Pilot kick-off event

Istanbul, April 2026

NextEtruck: Türkiye Pilot Use Case

Mustafa Başaran(Ford Otosan)
mbasara3@ford.com.tr

Furkan Aksu (Ford Otosan)
faksu@ford.com.tr

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Co-funded by UK Government

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Enabling Next-Gen Electric Truck Platforms

FORD OTOSAN

NexT ELTRUCK

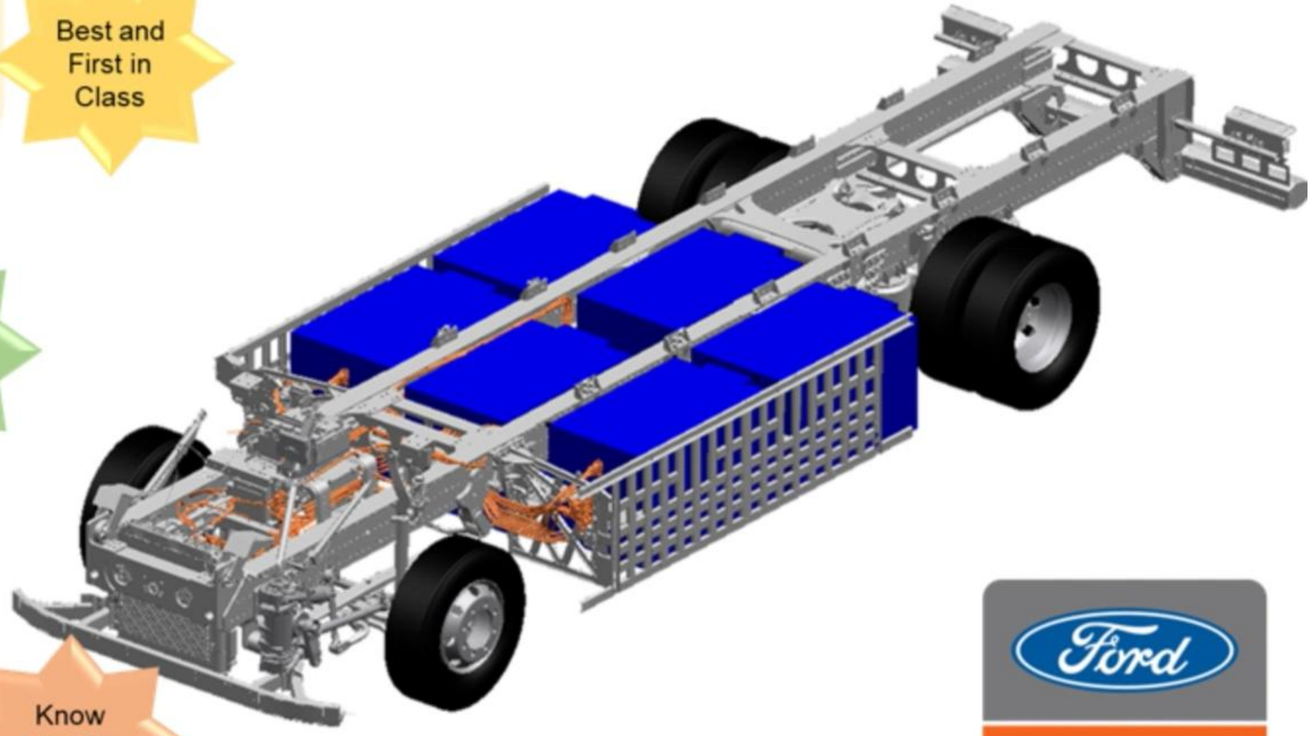
Shaping The Future of Electric Mobility

- 6.000 kg curb weight with 10.000 kg payload
- Aluminum & modular e-platform
- EPS for trucks as first demo in market

Best and First in Class

- AVAS development for BEV trucks
- New battery packaging strategy
- E-axle for rigid truck
- TMS development for IHB
- Lightweight battery protection
- Megacasting part for undercab
- No joggle for BEV platform

Applicable for all BEV



- Lower cab location
- Air Tube Cross
- Fully aluminum RUP
- Electromechanical brake (airless vehicle system)
- Opportunity for patents and papers

Know How for all Trucks

Ford TRUCKS

Development of **Expertise** and **Specifications** for a Dedicated Electric Platform

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LADDER FRAME

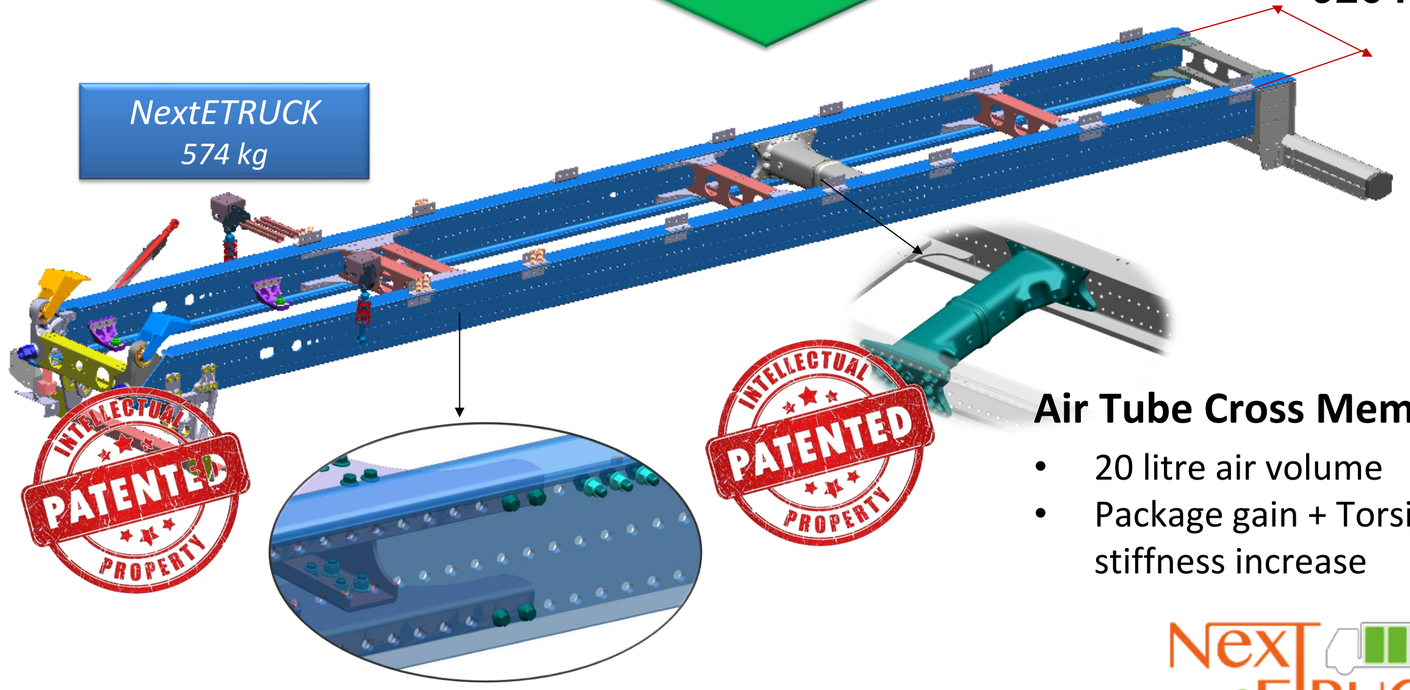
All frame components are changed

- Lightweight, and modular ladder frame
- Ordered hole pattern on side members

Rigid E-Truck
1062 kg

46%
weight reduction

NextETRUCK
574 kg



Air Tube Cross Member

- 20 litre air volume
- Package gain + Torsional stiffness increase

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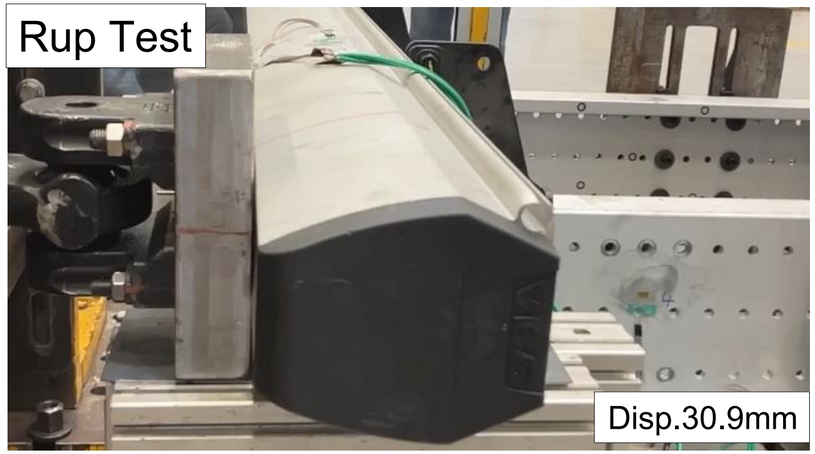
LADDER FRAME - TESTING

