HYSTER

STRONG PARTNERS.
TOUGH TRUCKS.™

SECOND RAILROAD HANDLING OF SEA CONTAINERS

STRONG PARTNERS.
TOUGH TRUCKS.™

COMPANY & COVERAGE

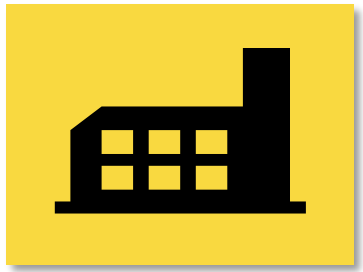
STRONG PARENT COMPANY

HYSTER-YALE
MATERIALS HANDLING

$2.9 Bil
TURNOVER
2017

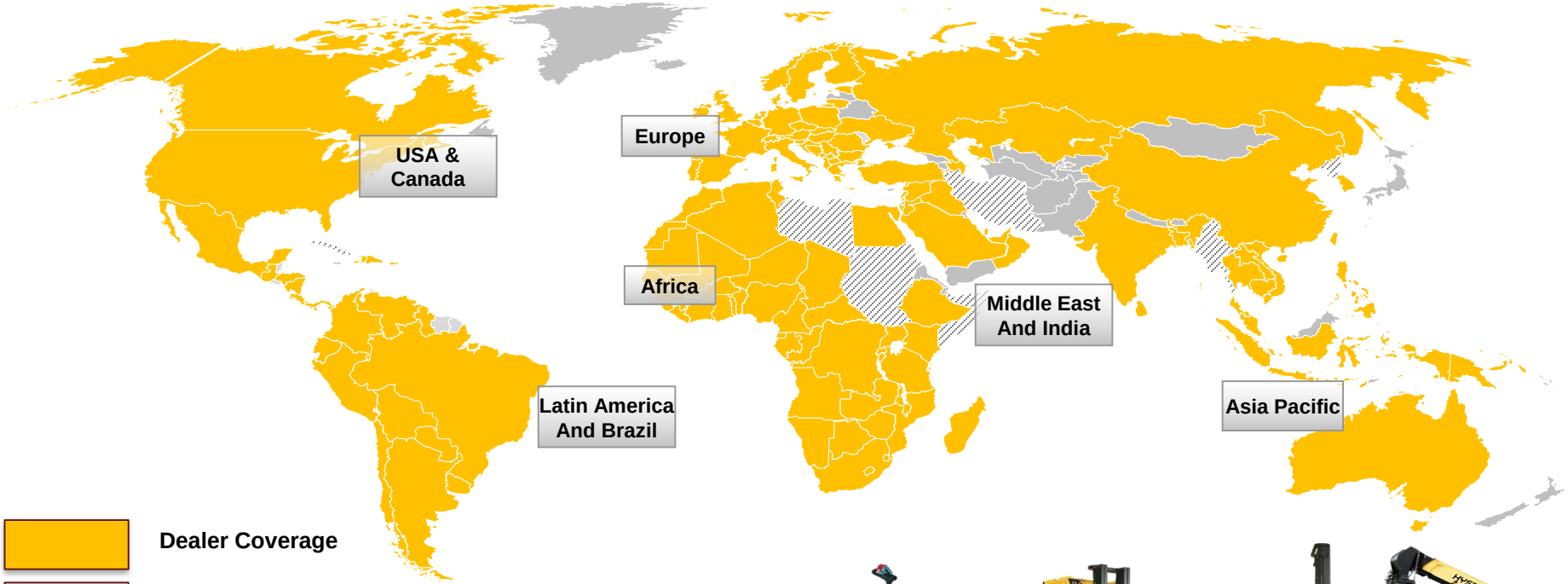
6 800*
EMPLOYEES
WORLDWIDE
[* as of 09/17]

830 000
INSTALLED
TRUCKS



800
INDUSTRY
SECTORS

GLOBAL SALES AND SERVICE COVERAGE



HYSTER TODAY

- Strong Brand since 1929
- Full – Range 1-52 Tones
- 12 Manufacturing locations
- Including 3 plants in Europe
- Independent Distribution
- Including strong network
- Big Truck manufacturing only in Europe - Netherlands

