 20 Stations (100% owned)



Highlights

- FIRST and ONLY dairy digester to vehicle fuel facility in US certified by EPA for RFS
- Only dairy RNG pathway awarded by CARB to make LCFS credits
- Tripled dairy gas production 3 years... another 3x by end of 2018

- Already delivering dairy gas to customer stations in California
- Only marketer bringing RNG economics to fleet owners

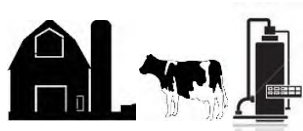
- More than just a fuel supplier... experienced operator of 42-truck dairy CNG fleet
- Among first fleets to 30M miles on CNG
- One of first trucks to hit 1M miles CNG in Sep 2017



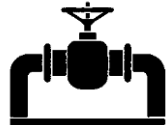
Asset-based business: AMP station network and RNG production

Amp Americas assets, partnerships, and customers extend throughout supply chain allowing us to control and capture maximum value

RNG production



Distribution contracts



ampCNG stations & fueling contracts



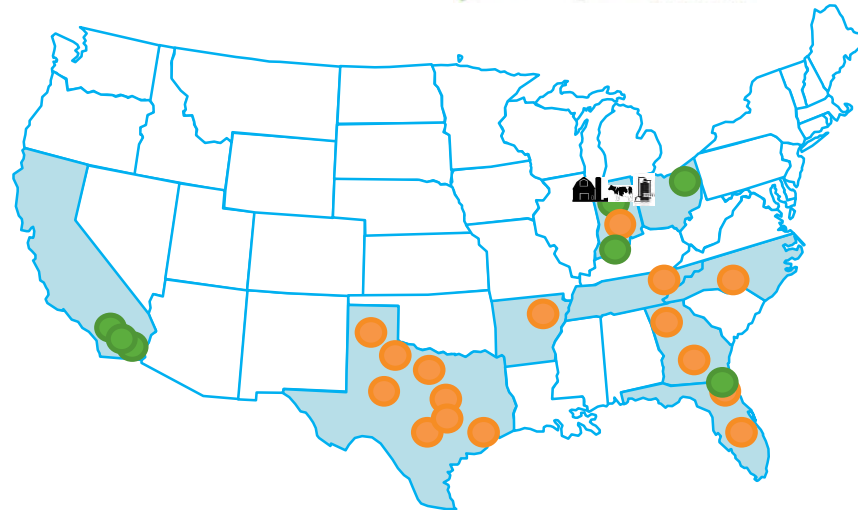
RIN supply contracts



CA LCFS contracts



Assets map –
RNG production,
RNG distribution,
CNG stations



Our Partner Fair Oaks Farm

- Leading innovator in dairy sustainability and commercial practices
- 18,000 head of milking cows
- Milk production, public education, sustainability demonstration and commercialization
- Selected innovations
 - Manure management with anaerobic digester
 - Nutrient recovery – phosphorous, fiber
 - Water management – reduction, reuse, recycling
 - Sustainable energy production: electric, heat, transportation fuel
- ***Vision: transparent, carbon neutral milk production***



