

TW LogStacker

Efficiency in Wood yard logistics



RTD32

The heavyweight
Champion

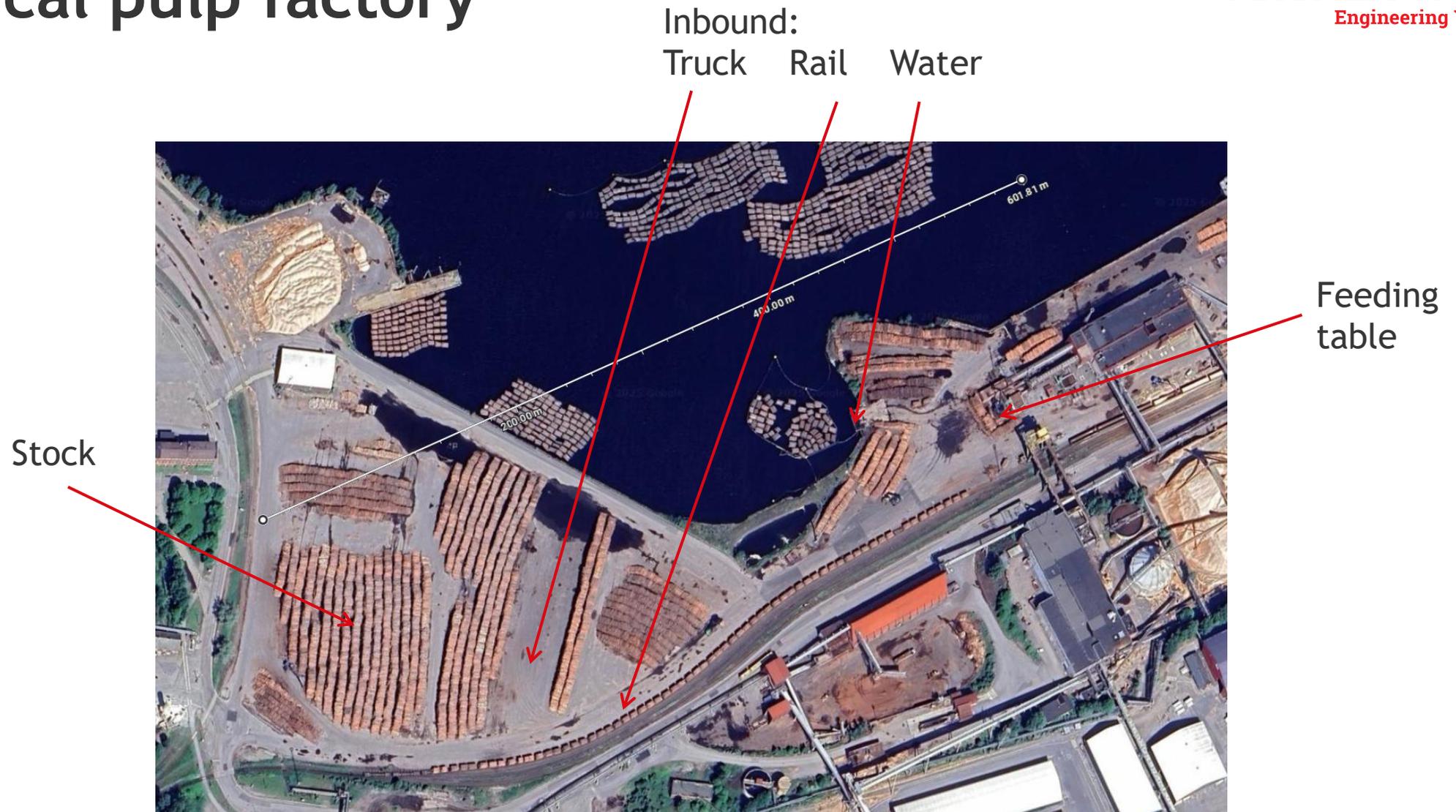
TW 
LogStacker

Principle for Log Handling

Other applications:

- Intermediate storage of logs off-site or terminals
 - Loading / unloading trains and trucks
- Efficiency of the LogStacker
 - Stacking height (less area needed, shorter driving distance)
 - Efficient transport between operations
 - Speed and capacity
 - Large capacity
 - Unloading the truck the whole bunch at once
 - Less waiting time for drivers, less congestion in the yard
 - Distance plays a big role in the efficiency

Typical pulp factory



Video Loghandling from forest to pulp

Estimated values!