HYSTER

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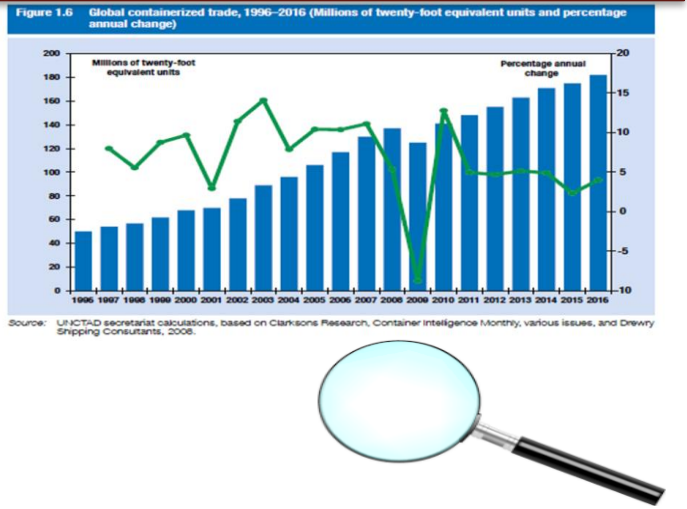
CHALLENGES TO INLAND PORTS & TERMINALS

INLAND PORTS AND TERMINALS GROW IN IMPORTANCE AS ROADS FILL UP

- Year on year growth since 2009
- Rail and water favoured over increasingly slower roads with erratic arrival and delivery times
- Environmental constraints noise and emissions support rail and water

GLOBAL TEU BROKE 180M TEU IN 2016



CONTAINER HANDLING EQUIPMENT CAN REPRESENT A SIGNIFICANT PERCENTAGE OF OPERATIONAL COST. THE RIGHT PARTNERS AND SOLUTIONS CAN MAKE A DIFFERENCE TO YOUR OPERATION

YOUR CHALLENGES…

TOP CONSIDERATIONS & NEEDS

- Environment – low noise emissions
- Productivity – truck utilisation
- Reliability – container throughput
- Cost of ownership – improve margin
- Versatility – one truck not many

CHALLENGE 1: 2ND RAIL VISIBILITY – ELEVATING CABIN

Containers and trailers are regularly loaded and unloaded from train wagons on the second rail. When the first rail is occupied, this is impossible as the driver has no visibility on the load.

Having to clear the first rail, or rearranging the trains, is costly and often impossible

- Lost production
- Product damage
- Truck damage
- Site damage
- Employee risks
- Fines, Penalties
- CSR losses

A SOLUTION TO 2ND RAIL VISIBILITY – ELEVATING CABIN

An elevating cabin that enables the driver to directly see the load, even when the first rail is occupied by a high cube.

BENEFITS

- Direct view on the load

The system is designed so that the driver can look over one container (standard 8'6" or high cube 9'6") placed on a railcar or on ground level

- No time lost to clear the first rail
- Field proven system for Heavy Duty applications
- The lifting and lowering motion is very smooth and the speed can be adjusted
- There are no restriction on driving with cabin raised – at any height

Note: The maximum height, from ground to the bottom of the cabin, is 3600mm

- Tilt up to 10° can be added which improves ergonomics when handling high stacks
- Improve productivity
- Lower operational costs

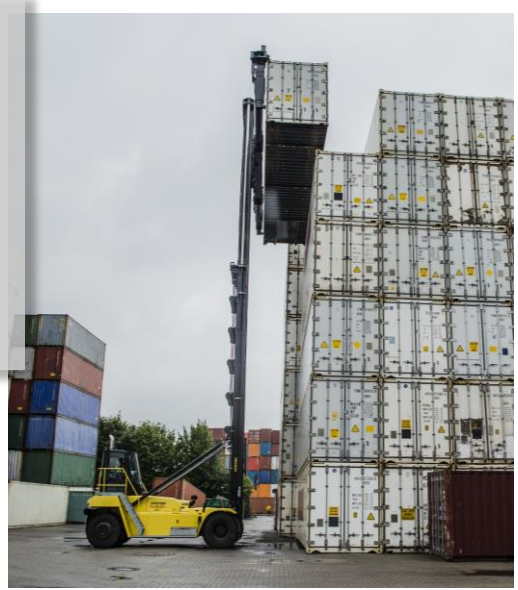
CHALLENGE 2: DOUBLE REEFER HANDLING

Challenge faced by reefer handling operations is to double handle the units with cooling units at same end. Units are stacked one at a time which means:

Major issues

- Throughput speed
- Cost per move
- Truck utilisation
- Reduced operating margins
- Cost of ownership

€ cost per move



A SOLUTION TO: DOUBLE REEFER HANDLING

Empty container handler with an 11 ton capacity allowing for double handling of reefers with cooling units at same end

Cost per moved in stacking operation reduced, increasing efficiency and operating margins. Decreasing total cost of ownership

BENEFITS

- Increased through put✓
- Increased efficiency ✓
- Cost per move reduced ✓
- Increase operating margins✓
- Cost of ownership decreased ✓

CHALLENGE 3: NOISE EMISSION – SOFT LANDING FOR ALL CONTAINER HANDLERS

Land for residential purposes is increasingly being taken from the surroundings of ports and terminals. As this trend grows, due to noise emissions impacting on residents quality of life, container handling operations as a result of legislation may face restricted working hours.