How does our partnership work

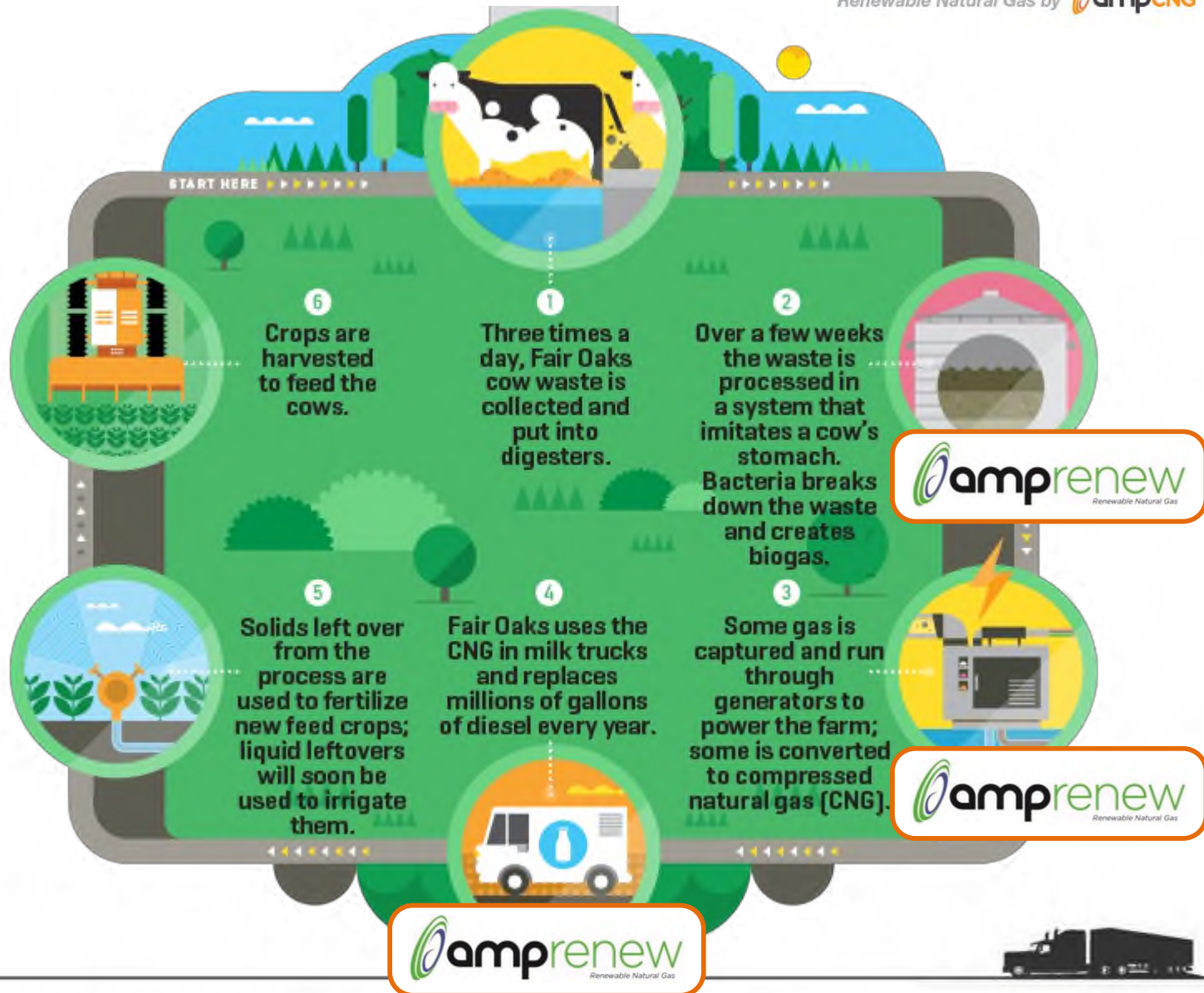
- Digester built in 1999
- Amp pays attractive economics to dairy – defrays waste handling costs
- Amp / dairy tightly aligned in partnership
- Large step in dairy goal toward carbon neutrality, brand benefits
- Amp now has distinctive and singular experience and expertise running dairy project from start to finish



Amp converts waste to vehicle fuel

ampCNG's project at Fair Oaks Farm is a partnership with one of the largest dairy farms in the US

We transform manure from 18,000 cows into methane to fuel our trucks



Pretreatment and Preparation



Emission and Odor Reduction



Advanced Heat Recovery



Heat recovered from Digestate, Gas Compression, Engine Cooling and Exhaust Heat Recovery