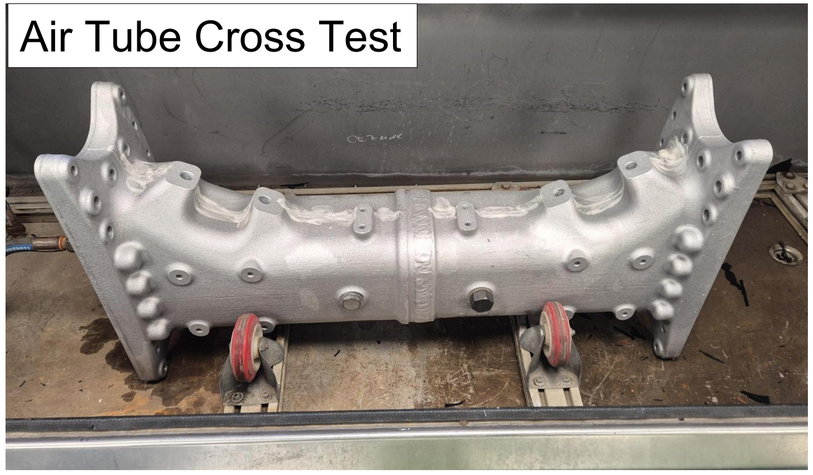
Torsional&Bending Stiffness Test

	Test	CAE
Torsional Stiffness	80.84 kNm/rad	79.20 kNm/rad
Bending Stiffness	4.14 kN/mm	4.15 kN/mm

Rup Test



Air Tube Cross Test



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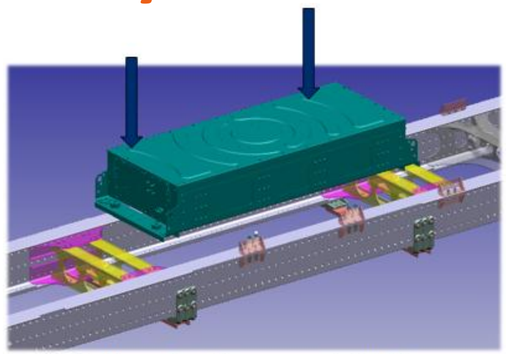
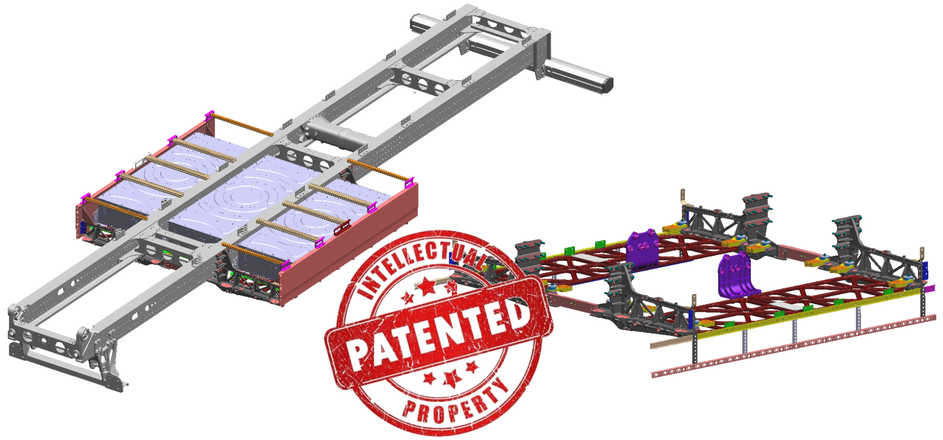
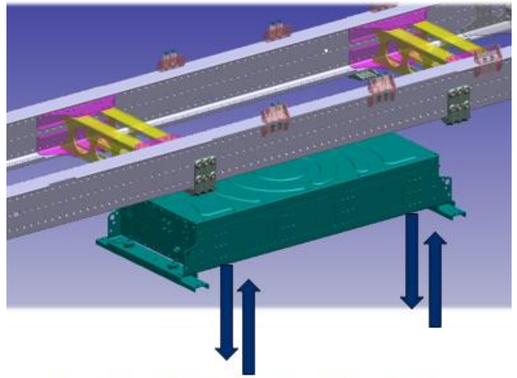
Battery Location & Serviceability



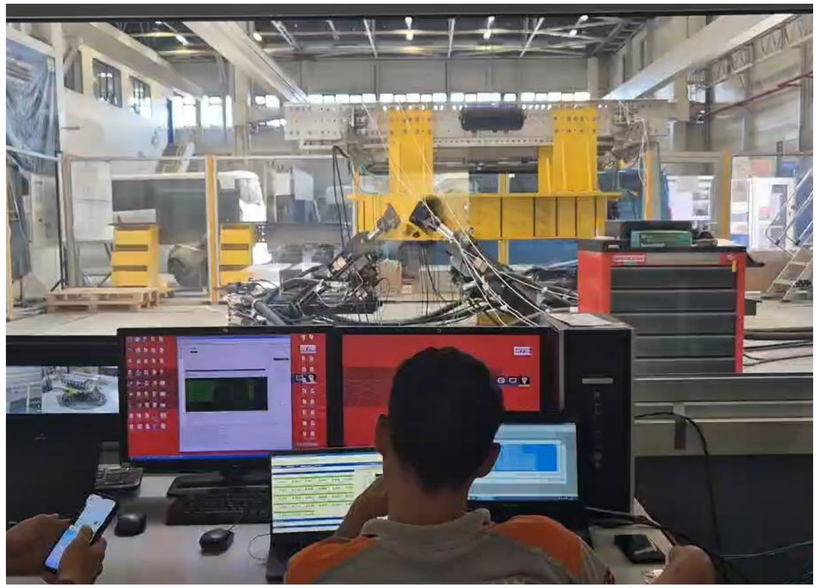
Battery decking on vehicle line from the top of the chassis.

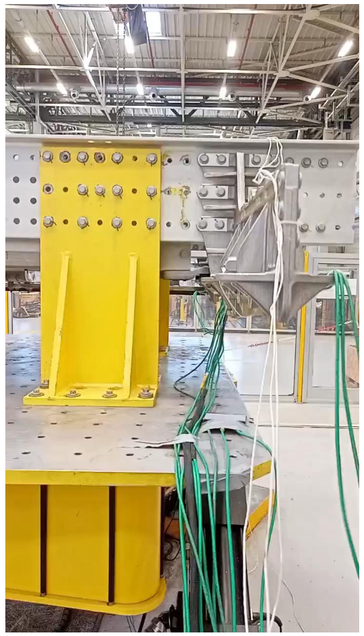


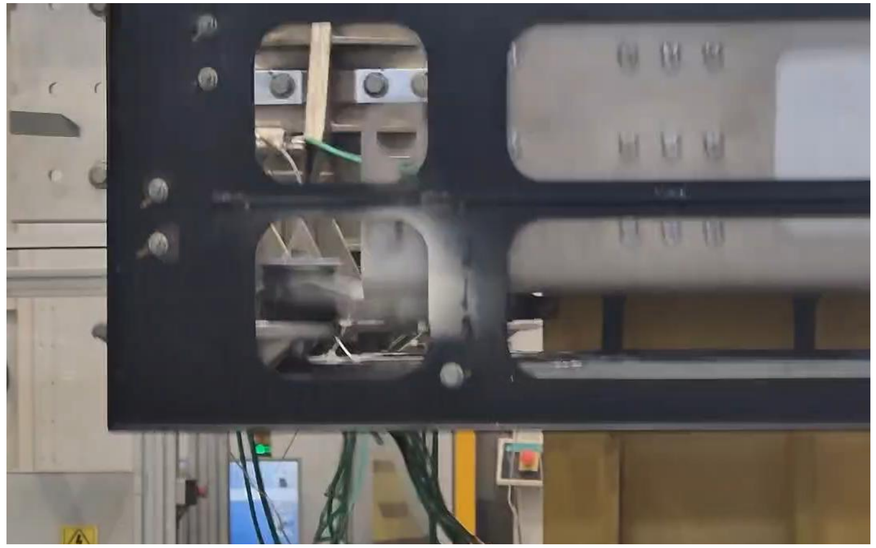


Battery decking at service usage from the bottom of the chassis

Test & Validation







Tests are conducted for CAE correlation.