If your operation had to shut down each day at 18.00, how much would that cost you?

- Lost production
- Possible container damage
- Possible spreader damage
- Fines, Penalties
- CSR losses

A SOLUTION TO: NOISE EMISSION – SOFT LANDING FOR ALL CONTAINER HANDLERS

Solution that meet requirements of not only the operation, but also the total environment. The spreader soft landing system forms an effective solution that contributes to lowering sound emissions. Controlling the speed of spreader landing minimizes the sound of container engagement, further supported by additional wear pads at container contact points.

BENEFITS

- Lower sound emissions✓
- Reduction impact on environment ✓
- Increase productivity✓
- Less damage containers ✓
- Less damage spreader ✓

Lower sound emissions allowing less impact on environment

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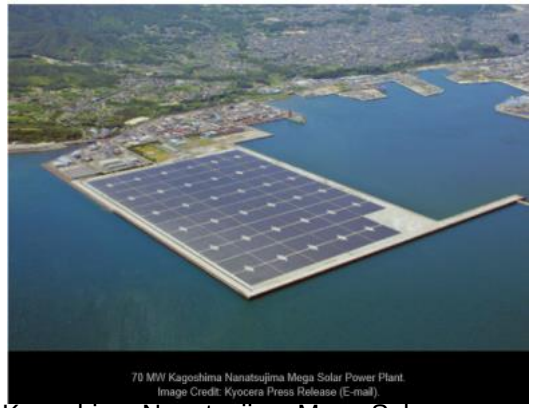
ZERO EMISSION TERMINALS - 2030

A SOLUTION TO: ZERO-EMISSIONS OPERATIONS IN FUTURE

. Environment requirements are coming for ports – is the industry ready?



Kagoshima Nanatsujima Mega Solar Power Plant

Los Angeles Times

June 12, 2017

L.A. and Long Beach mayors sign pact setting zero-emissions goals for ports

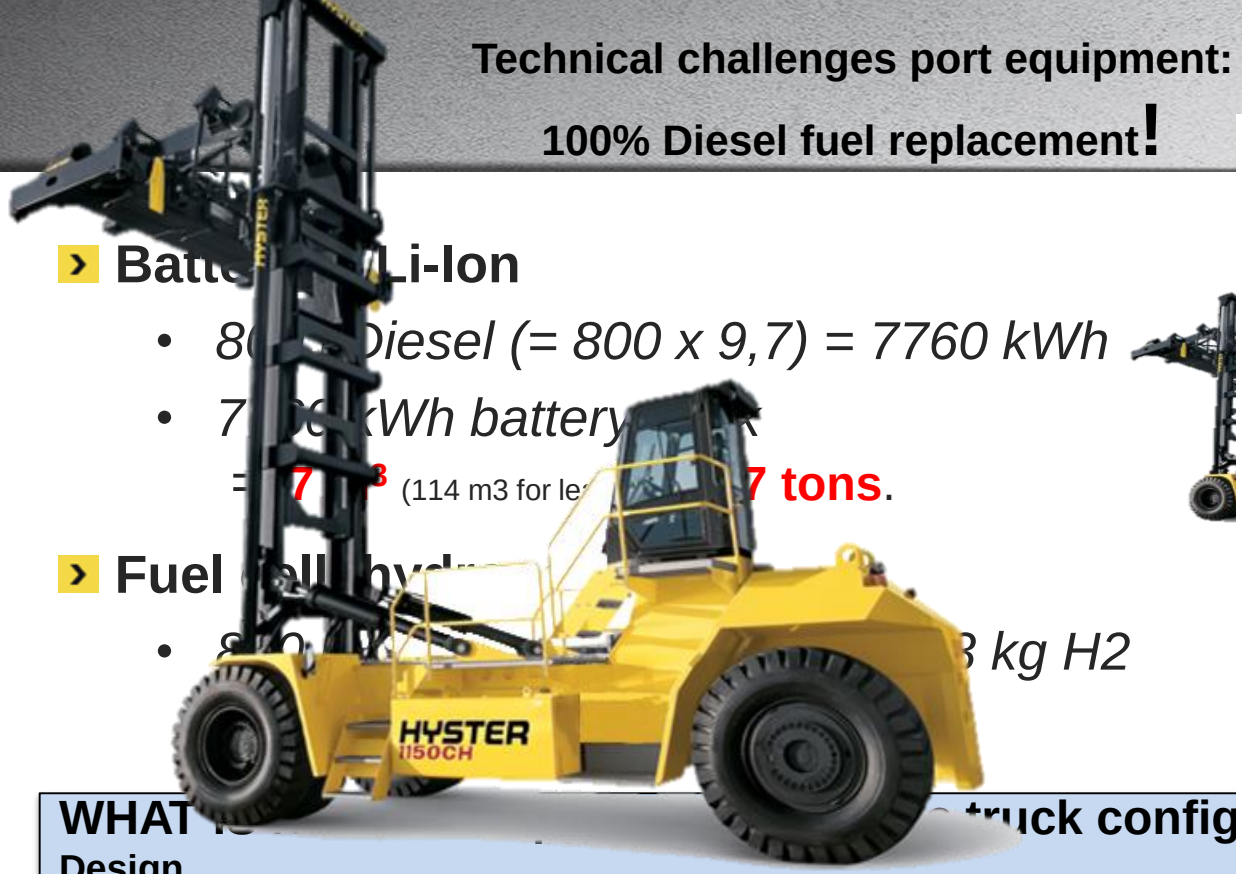
Creating a Zero Emissions Goods Movement Future