RTD17

- Sawmill operation (16 h)
- Up to 2000 tons per day (16 h)
 - 125 ton/hour
 - About 70 km/day (16 h)
 - Unloading truck to sorting table
 - Sorting pocket to storage
 - Storage to feeding table
- 22 l/h or 4-6 ton/l
- Empty trucks quick
 - Less trucks waiting unloading

RTD32/RTE32

- Pulp mill (24/7)
- Up to 5000 tons per day (24 h)
 - 200 ton/hour
 - About 100 km/day (24 h)
 - Unloading truck to storage
 - Unloading truck direct to feeding table
 - Storage to feeding table
- 22 l/h or 10-12 ton/l
- Empty trucks and trains quick
 - Less trucks waiting unloading

RTD32 TECHNICAL DATA

OPERATING DATA	
Operating weight*	73 900kg
Rated capacity	31 000kg
Static tipping load	
Grapple at carrying position	120 000kg
Grapple at basic working distance	64 800kg
Stacking height (with standard grapple)	7.9m
Standard grapple size	7.8m ²
Maximum horizontal reach	4.7m
Turning radius	R 7.8m
Travel speed	27km/h

*Weight with standard grapple

ENGINE	
Manufacturer	VOLVO
Model	TAD1183VE
Type	6 cylinder diesel engine
Power	315kW @ 1700rpm
Torque	1938Nm @ 1400rpm
Displacement	10840cm ³
Emission standard	Stage V / Tier5
Fuel tank capacity	510 liters
AdBlue tank capacity	45 liters

TRANSMISSION	
Manufacturer	ZF
Model	5WG310
Gears FWD / REW	5 / 3
Control	Electrical, automatic, torque converter lock-up

DRIVE AXLE	
Manufacturer	Kessler
Model	D102PL341/528-NLB8460
Track	3033mm
Width over tyres	4210mm
Axle ratio	33,44

STEERING AXLE	
Manufacturer	TW
Design	Welded steel construction

WHEELS AND TYRES	
Drive axle (dual)	18.00R33
Inflation pressure	10.0 bar
Steering axle	18.00R33
Inflation pressure	10.0 bar

BRAKE SYSTEM	
Service brake	Hydraulic dual-circuit wet disc brakes, which affect the drive wheels. Brake cooling oil tank capacity 110 liters.
Parking brake	Hydraulic spring actuated disc brake, which affects drive wheels via the drive shaft.

GRAPPLE	
Standard grapple size	7.8m ²
Standard grapple model	7.8P900
Unlimited rotation in both directions. Fully controlled movements. Various grapple models available between 7.0m ² and 9.4m ² .	

HYDRAULIC SYSTEM	
Hydraulic system oil capacity	1200l
Tank capacity	700l
Hydraulic pumps & valves	Variable displacement axial piston pumps for all main functions. Directional valves are electronically (proportionally) controlled. Boom and grapple can be operated simultaneously.
Total pump capacity	865l / min / 2000rpm
System max. pressure	250 bar
Filtering	Full flow with magnetic separator. Air filter in tank (breather). Pressure filter in brake circuit.
Oil return filter	10 microns

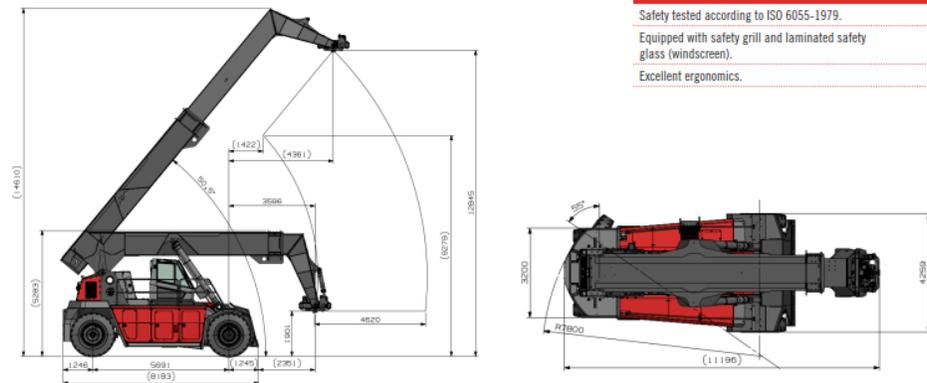
NOISE LEVELS	
Noise level in the cabin	68dB
Sound power level to the exterior	104dB
Noise level according to EN12053+AC. Sound power calculations according to EN12053+AC / ISO 3744.	

