



The Future of Sustainable
Heavy Freight Logistics.

December 2025

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Prior Experience: AZETEC

- The first 63.5T tandem trailer hydrogen fuel cell trucks.
- Funded by Alberta ERA and AMTA.
- Key lessons learned in design, manufacturing, certification and performance.



ERA Funding Support: \$7.3M



Lead Applicant:



Fueling System:



Carriers:



Research, GHG Accounting, Commercialization:



Vehicle Design, Components/Manufacturing:



Elemental Trucks



Hydrogen

Class 8 Tractor

GCW 63t

FC power 360kW
Range 800km
Available Q1 2026



Battery

BEV version

GCW 63t

Range 150km (for shuttle trips)
Charging speed 300+km/h
Available Q2 2026



Hydrogen

Class 8 10-wheeler

Boom truck, dump truck, flat bed

Range 500km
Up to 30,000lbs payload, PTO



Hydrogen

Class 8 Delivery truck

16ft-26ft box

Range 500km
Up to 25,000lbs payload
Available Q3 2026



Hydrogen

Class 8 12-wheeler

**Dump truck, snow-plow,
concrete mixer**

Up to 45,000lbs payload, PTO
Range 500km
Available Q3 2026



Proudly made
in Canada



Elemental Trucks

Alpha HD+ 80

Hydrogen-powered zero-emission tandem-trailer trucks purpose built for heavy duty and severe operational conditions.

TECHNICAL SPECIFICATIONS

GCW	140,000 lbs / 63.5 t
e-motor	550 kW
Transmission	6x4, 3-speed
Fuel cell power	360 kW
Hydrogen capacity	88-110 kg
Hydrogen pressure	700 bar
Battery packs	200 kWh

PERFORMANCE

Top speed	110 kph
Gradeability	40 kph on 6% grade
Range	750-900 km
Brakability	Powerful resistors + regenerative braking

ZERO-EMISSION

HYDROGEN
FUEL CELL

63.5 T GCW

800+ KM
RANGE

COLD-START

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Straight-truck hydrogen variant

Ultra HD 50 10-wheeler

Hydrogen-powered zero-emission straight trucks purpose built for heavy payloads in severe operational conditions.

TECHNICAL SPECIFICATIONS

GVW	58000 lbs / 26 t
e-motor	300 kW
Transmission	6x4, 3-speed
Fuel cell power	180 kW
Hydrogen capacity	44 kg
Hydrogen pressure	700 bar
Battery packs	100 kWh

PERFORMANCE

Top speed	110 kph
Payload on chassis	up to 15t
Box length	16 to 26ft
Range	500 km

ZERO-EMISSION

HYDROGEN
FUEL CELL

15 T PAYLOAD

500 KM RANGE

COLD-START



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Vocational hydrogen variant



Elemental Trucks

Ultra HD 50 12-wheeler

Hydrogen-powered zero-emission vocational trucks purpose built for high power and heavy payloads.

TECHNICAL SPECIFICATIONS

GVW	66000 lbs / 30 t
e-motor	300 kW
Transmission	6x4, 3-speed
Fuel cell power	180 kW
Hydrogen capacity	44 kg
Hydrogen pressure	700 bar
Battery packs	100 kWh

