

Tearing up the trucking rulebook – bold claims from new arrival

Nikola Motors thinks it has a business case for an electrified Class 8 truck. CEO Trevor Milton tells Megan Lampinen that it is "hard to even fathom the numbers" it could see once its dealer programme is up and running

There will soon be a fresh face on the US heavy truck market and it's looking to rewrite the rule book. Named for the brilliant and eccentric inventor Nikola Tesla, the Nikola Motor Company plans to launch an electrified Class 8 semi-truck, currently called the Nikola One. The model is scheduled to make its global debut on 2 December. Details are scarce but initial interest has been strong and the company is coming out with some pretty bold claims.

More Nikola Tesla than Tesla Motors

"Our technology is 10-15 years ahead of any other OEM in fuel efficiencies, mpg and emissions," boasts company Chief Executive Trevor Milton. "We are the only OEM to have a near zero emission truck and still outperform diesel trucks running at 80,000 pounds."

The Nikola One is a hybrid model that brings together an 800-volt AC motor, a 320 kWh lithium-ion battery pack and a fuel agnostic turbine. Milton envisions the turbine operating on CNG in the US, but more likely gasoline or diesel in other countries. This avoids the range anxiety associated with pure electric vehicles, particularly important as the Nikola One is targeted at long-haul operations. "Drivers don't ever have to charge because there's a turbine onboard that automatically charges the batteries as they drive. All they have to do is fill up with natural gas," Milton told *Automotive World*.

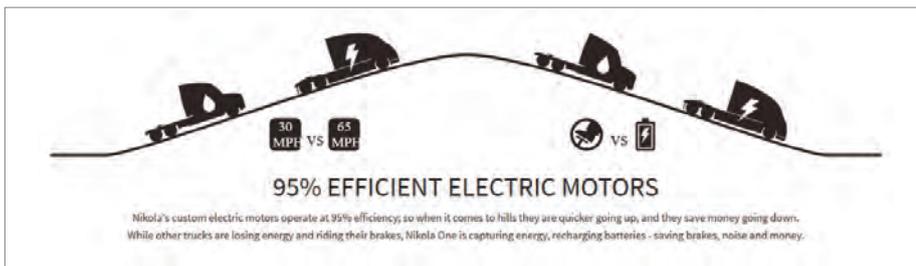
Nikola plans to set up 55 CNG stations across the US and Canada. As an extra incentive, for the first 25,000 trucks sold it is offering free fuel for the first 1,000,000 miles.

"The emissions on this truck are many, many, many times cleaner than a diesel," Milton emphasised. "You'll see a lot of trucks today driving down the road and they're just blowing black smoke. This truck is near zero emissions. You can drive this thing under full load and you're not blowing black smoke."

It is not a pure EV, though, and that marks a notable difference from the pure electric models coming out of California car manufacturer Tesla Motors, which pays tribute to the same inventor with its company name. However, that's as far a comparison as Milton is happy with. "I actually had that name reserved long before Tesla ever

WHAT'S INSIDE

- 1 Front Radiator Assembly**
Massive electric fans attached to world class radiators. These fans can scale through software to the correct RPM needed to keep the truck, batteries, cab, turbine, motors and gearboxes nice and cold under any circumstance. No more power take off units (PTO's), as seen in traditional diesel tractors. These electric motors are 95% efficient - a first for the trucking industry.
- 2 Nikola Motor Gearbox / Steering Front End**
A 14,000 lb front end, custom made to incorporate two electric motors and two gearboxes allowing for torque vectoring and best in class performance while providing a smooth ride for the driver.
- 3 Power Electronics**
The truck needs a sophisticated power-electronics box to manage the energy the turbine produces. This custom built device that took nearly a year to develop, takes 400 kW of energy, cleans it up, then dumps it in the batteries at a constant 800V DC - keeping the batteries topped off when needed.
- 4 Nikola Battery Storage System**
There are over 32,000 individual lithium-ion cells welded together on the Nikola One, resulting in a 320 kilowatt hour (kWh) battery pack. That is 3x the pack size of a Tesla Model S P90D.
- 5 Chiller and Air Tanks**
The 800 volt chiller provides cold water to cool the batteries and, like many parts on the truck, was custom built. The air tanks keep the backup air disc brakes DOT compliant and offer redundancy - another first in the transportation industry.
- 6 Turbine**
The turbine outputs nearly 400 kilowatts (kW) of clean energy straight to the batteries, keeping them charged - a powerhouse unlike any the world has seen before. This proprietary turbine has the ability to turn on and off within seconds - another first in the transportation industry. The turbine is also fuel agnostic, allowing customers to order it in multiple versions: diesel, gasoline or clean burning natural gas.
- 7 Natural Gas Fuel System**
The battery bank is charged by a turbine, which needs fuel. There are 100 gallons of natural gas onboard, enough to power this truck up to 1,200 miles without stopping to fill up.
- 8 Rear Motor Gearbox Housing and Independent Suspension**
This patent-pending, custom built housing can support up to 46,000 lbs. and holds both electric motors and gearboxes. It also helps support the first ever Short Long Arm (SLA) suspension in the linehaul industry - creating a super smooth ride.
- 9 5th Wheel**
The innovative HOLLAND FWAL aluminum fifth wheel is the lightest weight standard duty fifth wheel in the industry. Combine the proven reliability of HOLLAND fifth wheels with the leading technology of ALCOA forged aluminum, and the most innovative, lightweight fifth wheel in the world is created. Lighter than competitive fifth wheels, the FWAL is designed for standard-duty applications and forged from the same alloy as Alcoa's aluminum truck wheels. The LowLube technology reduces customer maintenance time and costs, while keeping our environment cleaner.