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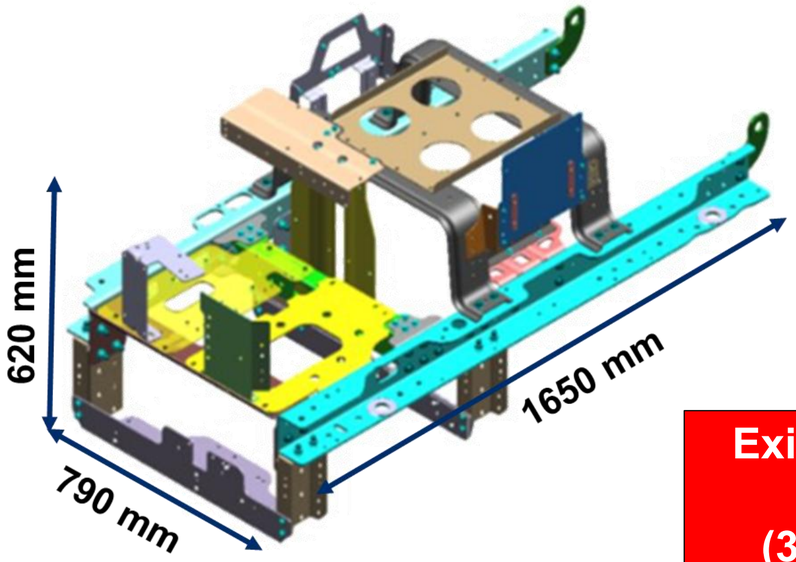
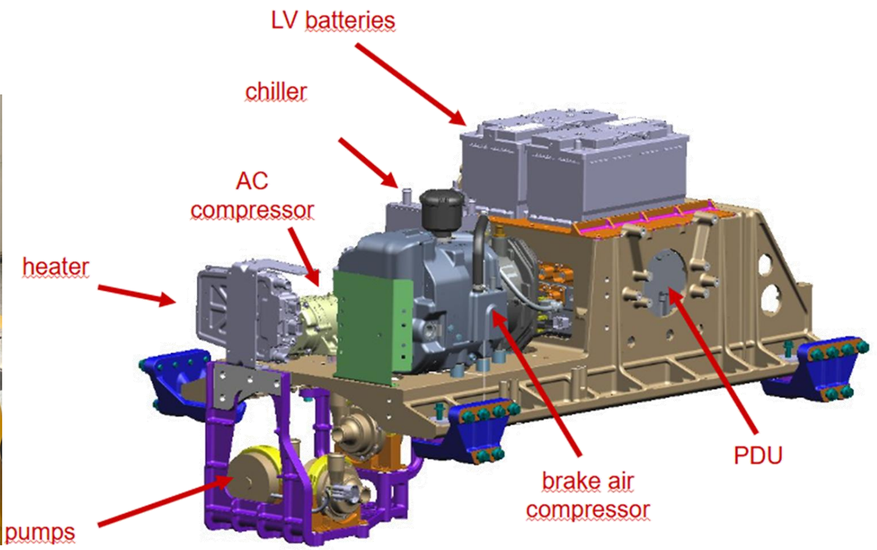
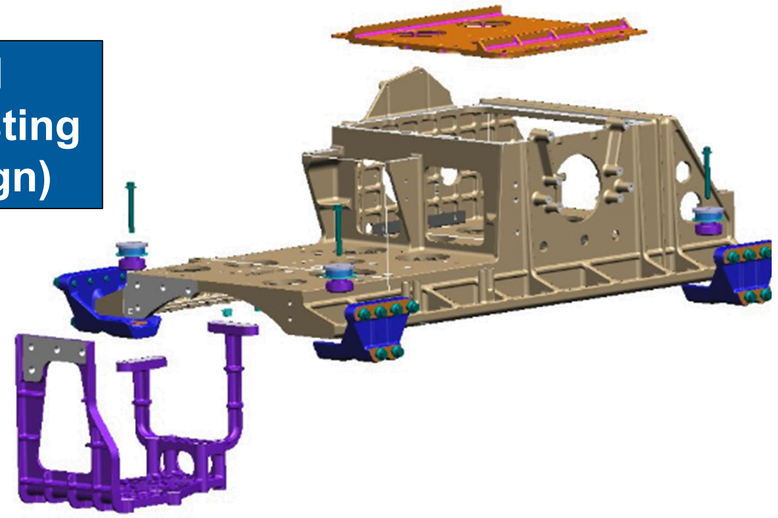
Mega-Cast Undercab Carrier:





Existing Steel Design
161 kg
(33-part assembly)

3D Sand-Printed Aluminum Giga-Casting
66 kg (3-part design)



The under-cab carrier system is designed to carry electric vehicle systems with a total weight of approximately 150 kg.

60 % Weight Reduction (95 kg)

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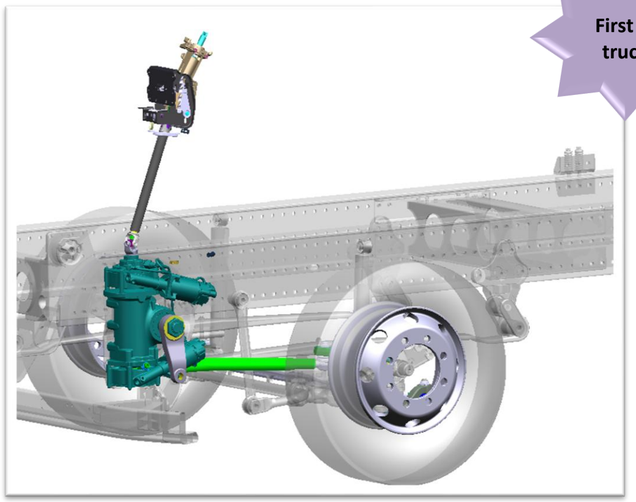
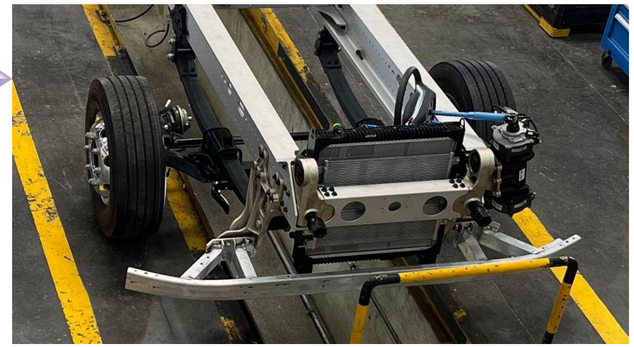
Steering & WTJ

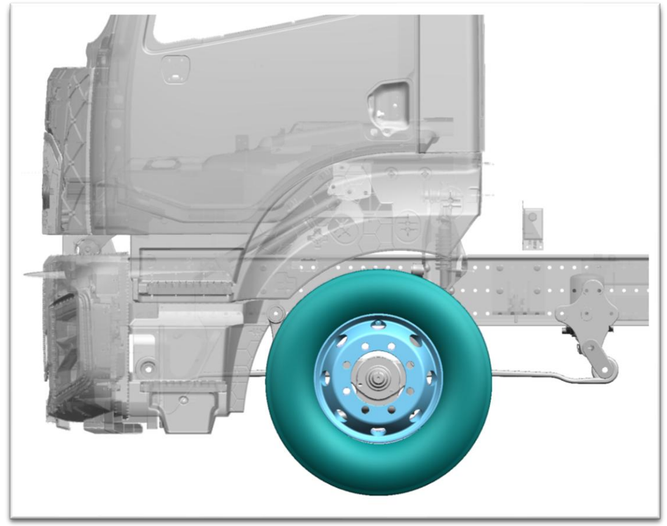




EPS

- No hydraulic support needed.
- Supports fully autonomous drive (L4).
- High efficiency >%82 savings vs. EHPAS.

- Plug & Play component
- No oil in assembly line
- No additional e-pump required in BEV/FCEV
- Power on Demand component
- Better overall efficiency
- Emergency Steering Support
- Steer-by-wire applicable
- Level 4 Automation ready
- Extremely low free play and excellent steering feel



19,5 inch wheels and tyre

- Aluminum rim
- Lighter system
- Lower SLR

171 kg Weight Reduction

90mm Lower SLR

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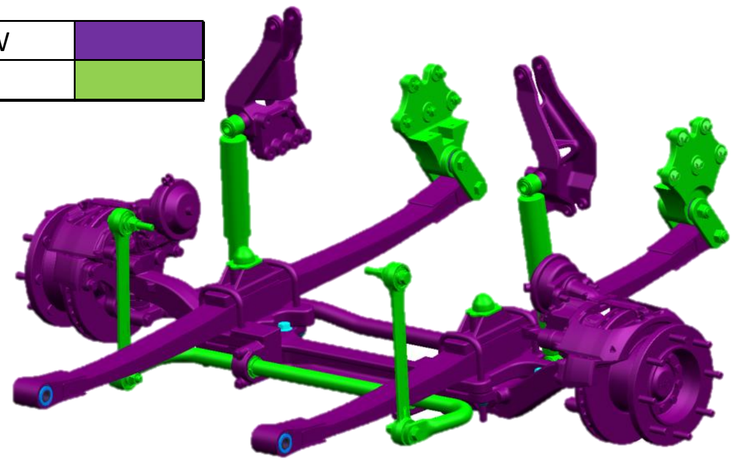
Front Suspension system

NEW	
C/O	

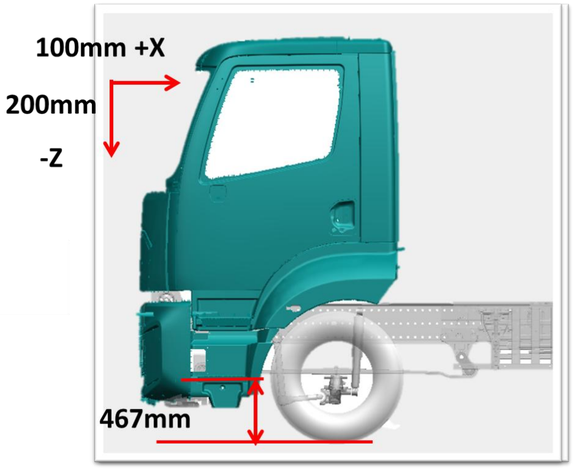


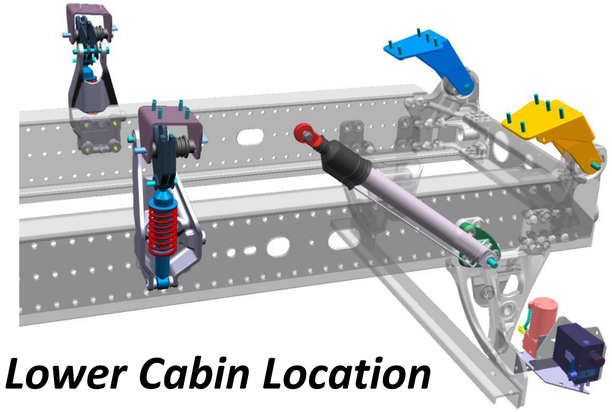
- Significantly lighter **composite monoleaf springs**
- 19" rim-compatible off-the-shelf axle subsystem (incl. braking & steering)
- Significantly **lighter aluminum hub** — among the first in the European market