PERFORMANCE

Top speed	110 kph
Payload on chassis	up to 19t
Range	500 km

ZERO-EMISSION

HYDROGEN
FUEL CELL

19 T PAYLOAD

500 KM RANGE

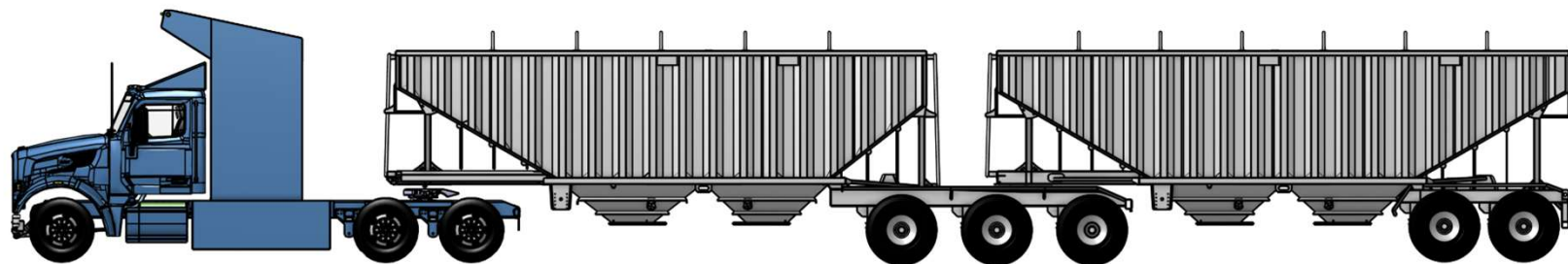
COLD-START

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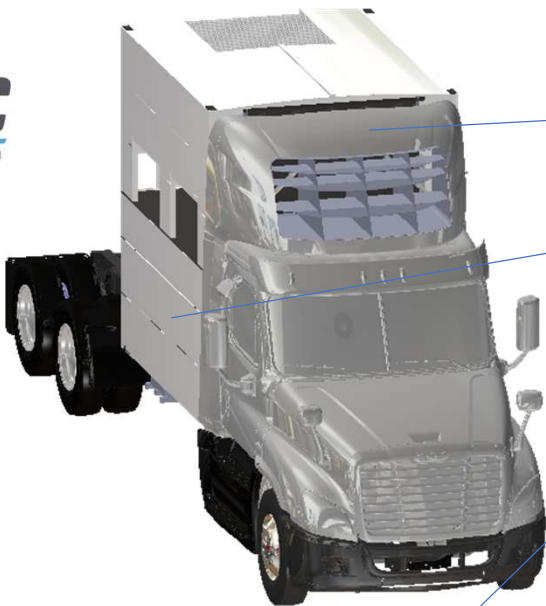
Elemental Trucks deliver more !

Hydrogen fueled, zero-emission, tandem-trailer trucks.
Superior on payload and power (the metrics that matter).

Spec	Typical Diesel Class 8	Competitor FCEV Trucks	Elemental Alpha HD+
Gross combined weight	80,000 – 140,000 lbs	82,000 lbs	141,900 lbs
Payload	~40,000 – 86,000 lbs	~40,000 lbs	~80,000 lbs
Fuel cell power	N/A	110 – 200 kW	360 kW
Powertrain	~550 kW	400 kW	600 kW
Curb weight	18,500lbs	25,500 – 28,000lbs	27,000lbs
Max speed	110kph	90–110kph	110kph
Brakability	Engine brake	Regen only	Regen + brake resistors



