

Appendix B: Commercially Available CHE

This appendix provides a list of commercially available zero-emission bulk material CHE, container CHE, and facility support CHE. For the purposes of this assessment, commercially available means the zero-emission CHE is offered to the public by a manufacturer or an OEM either on their website or through a dealer or distributor. Staff conducted a comprehensive search of available publications, the internet, and CARB resources to compile the following list of CHE that were commercially available on or before January 2025. Staff also researched the availability of the equipment in the U.S. by determining the location of the manufacturer and if the manufacturer has a dealership or equipment distributor in the U.S. CHE that is in prototype or pre-release phase is not considered commercially available and is listed in Appendix E.

Commercially Available Bulk Material CHE

Table B-1 provides a list of commercially available zero-emission bulk material CHE. While bulk material handling equipment designated by the OEM as “compact” or “mini” may be subject to the CHE Regulation if it is diesel-powered, zero-emission CHE with these designations is not considered CHE for this assessment and is not listed here.

Table B-1: Commercially Available Bulk Material CHE

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Crane, Material Handling	Crawler (C), Wheeled (M)	Liebherr	LH 26 (C or M) Electro Industry Litronic ¹	BE, GE	Yes

¹ Liebherr, “Electric Material Handling Machine: LH 26- LH E Litronic,” n.d. <https://assets-cdn.liebherr.com/assets/api/bc040175-be16-43b5-938e-43ac2a89e403/Original/>; Liebherr, “Optimized Operating Costs and Environmentally Friendly,” n.d. Accessed April 2, 2025. <https://www.liebherr.com/en-us/material-handling/products/material-handling-machines/electric-material-handling-machines-4672141?ps=100>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Crane, Material Handling	Crawler (C), Wheeled (M)	Liebherr	LH 40 (C or M) Electro Industry Litronic ²	GE	Yes
Crane, Material Handling	Wheeled	Liebherr	LH 60 M Electro Industry Litronic ³	GE	Yes
Crane, Material Handling	Wheeled	Liebherr	LH 80 M Electro Industry Litronic ⁴	GE	Yes
Crane, Material Handling	Crawler	Liebherr	LH 110 C Electro Industry Litronic ⁵	GE	Yes
Crane, Material Handling	Wheeled	Liebherr	LH 150 M Electro Industry Litronic ⁶	GE	Yes
Crane, Material Handling	Tracked	Sany	SMHC50-D ⁷	BE	Yes

² Ibid.

³ Ibid.

⁴ Ibid.

⁵ Liebherr, "Electric Material Handling Machine: LH 26- LH E Litronic," n.d. <https://assets-cdn.liebherr.com/assets/api/bc040175-be16-43b5-938e-43ac2a89e403/Original/>; Liebherr, "Optimized Operating Costs and Environmentally Friendly," n.d. Accessed April 2, 2025. <https://www.liebherr.com/en-us/material-handling/products/material-handling-machines/electric-material-handling-machines-4672141?ps=100>.

⁶ Ibid.

⁷ Sany, "SMHC50V-D 50t Electric Material Handler," n.d. Accessed June 10, 2025. https://www.sanyglobal.com/product/port_machinery/material_handler/70/501/; Sany, "SMHC50V-D," n.d. Accessed June 10, 2025. <https://www.sany.in/port-machinery/material-handler-cranes/smhc50-d/>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Crane, Material Handling	Wheeled	Sennebogen	817E ⁸ , 817E Electro Battery ⁹	BE, GE	Yes
Crane, Material Handling	Wheeled (M), Crawler (R)	Sennebogen	818E (M or R) ¹⁰	GE	Yes
Crane, Material Handling	Wheeled (M), Crawler (R)	Sennebogen	821E (M or R) ¹¹	GE	Yes
Crane, Material Handling	Wheeled (M), Crawler (R)	Sennebogen	825E (M or R), ¹² 825E Electro Battery ¹³	BE, GE	Yes
Crane, Material Handling	Wheeled (M), Crawler (R)	Sennebogen	830E/G (M or R) ¹⁴	GE	Yes
Crane, Material Handling	Wheeled (M), Crawler (R)	Sennebogen	835E/G (M or R) ¹⁵	GE	Yes
Crane, Material Handling	Wheeled (M), Crawler (R)	Sennebogen	840E (M or R) ¹⁶	GE	Yes

⁸ Sennebogen, "Reduce Your Operating Costs! Electric Material Handlers," n.d. Accessed April 2, 2025.

<https://www.sennebogen.com/en/products/electric-material-handler>.

⁹ Sennebogen, "Battery Excavator Sennebogen 817 E Electro Battery," n.d. Accessed April 2, 2025.

<https://www.sennebogen.com/en/products/material-handler/sennebogen-817/sennebogen-817-electro-battery>.

¹⁰ Sennebogen, "Reduce Your Operating Costs! Electric Material Handlers," n.d. Accessed April 2, 2025.

<https://www.sennebogen.com/en/products/electric-material-handler>.

¹¹ Ibid.

¹² Ibid.

¹³ Sennebogen, "Material Handler: Sennebogen 825 E Electro Battery," n.d. Accessed April 2, 2025.

<https://www.sennebogen.com/en/products/material-handler/sennebogen-825/sennebogen-825-e-electro-battery>.

¹⁴ Sennebogen, "Reduce Your Operating Costs! Electric Material Handlers," n.d. Accessed April 2, 2025.

<https://www.sennebogen.com/en/products/electric-material-handler>.

¹⁵ Ibid.

¹⁶ Ibid.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Crane, Material Handling	Wheeled (M), Crawler (R)	Sennebogen	850E (M or R) ¹⁷	GE	Yes
Crane, Material Handling	Wheeled	Solmec	EXP 50ZE ¹⁸	BE	No
Crane, Material Handling	Wheeled	Solmec	EXP5015WW ¹⁹	GE	No
Crane, Material Handling	Wheeled	Solmec	EXP5020ZE ²⁰	BE	No
Crane, Material Handling	Wheeled	Volvo	EW240 ²¹	BE	No
Crane, Mobile	Carry Deck	Manitex Valla	100SE ²²	BE	Yes
Crane, Mobile	Carry Deck	Manitex Valla	160SE ²³	BE	Yes
Crane, Mobile	Carry Deck	Manitex Valla	180SE ²⁴	BE	Yes
Crane, Mobile	Carry Deck	Manitex Valla	220SE ²⁵	BE	Yes

¹⁷ Ibid.

¹⁸ Solmec, "EXP 50ZE Zero Emission," May 2022. https://www.solmec.it/brochures_pdf/New/EN/EXP50ZE_WEB_EN.pdf.

¹⁹ Solmec, "EXP 5015ww," n.d. https://www.solmec.it/brochures_pdf/Inglese/SOLMEC5015WWUK.pdf.

²⁰ Solmec, "SOLMEC, a Leading Manufacturer of Electric Rehandler with Batteries, Launches the New EXP5020ZE," n.d. Accessed April 2, 2025. <https://www.solmec.it/en/prodotti/caricatore-elettrici/exp-5020ze>.

²¹ Volvo Construction Equipment Europe, "Electric Construction Machines," n.d. Accessed June 16, 2025, <https://www.volvoce.com/europe/en/products/electric-machines/>.

²² Manitex Valla, "100SE Carry Deck Crane," n.d. Accessed June 10, 2025. https://www.valla.com/us/self_propelled_cranes/100-se/.

²³ Manitex Valla, "160SE Carry Deck Crane," n.d. Accessed June 10, 2025. https://www.valla.com/us/self_propelled_cranes/160-se/.

²⁴ Manitex Valla, "180SE Carry Deck Crane," n.d. Accessed June 10, 2025. https://www.valla.com/us/self_propelled_cranes/180-se/.

²⁵ Manitex Valla, "220SE Carry Deck Crane," n.d. Accessed June 10, 2025. https://www.valla.com/us/self_propelled_cranes/220-se/.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Crane, Mobile	N/A	Tadano	EVOLT eGR-1000XLL-1 ²⁶	BE	Yes
Crane, Mobile	Carry Deck	Zee Crane	4500 ²⁷	BE	Yes
Crane, Mobile	Carry Deck	Zee Crane	9000 ²⁸	BE	Yes
Crane, Mobile	N/A	Zoomlion	ZTC250N-EV ²⁹	BE	Yes
Crane, Mobile Harbor	N/A	Konecranes	Gottwald Generation 6 MHC ³⁰	GE	Yes
Crane, Mobile Harbor	N/A	Liebherr	LPS 420 E ³¹	GE	Yes
Crane, Off-road	Crawler	Liebherr	LR 1130.1 Unplugged ³²	BE, GE	Yes
Crane, Off-road	Crawler	Liebherr	LR 1160.1 Unplugged ³³	BE, GE	Yes

²⁶ Tadano, "Tadano Introduces the US and Canada's First and Fully Electric Rough Terrain Crane," October 30, 2024. Accessed December 12, 2024. <https://group.tadano.com/uscan/en/news/tadano-introduces-the-us-and-canadas-first-fully-electric-rough-terrain-crane/>.

²⁷ Grayson, Wayne. "With Zee Cranes Launch, the All-electric Heavy Equipment Era Is Upon Us (PHOTOS)." *Equipment World*, October 19, 2015. Accessed April 18, 2025. <https://www.equipmentworld.com/construction-equipment/article/14963862/with-zee-cranes-launch-the-all-electric-heavy-equipment-era-is-upon-us-photos>.

²⁸ Ibid.

²⁹ Dahm, Alex. "Zoomlion Claims First Electric Truck Crane." *KHL Group*, May 26, 2020. Accessed April 21, 2025. <https://www.khl.com/1144261.article>.

³⁰ Konecranes, "Time for a New Generation Konecranes Generation 6 Mobile Harbor Crane," n.d. Accessed April 2, 2025. <https://www.konecranes.com/Generation6/in-detail>.

³¹ Liebherr, "Borg Havn Modernises Port with All-Electric LPS 420 E," June 6, 2023. Accessed April 2, 2025. <https://www.liebherr.com/en-ph/n/borg-havn-modernises-port-with-all-electric-lps-420-e-27416-5934641>; Liebherr, "Borg Havn Modernises Port with All-Electric LPS 420 E," June 6, 2023. Accessed April 2, 2025. <https://www.liebherr.com/en-us/n/borg-havn-modernises-port-with-all-electric-lps-420-e-27416-3782185>.

³² California CORE, "Liebherr-Werk Nenzing LR 1130.1 Unplugged," n.d. Accessed April 2, 2025. <https://californiacore.org/equipment/lr-1130-1-unplugged/>.

³³ California CORE, "Liebherr-Werk Nenzing LR 1160.1 Unplugged," n.d. Accessed April 2, 2025. <https://californiacore.org/equipment/lr-1160-1-unplugged/>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Crane, Off-road	Crawler	Liebherr	LR 1250.1 Unplugged ³⁴	BE, GE	Yes
Crane, Off-road	Crawler	Marchetti	Marchetti CW 25.35 HY ³⁵	BE	Yes
Crane, Off-road	Crawler	Sennebogen	653 E Electro Battery ³⁶	BE, GE	Yes
Dozer	Crawler	Shantui	DE26-X2 ³⁷	BE	No
Dozer	Crawler	Shantui	SD17e-X Electric Dozer ³⁸	BE	No
Excavator	Wheeled	HEVI	GEX8000 ³⁹	BE	Yes
Excavator	Wheeled	JinGong Machinery	JGM9085e ⁴⁰	BE	No
Excavator	Crawler	Komatsu	PC210e ⁴¹	BE	No

³⁴ California CORE, "Liebherr-Werk Nenzing LR 1250.1 Unplugged," n.d. Accessed April 2, 2025. <https://californiacore.org/equipment/lr-1250-1/>.

³⁵ Silcom North, "Crawler Crane Marchetti CW-25.35-HY," February 26, 2025. <https://www.silcomnorth.com/crawler-cranes/crawler-crane-marchetti-cw-25-hy-shepina-full-electric-battery-powered>.

³⁶ Sennebogen, "Telehandler Sennebogen 653 E Electro Battery," December 11, 2024. <https://www.sennebogen.com/en/products/telescopic-crane/sennebogen-653-e-electro-battery>.

³⁷ Shantui, "Electric Bulldozer DE26-X2," n.d. Accessed March 27, 2025. <https://www.shantui-global.com/product/pro-detail-327.htm>.