MAINTENANCE	
Engine oil change interval	1000h

ELECTRIC SYSTEM	
Voltage	24V
Battery	2 x 220Ah
Alternator	24V / 150A

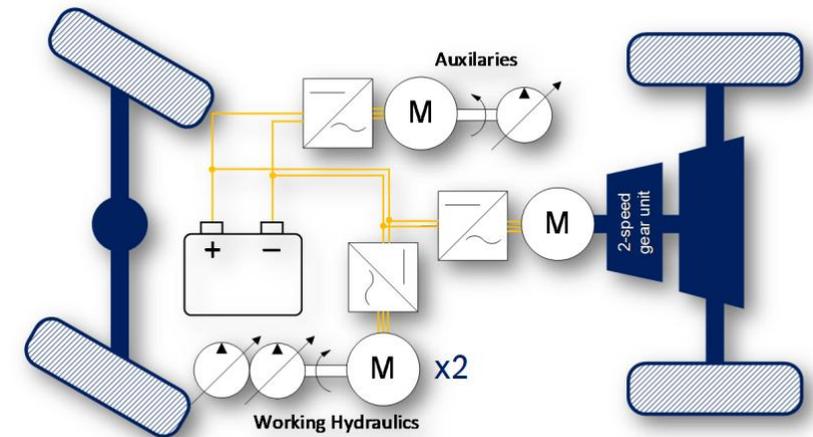
BOOM	
Welded square pipe construction.	
Telescopic boom with double-action cylinder.	
Boom equipped with plastic slide pads.	
Automatic central lubrication system.	

CABIN	
Safety tested according to ISO 6055-1979.	
Equipped with safety grill and laminated safety glass (windscreen).	
Excellent ergonomics.	