Truck architecture



HT cooling radiator kept over the cab

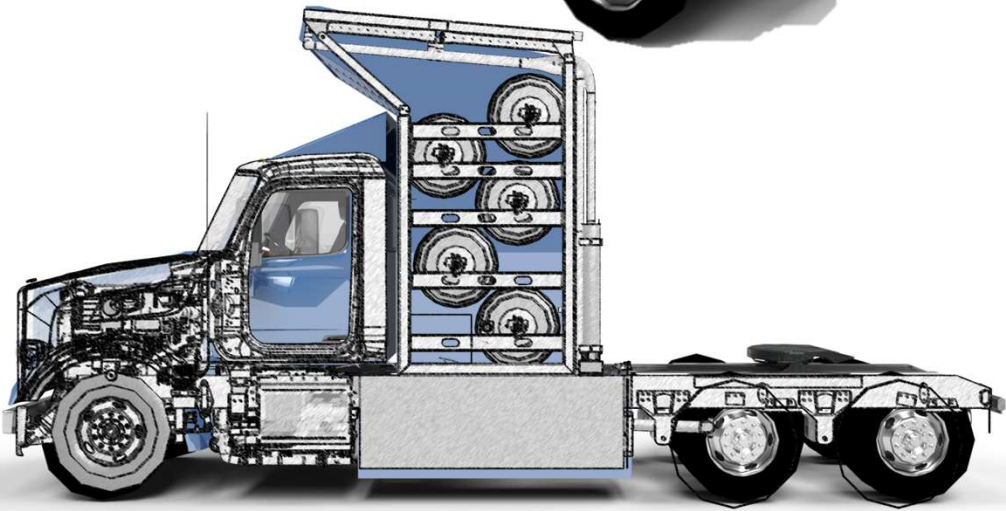
Hydrogen storage system behind the cab

Fuel cell systems moved from back of cab to engine bay

E-axles replaced by central powertrain



Decreased wheelbase 297in => 231 in (sleeper equivalent)



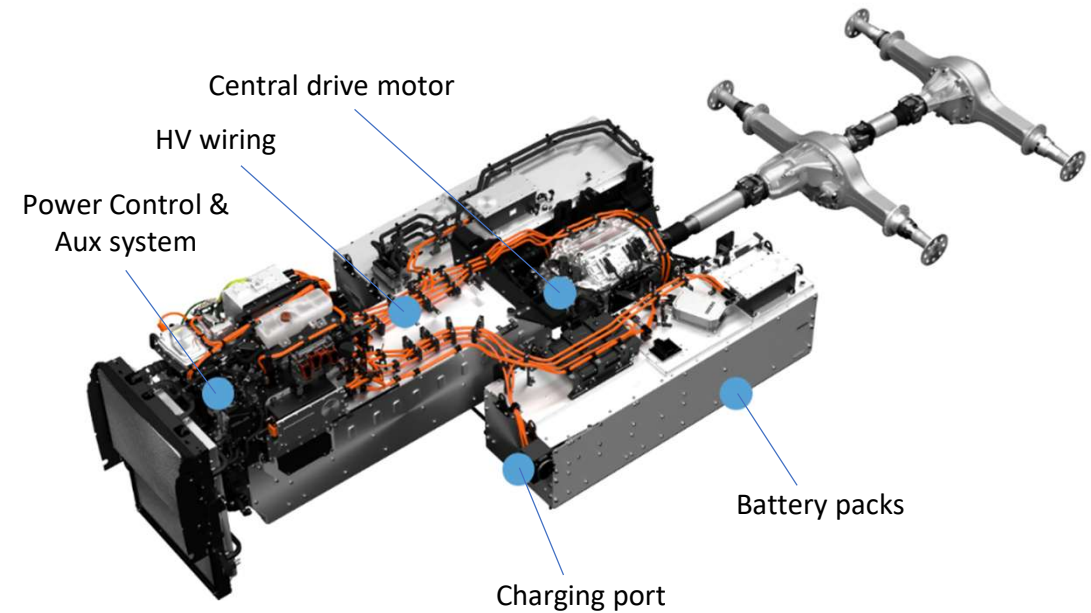
E-Axles vs Central Powertrain

AZETEC trucks are equipped with **DANA** e-axes



Source : <https://www.trucknews.com/transportation/azetec-project-debuts-63-5-ton-hydrogen-fuel-cell-electric-truck/1003189674/>