A Joint Declaration of the Mayors of the Cities of Los Angeles and Long Beach

- **CAAP 2017 Update:** Ensuring the creation and approval of a 2017 CAAP Update by November 2017 that is bold in achieving a clear timeline and sets measurable milestones to help ensure progress toward near-term regional air quality attainment goals—including through zero and near-zero technologies—as well as our ultimate goals of zero emissions for cargo-handling equipment by 2030 and zero emissions for on-road drayage trucks serving the ports by 2035. The Updated CAAP should also include and highlight the following:

Technical challenges port equipment:

100% Diesel fuel replacement!



- **Batt… Li-Ion**
  - *80… Diesel (= 800 x 9,7) = 7760 kWh*
  - *7… kWh battery*
  - = **7… m³** (114 m3 for le… **7 tons**.
- **Fuel cell hyd…**
  - *8… …3 kg H2*

WHAT … truck config…

Design.

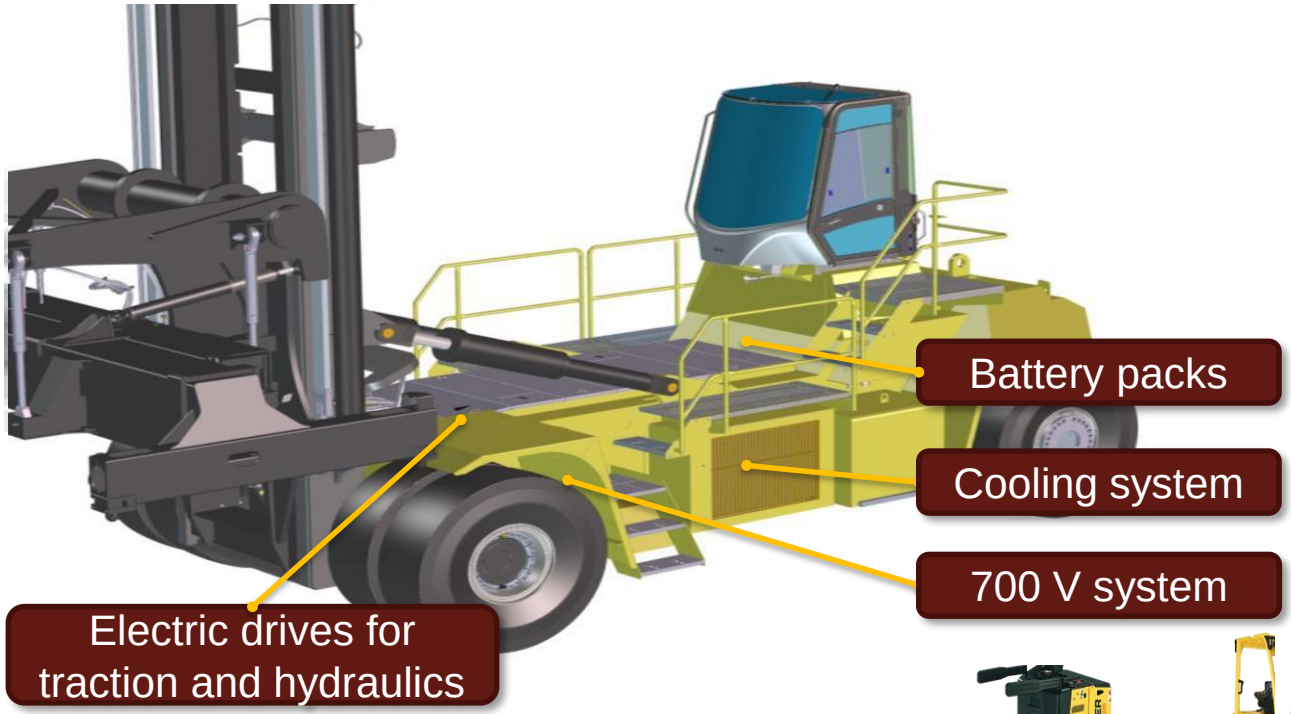
- Optimized Sizing of batteries and hydrogen system linked with Smart charging/Refill strategy
- Smart energy recovery for maximum efficiency