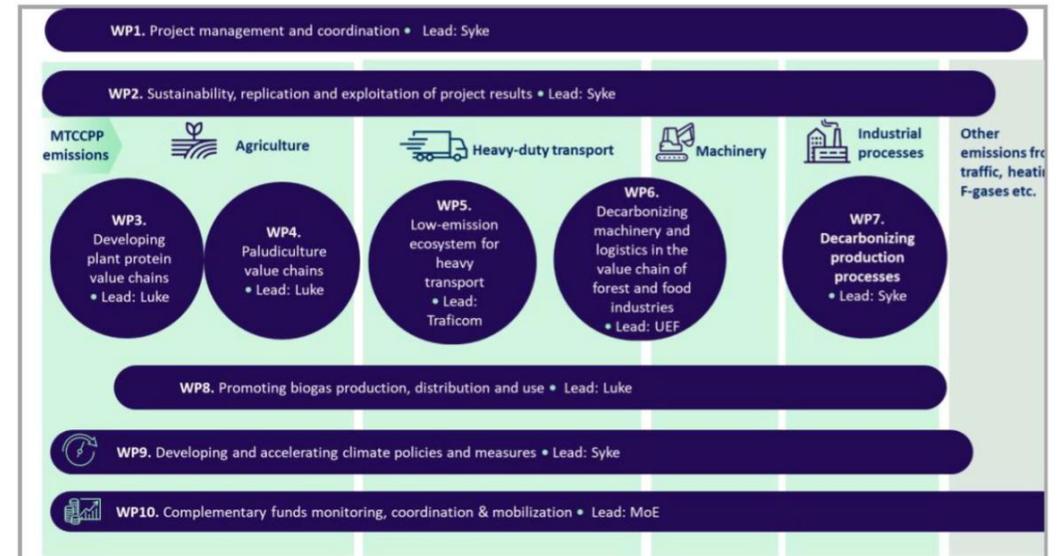
The Future

- Based on TW's studies, the consumption of Stage5 RTD3126 approx. 22 ltr/h
- Estimated energy recovery approx. 30% - based on own field measurements and calculations and e.g. Kalmar experiences
- Consumption of electric machine KA approx. 78 kWh/ hour
- Normal Nordic job rotation (Paper Mill)
- CCS2 level loading 6:1
- 24/7 process machine with MCS charging, charging power approx. 500 kW
- Charging strategy and battery capacity optimization needed to reach the requested duty cycle (22 h operation/day, including breaks)
 - Short charging and small battery
 - Long charging and big battery



ACE -Life

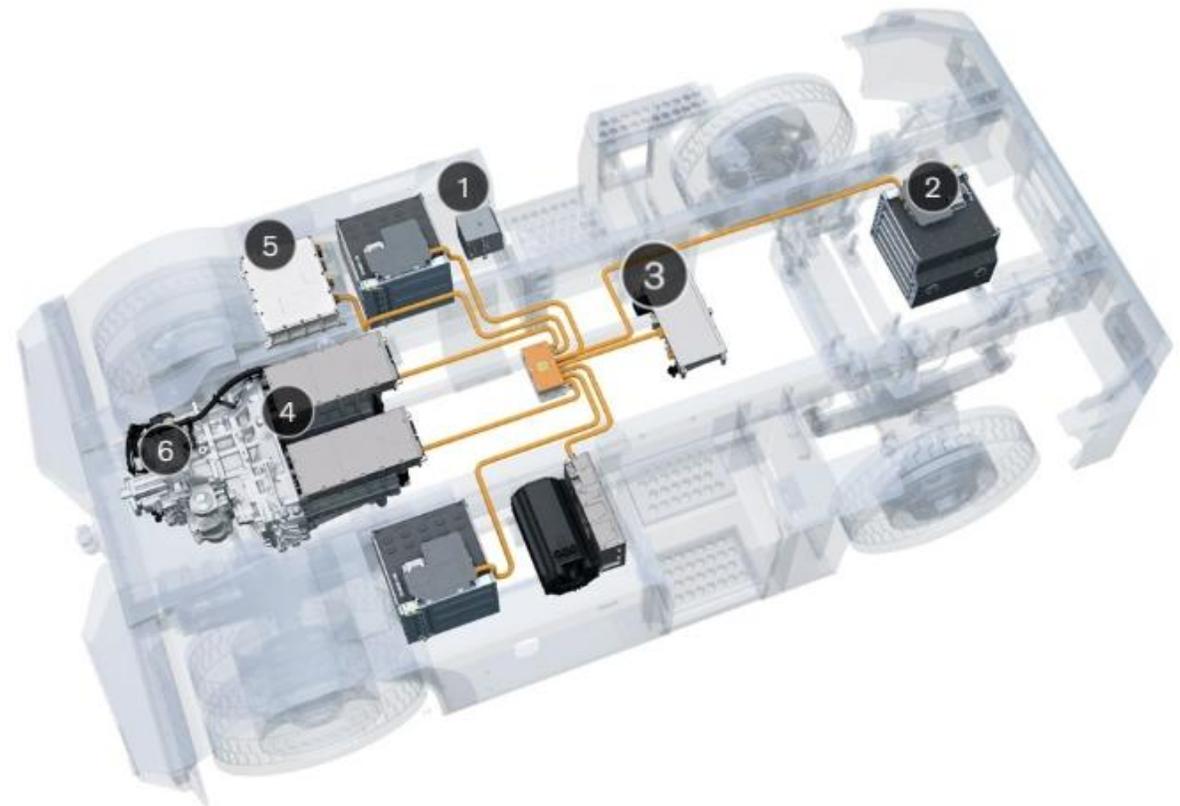
- Official project duration 2024–2030
- Toijala Works participates in work package 6, "Emission reductions in heavy traffic and machinery".
- For TW, the prototype should be ready during 2026.
- Field tests 2027