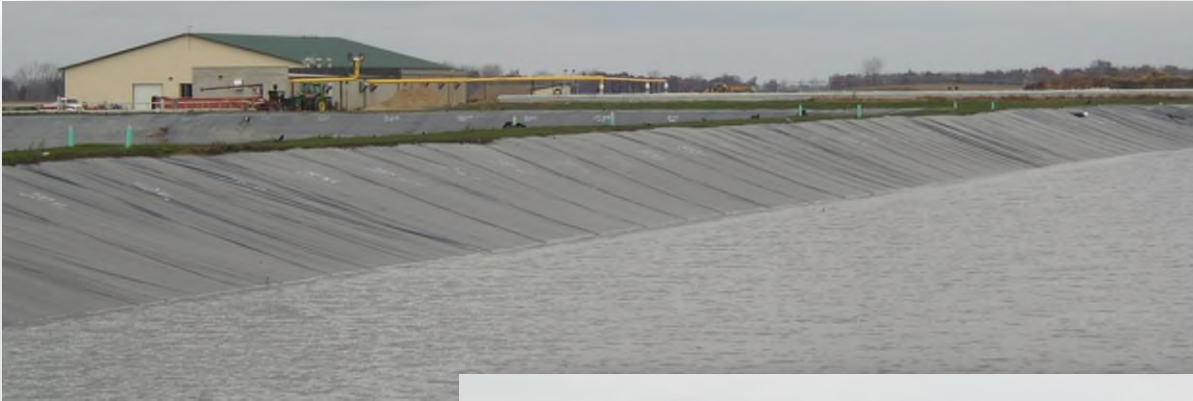
Value Added Fiber Sales



Advanced Nutrient Recovery



Low Nutrient Water



Electricity Generation



Gas Upgrading Skid (G.U.S.)



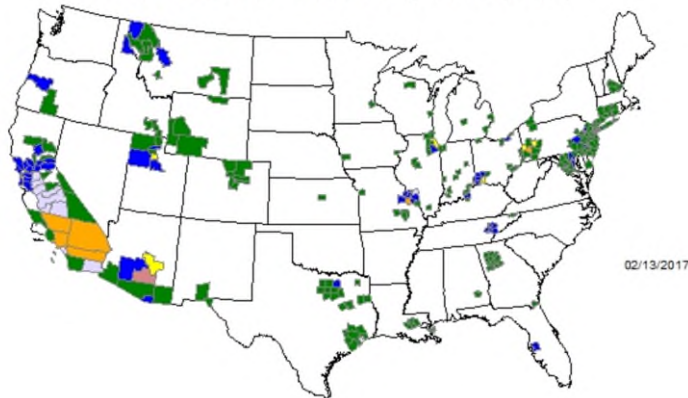
Truck fueling



What are we solving?

