



THE CASE FOR HD FUEL CELL AND LARGE SCALE HYDROGEN ROLL-OUT



JESSE SCHNEIDER

EVP, TECHNOLOGY, H2 & FC

ALL SLIDES © NIKOLA CORPORATION

NIKOLA CORPORATION:

INTRODUCTION TO NIKOLA PLATFORM

The first-ever zero emissions, hydrogen-powered semi-truck with 100% electric drivetrain for the long-haul market

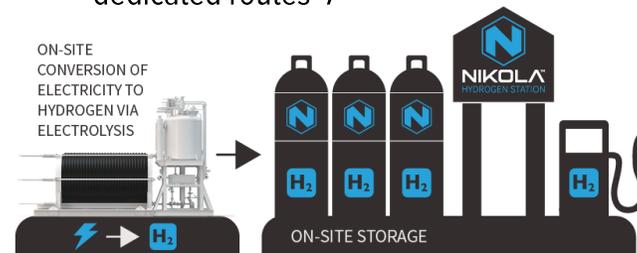


TRUCKS

- 15% - 20% total ownership cost savings over diesel. Zero emissions
- Partnering with world class strategic manufacturers has reduced the R&D expenditures required to build prototype and time to market
- Nikola's highly disruptive business plan offers an industry-first "**bundle pricing**" model (truck, fuel, repair & maintenance)

HYDROGEN FUELING

- 70 MPA HD Fueling (under development)
- Production – Via electrolysis
- Electricity input – Grid, Solar, Wind (depends on energy cost & renewables)
- Station Network – Targeted "dedicated" single-station H2 fueling model along "dedicated routes"⁷



UTILITY TASK VEHICLE (UTV)

- A 100% electric 4x4 Utility Task Vehicle with recreational and military applications
- Why? To help accelerate the development of truck drivetrain. Easy to drive, easy to implement technology and software



NIKOLA MOTOR'S WORLD-CLASS PARTNERS.

Nikola has partnered with some of the best industry leaders in the world. These partnerships enabled Nikola to come to market and make its' Zero Emission vision become reality.





NIKOLA TWO™

- OVER 8,000 TRUCKS ON ORDER
- 800 TRUCK ORDERS FROM ANHEUSER-BUSCH INBEV
- SMALL VOLUME PRODUCTION BEGINS IN 2021
- TRUCKS ARE LEASED WITH FUEL INCLUDED