System	Weight
Current Frt Susp.	480 kg
Next e-Truck Frt Susp.	370.2 kg

Total: 109,8 kg WR

CAB Suspension System





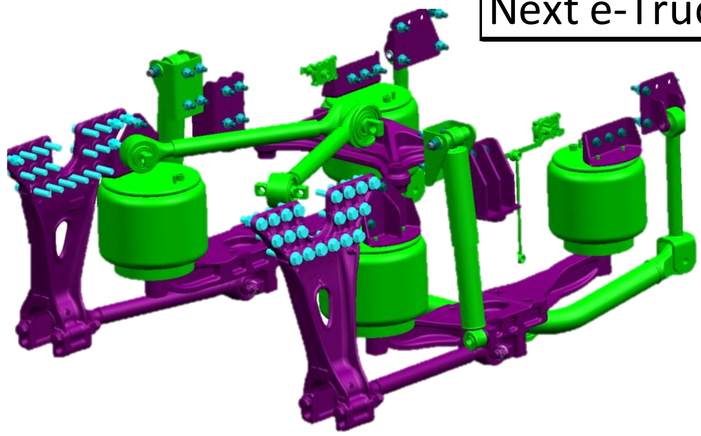
Lower Cabin Location

- Better driver vision
- Easier to get on the truck
- 467mm first step height

Rear Suspension System

NEW	
C/O	

System	Weight
Current C4AS	322,7 kg
Next e-Truck C4AS	294,6 kg



Total: 28,1 kg WR

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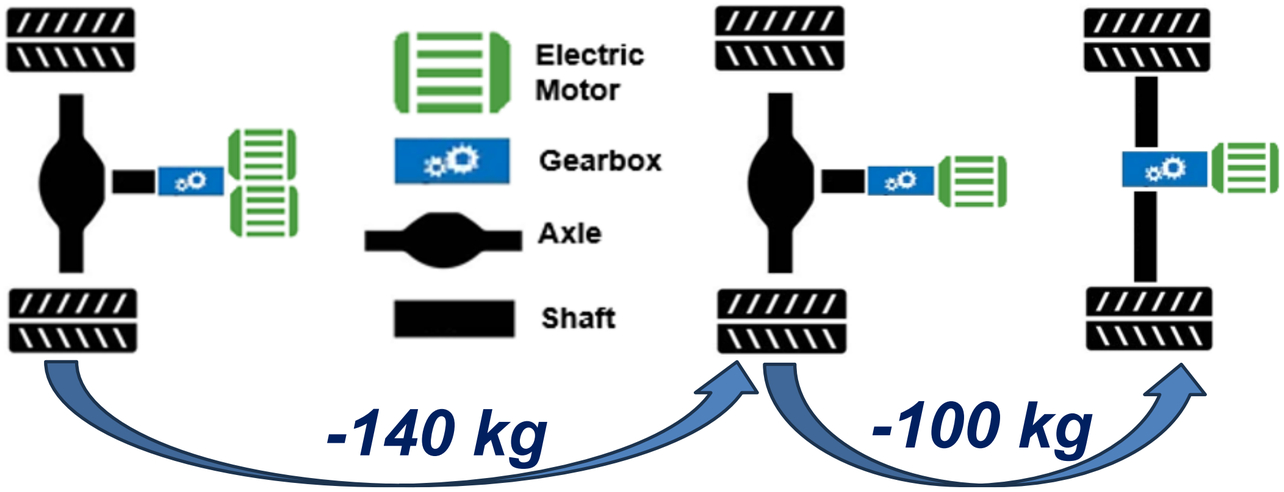
NEXT E-TRUCK

POWERTRAIN STUDIES

19T Baseline Vehicle



16T NextETRUCK

- Powertrain concept optimization (from dual- to single-motor) → 140 kg weight reduction
- Further eDrive system simplification with e-axle → additional 100 kg weight reduction
- 19.5" e-axle architecture (vs. 22.5"), among the first in the market → additional weight savings in brake and wheel-rim systems

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NexT ETRUCK

CABIN ARCHITECTURE

VA support is provided internally by the LCV Trim & Body Design Team.

Relocated Cabin Position

Easy entry to the cabin with two side steps

and lower position.

Better driver vision especially for urban usage.

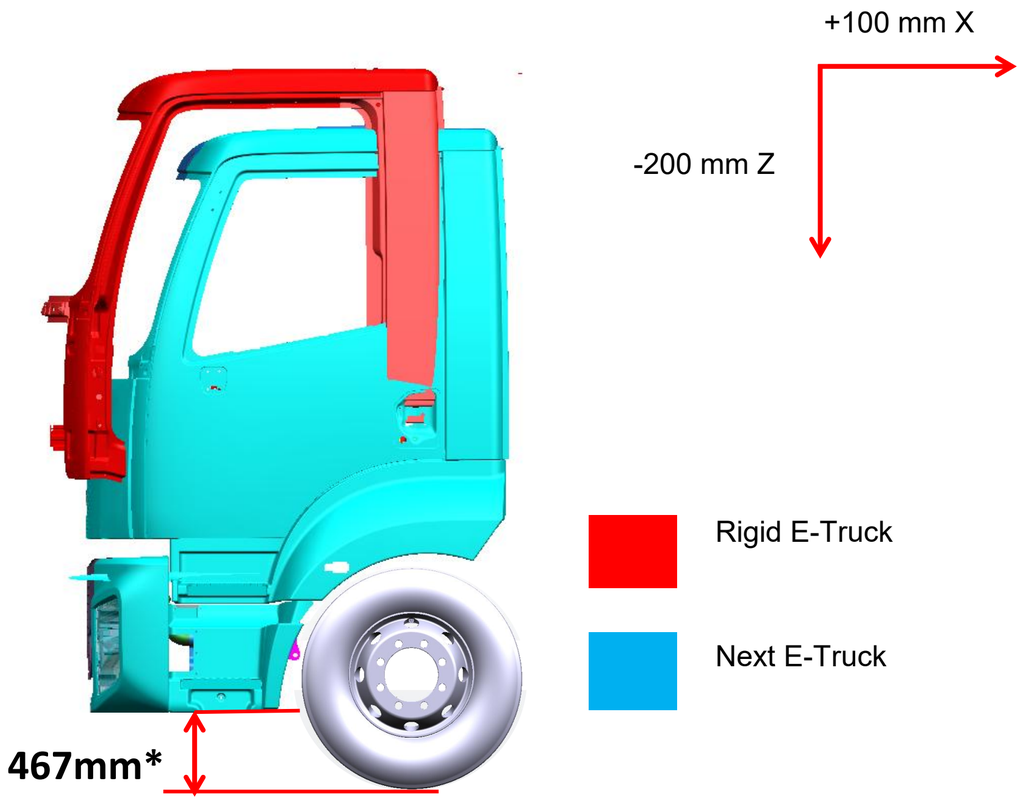
Improved aero performance

Construction short bumper implementation on road truck

for better ground clearence

With R19,5 Wheel size usage (First time in Truck projects),

467mm first step height can be achieved.



Improved accessibility: first step height reduced to 467 mm via optimized cabin layout and smaller tires

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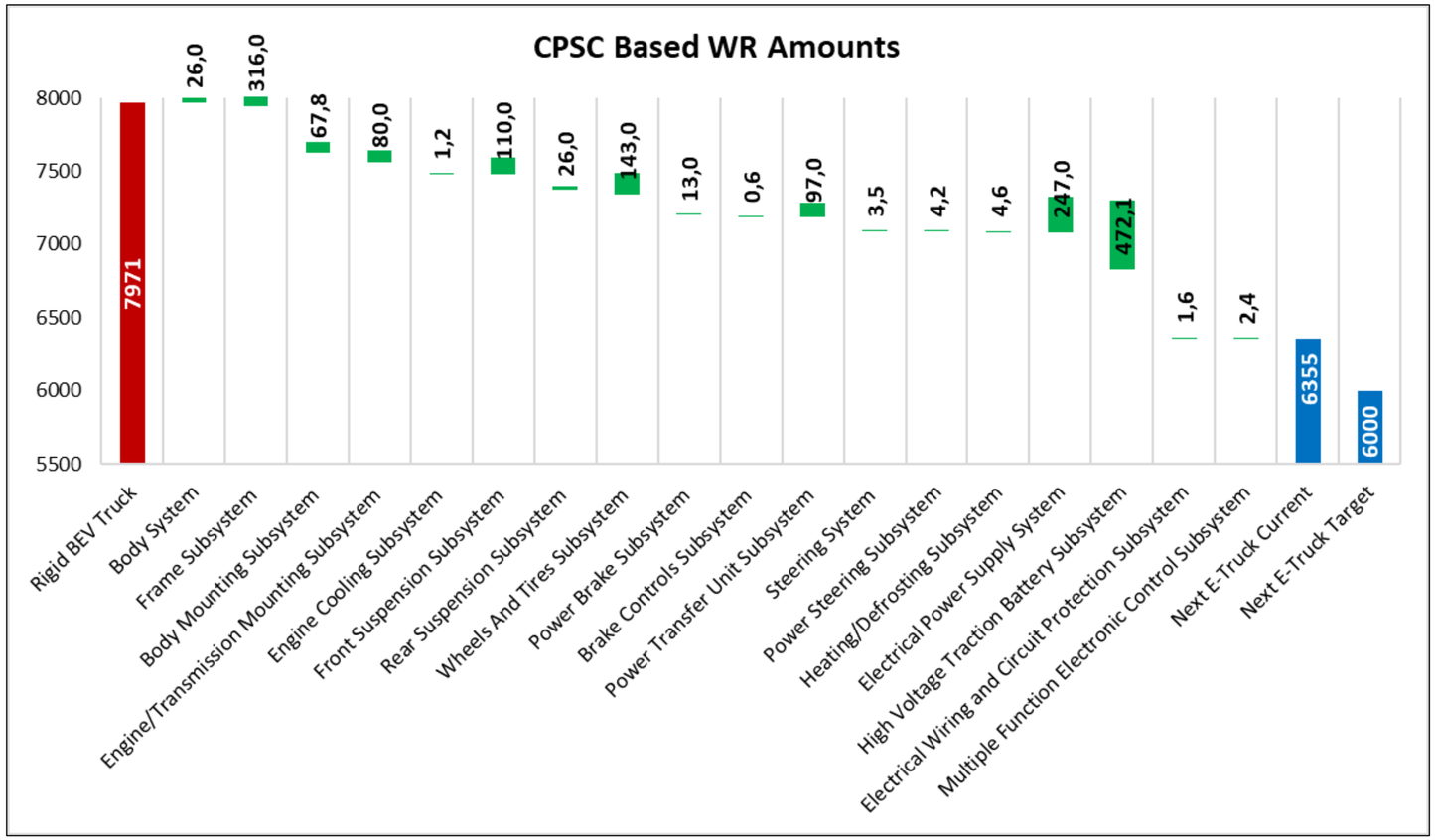
NEXT E-TRUCK