PACCAR EPOWERTRAIN

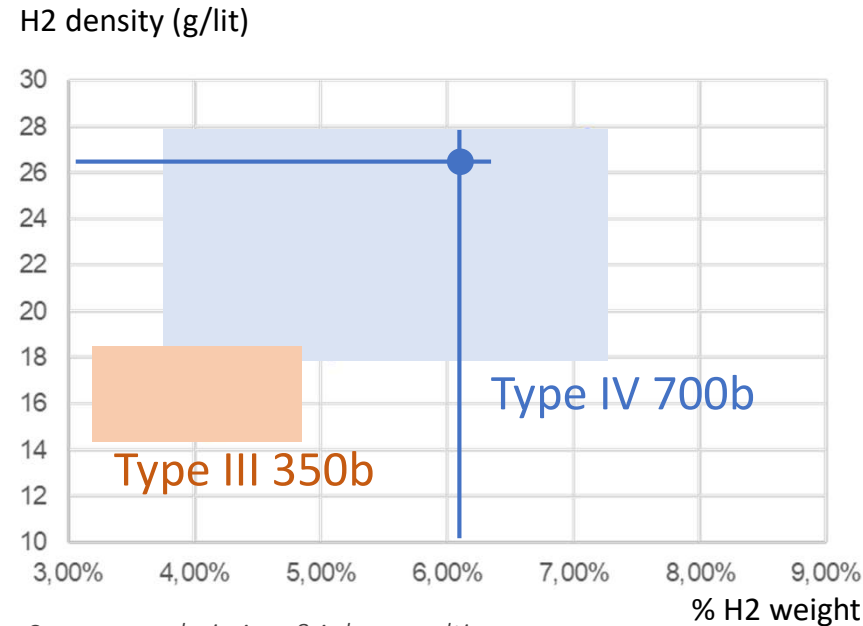
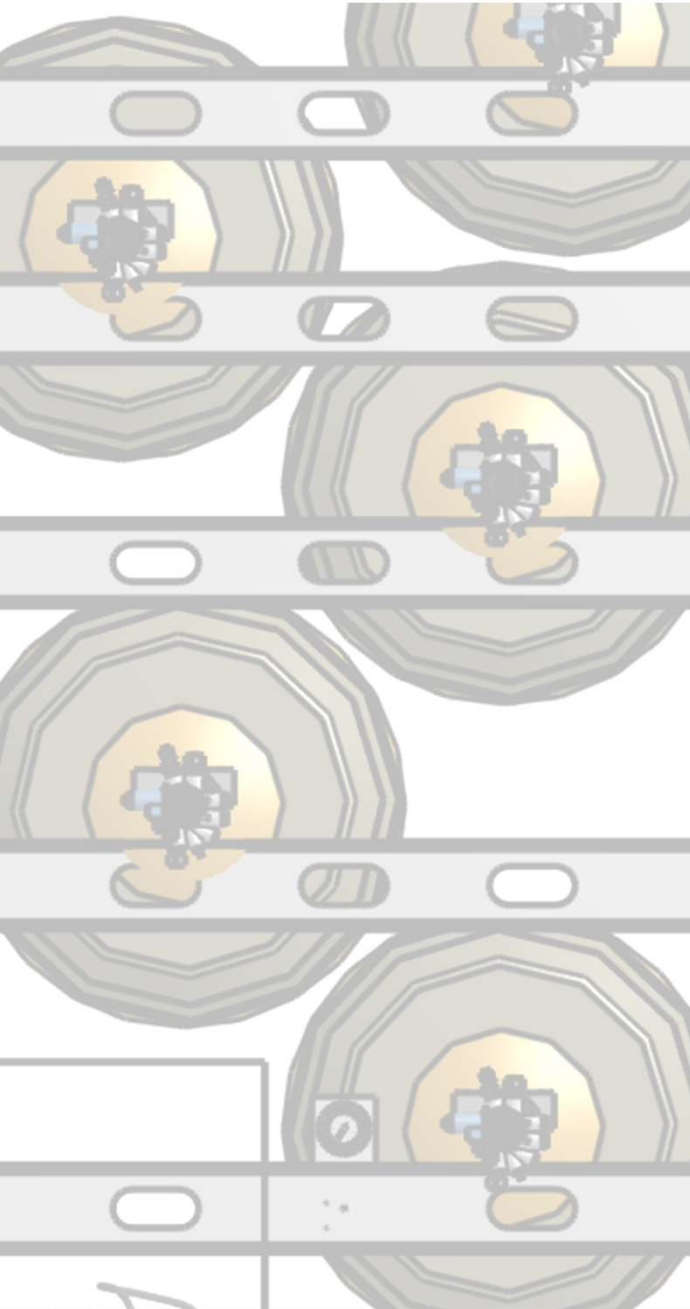