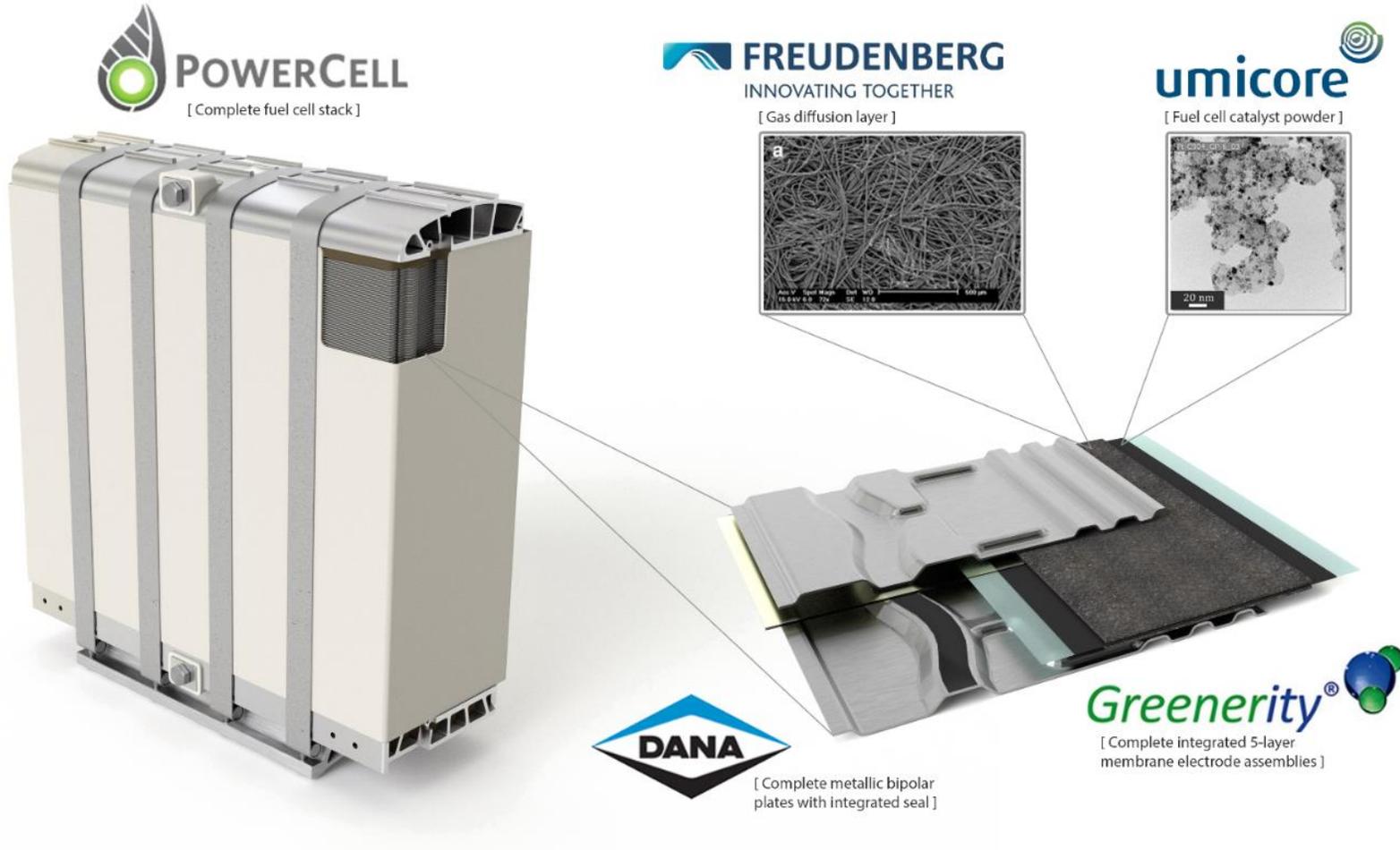
NIKOLA TWO™

- 100% ZERO TAILPIPE EMISSIONS
- 100% ELECTRIC DRIVE
- HYDROGEN POWERED
- 750 km - 1,200 km RANGE
- AUTONOMOUS CAPABILITIES
- 2,000 FT. LBS TORQUE
- 1,000 HORSEPOWER
- 125kW-250 kWh BATTERY
- 240 kW FUEL CELL





- 240kW Fuel Cell from Powercell
 - (2x 120kW Stacks)
- -30C to +50C Operation
- Shock, Vibration Resistant
- High Efficiency Operation (>60%LHV)
- High Lifetime: 20,000 hours
- Series component suppliers, Freudenberg, Umicore, DANA, etc.
- First generation A-Sample testing 4th Quarter 2018



H2 FUELING FROM ELECTROLYSIS

HYDROGEN GENERATION
WITH RENEWABLES + GRID
WITH LOW COST ELECTRICITY



NIKOLA H2 STANDARD STATIONS

- Developing 70 MPa Fast Fueling Protocol and Hardware for HD Hydrogen (In Process)
- 10 Minute HD Fueling Goal
- 60-80 kg HYDROGEN ON-BOARD
700 BAR
- SAE J2601 H70 Light Duty Hydrogen Also Available for Sale
- Bulk Hydrogen Sale @50MPa
- 4-8 Ton/day station (scalable up to 32 ton/day H2 for truck Depot)