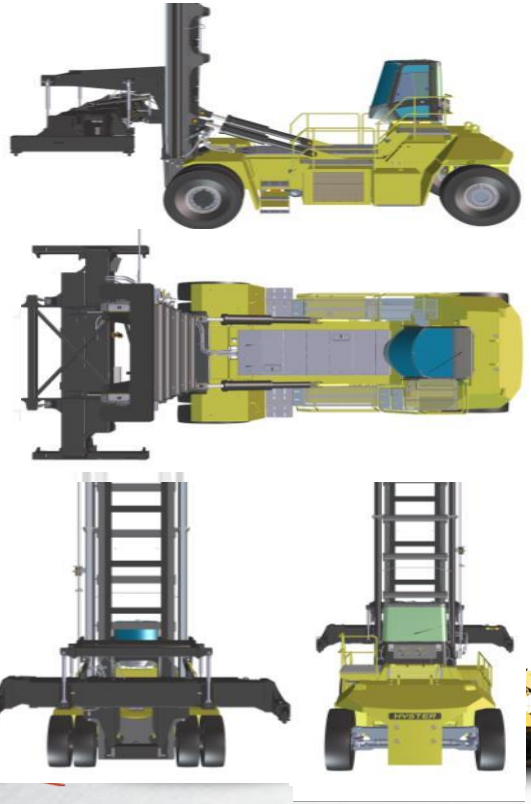
PROTOTYPE ZERO EMISSIONS SOLUTION FOR LADEN CONTAINER HANDLERS BASED ON THE H1150HD CH (H52XM-16CH)

Key characteristics:

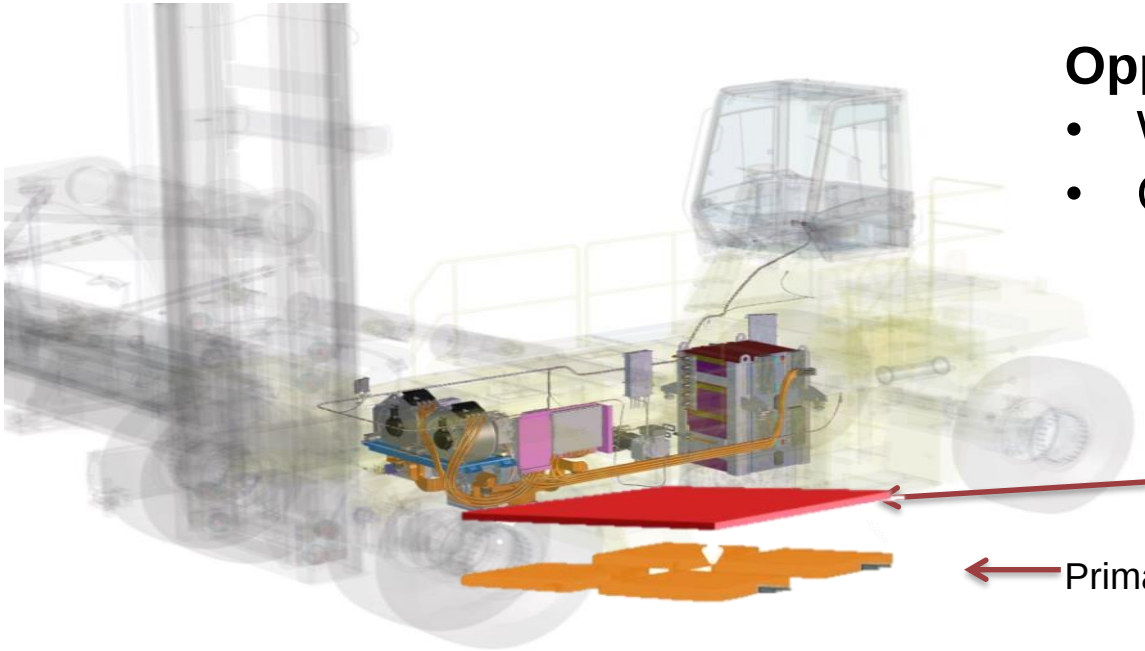
- Load Capacity: 52 tons
- Vehicle weight: ~80 tons
- Lift height: 6x 9’6” containers