Source : <https://paccarpowertrain.com/products/epowertrain/?v=92a31fc033f7>
Unveiled at ACT Expo 2025

Benefits of the central powertrain

- Higher power density
- Less power cables

Hydrogen storage system : type III 350b / type IV 700b



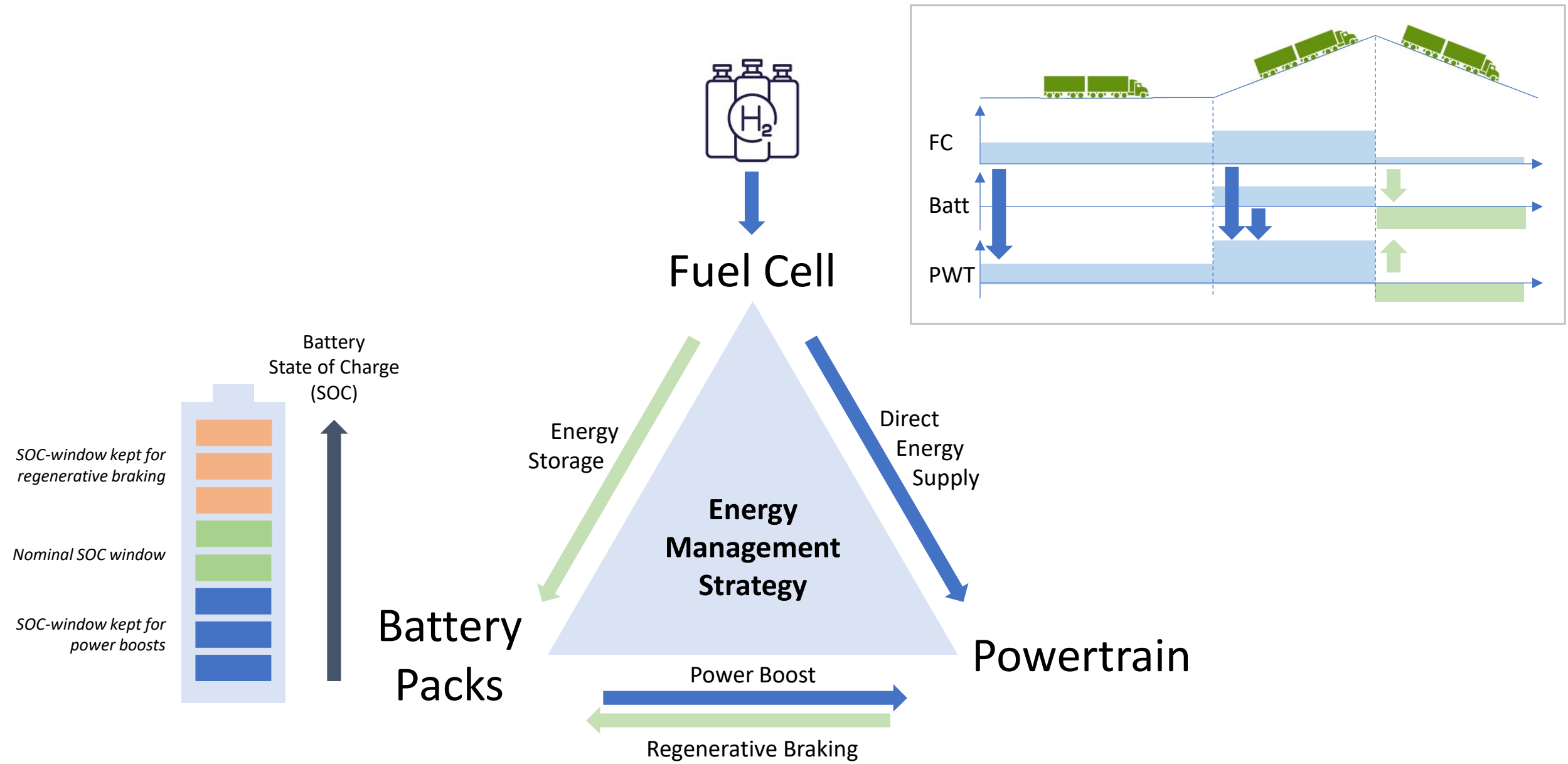
Source : analysis Amp&Axle consulting

Type IV 700bar contains almost twice more hydrogen per kilogram and liter of tank than type III 350bar