WEIGHT STATUS

	BKW 1.Axle (kg)	BKW 2.Axle (kg)	BKW Total (kg)	GVM Total
Rigid BEV Truck	4790	3181	7971	19000
Next E-Truck	3360	2578	**5938**	16000



Achieved weight reduction is 1607 kg

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NEXT E-TRUCK

NextETRUCK : Build of Vehicle

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NextETRUCK

Digital Twin Description and Pre-Studies

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NEXT ETRUCK

Digital Twin: Vehicle Application Layout

CLOUD TECHNOLOGY

VIRTURAL SPACE "Digital Tiwin"

Deep Learning

PREDICTIVE ANALYTICS

GPS

Device Connect

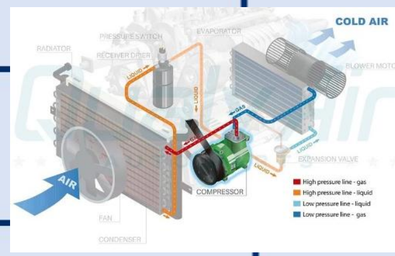
AVL

OBD

Private CAN 2

VCU

Cabin & Battery Cooling
- AC Compresor Control



High Temperature Circuit
- Fan Speed Control
- E-Drive, DC/DC, Air Comp.

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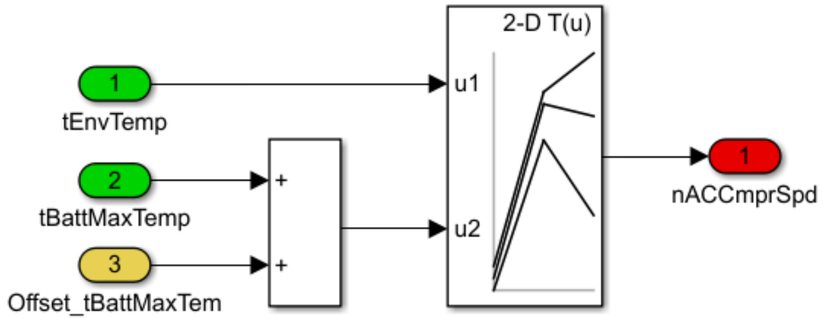
NexT ETRUCK

Setpoints and Signal Definitions

- Digital Twin model **optimizes fan and compressor control** in e-trucks by integrating real-time and cloud-based thermal signals.
- **Offset adjustments enhance cooling decisions**, ensuring efficient and intelligent control.



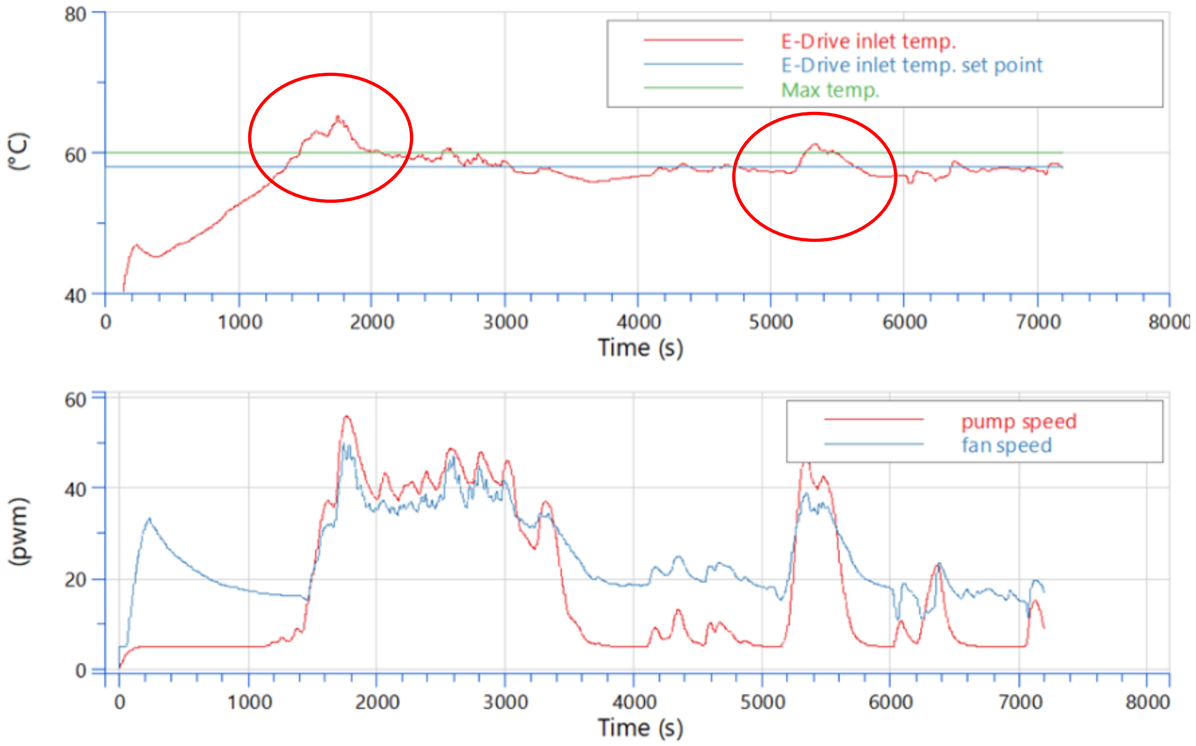
- This approach reduces energy consumption, improves thermal stability, and extends system longevity.

From Cloud to VCU
Set temperature of coolant at powertrain inlet
Set temperature of coolant at battery temperature
Connection Check value DT

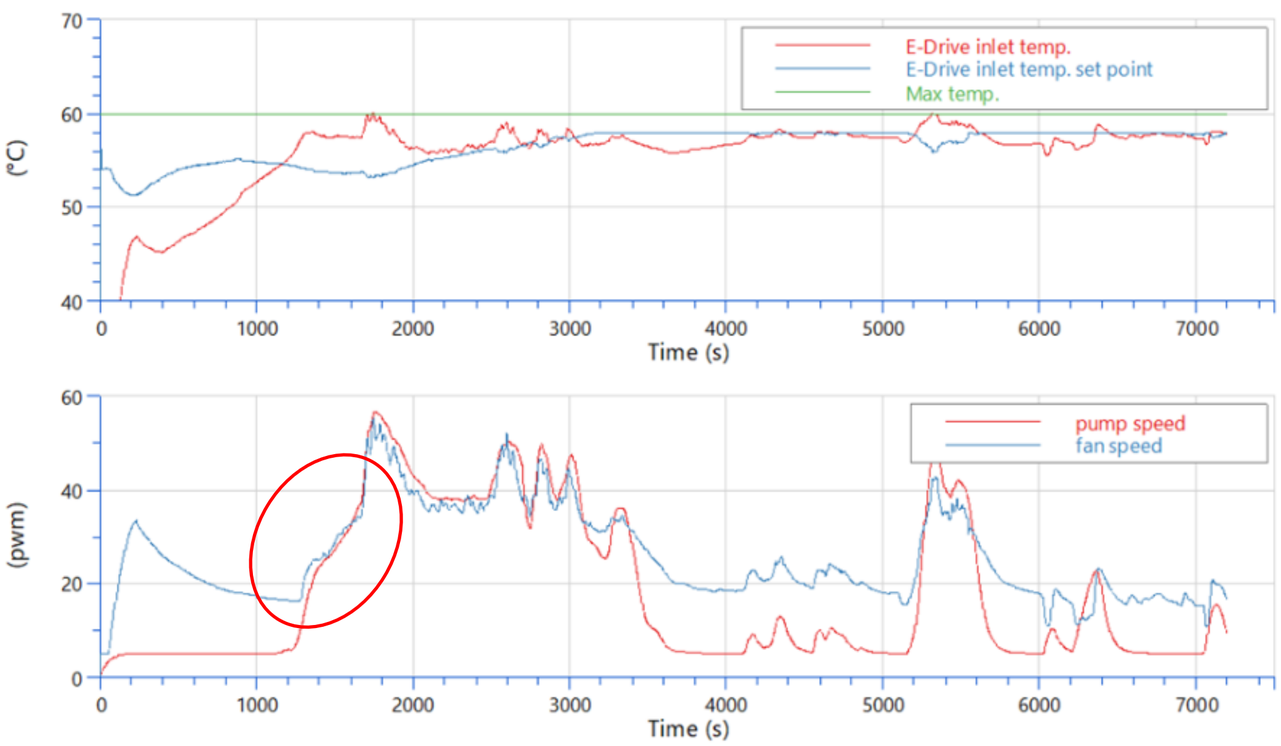
From VCU to Cloud
Connection Check value Truck
Cloud connection established
Actual vehicle speed
Vehicle slope
Vehicle total weight
Battery SoH
Battery SoC or SoE
Battery current
Battery voltage
Actual Ambient temperature
Cabin temperature Setpoint
Actual coolant temperature at powertrain inlet
Actual coolant temperature at battery inlet
Actual coolant temperature at battery outlet
Actual Maximal battery temperature
Actual Minimal battery temperature

Comparison of Predictive and Non-Predictive Setpoint

GoEkGo_V2 cycle at 30 °C with static setpoint of 58 °C



GoEkGo_V2 cycle at 30 °C with predictive setpoint up to 58 °C



A static setpoint of 58 °C without predictive adjustment leads to the temperature limit being exceeded.