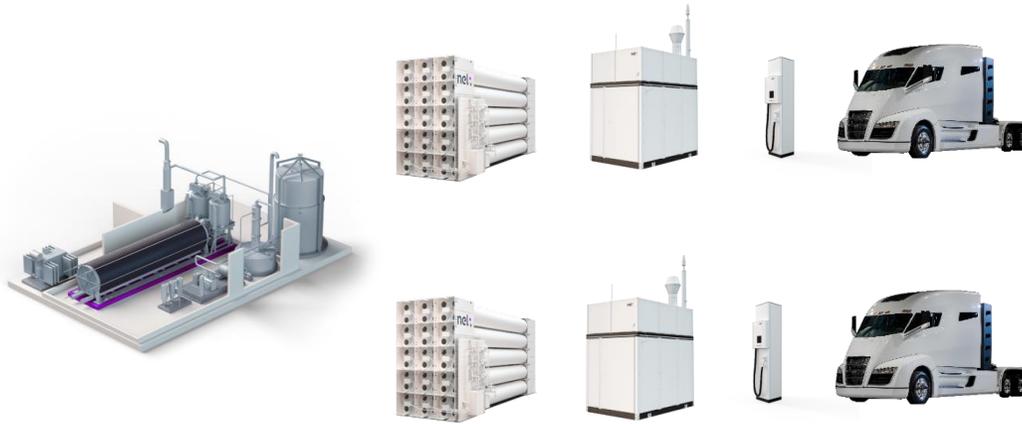
ZERO EMISSION HYDROGEN STATIONS. THE BEGINNING IN THE US.

- On-site hydrogen creation
- Public access to all Nikola H2 Stations
- The first development stations go online in 2019, AZ second in 2020 in CA.
- 28 stations ordered for Anheuser-Busch InBev by 2023
- Nikola H2@Scale Rampup 2025+



Initial Station 2019

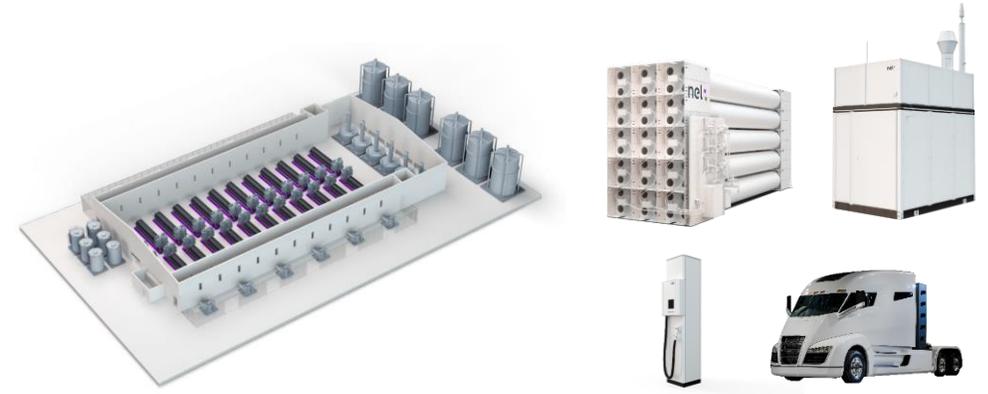
1,000kg hydrogen per day



Dual fueling lines

Commercial Station → 202+

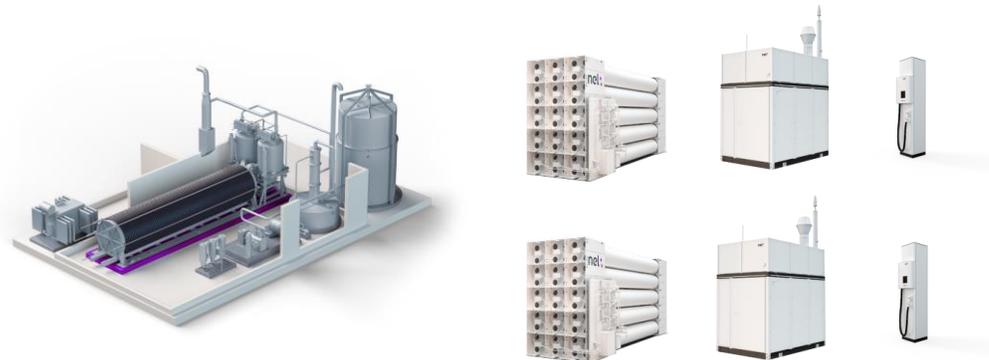
Modular 4-8T, up to 32 tons hydrogen per day



NEL HYDROGEN STATIONS FOR NIKOLA MOTOR:

- **ALKALINE ELECTROLYSIS**
“TRIED AND TRUE” TECHNOLOGY
(20 YEAR+ LIFETIME)
- **70 MPA HYDROGEN FUELING FOR HEAVY DUTY (IN DEVELOPMENT)**