³⁸ Made-in-China, "Shantui SD17e-X Electric Dozer 170HP Crawler Bulldozer for Sale," n.d. Accessed December 12, 2024. <https://acntruck.en.made-in-china.com/product/WZwtXurvLYd/China-Shantui-SD17e-X-Electric-Dozer-170HP-Crawler-Bulldozer-for-Sale.html>; Electrek, "This Massive Chinese Electric Bulldozer Could Wreck Your World, Emissions Free!" July 22, 2023. Accessed December 12, 2024. <https://electrek.co/2023/07/22/massive-chinese-electric-bulldozer>; Phate Zhang, "Pure Electric Bulldozer Goes into Service in China, First of its Kind in the World," CNEVPost, June 13, 2021. Accessed December 12, 2024. <https://cnevpost.com/2021/06/14/pure-electric-bulldozer-goes-into-service-in-china-first-of-its-kind-in-the-world/>.

³⁹ Hevi, "All Electric Excavator GEX-8000 Electric Excavator," n.d. Accessed December 11, 2024. <https://gethevi.com/electric-heavy-equipment/excavators/gex-8000/>.

⁴⁰ "JinGong Pure Electric Wheel Excavators JGM9085E," Ailisheng Construction Machinery, published on December 22, 2021, YouTube video, 1:05. Accessed 15, 2025. <https://www.youtube.com/watch?v=PiX8mAH6h-8>.

⁴¹ Komatsu, "At CONEXPO-CON/AGG 2023 Komatsu Features its 20-ton PC210LCE Electric Excavator," March 14, 2023. Accessed April 2, 2025. <https://www.komatsu.com/en/newsroom/2023/20-ton-pc210lce-electric-excavator-featured/>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Excavator	Crawler	Liebherr	R 900 E Series ⁴²	GE	Yes
Excavator	Crawler	LiuGong	900 EV Series ⁴³	BE	Yes
Excavator	Crawler	Shantui	EE225-X2 ⁴⁴	BE	No
Excavator	Crawler	Sinomach	323Ev ⁴⁵	BE	No
Excavator	Crawler	Staad/Doosan	DX300LC Electric ⁴⁶	BE	No
Excavator	Crawler	Staad/Doosan	DX555LC Electric ⁴⁷	BE	No
Excavator	Crawler	Sunward	SWE550FE ⁴⁸	BE	Yes
Excavator	Wheeled	Terminalift	TL-X540E ⁴⁹	BE	Yes
Excavator	Crawler	Volvo	EC230 ⁵⁰	BE	Yes

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- ⁴² Liebherr, "Two New Local Zero Emission Excavators from Liebherr: R976-E and R 980 SME-E Electric Crawler Excavator," April 9, 2021. Accessed June 19, 2024. <https://www.liebherr.com/en-us/n/two-new-local-zero-emission-excavators-from-liebherr-r-976-e-and-r-980-sme-e-electric-crawler-excavators-26263-3782185>.
- ⁴³ Made-in-China, "Liugong 20 Ton Pure Electric Excavator 922f-E," n.d. Accessed April 2, 2025. <https://sinomada.en.made-in-china.com/product/EJURGvoYTLVz/China-Liugong-20-Ton-Pure-Electric-Excavator-922f-E.html>; Made-in-China, "Liuzhou Made New Design Liugong 924ftn-E Crawler Excavator High Quality for Sale," n.d. Accessed April 2, 2025. <https://canmaxcn.en.made-in-china.com/product/FZlaJtwchGfV/China-Liuzhou-Made-New-Design-Liugong-924ftn-E-Crawler-Excavator-High-Quality-for-Sale.html>.
- ⁴⁴ Shantui, "Electric Excavator EE225-X2," n.d. Accessed April 2, 2025. <https://www.shantui-global.com/product/pro-detail-325.htm>.
- ⁴⁵ Seetao, "Sinomach Heavy Industry Changlin Electric Excavator Loader Heavy Release," November 26, 2020. Accessed April 2, 2025. <https://www.seetao.com/details/48766.html>.
- ⁴⁶ Staad, "DX355LC Electric," n.d. Accessed April 2, 2025. <https://www.staad-group.com/electric/electric-machines/dx355lc-electric/>.
- ⁴⁷ Ibid.
- ⁴⁸ "Sunward's First Pure Electric Hydraulic Excavator Rolled off the Assembly Line." Seetao. August 24, 2020. Accessed June 10, 2025. <https://www.seetao.com/details/36287.html>.
- ⁴⁹ Terminalift, "TL Electric Crawler Excavator," n.d. Accessed August 29, 2024. <https://www.terminalift.com/listings/5003390-tl-electric-crawler-excavator>.
- ⁵⁰ California CORE, "Volvo EC230 Electric MY23," n.d. Accessed April 5, 2025. <https://californiacore.org/equipment/ec230-electric-my23/>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Excavator	Wheeled	Volvo	EWR150 Electric ⁵¹	BE	No
Excavator	Crawler	XCMG	Heavy ⁵²	BE	Yes
Excavator	Crawler	XCMG	Medium ⁵³	BE	Yes
Forklift, Heavy Lift	N/A	Carer Electric Forklift Solutions	A120 ⁵⁴	BE	Yes
Forklift, Heavy Lift	N/A	Carer Electric Forklift Solutions	A140 ⁵⁵	BE	Yes
Forklift, Heavy Lift	N/A	Carer Electric Forklift Solutions	A160 ⁵⁶	BE	Yes

⁵¹ Volvo Construction Equipment Europe, "Electric Construction Machines," n.d. Accessed June 16, 2025, <https://www.volvoce.com/europe/en/products/electric-machines/>.

⁵² ChinaSPV, "Over 100 Units XCMG Electric Excavators Delivered to South America," August 31, 2022. Accessed April 2, 2025. <https://m.chinaspv.com/news/4999.html>.

⁵³ Machmall, "Introduce XCMG's Electric Legion," July 15, 2022. Accessed April 2, 2025. <https://www.machmall.com/content-info/introduce-xcmgs-electric-legion/668>.

⁵⁴ California CORE, "Carer Electric Forklift Solutions A120X," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/a120x/>; Care Forklifts, "Carer's Range of Electric Forklift Trucks," n.d. Accessed April 4, 2025. <https://www.carerforklifts.com/product-range/>.

⁵⁵ California CORE, "Carer Electric Forklift Solutions A140S," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/a140s/>; Care Forklifts, "Carer's Range of Electric Forklift Trucks," n.d. Accessed April 4, 2025. <https://www.carerforklifts.com/product-range/>.

⁵⁶ California CORE, "Carer Electric Forklift Solutions A160 (at 1200X)," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/a160-at-1200x/>; California CORE, "Carer Electric Forklift Solutions A160 (at 900S)," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/a160-at-900s/>; California CORE, "Carer Electric Forklift Solutions A160S," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/a160s/>; California CORE, "Carer Electric Forklift Solutions A160X," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/a160x/>; Care Forklifts, "Carer's Range of Electric Forklift Trucks," n.d. Accessed April 4, 2025. <https://www.carerforklifts.com/product-range/>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Forklift, Heavy Lift	N/A	Carer Electric Forklift Solutions	A200 ⁵⁷	BE	Yes
Forklift, Heavy Lift	N/A	Elwell Parker	ESE Series ⁵⁸	BE	Yes
Forklift, Heavy Lift	N/A	Hyster-Yale	J250XD ⁵⁹	BE	Yes
Forklift, Heavy Lift	N/A	Hyster-Yale	J280XD ⁶⁰	BE	Yes
Forklift, Heavy Lift	N/A	Hyster-Yale	J300XD ⁶¹	BE	Yes
Forklift, Heavy Lift	N/A	Hyster-Yale	J330XD ⁶²	BE	Yes
Forklift, Heavy Lift	N/A	Hyster-Yale	J360XD ⁶³	BE	Yes

⁵⁷ California CORE, "Carer Electric Forklift Solutions A200 (at 1200X)," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/a200-at-1200x/>; Carer Forklifts, "Carer's Range of Electric Forklift Trucks," n.d. Accessed April 4, 2025. <https://www.carerforklifts.com/product-range/>.

⁵⁸ Elwell-Parker, "ESE Electric Forklifts," n.d. Accessed April 2, 2025. <https://elwellparker.com/legacy-equipment/electric-forklifts/e-se-electric-forklifts/>.

⁵⁹ California CORE, "Hyster-Yale Group, Inc. J250XD / ERP250DF (Li-Ion Battery)," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/j250xd-erp250df-2-70-kwh-li-ion/>.

⁶⁰ California CORE, "Hyster-Yale Group, Inc. J280 XD / ERP280DF (Li-Ion Battery)," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/j280xd-erp280df-2-70-kwh-li-ion/>.

⁶¹ California CORE, "Hyster-Yale Group, Inc. J300XD / ERP300EF (Li-Ion Battery)," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/j300xd-erp300ef-2-70-kwh-li-ion/>.

⁶² California CORE, "Hyster-Yale Group, Inc. J330XD / ERP300EF (Li-Ion Battery)," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/j330xd-erp300ef-2-70-kwh-li-ion/>.

⁶³ California CORE, "Hyster-Yale Group, Inc. J360XD / ERP360EF (Li-Ion Battery)," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/j360xd-erp360ef-3-70-kwh-li-ion/>; California CORE, "Hyster-Yale Group, Inc. J360XD36 (Li-Ion Battery)," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/j360xd36-li-ion-battery/>; California CORE, "Hyster-Yale Group, Inc. J360XD48 (Li-Ion Battery 2)," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/j360xd48-li-ion-battery-3/>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Forklift, Heavy Lift	N/A	Kalmar Global	ECG120 ⁶⁴	BE	Yes
Forklift, Heavy Lift	N/A	Kalmar Global	ECG140 ⁶⁵	BE	Yes
Forklift, Heavy Lift	N/A	Kalmar Global	ECG150 ⁶⁶	BE	Yes
Forklift, Heavy Lift	N/A	Kalmar Global	ECG160 ⁶⁷	BE	Yes
Forklift, Heavy Lift	N/A	Kalmar Global	ECG180 ⁶⁸	BE	Yes

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- ⁶⁴ California CORE, "Kalmar Mobile Solutions ECG120-12-Lead Acid," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/ecg120-12-lead-acid/>; California CORE, "Kalmar Mobile Solutions ECG120-12S - Lead Acid," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/ecg120-12s-lead-acid/>; California CORE, "Kalmar Mobile Solutions ECG120-6 - Lead Acid," n.d. Accessed April 4, 2025.; California CORE, "Kalmar Mobile Solutions ECG127-6 - Lead Acid," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/ecg127-6-lead-acid/>.
- ⁶⁵ California CORE, "Kalmar Mobile Solutions ECG140-6 - Lead Acid," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/ecg140-6-lead-acid/>; California CORE, "Kalmar Mobile Solutions ECG140-6S - Lead Acid," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/ecg140-6s-lead-acid/>.
- ⁶⁶ California CORE, "Kalmar Mobile Solutions ECG150-12 - Lead Acid," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/ecg150-12-lead-acid/>; California CORE, "Kalmar Mobile Solutions ECG150-6 - Lead Acid," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/ecg150-6-lead-acid/>; California CORE, "Kalmar Mobile Solutions ECG150-6S - Lead Acid," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/ecg150-6s-lead-acid/>.
- ⁶⁷ California CORE, "Kalmar Mobile Solution ECG160-12 - Lead Acid," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/ecg160-12-lead-acid/>; California CORE, "Kalmar Mobile Solutions ECG160-6 - Lead Acid," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/ecg160-6-lead-acid/>; California CORE, "Kalmar Mobile Solutions ECG160-6S - Lead Acid," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/ecg160-6s-lead-acid/>; California CORE, "Kalmar Mobile Solutions ECG160-9 - Lead Acid," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/ecg160-9-lead-acid/>; California CORE, "Kalmar Mobile Solutions ECG160-9S - Lead Acid," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/ecg160-9s-lead-acid/>.
- ⁶⁸ Kalmar Global, "Heavy Electric Forklift Trucks 18-33 ton," n.d. Accessed April 2, 2025. <https://www.kalmarusa.com/equipment/forklift-trucks/electric-heavy-forklift-18-33-ton/>; California CORE, "Kalmar Mobile Solutions ECG180-6 - Lead Acid," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/ecg180-6-lead-acid/>; California CORE, "Kalmar Mobile Solutions ECG180-6S - Lead Acid," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/ecg180-6s-lead-acid/>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Forklift, Heavy Lift	N/A	Kalmar Global	ECG200 ⁶⁹	BE	Yes
Forklift, Heavy Lift	N/A	Kalmar Global	ECG220 ⁷⁰	BE	Yes
Forklift, Heavy Lift	N/A	Kalmar Global	ECG250 ⁷¹	BE	Yes
Forklift, Heavy Lift	N/A	Kalmar Global	ECG280 ⁷²	BE	Yes
Forklift, Heavy Lift	N/A	Kalmar Global	ECG300 ⁷³	BE	Yes
Forklift, Heavy Lift	N/A	Kalmar Global	ECG330 ⁷⁴	BE	Yes
Forklift, Heavy Lift	N/A	Konecranes Inc.	E-VER 10 ⁷⁵	BE	Yes
Forklift, Heavy Lift	N/A	Konecranes Inc.	E-VER 12 ⁷⁶	BE	Yes
Forklift, Heavy Lift	N/A	Konecranes Inc.	E-VER 13.6 ⁷⁷	BE	Yes
Forklift, Heavy Lift	N/A	Konecranes Inc.	E-VER 15 ⁷⁸	BE	Yes
Forklift, Heavy Lift	N/A	Konecranes Inc.	E-VER 16 ⁷⁹	BE	Yes
Forklift, Heavy Lift	N/A	Konecranes Inc.	E-VER 17 ⁸⁰	BE	Yes

⁶⁹ Kalmar Global, "Heavy Electric Forklift Trucks 18-33 ton," n.d. Accessed April 2, 2025. <https://www.kalmarusa.com/equipment/forklift-trucks/electric-heavy-forklift-18-33-ton/>.