HIL Testing and Vehicle Application Tests

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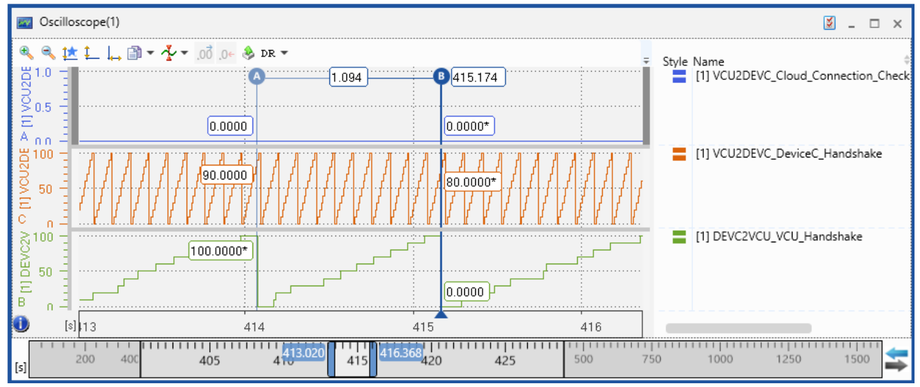
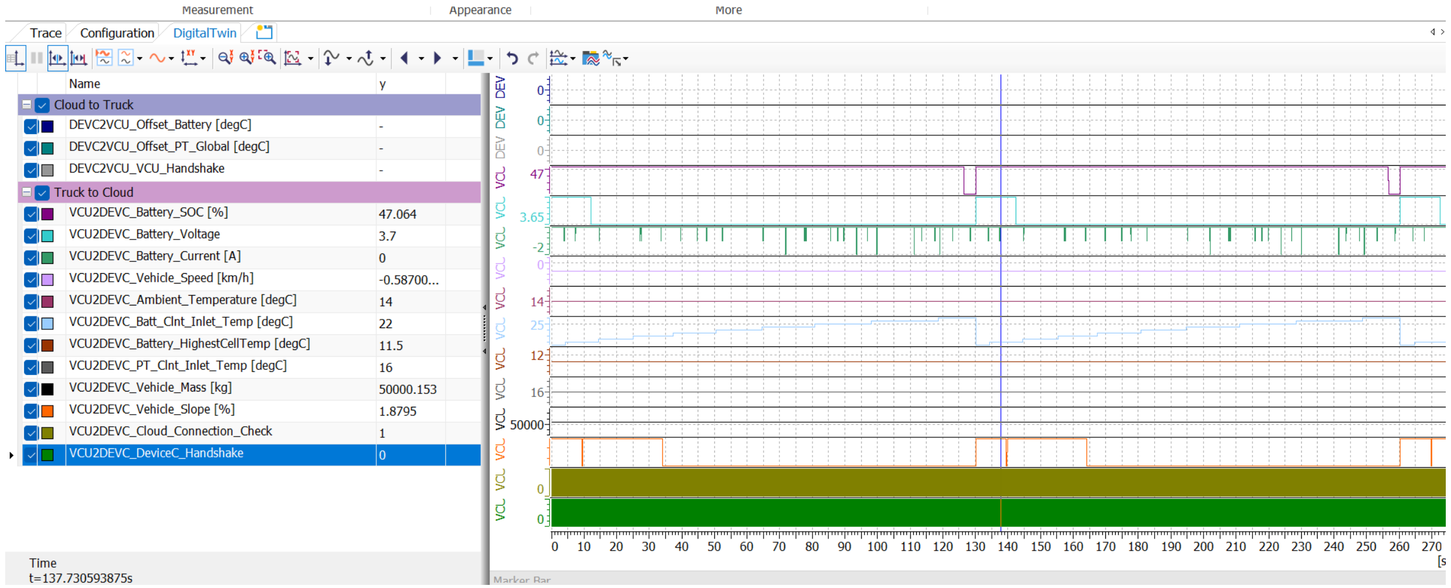
NexT E TRUCK

HIL Test Bench

- The aim of this study is to power up the Can Connect device on the HIL test bench and verify the successful transmission of signals to the Cloud.

- These tests were carried out in coordination with AVL.



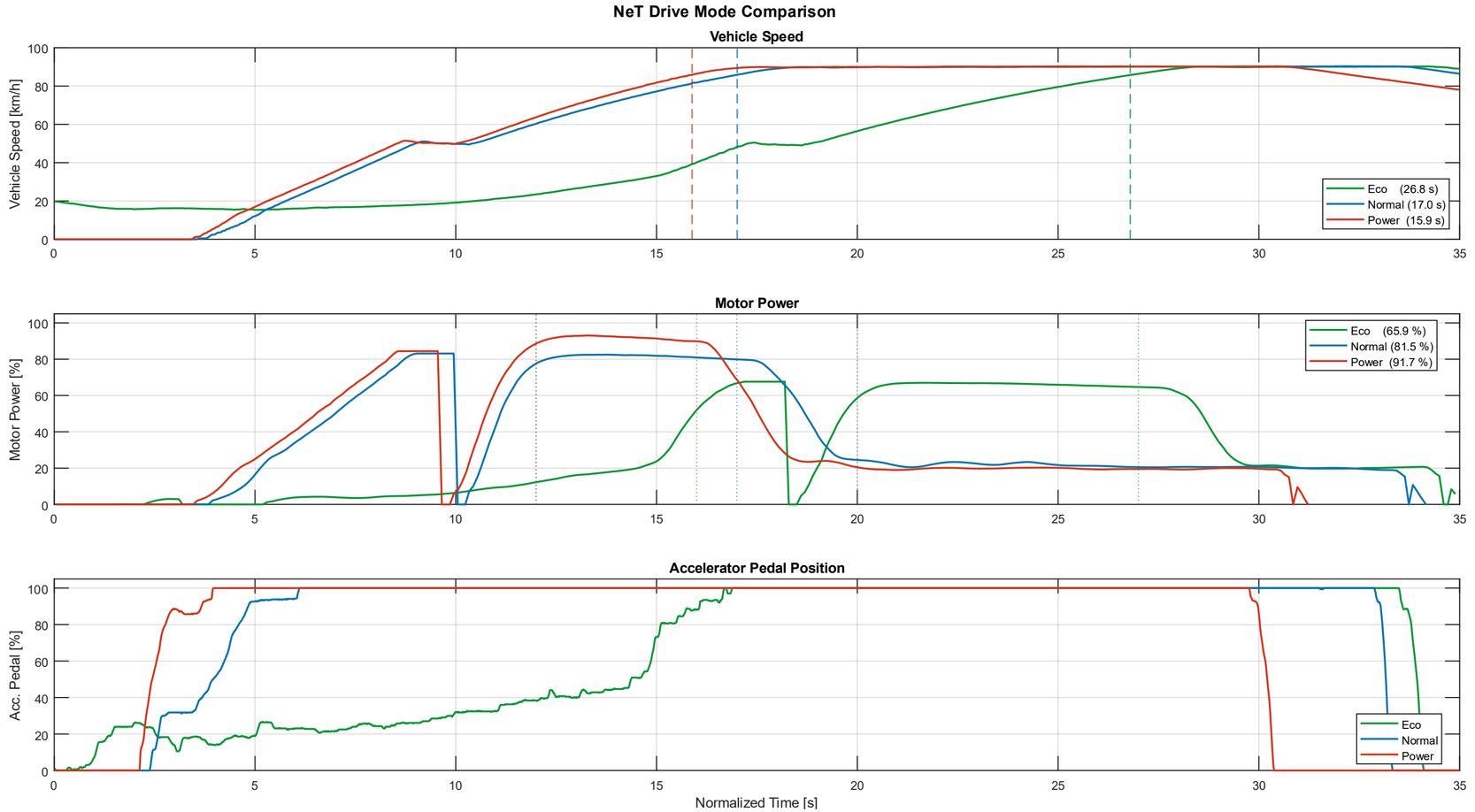


Calibration Studies

Platform Variations:
- Motor power: 250 kW
- Gross Vehicle Weight
- Different eDrive (eAxle)

Calibration Strategy & Outcome:
- Standardized calibration has been executed
- Relative power targets (65%, 80%, 100%) successfully integrated.