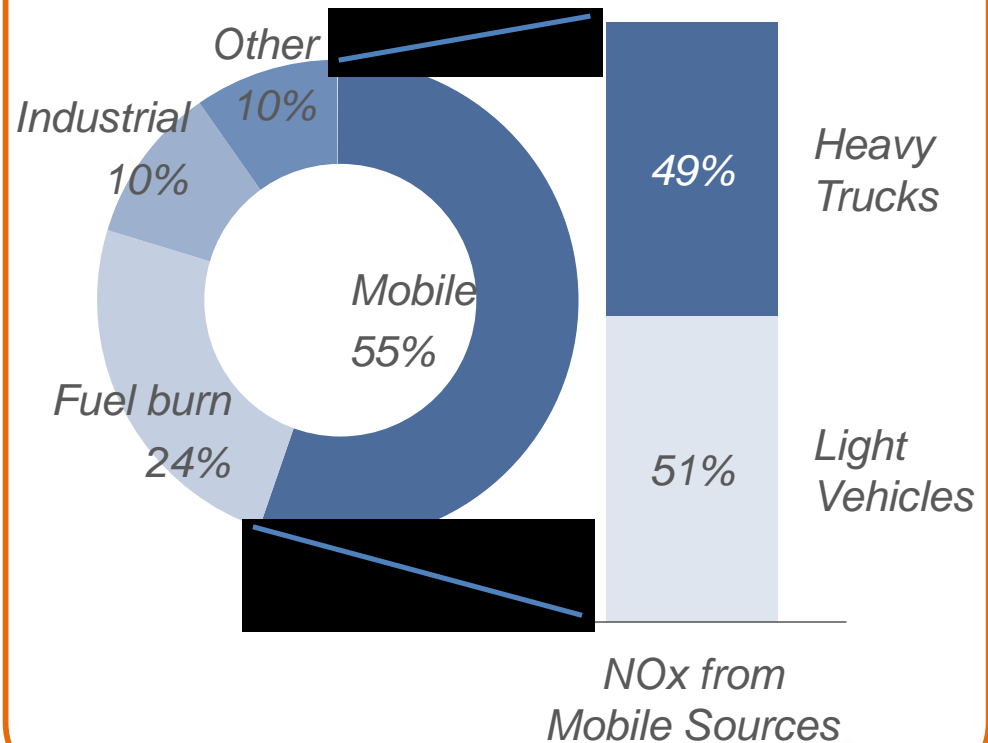
Smog is a national problem

Counties Designated "Nonattainment"
for Clean Air Act's National Ambient Air Quality Standards (NAAQS) *



>150 counties non-attainment
>700 maintenance

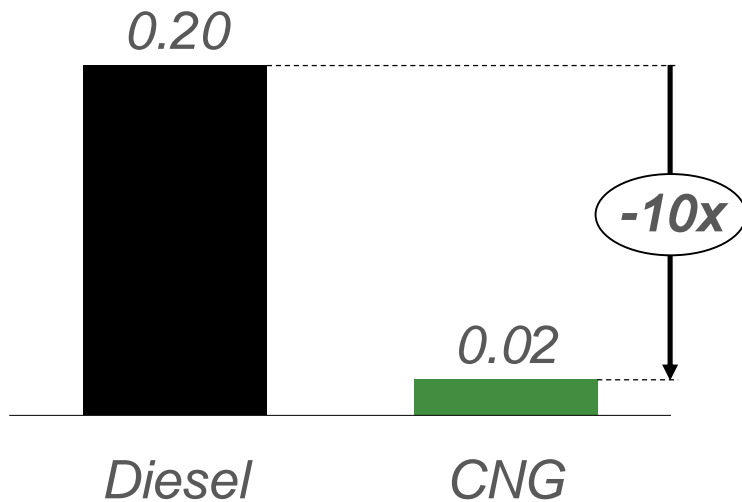
Diesel trucks cause 26% of smog



Dairy gas creates enormous air benefits...