⁷⁰ Ibid.

⁷¹ Ibid.

⁷² Ibid.

⁷³ Ibid.

⁷⁴ Kalmar Global, "Heavy Electric Forklift Trucks 18-33 ton," n.d. Accessed April 2, 2025. <https://www.kalmarusa.com/equipment/forklift-trucks/electric-heavy-forklift-18-33-ton/>.

⁷⁵ Konecranes Inc., "Konecranes Ecolifting Electric Forklifts," n.d. Accessed December 11, 2024. <https://www.kclifttrucks.com/equipment/forklifts/konecranes-e-ver-electric-forklifts>.

⁷⁶ Ibid.

⁷⁷ Ibid.

⁷⁸ Ibid.

⁷⁹ Ibid.

⁸⁰ Ibid.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Forklift, Heavy Lift	N/A	Konecranes Inc.	E-VER 18 ⁸¹	BE	Yes
Forklift, Heavy Lift	N/A	SOCMA	13.5-ton Electric Forklift ⁸²	BE	No
Forklift, Heavy Lift	N/A	SOCMA	15-ton Electric Forklift ⁸³	BE	No
Forklift, Heavy Lift	N/A	SOCMA	25-ton electric forklift ⁸⁴	BE	No
Forklift, Heavy Lift	N/A	SOCMA	30-ton Electric Forklift ⁸⁵	BE	No
Forklift, Heavy Lift	N/A	SOCMA	40-ton Electric Forklift ⁸⁶	BE	No
Forklift, Heavy Lift	N/A	SOCMA	50-ton Electric Forklift ⁸⁷	BE	No
Forklift, Heavy Lift	N/A	Taylor Machine Works	Z-350 ⁸⁸	BE	Yes

⁸¹ Konecranes Inc., "Konecranes Ecolifting Electric Forklifts," n.d. Accessed December 11, 2024.

<https://www.kclifttrucks.com/equipment/forklifts/konecranes-e-ver-electric-forklifts>.

⁸² Socma, "13.5 TON Electric Forklift Heavy Duty Equipment," n.d. Accessed April 3, 2025. <https://www.socma-forklift.com/electric-heavy-duty-forklift/13-5-ton-electric-forklift-heavy-duty.html>.

⁸³ Socma, "Electric Forklift 10Ton 15Ton 25Ton Battery," n.d. Accessed April 3, 2025. <https://www.socma-forklift.com/electric-heavy-duty-forklift/electric-forklift-10ton-15-ton-25-ton-battery.html>.

⁸⁴ Socma, "25 Ton electric Forklift Lithium Battery," n.d. Accessed December 12, 2024. <https://www.socma-forklift.com/electric-heavy-duty-forklift/25-ton-electric-forklift-lithium-battery.html>.

⁸⁵ Socma, "30 Ton Electric Forklift Lithium Ion Battery," n.d. Accessed April 3, 2025. <https://www.socma-forklift.com/electric-heavy-duty-forklift/30-ton-electric-forklift-lithium-ion-battery.html>.

⁸⁶ Socma, "40 Ton Electric Forklift Lithium Ion Battery," n.d. Accessed April 3, 2025. <https://www.socma-forklift.com/electric-heavy-duty-forklift/40-ton-electric-forklift-lithium-ion-battery.html>.

⁸⁷ Socma, "SOCMA 50-Ton Electric Forklift: Embracing New Energy and Environmental Protection," June 16, 2024. Accessed August 29, 2024. <https://www.socma-forklift.com/news/socma-50-ton-electric-forklift-embracing-new-78205579.html>.

⁸⁸ Taylor Machine Works, "ZH-350L Electric Lifts," n.d. Accessed April 3, 2025. <https://taylorforklifts.com/products/electric-lift-truck/pneumatic-tire-forklift/ZH-350L>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Forklift, Heavy Lift	N/A	Taylor Machine Works	Z-360 ⁸⁹	BE	Yes
Forklift, Heavy Lift	N/A	Taylor Machine Works	ZH-1000 ⁹⁰	BE	Yes
Forklift, Heavy Lift	N/A	Taylor Machine Works	ZH-375M ⁹¹	BE	Yes
Forklift, Heavy Lift	N/A	Taylor Machine Works	ZH-550M ⁹²	BE	Yes
Forklift, Heavy Lift	N/A	Taylor Machine Works	ZH-650L ⁹³	BE	Yes
Forklift, Heavy Lift	N/A	Taylor Machine Works	ZH-925L ⁹⁴	BE	Yes
Forklift, Heavy Lift	N/A	Terminalift	FL33E ⁹⁵	BE	Yes

⁸⁹ Taylor Machine Works, "Z-360L Electric Lifts," n.d. Accessed April 3, 2025. <https://taylorforklifts.com/products/electric-lift-truck/pneumatic-tire-forklift/Z-360L>; Taylor Machine Works, "Z-360M Electric Lifts," n.d. Accessed April 3, 2025. <https://taylorforklifts.com/products/electric-lift-truck/pneumatic-tire-forklift/Z-360M>; Taylor Machine Works, "ZH-360L Electric Lifts," n.d. Accessed April 3, 2025. <https://taylorforklifts.com/products/electric-lift-truck/pneumatic-tire-forklift/ZH-360L>.

⁹⁰ Taylor Machine Works, "ZH-1000 Electric Lifts," n.d. Accessed April 3, 2025. <https://taylorforklifts.com/products/electric-lift-truck/pneumatic-tire-forklift/ZH-1000>.

⁹¹ Taylor Machine Works, "ZH-375M Electric Lifts," n.d. Accessed April 3, 2025. <https://taylorforklifts.com/products/electric-lift-truck/pneumatic-tire-forklift/ZH-375M>.

⁹² Taylor Machine Works, "ZH-550M Electric Lifts," n.d. Accessed April 3, 2025. <https://taylorforklifts.com/products/electric-lift-truck/pneumatic-tire-forklift/ZH-550M>.

⁹³ Taylor Machine Works, "ZH-650L Electric Lifts," n.d. Accessed April 3, 2025. <https://taylorforklifts.com/products/electric-lift-truck/pneumatic-tire-forklift/ZH-650L>.

⁹⁴ Taylor Machine Works, "ZH-1000 Electric Lifts," n.d. Accessed April 3, 2025. <https://taylorforklifts.com/products/electric-lift-truck/pneumatic-tire-forklift/ZH-1000>.

⁹⁵ Terminalift LLC., "Our Machines," n.d. Accessed April 3, 2025. <https://www.terminalift.com/listings>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Forklift, Heavy Lift	N/A	Terminalift	TL ⁹⁶	BE	Yes
Forklift, Heavy Lift	N/A	Wiggins	W1.0M2e ⁹⁷	BE	Yes
Forklift, Heavy Lift	N/A	Wiggins	W1.3M2e ⁹⁸	BE	Yes
Forklift, Heavy Lift	N/A	Wiggins	W3.2M2e ⁹⁹	BE	Yes
Forklift, Heavy Lift	N/A	Wiggins	W260Y ¹⁰⁰	HFC	Yes
Forklift, Heavy Lift	N/A	Wiggins	W300Ye ¹⁰¹	HFC	Yes

⁹⁶ Terminalift LLC., "TL Electric Forklift," n.d. Accessed August 29, 2024. <https://www.terminalift.com/listings/5003430-tl-electric-forklift>.

⁹⁷ California CORE, "Wiggins W1.0M2e-108-30/12," n.d. <https://californiacore.org/equipment/w1-0m2e-108-30-12/>; California CORE, "Wiggins W1.0M2e-108-30/12 XR," n.d. <https://californiacore.org/equipment/w1-0m2e-108-30-12-xr/>; California CORE, "Wiggins W1.0M2e-108-30/12 XXR," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w1-0m2e-108-30-12-xxr/>; Wiggins Lift, "Zero Emissions Wiggins Yard eBull & H2 eBull," 2023. <https://wigginslift.com/wp-content/uploads/2023/07/Yard-eBull-Brochure-2023.pdf>.

⁹⁸ California CORE, "Wiggins W1.3M2e-108-30/12," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w1-3m2e-108-30-12/>; California CORE, "Wiggins W1.3M2e-108-30/12 XR," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w1-3m2e-108-30-12-xr/>; California CORE, "Wiggins W1.3M2e-108-30/12 XXR," n.d. Accessed 4, 2025. <https://californiacore.org/equipment/w1-3m2e-108-30-12-xxr/>; Wiggins Lift, "Zero Emissions Wiggins Yard eBull & H2 eBull," 2023. <https://wigginslift.com/wp-content/uploads/2023/07/Yard-eBull-Brochure-2023.pdf>.

⁹⁹ California CORE, "Wiggins W1.3M2e-108-30/12," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w1-3m2e-108-30-12/>; California CORE, "Wiggins W3.2M2e-140-30/12," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w3-2m2e-140-30-12/>; California CORE, "Wiggins W3.2Me-140-30/12 XR," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w3-2m2e-140-30-12-xr/>; California CORE, "Wiggins W3.2Me-140-30/12 XXR," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w3-2m2e-140-30-12-xxr/>; Wiggins Lift, "Zero Emissions Wiggins Yard eBull & H2 eBull," 2023. <https://wigginslift.com/wp-content/uploads/2023/07/Yard-eBull-Brochure-2023.pdf>.

¹⁰⁰ Wiggins Lift, "Zero Emissions Wiggins Yard eBull & H2 eBull," 2023. <https://wigginslift.com/wp-content/uploads/2023/07/Yard-eBull-Brochure-2023.pdf>.

¹⁰¹ California CORE, "Wiggins W300Ye-130," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w300ye-130/>; California CORE, "Wiggins W300Ye-130 XR," n.d. April 4, 2025. <https://californiacore.org/equipment/w300ye-130-xr/>; California CORE, "Wiggins W300Ye-130 XXR," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w300ye-130-xxr/>; Wiggins Lift, "Zero Emissions Wiggins Yard eBull & H2 eBull," 2023. <https://wigginslift.com/wp-content/uploads/2023/07/Yard-eBull-Brochure-2023.pdf>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Forklift, Heavy Lift	N/A	Wiggins	W335Ye ¹⁰²	HFC	Yes
Forklift, Heavy Lift	N/A	Wiggins	W365Ye ¹⁰³	HFC	Yes
Forklift, Heavy Lift	N/A	Wiggins	W450Y ¹⁰⁴	HFC	Yes
Forklift, Heavy Lift	N/A	Wiggins	W520Y ¹⁰⁵	HFC	Yes
Forklift, Heavy Lift	N/A	Wiggins	W550Y ¹⁰⁶	HFC	Yes

¹⁰² California CORE, "Wiggins W335Ye-130," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w335ye-130/>; California CORE, "Wiggins W335Ye-130 XR," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w335ye-130-xr/>; California CORE, "Wiggins W355Ye-130 XXR," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w335ye-130-xxr/>; Wiggins Lift, "Zero Emissions Wiggins Yard eBull & H2 eBull," 2023. <https://wigginslift.com/wp-content/uploads/2023/07/Yard-eBull-Brochure-2023.pdf>.

¹⁰³ California CORE, "Wiggins W365Ye-130," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w365ye-130/>; California CORE, "Wiggins W365Ye-130 XR," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w365ye-130-xr/>; California CORE, "Wiggins W365Ye-130 XXR," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w365ye-130-xxr/>; California CORE, "Wiggins W365YeH-140," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w365yeh-140/>; California CORE, "Wiggins W365YXXLe-150," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w365yxxle-150/>; California CORE, "Wiggins W365YXXLe-150 XR," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w365yxxle-150-xr/>; California CORE, "Wiggins W365YXXLe-150 XXR," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w365yxxle-150-xxr/>; Wiggins Lift, "Zero Emissions Wiggins Yard eBull & H2 eBull," 2023. <https://wigginslift.com/wp-content/uploads/2023/07/Yard-eBull-Brochure-2023.pdf>.