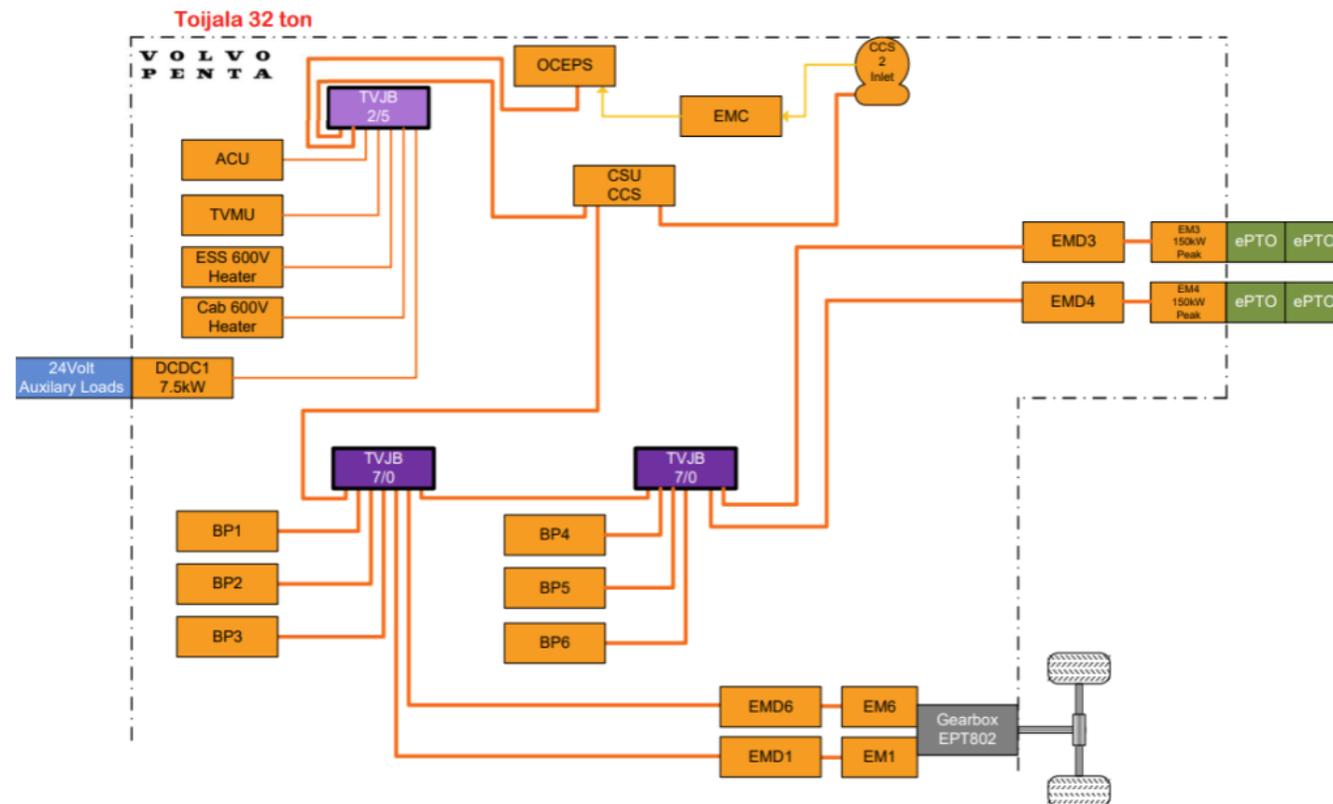
Existing solution

<https://www.volvopenta.com/industrial/industrial-engines/electromobility/>