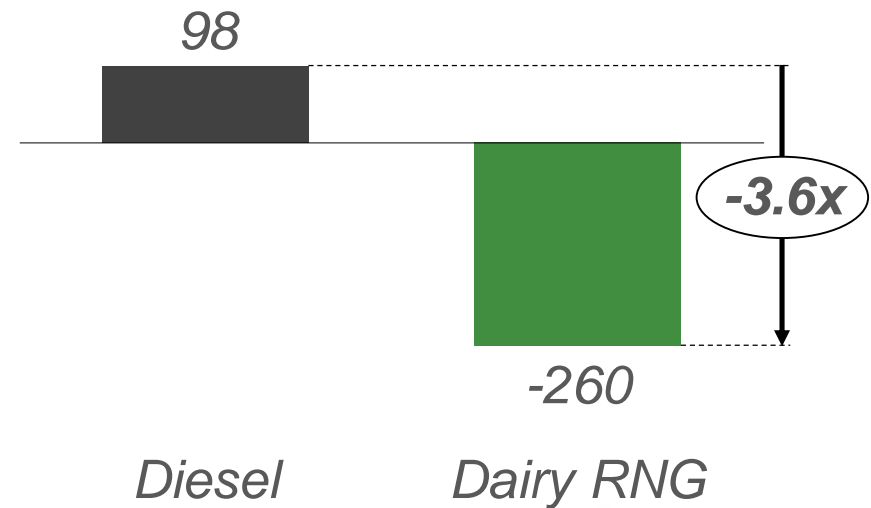
Smog

Smog-causing NO_x reduced 10x with Cummins Near-Zero engine
gNO_x/bhp-hr




Greenhouse gas

Dairy RNG like removing 3.5 diesel trucks of GHG emissions
gCO₂e/MJ



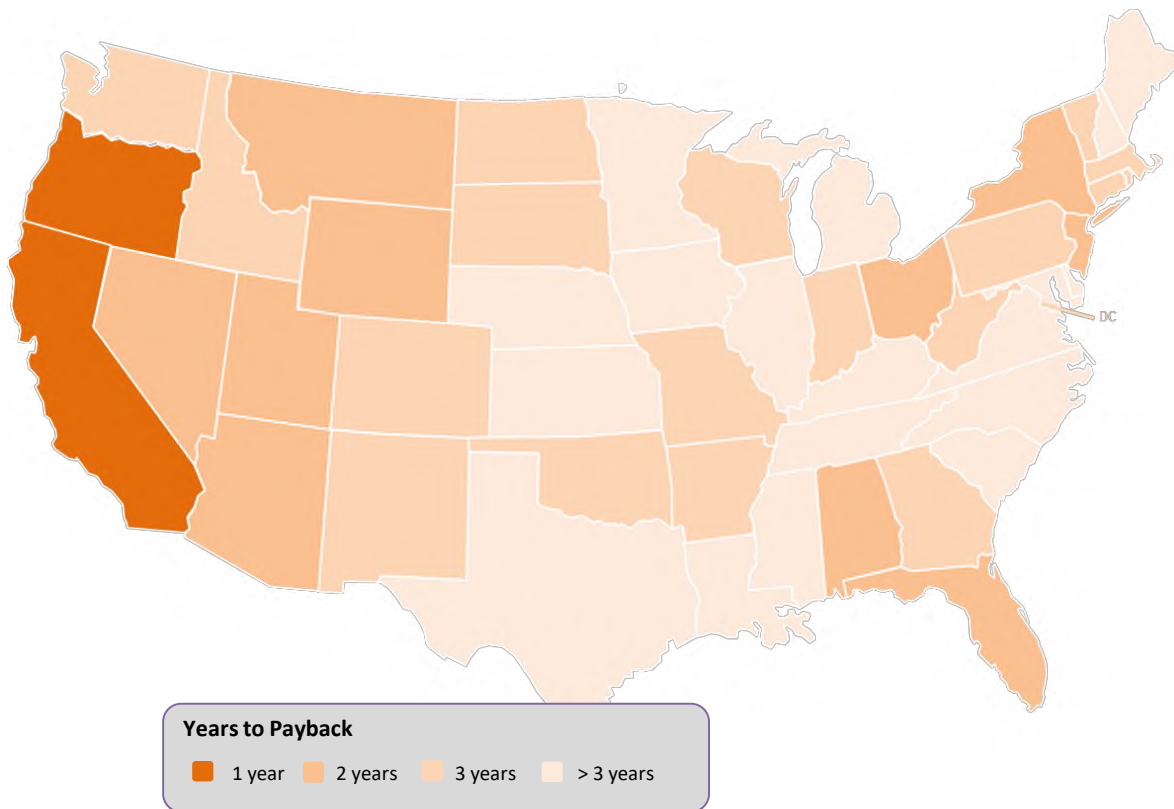
The future is now – RNG only practical renewable solution for heavy duty trucking

	Electric (EV)	Dimethyl Ether (DME)	RNG
Installed Base	25	0	>45,000
Range (miles)	124	500+	500+
New Unit Premium to Diesel ('000 \$)	224	??	45
Years to Payback	5-10	??	<1 – 3+
Commercially Available	2032	??	
Other Challenges	Few actual truck offerings, several promised	No clear economic benefit to DME vs. other uses for methanol	