Hydrogen infrastructure



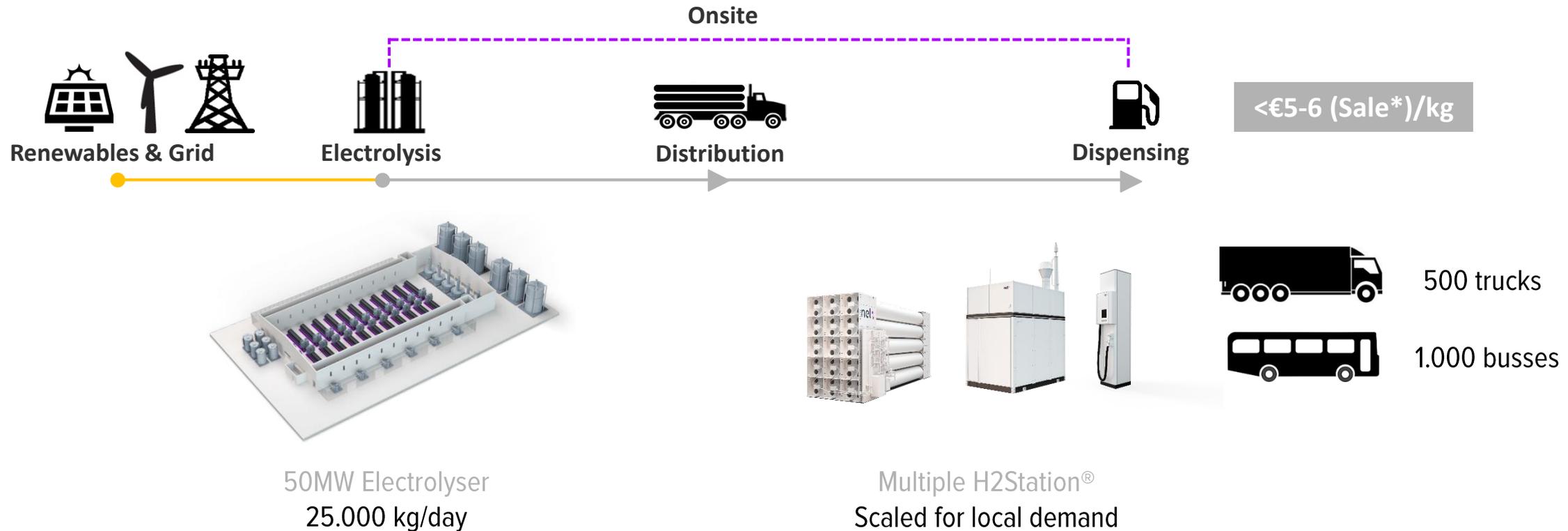
NEL A-485 electrolyzer
1,000kg/day 2.2MW