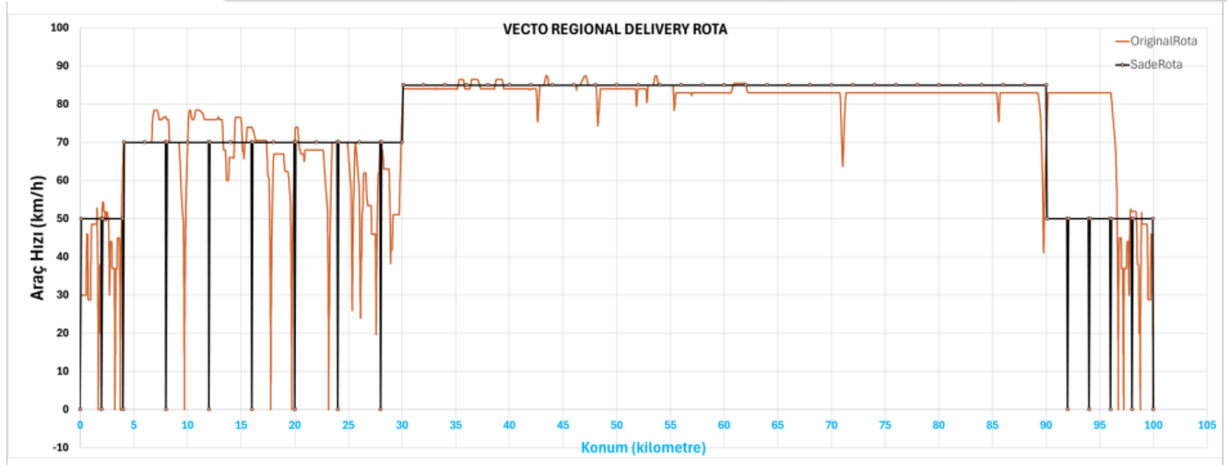
Mode	Desired Power	Actual Power
Eco	65%	65.9%
Normal	80%	81.5%
Power	100%	91.7%



Consistent torque behavior achieved across hardware variants

Demo Route Profile & Details

Distance & Lap	Target Speed	Notes
Preparation Phase	-	The vehicle must be fully charged first. Wait at least 30 minutes after charging.
Laps 1 and 2	~ 50 km/h	The vehicle must perform a full stop-and-go at the end of each lap.
Laps 3 to 15	~ 70 km/h	The vehicle must perform a full stop-and-go every 2 laps.
Laps 16 to 45	~ 85 km/h	Continue driving without stop-and-go.
Laps 46 and 47	~ 50 km/h	The vehicle must perform a full stop-and-go at the end of each lap.
Rest Period	-	The 2nd phase will be an exact repeat of the first 47 laps. However, the vehicle must be rested for 30 minutes before the 2nd phase.
Laps 48 and 49	~ 50 km/h	The vehicle must perform a full stop-and-go at the end of each lap.
Laps 50 to 62	~ 70 km/h	The vehicle must perform a full stop-and-go every 2 laps.
Laps 63 to 92	~ 85 km/h	Continue driving without stop-and-go.
Laps 92 and 93	~ 50 km/h	The vehicle must perform a full stop-and-go at the end of each lap.
Battery Depletion	Free Driving	If the battery is still not depleted after 93 laps, continue free driving until the battery is completely depleted.



The 200 km daily driving cycle combines rolling VDT regional delivery operation with low-speed LLT urban driving, fully aligned with the VECTO Regional Delivery cycle and optimized for energy consumption and thermal stability assessment.

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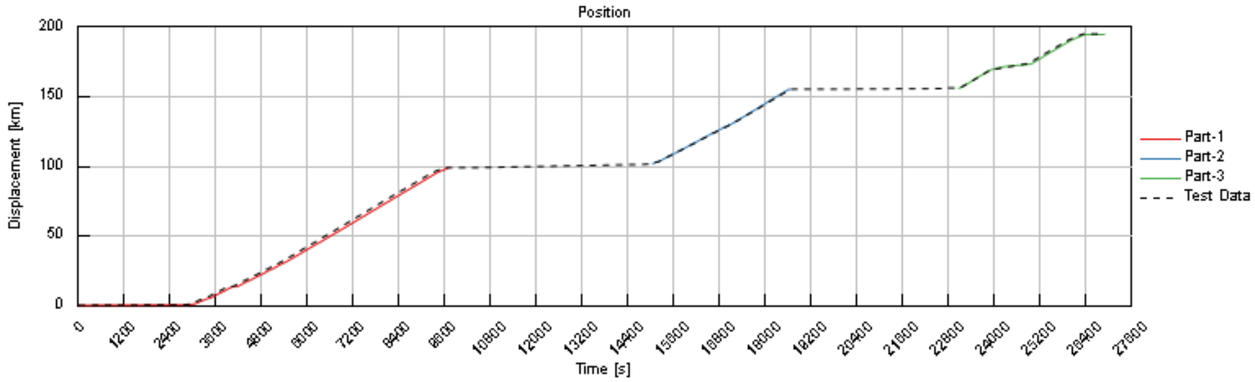
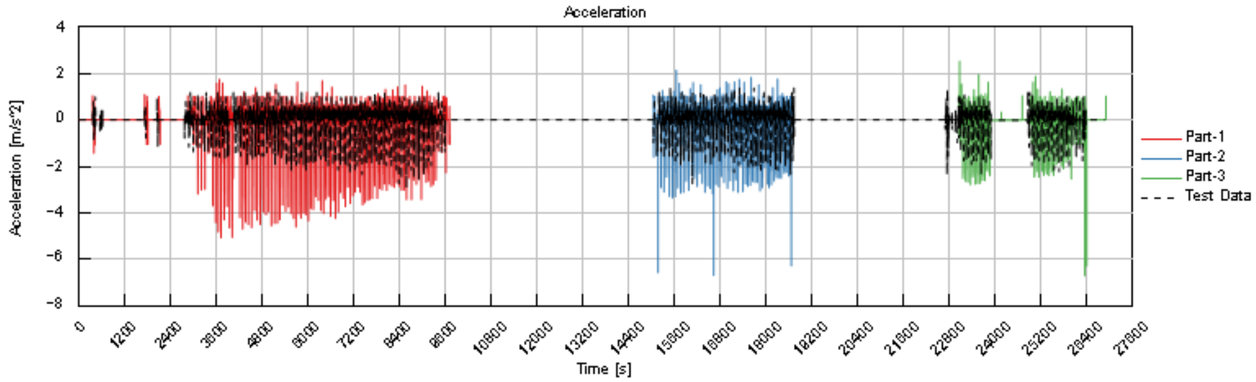
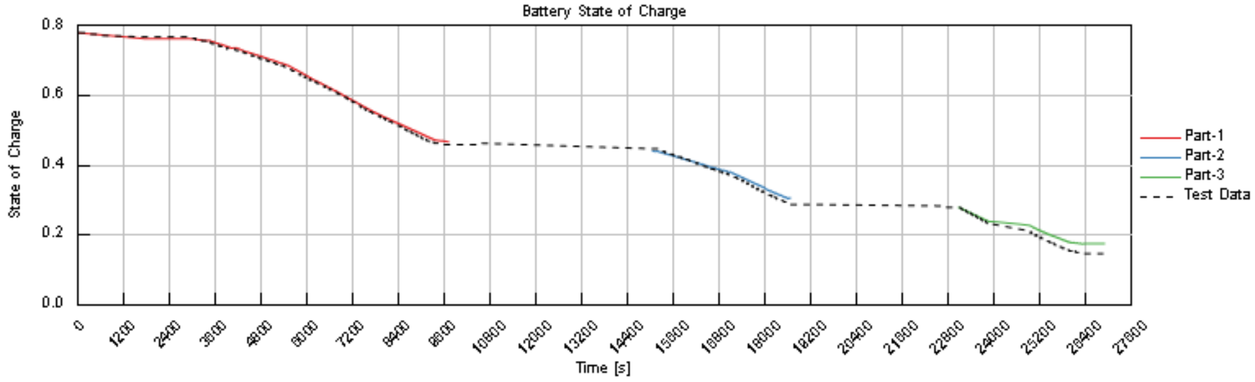
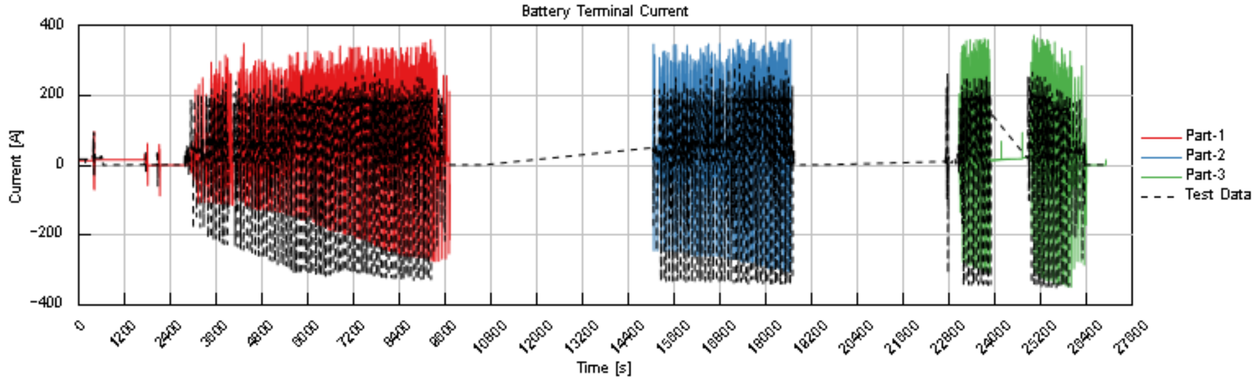
Internal Test Data & Model Comparison