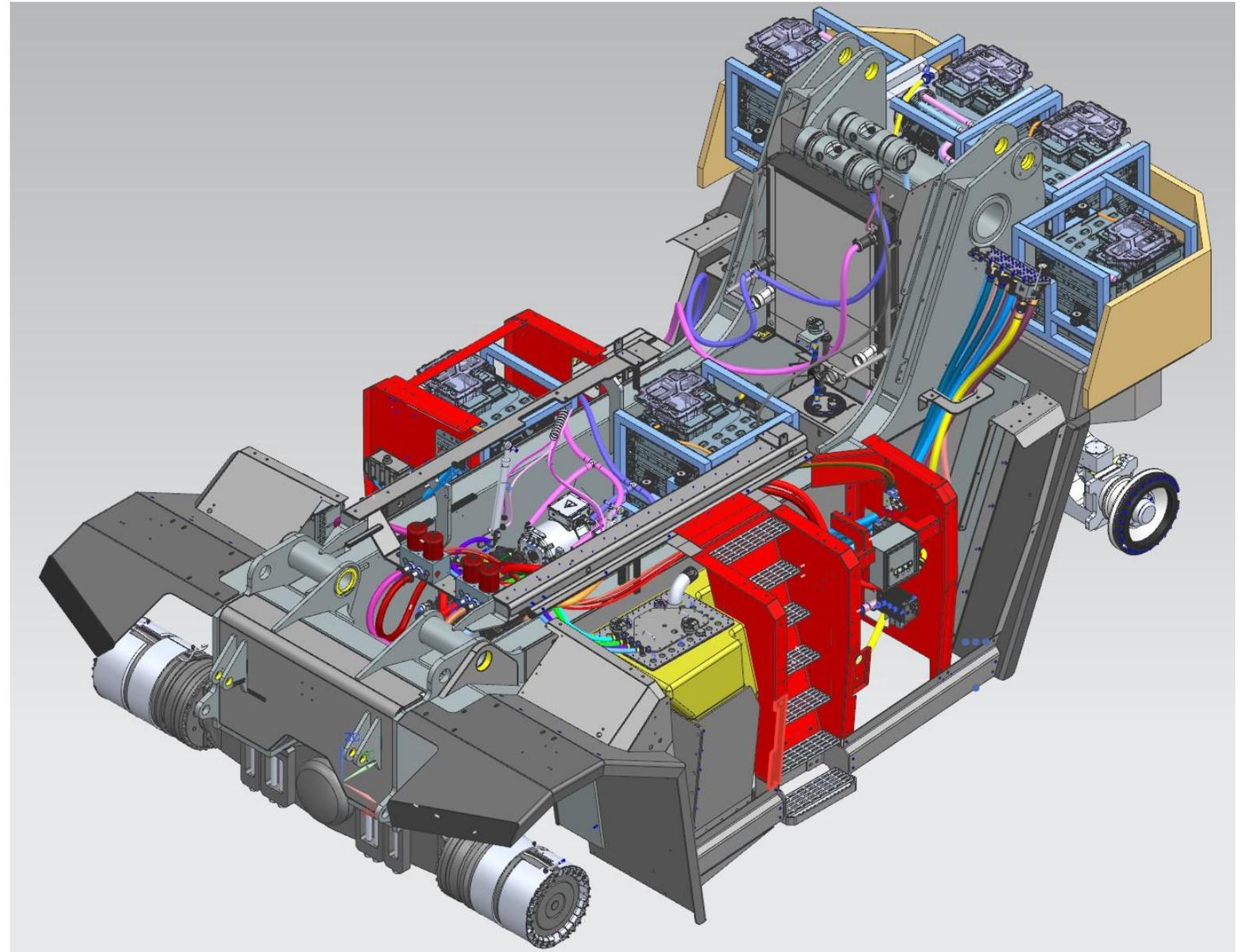
- Service network exists
- Continuous development
- Screw-on battery pack