Reminder :

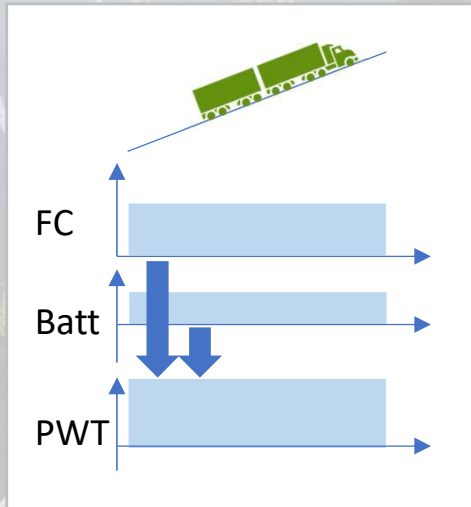
1 kg of H2 tank (typeIV 700b) contains 2,1kWh energy, that will generate 1kWh at the wheel
1 kWh at the wheel requires **5,4kg of battery pack** (NMC chemistry)

Energy Management Strategy

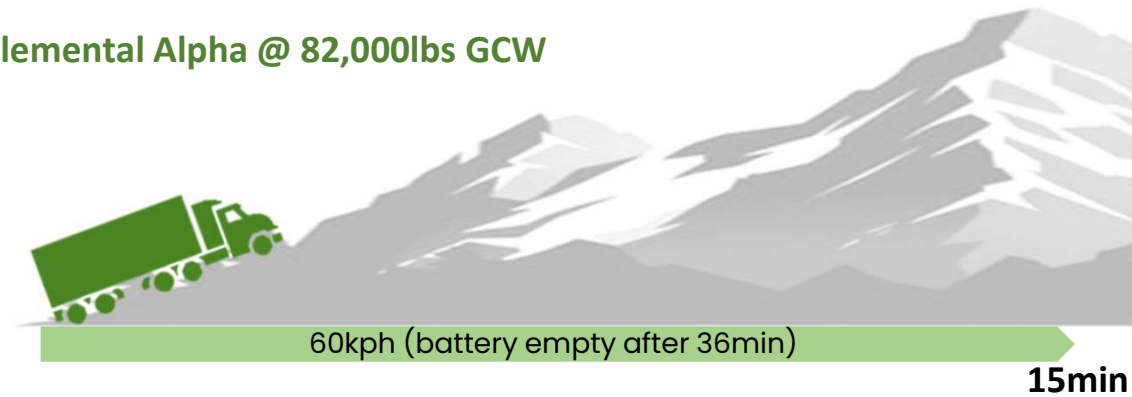


Battery sizing : designed for the Coquihalla Pass, BC (*)

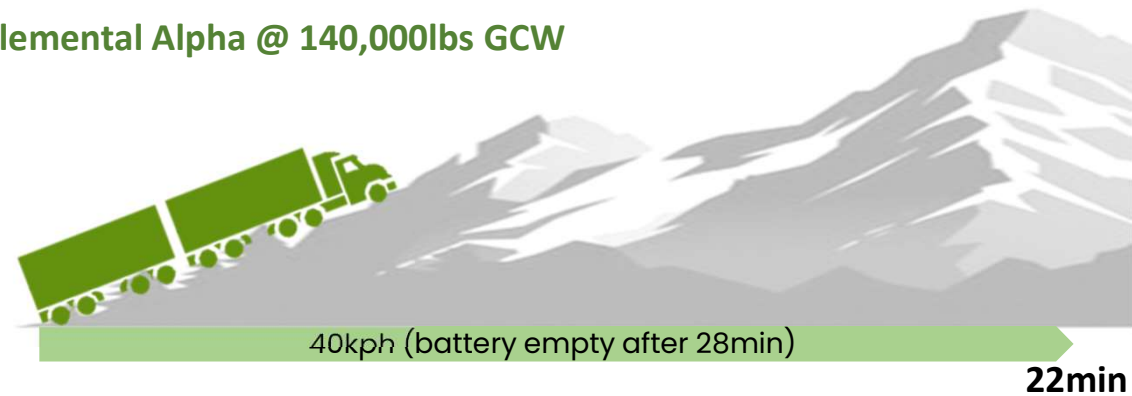
Fuel cell and Battery sized for 30min of full traction power