¹⁰⁴ "Wiggins W450YXXLe-170," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w450yxxle-170/>; Wiggins Lift, "Zero Emissions Wiggins Yard eBull & H2 eBull," 2023. <https://wigginslift.com/wp-content/uploads/2023/07/Yard-eBull-Brochure-2023.pdf>.

¹⁰⁵ California CORE, "Wiggins W520YXXLe-150," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w520yxxle-150/>; Wiggins Lift, "Zero Emissions Wiggins Yard eBull & H2 eBull," 2023. <https://wigginslift.com/wp-content/uploads/2023/07/Yard-eBull-Brochure-2023.pdf>.

¹⁰⁶ California CORE, "Wiggins W550YXXLe-160 RR," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w550yxxle-160-rr/>; California CORE, "Wiggins W550YXXLe-170," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w550yxxle-170/>; Wiggins Lift, "Zero Emissions Wiggins Yard eBull & H2 eBull," 2023. <https://wigginslift.com/wp-content/uploads/2023/07/Yard-eBull-Brochure-2023.pdf>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Forklift, Heavy Lift	N/A	Wiggins	W600Y ¹⁰⁷	HFC	Yes
Forklift, Heavy Lift	N/A	Wiggins	W700Y ¹⁰⁸	HFC	Yes
Forklift, Telehandler	N/A	Ausa	T164e ¹⁰⁹	BE	No
Forklift, Telehandler	N/A	Faresin	14.42, 17.40, 17.45 ¹¹⁰	BE	Yes
Forklift, Telehandler	N/A	Galizia	GF600 ¹¹¹	BE	No
Forklift, Telehandler	N/A	Galizia	MULTIS 636 ¹¹²	BE	No
Forklift, Telehandler	N/A	JCB	505-20E ¹¹³	BE	Yes
Forklift, Telehandler	N/A	JCB	525-60E ¹¹⁴	BE	Yes
Forklift, Telehandler	N/A	Manitou	MRT 2260, MRT 2660 ¹¹⁵	BE	Yes
Forklift, Telehandler	N/A	Manitou	MTE 625 ¹¹⁶	BE	Yes

¹⁰⁷ California CORE, "Wiggins W600YXXLe-170," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w600yxxle-170/>; Wiggins Lift, "Zero Emissions Wiggins Yard eBull & H2 eBull," 2023. <https://wigginslift.com/wp-content/uploads/2023/07/Yard-eBull-Brochure-2023.pdf>.

¹⁰⁸ California CORE, "Wiggins W700Ye XXL-190," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/w700ye-xxl-190/>; Wiggins Lift, "Zero Emissions Wiggins Yard eBull & H2 eBull," 2023. <https://wigginslift.com/wp-content/uploads/2023/07/Yard-eBull-Brochure-2023.pdf>.

¹⁰⁹ Ausa, "T164E Electric Handler," n.d. Accessed April 15, 2025. <https://www.ausa.com/en-ch/telehandlers/t164e>.

¹¹⁰ Faresin, "Full Electric," n.d. Accessed April 3, 2025. <https://www.faresin.com/us/full-electric/>.

¹¹¹ Galizia, "GF600 - 60 t - 2 mot fr drive 4 wheels," n.d. Accessed April 3, 2025. https://www.galiziagru.com/gru_en.php?id=48.

¹¹² Galizia, "Galizia GRU: Our Products," n.d. Accessed April 3, 2025. https://www.galiziagru.com/gru_en.php.

¹¹³ California CORE, "JCB, Inc. JCB 505-20E," n.d. Accessed April 3, 2025. <https://californiacore.org/equipment/jcb-505-20e/>.

¹¹⁴ Terra-World, "JCB 525-60E Electric Range," n.d. Accessed April 3, 2025. <https://www.terra-world.com/products/jcb-525-60e>.

¹¹⁵ Construction Equipment Guide, "VIDEO: Manitou Introduces Electrified Telehandler Range in North America," February 14, 2023. Accessed April 3, 2025. <https://www.constructionequipmentguide.com/manitou-introduces-electrified-telehandler-range-in-north-america/59961>.

¹¹⁶ Construction Equipment Guide, "VIDEO: Manitou Introduces Electrified Telehandler Range in North America," February 14, 2023. Accessed April 3, 2025. <https://www.constructionequipmentguide.com/manitou-introduces-electrified-telehandler-range-in-north-america/59961>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Forklift, Telehandler	N/A	Merlo	25.5 (2wd and 4wd) ¹¹⁷	BE	Yes
Forklift, Telehandler	N/A	Snorkel	SR5719e ¹¹⁸	BE	Yes
Forklift, Telehandler	N/A	Wacker Neuson	TH412e ¹¹⁹	BE	Yes
Haul Truck	Straight	SANY	SKT90E ¹²⁰	BE	Yes
Haul Truck	Articulated	Volvo	A30 ¹²¹	BE	No
Haul Truck	Articulated	Volvo	A40 ¹²²	BE	No
Loader or Loader-Excavator	Wheeled	Ahlmann	AZ95 ¹²³	BE	No
Loader or Loader-Excavator	Wheeled	Breton	BRT936EV ¹²⁴	BE	No

¹¹⁷ Merlo, "Electric Telehandler EW25.5," n.d. Accessed April 15, 2025. <https://www.merlo.com/usa/en/p/telehandlers/electric-telehandler/ew25-5/>.

¹¹⁸ Snorkel, "Electric Power Snorkel SR571E," n.d. Accessed April 3, 2025. <https://snorkellifts.com/equipment/sr5719e/>.

¹¹⁹ Wacker Neuson, "#Switchtogreen The Complete Zero Emission Pack-Age from Wacker Neuson," October 27, 2022. Accessed April 3, 2025. https://www.wackerneuson.com/northerneurope/about-us/news/detail?tx_news_pi1%5Baction%5D=detail&tx_news_pi1%5Bcontroller%5D=News&tx_news_pi1%5Bnews%5D=929&cHash=ba00a35beefb4416850b753385d0f5a9.

¹²⁰ Sany Global, "SKT90E Electric Off-Highway Mining Truck," n.d. Accessed April 3, 2025. https://www.sanyglobal.com/product/truck/off-highway_mining_truck/75/559/.

¹²¹ Volvo Construction Equipment Europe, "Electric Construction Machines," n.d. Accessed June 16, 2025, <https://www.volvoce.com/europe/en/products/electric-machines/>.

¹²² Ibid.

¹²³ Ahlmann Mecalac, "World Premiere Ahlmann Swing Shovel Loader AZ 95 Electric," n.d. Accessed April 3, 2025. <https://ahlmann.nl/wereldpremiere-ahlmann-zwenklader-az-95-electric/>.

¹²⁴ Echipamente și Atașamente Consulting, "China: Breton Starts Series Production Of EV Loaders," November 7, 2020. Accessed June 9, 2025. <https://www.echipamente-atasamente.ro/en/2020/11/07/china-breton-starts-series-production-of-ev-loaders/>; Made-in-China, "China Brand BRT936EV 3ton EV Electric Wheel Loader," n.d. Accessed June 9, 2025. <https://fullwon.en.made-in-china.com/product/YnMRivldrqVF/China-China-Brand-BRT936EV-3ton-EV-Electric-Wheel-Loader.html>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Loader or Loader-Excavator	Wheeled	Breton	BRT966EV ¹²⁵	BE	No
Loader or Loader-Excavator	Wheeled	Case Construction	CASE 580 EV ¹²⁶	BE	Yes
Loader or Loader-Excavator	Wheeled	Ensign	YX656EV ¹²⁷	BE	Yes
Loader or Loader-Excavator	Wheeled	HEVI	GEL1800 ¹²⁸	BE	Yes
Loader or Loader-Excavator	Wheeled	HEVI	GEL5000 ¹²⁹	BE	Yes
Loader or Loader-Excavator	Wheeled	HEVI	H55L ¹³⁰	BE	Yes

¹²⁵ Made-in-China, "Breton BRT966EV Front End Loader Electric Wheel Loader with 340kw," n.d. Accessed June 9, 2025.

<https://fullwon.en.made-in-china.com/product/FnTpeMSXEvkU/China-Breton-BRT966EV-Front-End-Loader-Electric-Wheel-Loader-with-340kw.html>.

¹²⁶ Case Construction, "Electric Vehicles," n.d. Accessed December 13, 2024. <https://www.casece.com/en-us/northamerica/solutions/case-ev>.

¹²⁷ Made-in-China, "Electric Wheel Loader, 5.5 Ton, Lithium Battery Power, Ensign Brand," n.d. Accessed June 10, 2025.

<https://ensign.en.made-in-china.com/product/zdoGhxjYbupB/China-Electric-Wheel-Loader-5-5-Ton-Lithium-Battery-Power-Ensign-Brand.html>.

¹²⁸ Hevi, "GEL-1800 Electric Wheel Loader," n.d. Accessed December 11, 2024. <https://gethevi.com/electric-heavy-equipment/electric-wheel-loaders/gel-1800/>.

¹²⁹ Hevi, "GEL-5000 Electric Wheel Loader," n.d. Accessed December 11, 2024. <https://gethevi.com/electric-heavy-equipment/electric-wheel-loaders/gel-5000/>.

¹³⁰ Hevi, "H55L Electric Wheel Loader," n.d. Accessed December 11, 2024. <https://gethevi.com/electric-heavy-equipment/electric-wheel-loaders/h55/>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Loader or Loader-Excavator	Wheeled	HEVI	H65L ¹³¹	BE	Yes
Loader or Loader-Excavator	Wheeled	HEVI	GEL-5000 ¹³²	BE	Yes
Loader or Loader-Excavator	Wheeled	Highland Industries	2N ¹³³	BE	Yes
Loader or Loader-Excavator	Wheeled	JinGong Machinery	JGM857E ¹³⁴	BE	No
Loader or Loader-Excavator	Wheeled	LiuGong	820T-E ¹³⁵	BE	Yes
Loader or Loader-Excavator	Wheeled	LiuGong	856H-E MAX ¹³⁶	BE	Yes

¹³¹ Hevi, "H65L Electric Wheel Loader," n.d. Accessed December 11, 2024. <https://gethevi.com/electric-heavy-equipment/electric-wheel-loaders/h65l/>.

¹³² Hevi, "Electric Heavy Equipment," n.d. Accessed April 3, 2025. <https://gethevi.com/electric-heavy-equipment/>.

¹³³ Highland Industries, "Model 2N," n.d. Accessed June 10, 2025. <https://hmcwv.com/lhd-1/>.

¹³⁴ Alibaba.com, "Jingong Earthmoving Machinery 5.5T Electric Lithium Battery Wheel Loader Front Loaders JGM57E Price List," n.d. Accessed April 4, 2025. https://www.alibaba.com/product-detail/JINGONG-Earthmoving-Machinery-5-5T-Electric_1600430146162.html.

¹³⁵ California CORE, "LiuGong Construction Equipment N.A., LLC 820T-E," n.d. Accessed April 3, 2025. <https://californiacore.org/equipment/820t-e/>; Equipment India, "Loading the Future," June 29, 2024. Accessed April 9, 2025. <https://equipmentindia.com/construction-machinery-news/top-equipment-news/webexclusive/Loading-the-Future/129462>.

¹³⁶ LiuGong, "856H-E Max Zero Emissions + Greater ROI," n.d. Accessed August 29, 2024. <https://www.liugongna.com/wheel-loaders-856h-e-max->; LiuGong, "Liugong Brings Proven, Tested Battery Electric 856H-E Max Wheel Loader to North America," March 8, 2023. Accessed August 29, 2025. <https://www.liugongna.com/blog/liugong-news/2023/03/08/liugong-brings-proven-tested-battery-electric-856h-e-max-wheel-loader-to-north-america->; Equipment India, "Loading the Future," June 29, 2024. Accessed April 9, 2025. <https://equipmentindia.com/construction-machinery-news/top-equipment-news/webexclusive/Loading-the-Future/129462>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Loader or Loader-Excavator	Wheeled	SDLG/Volvo	L956HEV ¹³⁷	BE	Yes
Loader or Loader-Excavator	Wheeled	SDLG/Volvo	L968HEV ¹³⁸	BE	Yes
Loader or Loader-Excavator	Wheeled	SEM/Caterpillar	Wheel loader ¹³⁹	BE	Yes
Loader or Loader-Excavator	Wheeled	Shantui	LE60-X3 ¹⁴⁰	BE	No
Loader or Loader-Excavator	Wheeled	SOCMA	5-ton Electric Loader ¹⁴¹	BE	No
Loader or Loader-Excavator	Wheeled	Terminalift	TL-WL5E ¹⁴²	BE	Yes
Loader or Loader-Excavator	Wheeled	Volvo	L90 Electric ¹⁴³	BE	No

¹³⁷ SDLG, "SDLG Speed Up in the Development of Green Products," December 2, 2022. Accessed April 3, 2025.