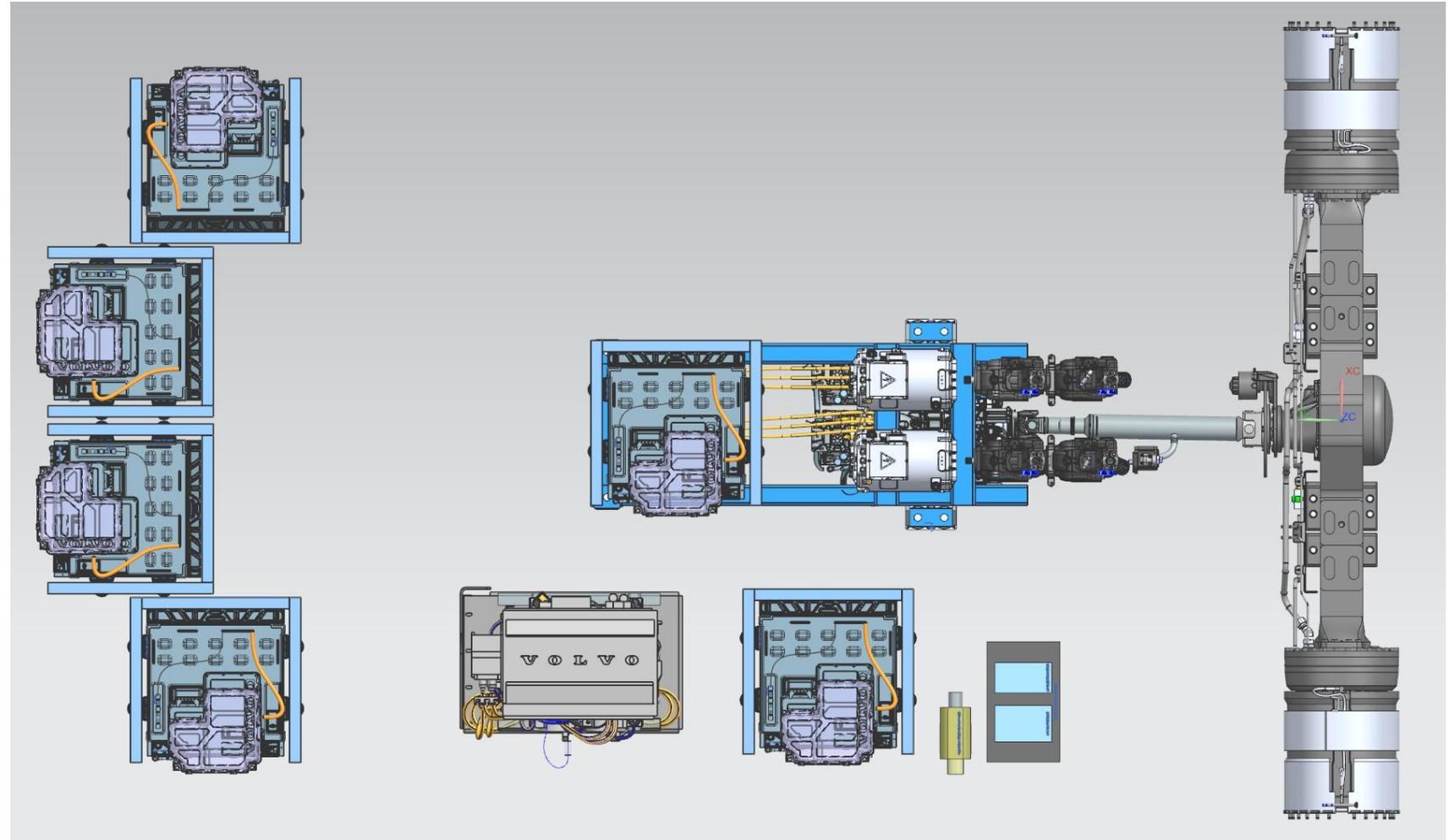
System set up



Implementation



Components



Specification

- 6 kpl batteries, 90 kWh each = 540 kWh
- Drive motors 200 kW
- 2-step gearbox
- Hydraulic drive motors 150 kW