Dual H2Station® fueling
1,000kg/day two dispensers

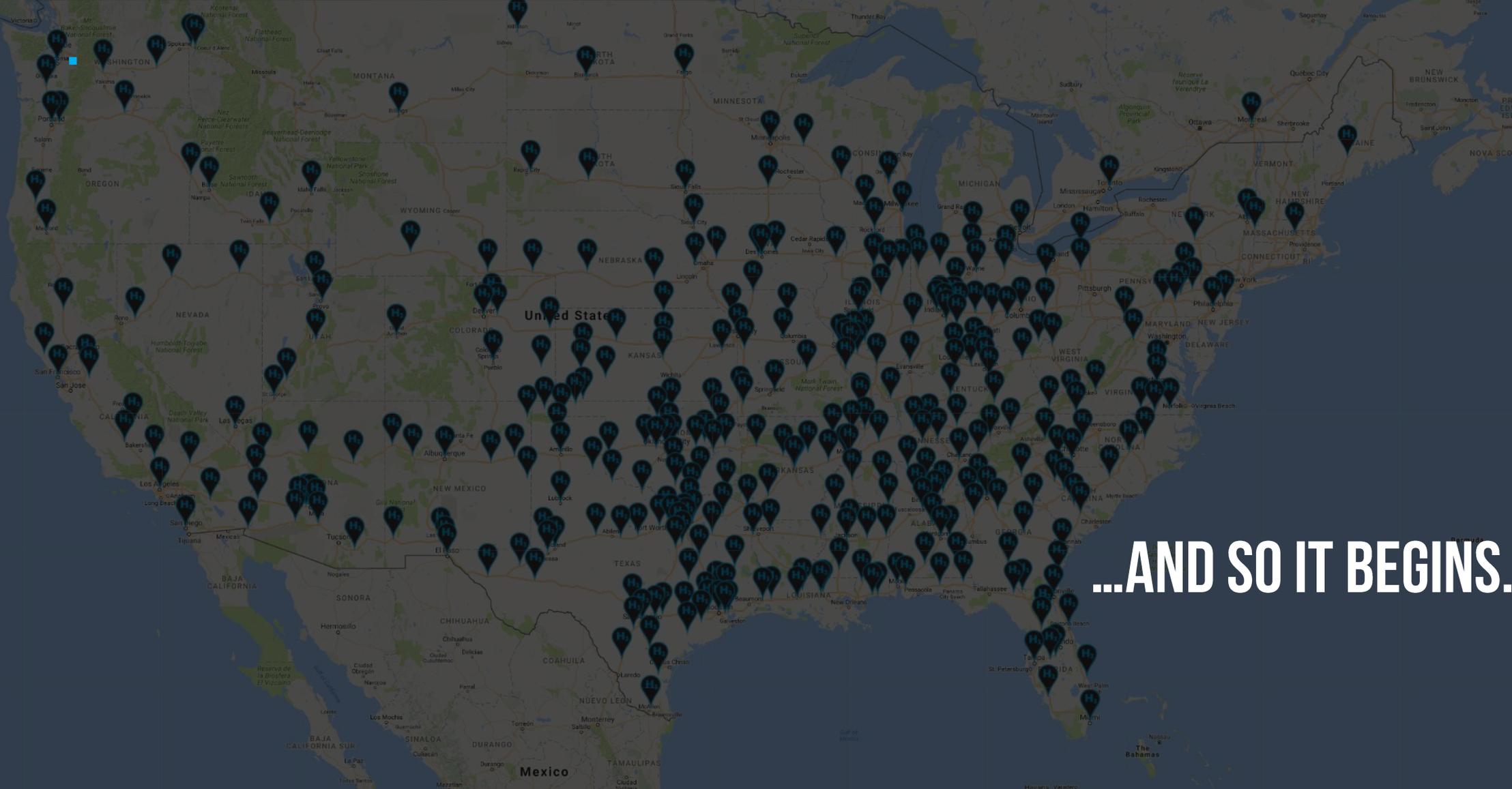
RENEWABLE & GRID HYDROGEN IS COMPETITIVE

In much of the US, hydrogen infrastructure can be reduce price down to <\$5-6 (Sale*)/kg competitive for sale, competitive to US diesel price. Depot Station Centralized production can use low cost renewables and achieve high scale – Onsite production eliminates costs for distribution. Fueling to be at 70MPa for LD & HD, Bulk Trailer Sale at 50MPa

<\$0.04/ kWh



NIKOLA'S PLANNED USA 400+ HYDROGEN STATION NETWORK FOR BOTH LD & HD FCVS TO SUPPORT H2@SCALE ROLL OUT



...AND SO IT BEGINS.

CONCLUSION



- **FUEL CELLS AND HYDROGEN COMBINED IN A “TCO LEASE” BUSINESS CASE FOR NIKOLA TO PROVIDE CLASS 8 HD TRUCKS AT LOWER LEASE COST TO TRUCKING COMPANIES**
- **R&D CENTER TO BE BUILT IN ARIZONA WITH FUEL CELL DEVELOPMENT FROM MEA TO SYSTEM TO VEHICLE AS WELL AS DEVELOPMENT HYDROGEN STATION FOR NEW FUELING**
- **FUEL CELL TRUCKS ARE HYBRIDIZED AND MOSTLY HIGHWAY CONDITIONS WHICH WILL HAVE LOWER STRESS FOR USE**
- **H₂@ SCALE WITH STANDARD STATIONS 4-8 TON/DAY ACROSS US**
- **HEAVY DUTY/ LIGHT DUTY FUELING TO SHARE LOCATIONS**



THE ZEV RACE IS ON...