Elemental Alpha @ 82,000lbs GCW

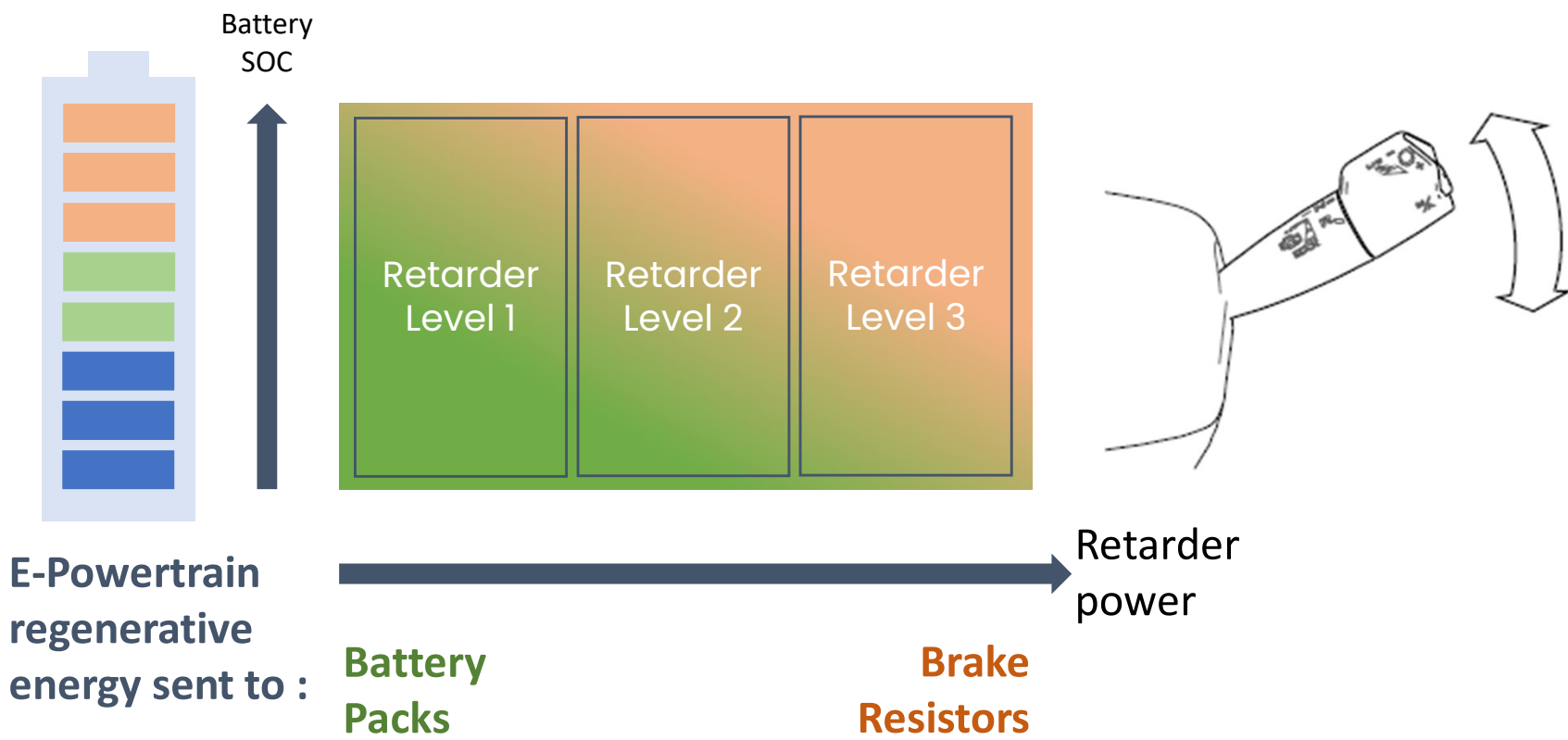
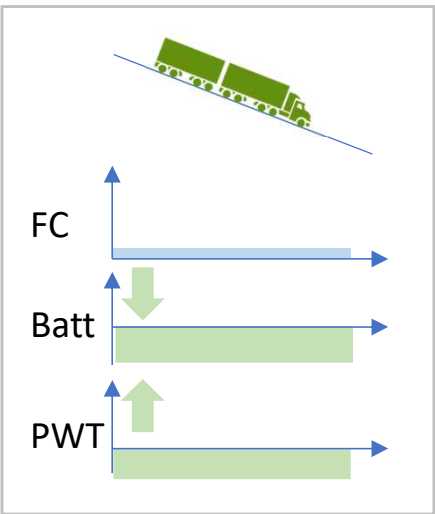