came around. A lot of people said, 'Hey, man, you're using Tesla Motors' name, but it's not true at all,' he clarified. Going one step further, Milton believes his company is more true to the inventor's vision. "Nikola Tesla developed a turbine and the AC electric motor, so our truck is a huge remembrance of him. It actually uses the turbine, something that the Tesla car does not do."

With this technology combination Nikola is promising impressive results – initial tests point to fuel economy of more than 15mpg under a full load of 80,000 lbs. Other than that, Milton isn't ready to provide any specifics ahead of the official unveiling. "Some of these numbers are really confidential," he explained. "We don't want to explain how it's done and through what area of the truck it's actually being accomplished. It would help our competitors if we were to give that out."

Bigger than Daimler, bigger than Volvo

Nikola may be the new kid on the block but it is clearly in it to win it, with lofty ambitions over the long term. "We believe we will pass the current market leaders like Daimler, Paccar, Volvo and Navistar in sales orders within the next 12-24 months," stated Milton. Although

its first model hasn't even made its global debut, the company has already received reservations for more than 7,000 units in just the first month since images (artistic renderings) were released. "To tell you the truth, we didn't think we'd have that kind of reception when we built the truck," Milton admitted. "We knew we'd sell some units, we knew we'd do well, but we had no idea we'd do US\$2.3bn since we unveiled it."

Looking at US Class 8 sales data for last month, Milton points out that these reservation levels would give it one-third of the total market. "Last month there were only 14,000 [Class 8] trucks sold on the market, and Nikola Motor had reserved over 7,000. If you add ours together that would be 21,000 trucks that were sold to the whole of the US, and we did 7,000 of them. That is pretty incredible considering the size of this business."

About two-thirds of the orders have come from fleets, most of which flew out to visit the company before laying down any deposit. "They have come to us and seen that the truck is legitimate and real," he explained. "They came out and they looked at it, and they walked away with orders. They said, 'This is the craziest thing we've ever seen – we're in.'"



Funding and sales

So far most of the funding has come from Milton himself. "I've self-funded the company, so we didn't have to go out to the finance world and sell off a lot of our stock. I own the majority of the company still," he explained. Over the last six months, the company has brought in some private wealthy investors and completed a seed round. It's now working on a US\$300m A round that will be done by December. "We sold out of our seed round in ten minutes, so I doubt we're going to have a problem selling our A round," observed Milton.

There has been no confirmation of a production start or delivery details but the company plans to sell directly and through dealers. The dealership programme is set to launch in the coming 60 to 90 days. "When those open up our sales orders are going to be incredible. It'll be hard to even fathom the numbers that we'll get when we open up our dealership programme," commented Milton.

He estimates total dealer count will be around 200-300 in the US at the time of the unveiling. While there has been a lot of interest from Europe, Nikola is focussing on the US only at this stage: "As soon as we get the trucks released here, I think that [Europe] is our second market, just because we've had fleets with thousands of trucks call us up and ask us for orders and we just couldn't take them. It is a very tough thing to turn down orders."

A lot to prove

It is still early days for Nikola, and there is a lot of work ahead. "We have to get our manufacturing plant up and running, get our stations built, get our brand out there. Our business plan is a 20-year business plan. We can't make this company a Volvo or a Daimler in two years. It can take 20 years and that's okay," said Milton. "There's a lot of money in it. There's a lot of growth and a lot of potential and that's what investors love to see. The roadblocks – the dealer network, the stations, the name brand recognition, the service, the warranty, the proving of the product – those are going to be what we have to prove."