ZERO EMISSIONS FUTURE ÒPTION 1





Zero emissions future Possible future option 2



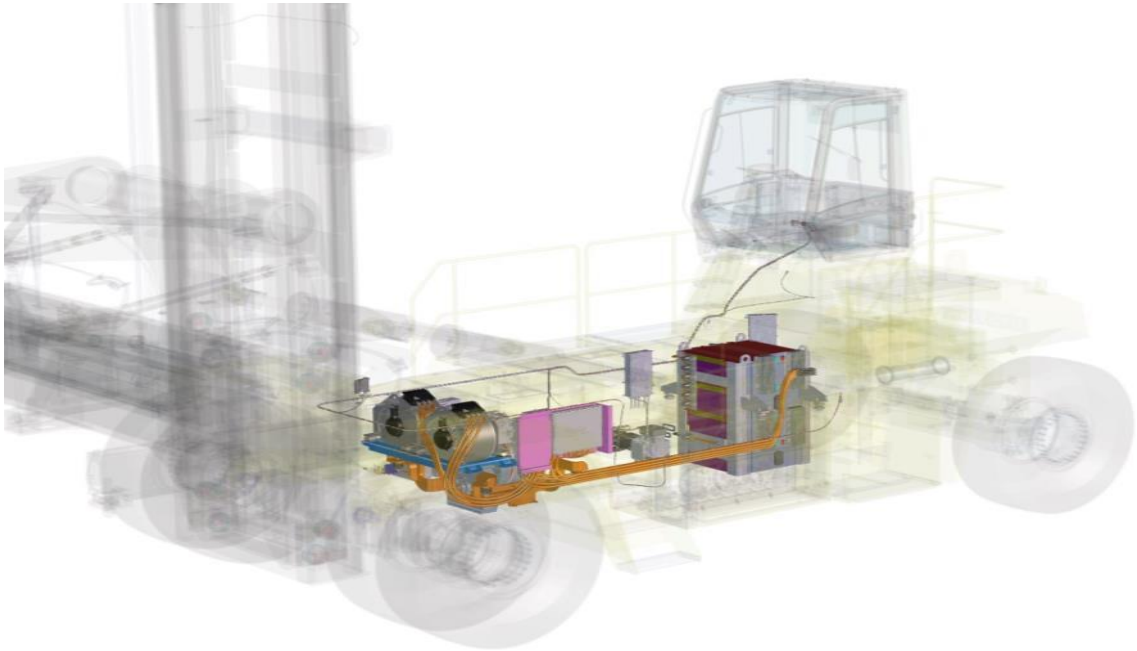
Opportunity charging options:

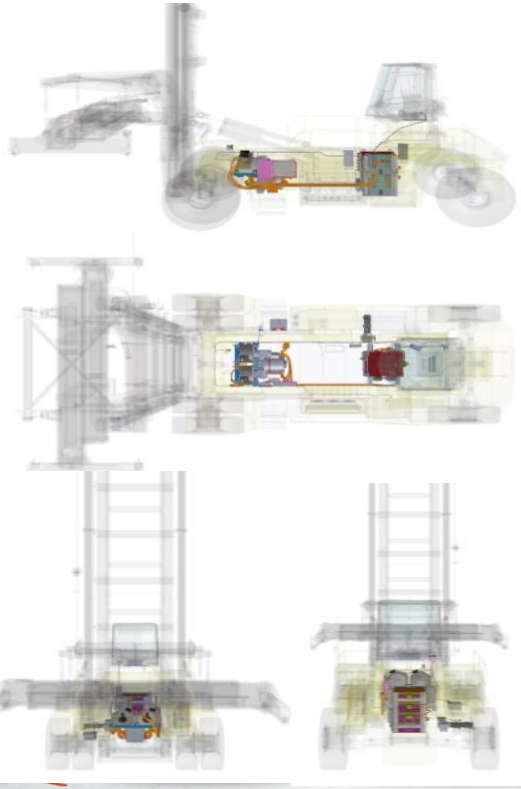
- Wireless (inductive)
- Quick disconnect (conductive)