<https://www.sdlg.com/news/1128>; SDLG, "SDLG Speed Up in the Development of Green Products," December 2, 2022. Accessed April 3, 2025. <https://www.sdlg.com/news/1128>; Equipment India, "Loading the Future," June 29, 2024. Accessed April 9, 2025. <https://equipmentindia.com/construction-machinery-news/top-equipment-news/webexclusive/Loading-the-Future/129462>.

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¹³⁹ Seetao, "The First SEM Electric Wheel Loader SEM658F Launched in China," June 20, 2022. Accessed April 3, 2025. <https://www.seetao.com/details/164809.html>.

¹⁴⁰ Shantui, "Electric Wheel Loader LE60-X3," n.d. Accessed April 3, 2025. <https://www.shantui-global.com/product/pro-detail-324.htm>.

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¹⁴² Terminalift, "TL Electric Wheel Loader," n.d. Accessed August 29, 2024. <https://www.terminalift.com/listings/5003378-tl-electric-wheel-loader>.

¹⁴³ Volvo Construction Equipment Europe, "Electric Construction Machines," n.d. Accessed June 16, 2025, <https://www.volvoce.com/europe/en/products/electric-machines/>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Loader or Loader-Excavator	Wheeled	Volvo	L120 Electric ¹⁴⁴	BE	Yes
Loader or Loader-Excavator	Wheeled	Wings Machinery	5.0t Electric Loader ¹⁴⁵	BE	No
Loader or Loader-Excavator	Wheeled	XCMG	XC918EV ¹⁴⁶	BE	Yes
Loader or Loader-Excavator	Wheeled	XCMG	XC938EV ¹⁴⁷	BE	Yes
Loader or Loader-Excavator	Wheeled	XCMG	XC968EV ¹⁴⁸	BE	Yes
Loader or Loader-Excavator	Wheeled	XCMG	XC975EV ¹⁴⁹	BE	Yes
Loader or Loader-Excavator	Wheeled	XCMG	XC988EV ¹⁵⁰	BE	Yes

¹⁴⁴ Volvo Construction Equipment North America, "Electric Construction Equipment," n.d. Accessed June 16, 2025, <https://www.volvoce.com/united-states/en-us/products/electric-machines/>.

¹⁴⁵ Wings Machinery, "5.0t Electric Wheel Loader," n.d. Accessed April 3, 2025. https://www.wingsmachinery.com/Electric_Wheel_Loader.html.

¹⁴⁶ Business Insider, "XCMG Commissions the World's First New Energy Loader Production Line," December 26, 2023. Accessed April 3, 2025. <https://markets.businessinsider.com/news/stocks/xcmg-commissions-the-world-s-first-new-energy-loader-production-line-1032925212;> Etrucks, "XC918EV Electric Loaders," n.d. Accessed April 11, 2025. <https://etrucks.co.nz/project/xc918ev/>.

¹⁴⁷ Etrucks, "XC938EV Electric Loaders," n.d. Accessed April 11, 2025. <https://etrucks.co.nz/project/xc938ev/>.

¹⁴⁸ Etrucks, "XC968EV Electric Loaders," n.d. Accessed April 11, 2025. <https://etrucks.co.nz/project/xc968ev/>.

¹⁴⁹ Etrucks, "XC975EV Electric Loaders," n.d. April 11, 2025. <https://etrucks.co.nz/project/xc975ev/>.

¹⁵⁰ Etrucks, "XC988EV Electric Loaders," n.d. April 11, 2025. <https://etrucks.co.nz/project/xc988ev-loader/>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Loader or Loader-Excavator	Wheeled	XCMG	XC9108EV ¹⁵¹	BE	Yes
Loader or Loader-Excavator	Wheeled	XCMG	XC968-FCEV ¹⁵²	FC	No

¹⁵¹ Etrucks, "XC9108EV Electric Loaders," n.d. April 11, 2025. <https://etrucks.co.nz/project/xc9108ev/>.

¹⁵² ChinaSPV, "World's First! XCMG 6-ton hydrogen-powered loader operated in Shanxi," June 26, 2023. Accessed August 29, 2024. <https://www.chinaspv.com/news/2023/5549.html>.

Commercially Available Container CHE

Table B-2 provides a list of commercially available zero-emission container CHE.

Table B-2: Commercially Available Container CHE

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
AGV	N/A	Kalmar	Fastcharge ¹⁵³	BE	Yes
AGV	N/A	Konecranes	Gottwald AGV ¹⁵⁴	BE	Yes
AGV	N/A	Sany	SIGV8850 ¹⁵⁵	BE	Yes
AGV	N/A	ZPMC	Durapower Battery ¹⁵⁶	BE	No
Rail-Mounted Gantry Crane	N/A	Aicrane	RMG ¹⁵⁷	GE	Yes

¹⁵³ Kalmar, "Kalmar FastCharge™ AGV Data Sheet," 2018. https://www.kalmar.no/globalassets/media/204161/204161_AGV-data-sheet-Web-singles.pdf.

¹⁵⁴ Konecranes, "Planning for a Sustainable Future," 2024. Accessed May 12, 2024. <https://www.konecranes.com/en-us/port-equipment-services/container-handling-equipment/automated-guided-vehicles/agv>.

¹⁵⁵ Sany, "SIGV8850 Intelligent Guided Vehicle," n.d. Accessed April 3, 2025. https://www.sanyglobal.com/product/port_machinery/electric_terminal_tractor/188/1350/.

¹⁵⁶ World Cargo News, "ZPMC supplies PSA Singapore with AGVs made in Malaysia," March 6, 2024. Accessed April 24, 2025. <https://www.worldcargonews.com/news/2024/03/zpmc-supplies-psa-singapore-with-agvs-made-in-malaysia>.

¹⁵⁷ Aicrane, "Rail Mounted Gantry Crane," n.d. Accessed April 4, 2025. <https://aicraneliftingsolution.com/gantry-cranes/rail-mounted/>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Rail-Mounted Gantry Crane	N/A	American Crane & Equipment Corporation (ACECO)	Gantry Crane ¹⁵⁸	GE	Yes
Rail-Mounted Gantry Crane	N/A	Huisman Equipment	ASC ¹⁵⁹	GE	Yes
Rail-Mounted Gantry Crane	N/A	Kalmar	ASC ¹⁶⁰	GE	Yes
Rail-Mounted Gantry Crane	N/A	Konecranes	Munck Cranes ¹⁶¹	GE	Yes
Rail-Mounted Gantry Crane	N/A	Konecranes	RMG ¹⁶²	GE	Yes
Rail-Mounted Gantry Crane	N/A	Kuenz	ASC ¹⁶³	GE	Yes

¹⁵⁸ American Crane, "Maximizing Productivity with Gantry Cranes," n.d. Accessed April 4, 2025. <https://www.americancrane.com/gantry-cranes/>.

¹⁵⁹ Huisman, "Equipped for Impact," n.d. Accessed April 4, 2025. <https://www.huismanequipment.com/en/products/cranes/container-handling-cranes/automated-stacking-cranes>.

¹⁶⁰ Kalmar, "Kalmar ASC System Your Foundation for the Future Today," 2017. <https://www.kalmarglobal.com/48d0fa/globalassets/equipment/automated-stacking-cranes/ASC-system-brochure>.

¹⁶¹ Munck, "Gantry Cranes & Semi Gantry Cranes," n.d. Accessed April 4, 2025. <https://www.munckcranes.com/products/gantry-cranes/>.

¹⁶² Konecranes, "Rail-Mounted Gantry Cranes," n.d. Accessed April 4, 2025. <https://www.konecranes.com/en-us/port-equipment-services/container-handling-equipment/rail-mounted-gantry-cranes>.

¹⁶³ Kuenz, "ASC - Automated Stacking Cranes," n.d. Accessed April 4, 2025. <https://www.kuenz.com/cranes/asc-cranes/>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Rail-Mounted Gantry Crane	N/A	Liebherr	RMG ¹⁶⁴	GE	Yes
Rail-Mounted Gantry Crane	N/A	ZPMC	ASC ¹⁶⁵	GE	Yes
Reach Stacker	N/A	Kalmar	ERG-420 ¹⁶⁶	BE	Yes
Reach Stacker	N/A	Kalmar	ERG-450 ¹⁶⁷	BE	Yes
Reach Stacker	N/A	Sany	SRSC45E ¹⁶⁸	BE	Yes
Reach Stacker	N/A	Taylor Machine Works	ZLC-994 ¹⁶⁹	BE	Yes
Reach Stacker	N/A	Taylor Machine Works	ZLC-995 ¹⁷⁰	BE	Yes
Reach Stacker	N/A	Taylor Machine Works	ZLC-996 ¹⁷¹	BE	Yes

¹⁶⁴ Liebherr, "Rail Mounted Gantry Cranes," n.d. Accessed April 4, 2025. <https://www.liebherr.com/en-us/maritime-cranes/products/port-equipment/rail-mounted-gantry-cranes-4433174?accordionModule-4432225-4432229-10=vantaggi-e-benefici-per-il-cliente&accordionModule-4432225-4432229-10=dati-tecnici#dati-tecnici>.

¹⁶⁵ ZPMC, "News," n.d. Accessed April 4, 2025. <https://www.zpmc.com/news/cont.aspx?id=258>.

¹⁶⁶ Kalmar, "Electric Reachstacker Kalma's Most Sustainable Reachstacker," n.d. Accessed December 5, 2024. <https://www.kalmarglobal.com/equipment/reachstackers/electric-reachstacker/>; Kalmar, "The Kalmar Electric Reachstacker," 2022. https://www.kalmarglobal.com/49c9b7/globalassets/media/268853/268853_Electric-Reachstacker-Brochure_EN2-lr-web.pdf.pdf.

¹⁶⁷ Ibid.

¹⁶⁸ Sany, "SRSC45E 45t Electric Reach Stacker," n.d. Accessed August 29, 2024. https://www.sanyglobal.com/product/port_machinery/reach_stack/58/557/.

¹⁶⁹ California CORE, "Taylor Machine Works ZLC-994," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/zlc-994/>.

¹⁷⁰ California CORE, "Taylor Machine Works ZLC-995," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/zlc-995/>.

¹⁷¹ California CORE, "Taylor Machine Works ZLC-996," n.d. Accessed April 4, 2025. <https://californiacore.org/equipment/zlc-996/>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Reach Stacker	N/A	Taylor Machine Works	ZRS-9972 ¹⁷²	BE	Yes
Reach Stacker	N/A	Terminalift	TL-RS55E ¹⁷³	BE	Yes
Reach Stacker	N/A	XCMG	XCS4531E ¹⁷⁴	BE	No
Rubber-Tired Gantry Crane	N/A	Cavotec	Grid-Electric Conversion ¹⁷⁵	GE	Yes
Rubber-Tired Gantry Crane	N/A	Conductix-Wampfler	Grid-Electric Conversion ¹⁷⁶	GE	[Staff is seeking information.]
Rubber-Tired Gantry Crane	N/A	Electroflex	Grid-Electric Conversion ¹⁷⁷	GE	[Staff is seeking information.]
Rubber-Tired Gantry Crane	N/A	Huadelift	Electric Straddle Carrier ¹⁷⁸	BE	No

¹⁷² Taylor, "ZRS-9972 Electric Lifts," n.d. Accessed April 4, 2025. <https://taylorforklifts.com/products/electric-lift-truck/reach-stacker/ZRS-9972>.

¹⁷³ Terminalift, "Terminalift Electric Container Reach Stacker," n.d. Accessed December 6, 2024. <https://www.terminalift.com/listings/5120201-terminalift-electric-container-reach-stacker>.

¹⁷⁴ China XCMG Group, "Port Machinery XCS4531E Container Reach Stacker," 2023. <https://chinaxcmgroup.com/wp-content/uploads/2023/03/XCS4531E-Container-reach-stacker-pdf.pdf>; XCMG Melbourne, "Container Reach Stacker XCS4531E," n.d. Accessed August 29, 2024. <https://xcmgmelbourne.com.au/products/xcs4531e/>.

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¹⁷⁶ Conductix Wampfler, "Conductix-Wampfler Achieves Several Firsts with Port of Montreal's E-RTG Conversion Project," December 19, 2016. Accessed April 3, 2025. <https://www.conductix.us/en/news/2016-12-16/conductix-wampfler-achieves-several-firsts-port-montreals-e-rtg-conversion-project>.

¹⁷⁷ ElectroFlex, "Case Study Electrification of RTG - Navkar CFS Mumbai," n.d. Accessed April 3, 2025. <https://electroflexengineering.com/case-study/electrification-of-RTG-Navkar-CFS-Mumbai.php>.