CNG payback vs. diesel 3 years or less in most of country today

CNG payback for a Large User by State (\$/DGE)



California diesel prices, public funding make CNG business case less than 1 year payback

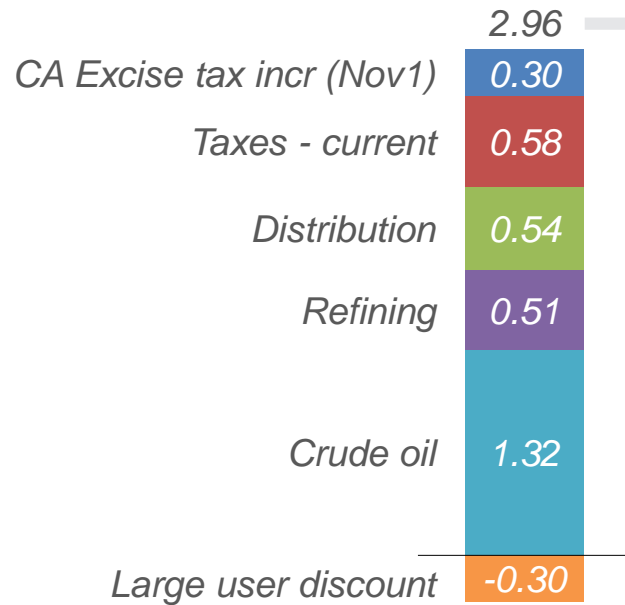
30 states payback less than 3 years

If Federal Excise Tax Credit renewed (as it has been last several years) ALL states less than 3 year payback