Secondary coils (fixed to vehicle)

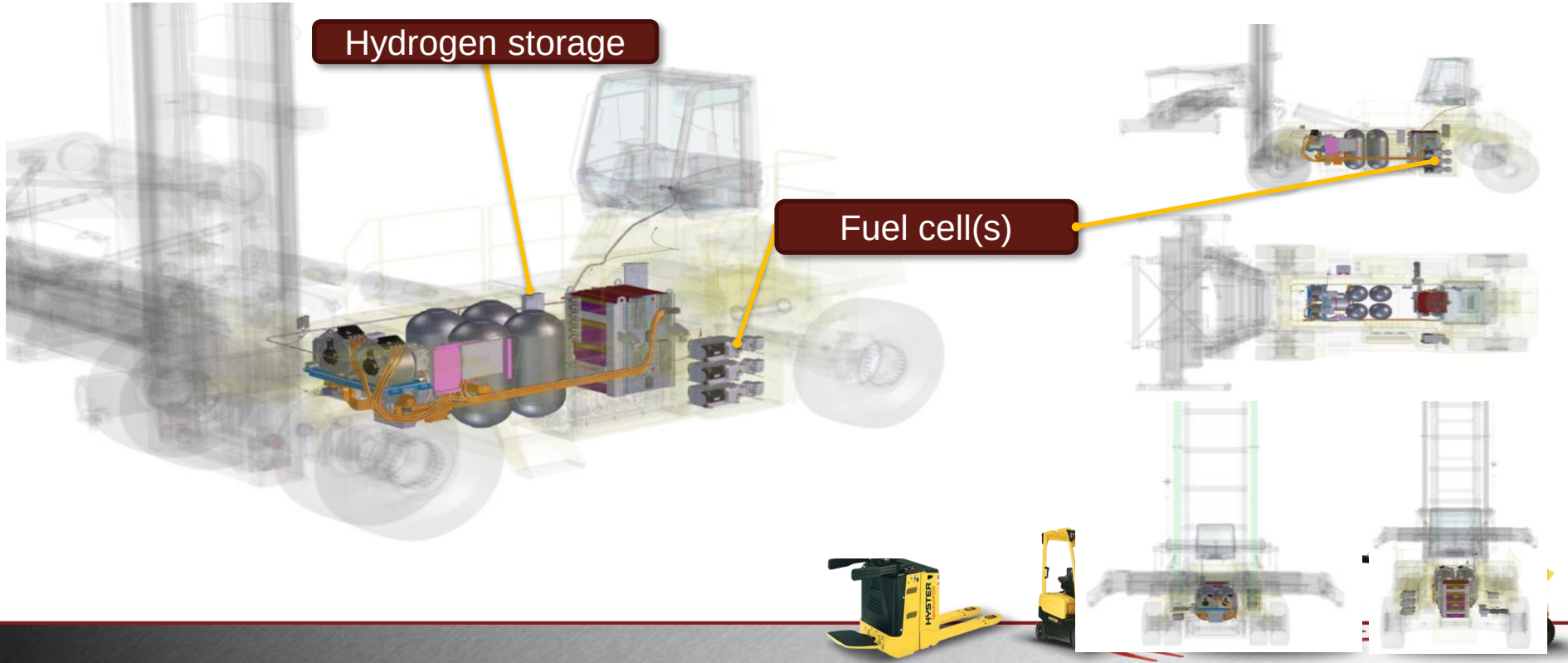
Primary coils (fixed to road)