¹⁷⁸ Huadelift, "Electric Straddle Carrier | Zero Emissions," September 6, 2024. Accessed April 3, 2025. <https://www.huadelift.com/blog/electric-straddle-carrier-zero-emissions/>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Rubber-Tired Gantry Crane	N/A	Hyundai-Samho	Inductively charged electric RTG ¹⁷⁹	GE	No
Rubber-Tired Gantry Crane	N/A	Kalmar	Fully Electric RTG ¹⁸⁰	BE, GE	Yes
Rubber-Tired Gantry Crane	N/A	Konecranes	Battery, cable reel, and busbar electric power options ¹⁸¹	BE, GE	Yes
Rubber-Tired Gantry Crane	N/A	Liebherr	RTG ¹⁸²	GE	Yes
Rubber-Tired Gantry Crane	N/A	Liebherr	Grid-Electric Conversion ¹⁸³	GE	Yes
Rubber-Tired Gantry Crane	N/A	Mi-Jack	JL1400P ¹⁸⁴	GE	Yes

¹⁷⁹ WorldCargo News, "Hyundai-Samho's Inductive Reasoning," January 7, 2019. Accessed April 8, 2025.

<https://www.worldcargonews.com/cargo-handling-equipment/2019/07/hyundai-samhos-inductive-reasoning/>; "[Hyundai Cranes] Wireless Power Transmission Yard Crane (Eng)," Hyundai Cranes, published on June 25, 201, YouTube video, 3:25. Accessed April 8, 2025. <https://www.youtube.com/watch?v=TDUNsD-XOIM>.

¹⁸⁰ Danny Gill, "Kalmar to Supply TCPH Terminal with Fully Electric RTG Solution," Logistics Manager, October 13, 2020. Accessed April 3, 2025. <https://logistics-manager.com/kalmar-to-supply-tcph-terminal-with-fully-electric-rtg-solution/>.

¹⁸¹ Konecranes, "Konecranes Puts the Battery in RTGs, Straddle Carriers and Mobile Harbor Cranes with Ecolifting," June 15, 2022. Accessed May 12, 2024.

¹⁸² Liebherr, "Rubber Tyre Gantry Cranes," n.d. Accessed April 3, 2025. <https://www.liebherr.com/en-us/maritime-cranes/products/port-equipment/rubber-tyre-gantry-cranes-4433172?accordionModule-4432236-4432241-19=rtg-elettrica#rtg-elettrica>.

¹⁸³ Port Strategy, "Era of the eRTG," January 6, 2023. Accessed April 4, 2025. <https://www.portstrategy.com/era-of-the-ertg/1485459.article>.

¹⁸⁴ Mi-Jack, "JL1400P | Electric RTG Crane," n.d. Accessed June 19, 2024. <https://mi-jack.com/jl1400p-electric-rtg-crane/>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Rubber-Tired Gantry Crane	N/A	PACECO	Grid-Electric Conversion ¹⁸⁵	GE	Yes
Rubber-Tired Gantry Crane	N/A	Vahle	Grid-Electric Conversion ¹⁸⁶	GE	Yes
Rubber-Tired Gantry Crane	N/A	Shanghai Zhenhua Heavy Industries (ZPMC)	Grid-Electric Conversion ¹⁸⁷	GE	Yes
Ship-to-Shore Crane	N/A	Doosan Vina	Electric ship-to-shore crane ¹⁸⁸	GE	Yes
Ship-to-Shore Crane	N/A	Hyundai-Samho	Electric ship-to-shore crane ¹⁸⁹	GE	Yes
Ship-to-Shore Crane	N/A	Kalmar Global	Electric ship-to-shore crane ¹⁹⁰	GE	Yes

¹⁸⁵ Electric Power Research Institute (EPRI), Inc., "Electric Cable Reel Rubber-Tired Gantry Cranes: Costs and Benefits," EPRI, March 2010. <https://restservice.epri.com/publicdownload/000000000001020646/0/Product>.

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¹⁹⁰ Kalmar Global, "Kalmar STS Crane Experience that Counts," Kalmar Global, 2017. https://www.kalmarglobal.com/49b8ec/globalassets/media/9529/9529_STS-Brochure-web-spreads.pdf.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Ship-to-Shore Crane	N/A	Konecranes	Electric ship-to-shore crane ¹⁹¹	GE	Yes
Ship-to-Shore Crane	N/A	Liebherr	Electric ship-to-shore crane ¹⁹²	GE	Yes
Ship-to-Shore Crane	N/A	PACECO-MITSUI	Electric ship-to-shore crane ¹⁹³	GE	Yes
Ship-to-Shore Crane	N/A	Sany	Electric ship-to-shore crane ¹⁹⁴	GE	Yes
Ship-to-Shore Crane	N/A	ZPMC	Electric ship-to-shore crane ¹⁹⁵	GE	Yes
Shuttle and Straddle Carriers	N/A	Hydraulische Straddle Carrier	Electric Straddle Carrier ¹⁹⁶	BE	No
Shuttle and Straddle Carriers	N/A	Kalmar	Fastcharge Straddle ¹⁹⁷	BE	Yes

¹⁹¹ Konecranes, "Ship-to-Shore Crane," n.d. Accessed April 4, 2025. <https://www.konecranes.com/en-us/port-equipment-services/container-handling-equipment/konecranes-ship-to-shore-cranes>.

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¹⁹⁶ Straddle Carrier, "EVA Straddle Carrier," n.d. Accessed April 4, 2025. <https://www.straddlecarrier.de/engl/mobile/smartphone/straddlecarrier/elektrischestraddlecarrier/index.php>.

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CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Shuttle and Straddle Carriers	N/A	Kalmar Global	Electric Straddle Carrier ¹⁹⁸	BE	Yes
Shuttle and Straddle Carriers	N/A	Kone Cranes	Electric Straddle Carrier ¹⁹⁹	BE	Yes
Side Handler	N/A	Kalmar Global	ECG70 ²⁰⁰	BE	Yes
Side Handler	N/A	Kalmar Global	ECG90-110 ²⁰¹	BE	Yes
Side Handler	N/A	Sany	SDCE100K7-T ²⁰²	BE	Yes
Side Handler	N/A	Sany	SDCE90K7 ²⁰³	BE	Yes
Side Handler	N/A	Sany	SDCE90K7E5 ²⁰⁴	BE	Yes
Side Handler	N/A	SOCMA	ECH907E ²⁰⁵	BE	No

¹⁹⁸ Kalmar, "Kalmar Electric Straddle Carrier," n.d. Accessed December 13, 2024. <https://www.kalmarusa.com/equipment/straddle-carriers/electric-straddle-carrier/>.

¹⁹⁹ Konecranes, "Features and Technical Information Konecranes Noell Straddle Carriers," May 2023. https://www.konecranes.com/sites/default/files/2023-05/Konecranes_Straddle_Carriers_tech_document_2023.pdf.

²⁰⁰ Kalmar USA, "Electric Empty Container Handler," n.d. Accessed April 8, 2025. <https://www.kalmarusa.com/equipment/masted-container-handlers/electric-empty-handler-ecg70/>.

²⁰¹ Kalmar USA, "Kalmar Electric Empty Container Handler," n.d. Accessed April 8, 2025. <https://www.kalmarusa.com/equipment/masted-container-handlers/electric-empty-container-handler-ecg90-110/>.

²⁰² Sany, "SCDE100K7-T 10t Electric Empty Container Handler," n.d. Accessed April 8, 2025. https://www.sanyglobal.com/product/port_machinery/empty_container_handler/67/694/.

²⁰³ Sany, "Electric Empty Container Handler the Pioneer in Electric ECH," n.d. Accessed August 29, 2024. https://www.sanyglobal.com/product/port_machinery/empty_container_handler/67/.

²⁰⁴ Sany Europe, "SCD90K7E5 - Full Electric Empty Container Handler Sustainable Technology for Your Container Logistics," n.d. Accessed April 8, 2025. <https://www.sanyeurope.com/en/produkte/hafenmaschinen/sdce90k7e5/>.

²⁰⁵ Socma, "9tons 9t Electric Empty Handler ECH," n.d. Accessed August 29, 2024. <https://www.socma-forklift.com/reach-stacker/9tons-9t-electric-empty-container-handler-ech.html>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Side Handler	N/A	Taylor Machine Works	ZEC-205/6 ²⁰⁶	BE	Yes
Side Handler	N/A	Taylor Machine Works	ZEC-206/7 ²⁰⁷	BE	Yes
Side Handler	N/A	Taylor Machine Works	ZEC-207/8 ²⁰⁸	BE	Yes
Side Handler	N/A	XCMG	XCH907E ²⁰⁹	BE	Yes
Top Handler	N/A	Taylor Machine Works	ZLC-994 ²¹⁰	BE	Yes
Top Handler	N/A	Taylor Machine Works	ZLC-995 ²¹¹	BE	Yes
Top Handler	N/A	Taylor Machine Works	ZLC-996 ²¹²	BE	Yes

²⁰⁶ Taylor Machine Works, "ZEC-205/6 Electric Lifts," n.d. Accessed April 8, 2025. <https://taylorforklifts.com/products/electric-lift-truck/empty-container-handler/ZEC-205/6>.

²⁰⁷ Taylor Machine Works, "ZEC-206/7 Electric Lifts," n.d. Accessed April 8, 2025. <https://taylorforklifts.com/products/electric-lift-truck/empty-container-handler/ZEC-206/7>.

²⁰⁸ Taylor Machine Works, "ZEC-207/8 Electric Lifts," n.d. Accessed April 8, 2025. <https://taylorforklifts.com/products/electric-lift-truck/empty-container-handler/ZEC-207/8>.

²⁰⁹ Machmall, "XCMG 9 tons Empty Container Handler XCH907E Pure Electric Container Reach Stacker," n.d. Accessed August 29, 2025. <https://www.machmall.com/item-detail/xcmg-xch907e-6778.html>.

²¹⁰ Taylor Machine Works, "ZLC-994 Electric Lifts," n.d. Accessed April 25, 2025. <https://taylorforklifts.com/products/electric-lift-truck/loaded-container-handler/zlc-994>.

²¹¹ Taylor Machine Works, "ZLC-995 Electric Lifts," n.d. Accessed April 8, 2025. <https://taylorforklifts.com/products/electric-lift-truck/loaded-container-handler/ZLC-995>.

²¹² Taylor Machine Works, "ZLC-996 Electric Lifts," n.d. Accessed April 8, 2025. <https://taylorforklifts.com/products/electric-lift-truck/loaded-container-handler/ZLC-996>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Yard Truck	N/A	Autocar	E-ACTT ²¹³	BE	Yes
Yard Truck	N/A	Autocar	E-ACTT 4x2 MY2025/2026 Off-Road ²¹⁴	BE	Yes
Yard Truck	N/A	Autocar	E-ACTT 4x2 DOT ²¹⁵	BE	Yes
Yard Truck	N/A	BYD/Ride	8Y ²¹⁶	BE	Yes
Yard Truck	N/A	Easy Mile	TractEasy ²¹⁷	BE	Yes
Yard Truck	N/A	Hyster-Yale	182,000 GCWR ²¹⁸	BE	Yes
Yard Truck	N/A	Kalmar	T2 EV ²¹⁹	BE	Yes

²¹³ Autocar Truck, "Autocar, LLC Launches the E-Actt, An Emissions-Free, All-Electric Terminal Tractor," May 13, 2021. Accessed April 8, 2025. <https://www.autocartruck.com/news/autocar-llc-launches-the-e-actt-an-emissions-free-all-electric-terminal-tractor>.

²¹⁴ California CORE, "Autocar Trucks E-ACTT 4x2 MY2025/2026 Off-Road," n.d. Accessed April 8, 2025. <https://californiacore.org/equipment/e-actt-4x2-my2025-2026/>.

²¹⁵ California CORE, "Autocar Trucks E-ACTT 4x2 Off-Road," n.d. Accessed April 15, 2025. <https://californiacore.org/equipment/e-actt4x2-on-road/>.

²¹⁶ California CORE, "BYD 8Y (Off-Road)," n.d. Accessed April 8, 2025. <https://californiacore.org/equipment/8y-off-road/>; California CORE, "BYD 8Y (Off-Road)," n.d. Accessed April 8, 2025. <https://californiacore.org/equipment/8y/>; California CORE, "BYD 8Y (On-Road)," n.d. Accessed April 8, 2025. <https://californiacore.org/equipment/8y-on-road/>; California CORE, "BYD 8Y (On-Road)," n.d. Accessed April 8, 2025. <https://californiacore.org/equipment/8y-on-road-2/>.