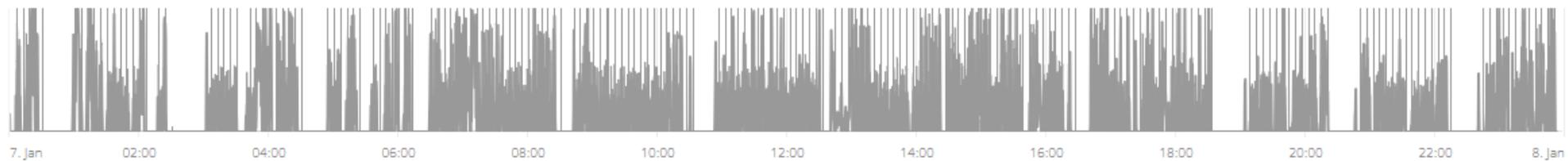
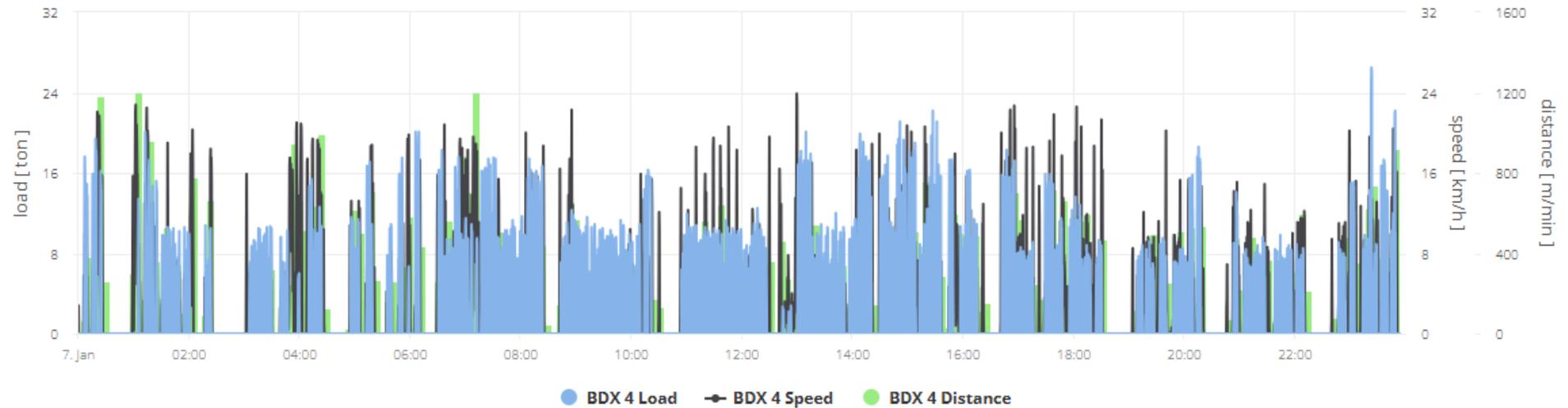
Schedule

- Component agreements signed in April 2025
- Mechanical Design Autumn 2025
- Electrical design spring 2026
- Construction of Proto 2026
- Program development Autumn 2026/Winter 2027
- Field tests will start in summer 2027

Challenge on the wood yard

DAILY	TOTAL LOAD	2 540,0 tons	AVG. LOAD	8,5 tons	AVG. SPEED	3,4 km/h	DUTY CYCLES	156	DISTANCE	80 km
SELECTED	TOTAL LOAD	2 540,0 tons	AVG. LOAD	8,5 tons	AVG. SPEED	3,4 km/h	DUTY CYCLES	156	DISTANCE	80 km


7.1.2026
Wednesday
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Charging Strategy

- The charging strategy will be critical in developing a continuous operation
- 540 kWh is sufficient for about 7 hours (78 kWh/h)
- 80% → 20 % on 325 kWh, which translates to about 4 hours operation
 - This is the optimal cycle of the battery pack
 - With 500 kWh charging, 40 min charging is needed
- The TW Remote shows a longer break after 4 of use, but not always.
- To feasible, the lifetime of the battery should be 15-20.000 h

- Optimizing for
 - Machine availability
 - Battery life-time

The cost and benefit

- Diesel
 - 22 ltr/h a 1,5 EUR/ltr = 33 EUR/h
 - 58 kg CO₂/h
- Electric
 - 78 kWh a 0,15 EUR/kWh = 12 EUR/h
 - Battery 80 kg/kWh = 43 t CO₂
 - 750 h on diesel
- On a lifetime of 20.000 h
 - Diesel 1160 tCO₂ vs Electric 43 tCO₂
 - HVO diesel is about 10% on CO₂ emission (110 tCO₂)
 - Battery can be changed, mechanical life about 40000 hours
- Machine cost additional 600 tEUR
- Service cost will be lower
- Battery life will be critical for economic benefit.