ZERO EMISSIONS FUTURE POSSIBLE FUTURE OPTION 3

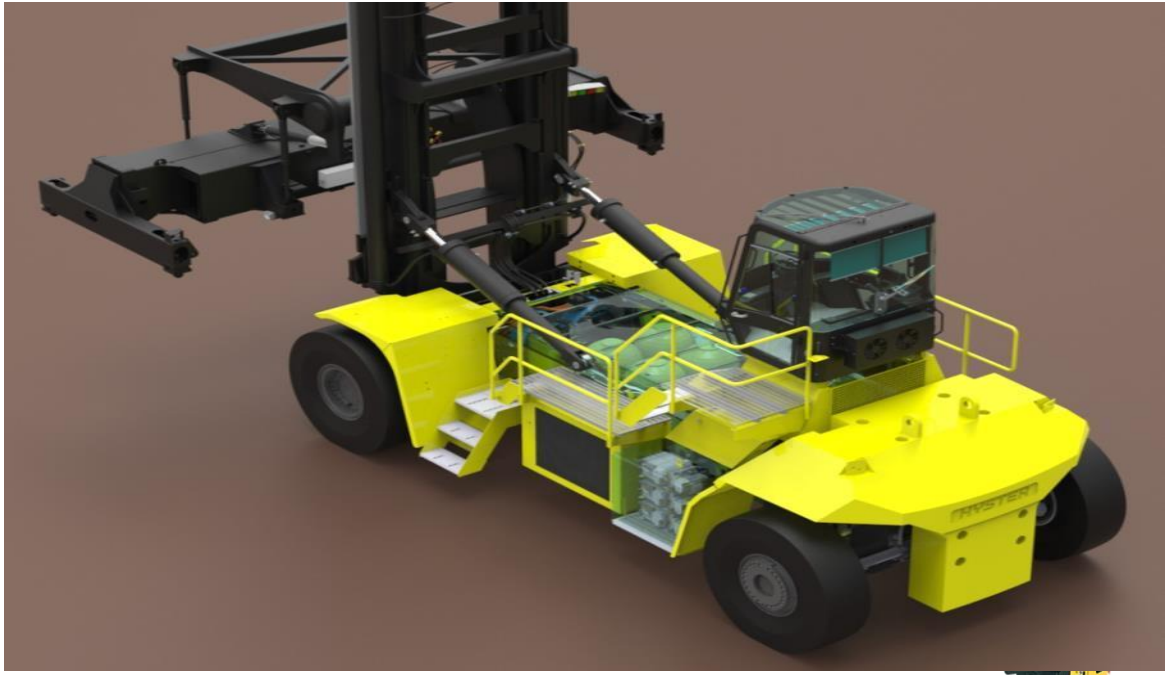


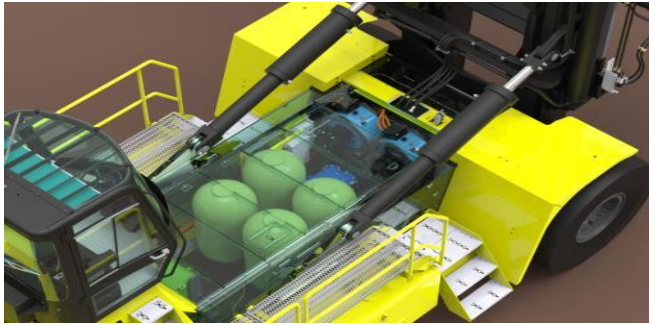


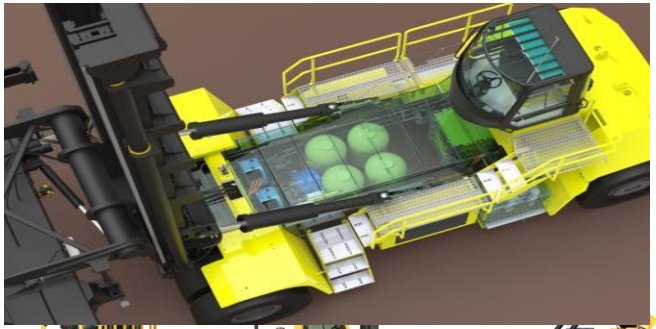
Zero emissions future Possible future option 3



Possible future option 3

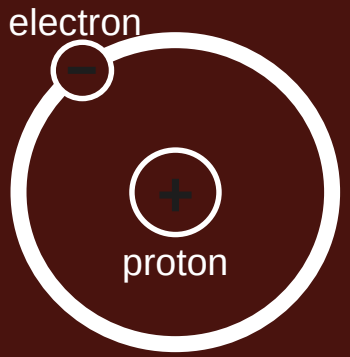






Why hydrogen and fuel cells?

Hydrogen is abundant, simple, **clean**



Hydrogen **stores** energy

Hydrogen is electricity…

…with the **convenience** of fuel

*Hydrogen is **portable** electricity*