²¹⁷ Easy Mile, "EZTow Autonomous Tow Tractor," n.d. Accessed April 8, 2025. <https://easymile.com/vehicle-solutions/EZTow>.

²¹⁸ Hyster, "Hyster to Supply 10 Zero-Emission Battery Electric Terminal Tractors to APM Terminals," March 4, 2024. Accessed April 8, 2025. <https://www.hyster.com/en-us/north-america/why-hyster/press-releases/2024/hyster-to-supply-10-electric-terminal-tractors-to-apm-terminals/>.

²¹⁹ Kalmar Ottawa, "T2 EV Electric Terminal Tractor," January 27, 2025. <https://www.kalmarottawa.com/terminal-tractors/t2-ev-electric-terminal-tractor-yard-truck/>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Yard Truck	N/A	Kalmar	TX Electric Terminal Tractor ²²⁰	BE	Yes
Yard Truck	N/A	Lonestar	S12 ²²¹	BE	Yes
Yard Truck	N/A	Lonestar	S22 ²²²	BE	Yes
Yard Truck	N/A	MAFI	MAFI T 230 e ²²³	BE	Yes
Yard Truck	N/A	Orange	eTriever ²²⁴	BE	Yes
Yard Truck	N/A	Orange	Husk-e ²²⁵	BE	Yes
Yard Truck	N/A	Orange	Husk-e XP ²²⁶	BE	Yes
Yard Truck	N/A	Sany	SM4256 ²²⁷	BE	Yes
Yard Truck	N/A	Sany	SM4600 ²²⁸	BE	Yes
Yard Truck	N/A	Sany	SM4602 ²²⁹	BE	Yes
Yard Truck	N/A	Terberg	YT203-EV ²³⁰	BE	Yes

²²⁰ Kalmar, "Kalmar TX Electric Terminal Tractor," n.d. Accessed April 15, 2025. <https://www.kalmarglobal.com/equipment/terminal-tractors/tx-electric-terminal-tractor-shunt-truck/>.

²²¹ Lonestar SV, "Electric Terminal Tractors 4x2," n.d. Accessed December 10, 2024. <https://www.lonestarsv.com/4x2models>.

²²² Lonestar SV, "Electric Terminal Tractors 4x2," n.d. Accessed December 10, 2024. <https://www.lonestarsv.com/4x2models>.

²²³ Mafi, "Overview MAFI Products," n.d. Accessed April 8, 2025. <https://mafi.de/en/products/#tractorselectric-terminal-tractor-t-230e/>.

²²⁴ Orange, "Orange EV e-Triever," n.d. Accessed April 15, 2025. <https://orangeev.com/etriever/>.

²²⁵ Orange, "Orange EV Husk-e," n.d. Accessed April 15, 2025. <https://orangeev.com/huske-2/>.

²²⁶ Ibid.

²²⁷ Sany, "SM4256 Electric Terminal Tractor," n.d. Accessed August 29, 2024. https://www.sanyglobal.com/product/port_machinery/electric_terminal_tractor/188/1346/.

²²⁸ Sany, "SM4600 Electric Terminal Tractor," n.d. Accessed April 8, 2025. https://www.sanyglobal.com/product/port_machinery/electric_terminal_tractor/188/1347/.

²²⁹ Sany, "SM4602 Electric Terminal Tractor," n.d. Accessed April 8, 2025. https://www.sanyglobal.com/product/port_machinery/electric_terminal_tractor/188/1349/.

²³⁰ Terberg Special Vehicles, "YT193/YT223 Yard and Terminal Tractor," n.d. December 10, 2024. <https://www.terbergspecialvehicles.com/en/vehicles/terminal-tractors/>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Yard Truck	N/A	Tico	Pro-Spotter Electric ²³¹	BE	Yes
Yard Truck	N/A	TrovaCV	Terminal Tractor ²³²	BE	Yes

²³¹ Tico Tractors, "Tico Pro-Spotter EV Electric Terminal Tractor," n.d. Accessed April 8, 2025. <https://ticotracactors.com/tico-pro-spotter-ev/>.

²³² Jim Park, "TrovaCV, Chateau Energy Solutions Team Up for Simplified, Low-Cost EV Deployment," Truckinginfo, March 7, 2023. Accessed April 8, 2025. <https://www.truckinginfo.com/10194305/trovacv-chateau-energy-solutions-team-up-for-simplified-low-cost-ev-deployment>.

Commercially Available Facility Support CHE

Table B-3 provides a list of commercially available zero-emission facility support CHE.

Table B-3: Commercially Available Facility Support CHE

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Aerial Lift	N/A	ACN Truck Trading Company	Mobile Electric Boom Lift 14m ²³³	BE	No
Aerial Lift	N/A	Jenie	Z-30/20 N and RJ ²³⁴	BE	Yes
Aerial Lift	N/A	Jenie	Z-34/22 N / Z-34/22 DC ²³⁵	BE	Yes
Aerial Lift	N/A	Jenie	Z-40/23 N / Z-40/23 N RJ ²³⁶	BE	Yes
Aerial Lift	N/A	Jenie	Z-45 DC ²³⁷	BE	Yes
Aerial Lift	N/A	Jenie	Z-60 DC ²³⁸	BE	Yes
Aerial Lift	N/A	JLG	EC600 Series ²³⁹	BE	Yes

²³³ Made-in-China, "Mobile Electric Boom Lift 14m Height Aerial Work Platform," n.d. Accessed April 8, 2025. <https://acntruck.en.made-in-china.com/product/mZiGSNDPhEYK/China-Mobile-Electric-Boom-Lift-14m-Height-Aerial-Work-Platform.html>.

²³⁴ Genie, "Z-30/20 N RJ Articulated Boom Lifts," n.d. Accessed April 8, 2025. <https://www.genielift.com/en/aerial-lifts/articulated-boom-lifts/z3020nrj>.

²³⁵ Genie, "Electric Lifts and Hybrid Lifts," n.d. Accessed April 8, 2025. <https://www.genielift.com/en/aerial-lift/electric-hybrid-lifts#hybrid>.

²³⁶ Ibid.

²³⁷ Genie, "Electric Lifts and Hybrid Lifts," n.d. Accessed April 8, 2025. <https://www.genielift.com/en/aerial-lift/electric-hybrid-lifts#hybrid>.

²³⁸ Ibid.

²³⁹ JLG Industries, "Telescopic Boom Lifts EC600 & H600 Series," n.d. Accessed December 13, 2024. <https://www.jlg.com/equipment/boom-lifts/telescopic/electric-hybrid/ec600-and-h600-series>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Aerial Lift	N/A	JLG	H600 Series ²⁴⁰	BE	Yes
Aerial Lift	N/A	Niftylift	SP34 ²⁴¹	BE	Yes
Aerial Lift	N/A	Niftylift	SP45 ²⁴²	BE	Yes
Aerial Lift	N/A	Niftylift	SP45H ₂ E (HR15 in Europe) ²⁴³	HFC	Yes
Aerial Lift	N/A	Niftylift	SP50 ²⁴⁴	BE	Yes
Aerial Lift	N/A	Niftylift	SP50 H ₂ E (HR17 in Europe) ²⁴⁵	HFC	Yes
Aerial Lift	N/A	Niftylift	SP64 ²⁴⁶	BE	Yes
Aerial Lift	N/A	Niftylift	SP85 ²⁴⁷	BE	Yes

²⁴⁰ JLG Industries, "Telescopic Boom Lifts EC600 & H600 Series," n.d. Accessed December 13, 2024. <https://www.jlg.com/equipment/boom-lifts/telescopic/electric-hybrid/ec600-and-h600-series>.

²⁴¹ NiftyLift, "Self Propelled – Electric Booms," n.d. Accessed April 8, 2025. <https://www.niftylift.com/usa/products/self-propelled-electric>.

²⁴² Ibid.

²⁴³ Jordanne Waldschmidt, "UK Companies Launch World's First Hydrogen-Electric Powered Access Platform," Equipment World, July 17, 2023. Accessed April 8, 2025. <https://www.equipmentworld.com/aeriallifting-equipment/aerial-lifts/article/15542244/the-worlds-first-hydrogenelectric-powered-access-platform>; "Hydrogen-Electric: The Future of Green Construction," Niftylift, n.d. Accessed April 8, 2025. <https://www.niftylift.com/usa/innovations/hydrogen-electric>; "Introducing the Hydrogen-Electric HR15E & HR17E," Niftylift, n.d., Accessed April 8, 2025. https://www.niftylift.com/application/files/9117/1164/9242/HR15E_-_HR17E_Hydrogen-Electric_2-Page_IS-01.pdf.

²⁴⁴ NiftyLift, "Self Propelled – Electric Booms," n.d. Accessed April 8, 2025. <https://www.niftylift.com/usa/products/self-propelled-electric>.

²⁴⁵ Jordanne Waldschmidt, "UK Companies Launch World's First Hydrogen-Electric Powered Access Platform," Equipment World, July 17, 2023. Accessed April 8, 2025. <https://www.equipmentworld.com/aeriallifting-equipment/aerial-lifts/article/15542244/the-worlds-first-hydrogenelectric-powered-access-platform>; "Hydrogen-Electric: The Future of Green Construction," Niftylift, n.d. Accessed April 8, 2025. <https://www.niftylift.com/usa/innovations/hydrogen-electric>; "Introducing the Hydrogen-Electric HR15E & HR17E," Niftylift, n.d., Accessed April 8, 2025. https://www.niftylift.com/application/files/9117/1164/9242/HR15E_-_HR17E_Hydrogen-Electric_2-Page_IS-01.pdf.

²⁴⁶ NiftyLift, "Self Propelled – Electric Booms," n.d. Accessed April 8, 2025. <https://www.niftylift.com/usa/products/self-propelled-electric>.

²⁴⁷ Ibid.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Aerial Lift	N/A	XCMG	XGA20K Boom Lift ²⁴⁸	BE	Yes
Aerial Lift	N/A	XCMG	XGA60ACJ Boom Lift ²⁴⁹	BE	Yes
Aerial Lift	N/A	XCMG	XGS20AC Boom Lift ²⁵⁰	BE	Yes
Aerial Lift	N/A	YG-Mechanical	Hydraulic Electric Diesel Boom Lift ²⁵¹	BE	Yes
Cone Vehicle	N/A	JCB Incorporated	S1932E ²⁵²	BE	Yes
Cone Vehicle	N/A	MEC	Nano10-XD ²⁵³	BE	Yes
Cone Vehicle	N/A	Motrec	MX-700 ²⁵⁴	BE	Yes
Cone Vehicle	N/A	XCMG	XG2225RT ²⁵⁵	BE	Yes
Railcar Mover	N/A	Colmar	Railcar Mover ²⁵⁶	BE	No

²⁴⁸ "XCMG 20m Articulated Boom Lift XGA20K," XCMG Machmall, published on July 11, 2021, YouTube video, 1:03. Accessed April 8, 2025. <https://www.youtube.com/watch?v=w-iL9TgrWjo>.

²⁴⁹ CanLift, "XCMG XGA60ACJ Boom Lift," n.d. Accessed April 8, 2025. <https://www.canlift.ca/equipment/xcmg/xga60acj/>.

²⁵⁰ Machmall, "XCMG XGS20AC Electric Telescopic Lift 20m Aerial Lift," n.d. Accessed April 15, 2025. <https://www.machmall.com/item-detail/XCMG-XGS20AC-electric-telescopic-lift-20m-aerial-lift-platform-price-9533.html>.

²⁵¹ Amazon, "Hydraulic Electric Diesel Boom Lift Folding Arm Articulated Platform Manlift Aerial Work Platform Self Propelled boom Lift," n.d. Accessed April 8, 2025. https://www.amazon.com/dp/B0DDKPYNJW?ref=cm_sw_r_cp_ud_dp_JX1EF9DQGHEASHWYT3WB&ref_=cm_sw_r_cp_ud_dp_JX1EF9DQGHEASHWYT3WB&social_share=cm_sw_r_cp_ud_dp_JX1EF9DQGHEASHWYT3WB&peakEvent=5&dealEvent=0.

²⁵² JCB, "Electric Scissors," n.d. Accessed December 11, 2024. <https://www.jcb.com/en-us/products/access-platforms/electric-scissors>.

²⁵³ Mec Aerial Work Platforms, "NetZero™-All Electric Lifts," n.d. Accessed April 8, 2025. <https://www.mecawp.com/about-mec/mec-netzero-all-electric-lifts/>.

²⁵⁴ Motrec, "MX 700 The Best Way to Work at a Height," n.d. Accessed April 8, 2025. <https://motrec.com/vehicles/series/mx-series/mx-700/>.

²⁵⁵ Vertikal.net, "New 66t Electric RT Scissor," July 15, 2024. Accessed April 8, 2025. <https://vertikal.net/en/news/story/44235/new-66t-electric-rt-scissor>.