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EFFECTIVE ENERGY MANAGEMENT

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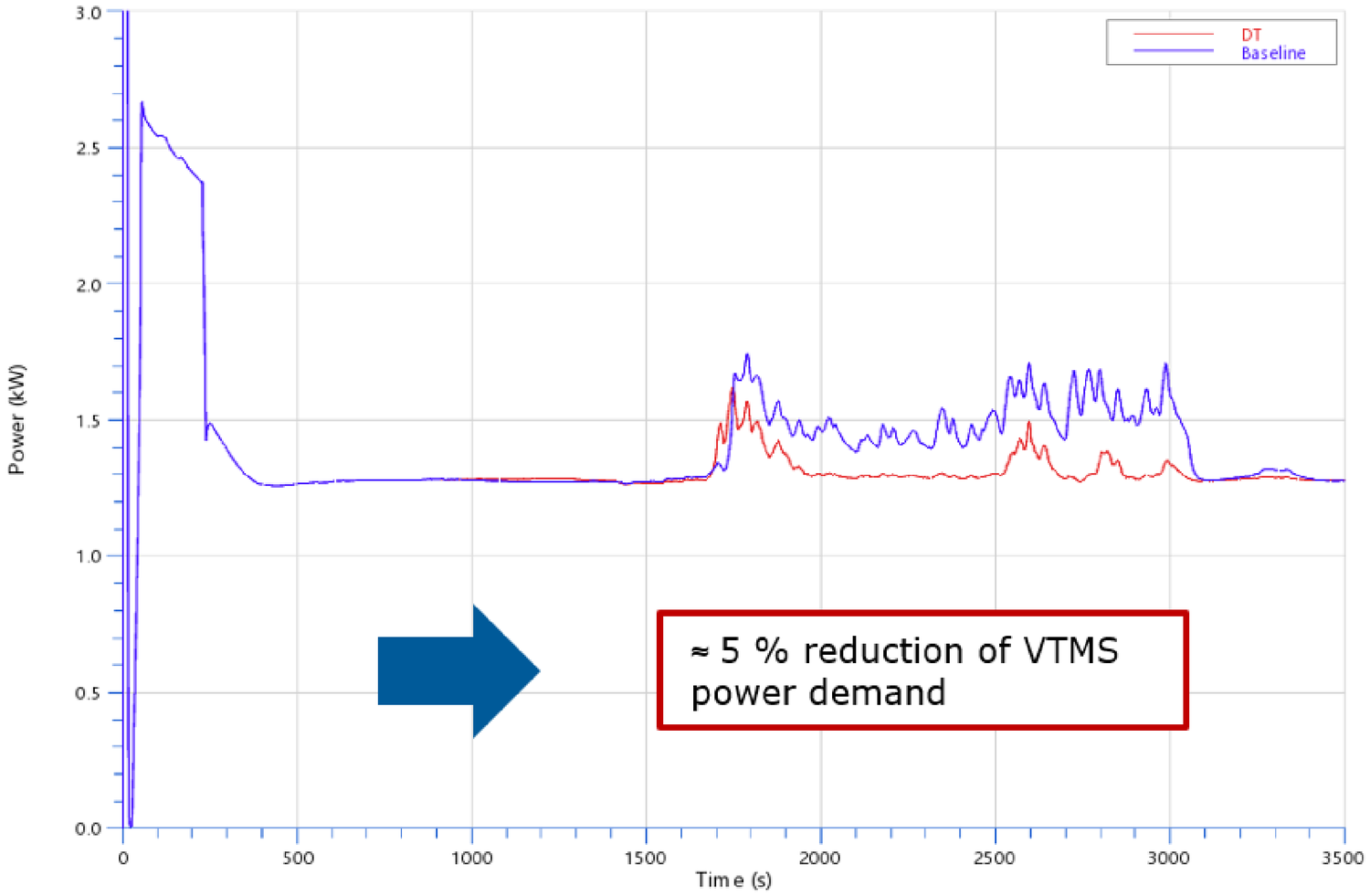
NexT ETRUCK

Digital Twin: Benefit in Simulation



By using a higher setpoint, which is verified predictively, savings of up to **5% TMS energy** consumption and **0.3% vehicle energy** saving can be achieved.

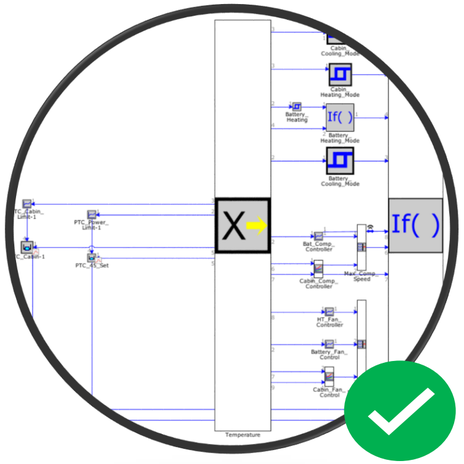
Thermal System: Benefit in Simulation

15% Thermal Efficiency Improvement Target

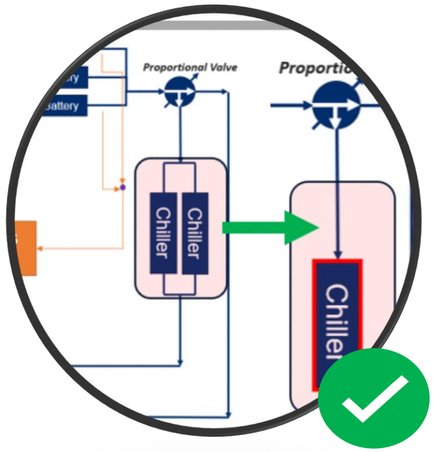
Done – Will be demonstrated on the vehicle

Assessment Completed.

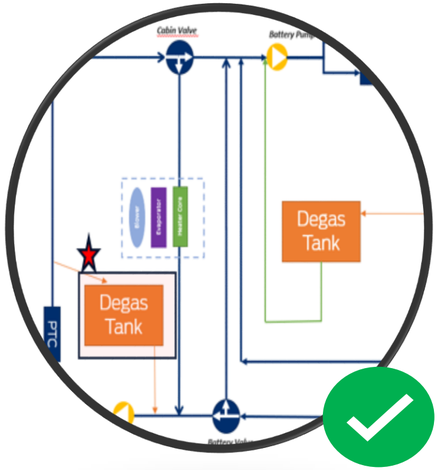
Calibration improvements



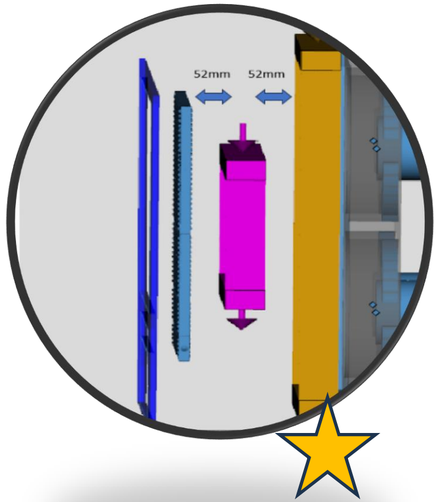
Battery Cooling - Chiller



Degas Solutions



Active cooling for battery



AIT (Austrian Institute of Technology) / Cabin İmprovements

15%

Improvements;

1. Up to 20% improvement for winter case from degas study
2. Up to 8% improvement for summer case from chiller study
3. Up to 40% improvement for spring case from active cooling(in progress)

Up to 1,1% improvement overall vehicle energy effcieny for winter case from degas study

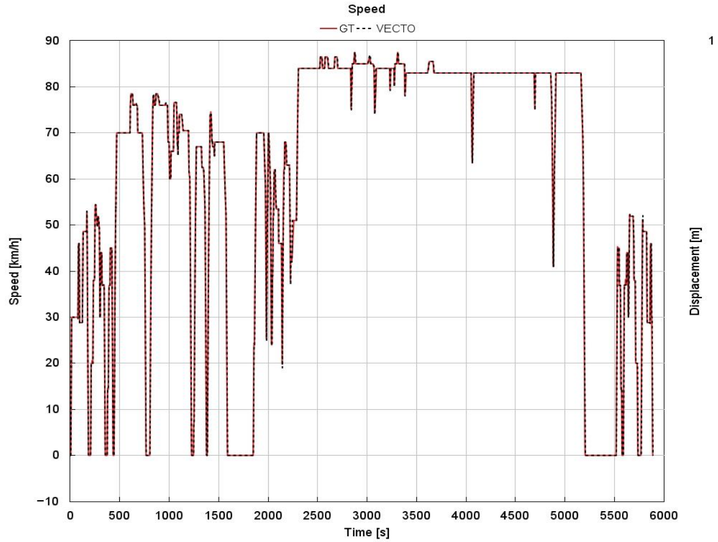
Next e Truck

Powertrain: Benefit in Simulation

Baseline; F-Line BEV (4x2, 19T)

NextETRUCK Vehicle (4x2, 16T)

Parameter	Baseline Truck (Rigid 4x2 – 19t)	NextETRUCK (4x2 – 16t)
Battery Configuration	3-pack, 294 kWh	3-pack, 294 kWh
Continuous Power Output	234 kW (voltage-limited) – Central Drive	210 kW (fully usable) – e-axle
Peak Torque	24,700 Nm	26,000 Nm
Payload	~9.1 t	9.1t
Usable Energy of Battery	~235.2 kWh	~235.2 kWh
Average Energy Consumption	0.974 kWh / km	0.895 kWh/km (%8,2 efficient)
Estimated Loaded Max Range	~242 km	~ up to 316 km
Energy Efficiency (kWh/ton-km)	0.107 (Calculated with 9.1t sim. payload)	0.097 (Calculated with 9.1t sim. payload)



VECTO Regional Delivery route is used in the simulations.

$$\text{Energy Efficiency (kWh/ton-km)} = \frac{\text{Energy Used}}{\text{Payload} \times \text{Distance}}$$

9.3 % Energy Efficiency (kWh/ton-km) improvement with simulations

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Energy Efficiency Executive Summary

10.7 % Vehicle Energy Efficiency Improvement is reported.

0.3 % Digital Twin: Thermal Energy Efficiency Improvement

1.1 % Thermal Energy Efficiency Improvement

9.3 % Powertrain Energy Efficiency Improvement

Baseline -NextETRUCK

Base Line – 4x2, 19T F-Line BEV

Next e-TRUCK Vehicle
4x2, 16t New BEV Platform

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Thank you for your attention!

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