Elemental Alpha @ 140,000lbs GCW



(*) : Altitude change +900m in 15km.

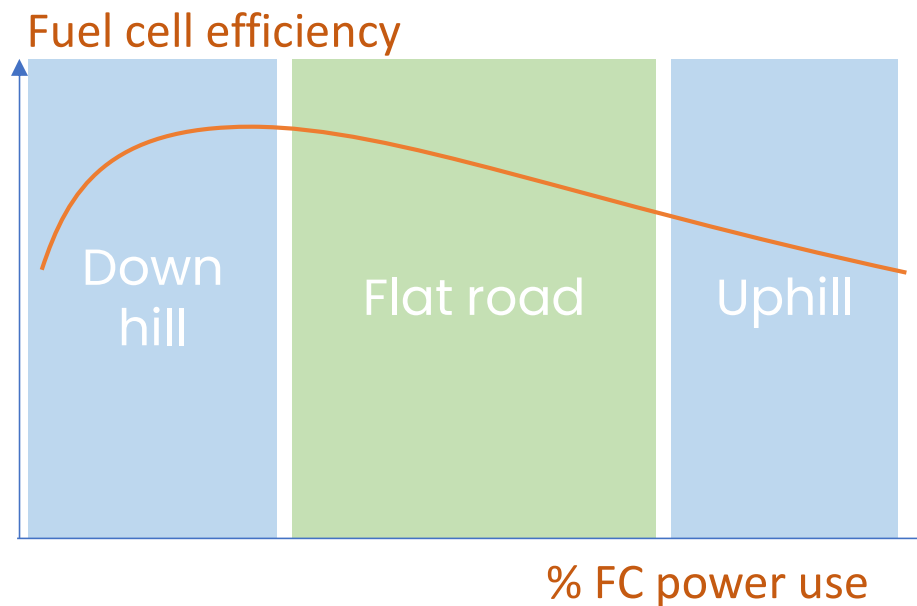
Brake Retarder Strategy



Fuel efficiency : Use the best of hydrogen power

Our truck is square from the shoulders but that's what power looks like

- Best use of the air flow to reduce cooling power consumption
- Best use of the fuel cell power to maximize efficiency



➡ 40-50%
Heat rejection

Cold start



Cold start duration from 30min to 2 hours when the battery packs are soaked at -25°C



On-board charger to plug the vehicle overnight and keep the battery temperature $>0^{\circ}\text{C}$
Fuel cell rated to start in 5min at -25°C



ELEMENTAL TRUCKS