²⁵⁶ Colmar Equipment, "Railroad Equipment Mobile Railcar Movers Electric," n.d. Accessed April 8, 2025. <https://www.colmarequipment.com/en/equipment/railway/railcar-movers-electric>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Railcar Mover	N/A	Nordco	NVX- Electric ²⁵⁷	BE	Yes
Railcar Mover	N/A	RailQuip	B-MAXI ²⁵⁸	BE	No
Railcar Mover	N/A	Shuttlewagon	NVX-E140 ²⁵⁹	BE	Yes
Railcar Mover	N/A	Shuttlewagon	NVX-E200 ²⁶⁰	BE	Yes
Railcar Mover	N/A	Shuttlewagon	SWX e90 ²⁶¹	BE	Yes
Railcar Mover	N/A	Shuttlewagon	SWX e120 ²⁶²	BE	Yes
Railcar Mover	N/A	Shuttlewagon	SWX e160 ²⁶³	BE	Yes
Railcar Mover	N/A	Zephir	EZ1 ²⁶⁴	BE	Yes
Railcar Mover	N/A	Zephir	EZ3 ²⁶⁵	BE	Yes
Railcar Mover	N/A	Zephir	EZ5 ²⁶⁶	BE	Yes
Railcar Mover	N/A	Zephir	LOK 5.5 MPV E ²⁶⁷	BE	Yes

²⁵⁷ Nordco, "Navigator; Electric NVX-Electric," n.d. Accessed April 8, 2025. <https://www.nordco.com/products-catalog/mobile-rail-car-movers/navigator-series/NVX5025e.htm>.

²⁵⁸ Railquip, "Catalog Products & Services," 2024. <https://railquip.com/railcar-movers/>.

²⁵⁹ California CORE, "Railcar Mover and Freight Locomotives," n.d. Accessed April 5, 2025. <https://californiacore.org/equipment-category/railcar-movers-switchers/?oem=123>.

²⁶⁰ California CORE, "Railcar Mover and Freight Locomotives," n.d. Accessed April 5, 2025. <https://californiacore.org/equipment-category/railcar-movers-switchers/?oem=123>.

²⁶¹ Ibid.

²⁶² Ibid.

²⁶³ Ibid.

²⁶⁴ Zephir, "Leading Innovators of Railcar Shunting Technology Products Overview," 2024. https://zephir.eu/cms/wp-content/uploads/2024/05/New_Brochure-Zephir_2024-USA.pdf.

²⁶⁵ Ibid.

²⁶⁶ Ibid.

²⁶⁷ Foursite Pape Production, "Electric Railcar Mover LOK 5.5 E - MPV," August 2018. <https://foursite-pape-production.s3.amazonaws.com/papemh.com/f4de48b0-edce-4bac-97e6-a521a15ac8ab.pdf>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Railcar Mover	N/A	Zephir	LOK 7.90 E ²⁶⁸	BE	Yes
Railcar Mover	N/A	Zephir	LOK 10.90 E ²⁶⁹	BE	Yes
Railcar Mover	N/A	Zephir	LOK 13.90 E ²⁷⁰	BE	Yes
Railcar Mover	N/A	Zephir	LOK 16.150 E ²⁷¹	BE	Yes
Railcar Mover	N/A	Zephir	LOK 20.150 E ²⁷²	BE	Yes
Railcar Mover	N/A	Zephir	LOK 22.150 E ²⁷³	BE	Yes
Utility Truck, Other	Battery Swap Vehicle	Sany	SM5180 ²⁷⁴	BE	Yes
Utility Truck, Other	Cab-chassis	Battle Motors	LNT Electric ²⁷⁵	BE	Yes
Utility Truck, Other	Cab-chassis	GreenPower	EV Star ²⁷⁶	BE	Yes

²⁶⁸ Zephir, "Leading Innovators of Railcar Shunting Technology Products Overview," 2024. https://zephir.eu/cms/wp-content/uploads/2024/05/New_Brochure-Zephir_2024-USA.pdf.

²⁶⁹ Ibid.

²⁷⁰ Zephir, "Leading Innovators of Railcar Shunting Technology Products Overview," 2024. https://zephir.eu/cms/wp-content/uploads/2024/05/New_Brochure-Zephir_2024-USA.pdf.

²⁷¹ Ibid.

²⁷² California CORE, "Railcar Mover and Freight Locomotives," n.d. Accessed April 5, 2025. <https://californiacore.org/equipment-category/railcar-movers-switchers/?oem=123>.

²⁷³ Zephir, "Leading Innovators of Railcar Shunting Technology Products Overview," 2024. https://zephir.eu/cms/wp-content/uploads/2024/05/New_Brochure-Zephir_2024-USA.pdf.

²⁷⁴ Sany, "SM5180 Battery-Swap Mobile Vehicle," n.d. Accessed April 8, 2025. https://www.sanyglobal.com/product/port_machinery/electric_terminal_tractor/188/1348/.

²⁷⁵ California HVIP, "Battle Motors LNT Battery Electric Vehicle," n.d. Accessed April 15, 2025. <https://californiahvip.org/vehicles/battle-motors-lnt-battery-electric-vehicle-class6-7/>.

²⁷⁶ GreenPower Motor Company, "EV Star Cab & Chassis features," n.d. Accessed April 8, 2025. <https://greenpowermotor.com/gp-products/ev-star-cc/>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Utility Truck, Other	Cab-chassis	Lightning	ZEV4 ²⁷⁷	BE	Yes
Utility Truck, Other	Cab-chassis	R3E	P7-C ²⁷⁸	BE	No
Utility Truck, Other	Cab-chassis	Zeus	Z19 ²⁷⁹	BE	Yes
Utility Truck, Other	Cab-chassis	Zeus	Z22 ²⁸⁰	BE	Yes
Utility Truck, Other	Straight	BYD	6F ²⁸¹	BE	Yes
Utility Truck, Other	Straight	BYD	6F Plus ²⁸²	BE	Yes
Utility Truck, Other	Straight	BYD	6R ²⁸³	BE	Yes
Utility Truck, Other	Straight	Freightliner	eM2 ²⁸⁴	BE	Yes
Utility Truck, Other	Straight	Kenworth	K270E ²⁸⁵	BE	Yes

²⁷⁷ Lightning eMotors, "Lightning ZEV4TM Utility/Service Truck," December 2023. Accessed December 23, 2024.

https://www.bing.com/search?q=lightning+ZEV4tm+Utility%2Fservice+truck&cid=4a3f9f0319234c8b911d9c2ff421a64b&gs_lcrp=EgRIZGdIKgYIABBFdKyBggAEEUYOTIICAQ6QcY_FXSAQkxMzQxNWowajSoAgiwAgE&FORM=ANAB01&PC=U531.

²⁷⁸ Ree Auto, "P7-C Chassis Cab Medium-Duty Electric Commercial Truck," n.d. Access December 29, 2024. <https://ree.auto/vehicles/p7-c-chassis-cab/>.

²⁷⁹ Zeus Electric Chassis, "Zeus Electric Chassis Signs Their First Dealer Agreement to Distribute Class 5 Zero Emission Work Trucks," October 24, 2024. Accessed December 19, 2025. <https://zeuselectricchassis.com/zeus-electric-chassis-signs-their-first-dealer-agreement-to-distribute-class-5-zero-emission-work-trucks/>.

²⁸⁰ Zeus Electric Chassis, "Zeus Electric Chassis Z-19 & Z-22 Receive Executive Order from California Air Resources Board," April 14, 2022. Accessed April 8, 2025. <https://zeuselectricchassis.com/zeus-electric-chassis-z-19-z-22-receive-executive-order-from-california-air-resources-board/>.

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²⁸² Ibid.

²⁸³ Ibid.

²⁸⁴ GreenPower Motor Company, "EV Star Cab & Chassis Features," n.d. Accessed December 19, 2024. <https://greenpowermotor.com/gp-products/ev-star-cc/>.

²⁸⁵ Kenworth, "K270E / K370E," n.d. Accessed April 8, 2025. <https://www.kenworth.com/trucks/k270e-k370e/>.

CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Utility Truck, Other	Straight	Kenworth	K370E ²⁸⁶	BE	Yes
Utility Truck, Other	Straight	Lion	LION6 ²⁸⁷	BE	Yes
Utility Truck, Other	Straight	Lion	LION8 ²⁸⁸	BE	Yes
Utility Truck, Other	Straight	Mack	MD BE Straight Truck ²⁸⁹	BE	Yes
Utility Truck, Other	Straight	Navistar	eMV ²⁹⁰	BE	Yes
Utility Truck, Other	Straight	Peterbilt	220EV ²⁹¹	BE	Yes
Utility Truck, Other	Vocational/ePTO	Peterbilt	567EV ²⁹²	BE	Yes
Utility Truck, Other	Straight	Volvo	VNRe Class 7 ²⁹³	BE	Yes
Utility Truck, Other	Straight	Volvo	VNRe Class 8 ²⁹⁴	BE	Yes
Utility Truck, Other	Straight	XOS	CC ²⁹⁵	BE	Yes
Utility Truck, Other	Straight	XOS	CV ²⁹⁶	BE	Yes

²⁸⁶ Ibid.

²⁸⁷ California HVIP, "Lion Electric Lion LION6 Battery Electric Truck," n.d. Accessed April 15, 2025. <https://californiahvip.org/vehicles/lion-lion6-battery-electric-truck/>.

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CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Utility Trucks, Sweeper	N/A	Aebi Schmidt/Shyft	eCityJet 3030 ²⁹⁷	BE	No
Utility Trucks, Sweeper	N/A	Aebi Schmidt/Shyft	eCleango 550 ²⁹⁸	BE	No
Utility Trucks, Sweeper	N/A	Aebi Schmidt/Shyft	eSwingo 200+ ²⁹⁹	BE	No
Utility Trucks, Sweeper	N/A	Bai Yi	BY-S50 ³⁰⁰	BE	No
Utility Trucks, Sweeper	N/A	Bucher Municipal	MaxPowa V65e ³⁰¹	BE	Yes
Utility Trucks, Sweeper	N/A	Boschung	Urban-Sweeper S2.0 ³⁰²	BE	No
Utility Trucks, Sweeper	N/A	BYD/CBM	16 CBM ³⁰³	BE	No

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²⁹⁹ "Sweepers | eSwingo 200+ | Aebi Schmidt Group." n.d. Accessed April 17, 2025. <https://www.aebi-schmidt.com/en/products/schmidt/sweepers/eswingo-200/>.

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Utility Trucks, Sweeper	N/A	Dulevo	D.Zero ²³⁰⁴	BE	Yes
Utility Trucks, Sweeper	N/A	Elgin	Electric Broom Bear ³⁰⁵	BE	Yes
Utility Trucks, Sweeper	N/A	Global	M3EV ³⁰⁶	BE	Yes
Utility Trucks, Sweeper	N/A	Global	M4EV ³⁰⁷	BE	Yes
Utility Trucks, Sweeper	N/A	Global	M4EVHSD ³⁰⁸	FC	Yes
Utility Trucks, Sweeper	N/A	Green Machines	500H2 ³⁰⁹	FC	No
Utility Trucks, Sweeper	N/A	Johnston Sweepers	EVIE ³¹⁰	BE	No

Itruck Import & Export Trading Co., Ltd. n.d. Accessed April 17, 2025. https://www.alibaba.com/product-detail/Chinese-12-Tons-Electric-Street-Sweepers_1600738402118.html.

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³⁰⁶ Global Environmental Products, "M3EV," n.d. Accessed April 8, 2025. <https://globalsweeper.com/products/mechanical/m3-electric-100-plug-in>.

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CHE Type	CHE Sub-Category	Manufacturer	Platform/Model	Fuel Type/ Power Source	Commercially Available in the US?
Utility Trucks, Sweeper	N/A	Tenax International	Electra 1.0 ³¹¹	BE	No
Utility Trucks, Sweeper	N/A	Tenax International	Electra 2.0 evos ³¹²	BE	No
Utility Trucks, Sweeper	N/A	Tenax International	Electra 5.0 ³¹³	BE	No

³¹¹ Tenax International, "Electra 1.0.," n.d. Accessed: April 18, 2025. <https://www.tenaxinternational.com/en/prodotto/street-sweepers-electra-1/>.

³¹² Tenax International, "Electra 2.0 evos +," n.d. Accessed: April 18, 2025. https://www.tenaxinternational.com/us/prodotto/electra-2-0-evos/?_gl=1*1jm20ws*_up*MQ..*_ga*MzczMDA1OTY0LjE3NDQ5MzUzNzM.*_ga_GR6RYHLV89*MTc0NDkzNTM3MS4xLjEuMTc0NDkzNTQ5NS4wLjAuOTcxNDQ5MDIx.

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