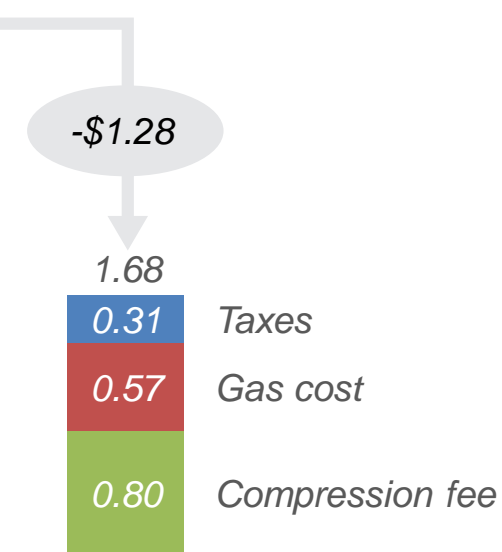


California diesel + RNG economics = large fuel savings opportunity

Diesel price breakdown \$/gallon



RNG price breakdown \$/diesel gallon equivalent

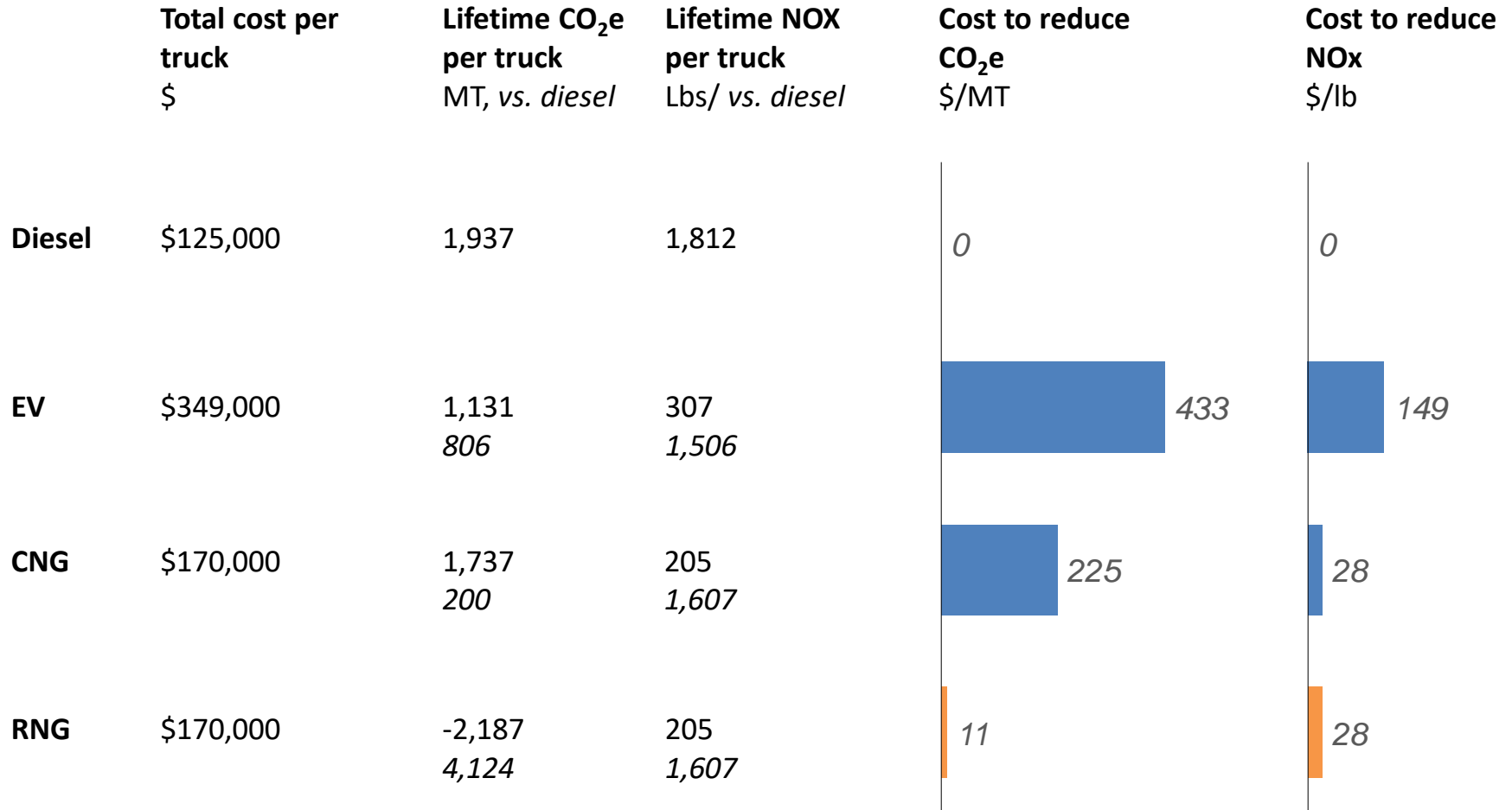


- California excise tax increase leads to 30c/gallon more cost in November 2017

- RINs and LCFS credits increase fuel savings



RNG dominates on cost effectiveness of emissions reductions



Source: ARB, Mercedes Benz, NGVA, CME, AAA, Southern California Edison, ampCNG analysis

Note: Assumes 116k miles traveled per year; using 7 year vehicle life for all vehicles; using vehicle specs of Mercedes Benz Electric Truck for EV; no public funding or environmental credits are included; EV CI score is CA Average Mix (105) divided by EER value (2.7)

What's required to make this dairy gas thing bigger

- Certainty
 - Revenue
 - Price: >100% range vs. lows a year ago
 - Quantity: requires an engineering study and negotiation with CARB to know how many credits a dairy is going to make
 - Feedstock supply: dairy continuation, digester operations, cleanup operations
 - Market access – i.e., the pipeline
 - Demand – CNG trucks
- Help from outside California wouldn't hurt
 - Alternative Fuels Tax Credit
 - RVO certainty
- Solution ideas
 - Simpler dairy gas rules for LCFS
 - Longer term LCFS solution post 2024 that doesn't penalize projects

