

CARB Advanced Clean Off-Road Equipment List Fact Sheet



Air Quality Planning and Science Division
Mobile Source Analysis Branch
Off-Road Diesel Analysis Section
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Executive Summary

Advanced Clean Equipment, including zero-emission and hybrid technologies, has a huge potential to reduce criteria pollutants and GHG emissions from off-road sources and contribute to meeting climate change goals, addressing regional air quality, and reducing exposure to air toxics in disadvantaged communities.

California Air Resources Board (CARB) staff has compiled and updated a list of zero-emission (ZE) and hybrid equipment models and energy supply and storage systems (CARB staff defined as alternative charging solutions).

This list provides a valuable technology snapshot in off-road sectors and this will be a reference to show electrification potential by equipment type and manufacturer. Since 2020, 554 equipment models have been added to the list and Table 1 shows the number of equipment models per sector per technology type. It also includes temporal energy storage and portable energy supply options expected to overcome the limitation of battery-electric technology and electrify more medium- and heavy-duty equipment types.

Table 1. Number of the listed equipment models by electrification type

Category	Number of equipment models (8/14/2023)
Electric Construction and Mining Equipment	299
Alternative Charging Solutions	50
H2FC Construction and Mining Equipment	7
Hybrid Construction and Mining Equipment	56
Grid-electric Construction & Industrial Equipment	36
Clean Agricultural Equipment	30
Electric Industrial & Forklift & Airport GSE	59
Hybrid Industrial Equipment Categories	17
Total	554

Advanced Clean Equipment (ACE) List

Off-road equipment (ORE) sector includes a broad spectrum of equipment and vehicle types, such as construction, agricultural, industrial, cargo handling equipment, locomotive, marine vessels, etc. Each ORE sector has unique operational characteristics and mechanical features.

ORE manufacturers have put a significant effort into implementing various zero-emission technologies into their conventionally fueled equipment. Many demonstration projects are currently underway, with a growing number becoming commercially accessible. This web page serves as a platform for showcasing zero-emission off-road equipment cases (as recognized by CARB) that are currently available in the market or are in various stages of research, development, or demonstration. By sharing this list, CARB's staff intends to achieve the following objectives:

- Compile and disseminate a comprehensive inventory of global efforts by off-road equipment manufacturers towards achieving zero emissions.
- Introduce temporary energy storage and portable energy supply alternatives.
- Provide a reference for evaluating the potential for electrification within the off-road sectors.

Engine power and battery capacity information may be subject to change as manufacturers continue to develop and update their demonstration project units.

Please contact us via junhyeong.park@arb.ca.gov if you have found unlisted zero-emission equipment cases or new information. We want to add powertrain and battery manufacturer information, too. Powertrain performance information is coming up soon.

Electric Construction and Mining Equipment

Equipment Type	Make	Model	Description	CORE Eligibility
Excavators	Pon / Caterpillar	323 Z-Line	Electric 26-Ton Excavator	
Excavators	Pon / Caterpillar	320 Z-line	Electric 25-Ton Excavator	
Excavators	Pon / Caterpillar	310 Z-line	Electric 12-Ton Excavator	
Excavators	Volvo CE	EX2	World's first fully electric compact excavator prototype according to the advertisement.	
Excavators	Volvo CE	ECR25	Trench digging equipment. Operating time is up to 4 hours	
Excavators	Volvo CE	EC18	Electric Compact Excavator	
Excavators	Volvo CE	ECR18	Electric Compact Excavator	
Excavators	Volvo CE	EC230 E	22-metric-ton EC230 electric excavator	O
Excavators	XCMG	XE35U-E	Cummins BM5.7E battery modules	
Excavators	Suncar HK	TB216e	Electric Excavator	
Excavators	Suncar HK	TB260e	Electric Excavator	
Excavators	Suncar HK	TB1140e	Electric Excavator	
Excavators	Doosan	DX300LC Electric	30 ton crawler excavator	
Excavators	Doosan	DX140	Electric Excavator	
Excavators	Doosan	DX165W	16.5 tonne excavator	
Excavators	Doosan	DX300	30 tonne excavator with battery swapping system	

Equipment Type	Make	Model	Description	CORE Eligibility
Excavators	Doosan	DX340	Electric Excavator	
Excavators	Doosan	DX380/420	Electric Excavator	
Excavators	Doosan	DX480/520	Electric Excavator	
Excavators	Komatsu	PC210LCE	20-ton excavator	
Excavators	Doosan & Danfoss		16-ton wheel excavator with battery swapping tech	
Excavators	Doosan & Danfoss		30-ton crawler excavator with battery swapping tech	
Excavators	Hyundai	HX 260 ALE	26 ton crawler excavator with interchangeable battery packs	
Excavators	Hyundai	HW 140	15 ton rubber wheeled excavator with interchangeable battery packs	
Excavators	Hitachi	Zeron ZE160LC peakshaver+		
Excavators	Hitachi / Nasta	ZE85		
Excavators	HIDROMEK	HMK 70W	rubber wheeled excavator	
Excavators	LiuGong	906E-EV	6 ton class tracked excavator	
Excavators	LiuGong	922F-EV	22 ton class tracked excavator	
Excavators	LiuGong	924FTN-EV	Tracked excavator	
Excavators	HEVI Greenland Electric	GEX-8000		
Excavators	Scoma	12 ton wheeled excavator	wheeled excavator	
Excavators	Scoma	8ton wheeled excavator	wheeled excavator	
Excavators	Jingong Machinery	JGM9085e	5-ton wheeled excavator	
Excavators	SDLG	E660F-Ex	6 ton capacity tracked excavator	
Excavators	Sinomach	323Ev		
Excavators	Sinomach	950E		
Excavators	Bosch		wheeled excavator concept / wheeled excavator design exercise by Tier 1 supplier	
Excavators	Sany	SY215E	20ton excavator, dual gun charging, DCFC	
Excavators	NULLUTSLIPP AS / Kubota	U17-3	Battery electric excavator	
Excavators	NULLUTSLIPP AS / Kubota	KX019-4	Battery electric excavator	
Excavators	NULLUTSLIPP AS / Kubota	KX027-4	Battery electric excavator	
Excavators	NULLUTSLIPP AS / Kubota	KX037-4	Battery electric excavator	
Excavators	NULLUTSLIPP AS / Kubota	KX057-4	Battery electric excavator	
Excavators	NULLUTSLIPP AS / Kubota	ET90	Electric excavator	
Excavators	John Deere	Fully electric excavator	Introduced at CES 2023	
Mini excavator (Compact Excavator)	Deutz	kteg ze25 excavator	Battery electric mini excavator	
Mini excavator (Compact Excavator)	Terex	Twin Drive TC16	mini excavator	
Mini excavator (Compact Excavator)	CASE	CX15 EV	mini excavator for 2023 release	
Mini excavator (Compact Excavator)	Liteng Machinery	LT20EV	mini excavator	
Mini excavator (Compact Excavator)	Liteng Machinery	LT12EV	mini excavator	
Mini excavator (Compact Excavator)	Yanmar	SV17e	mini excavator prototype for EU 2022 release	

Equipment Type	Make	Model	Description	CORE Eligibility
Mini excavator (Compact Excavator)	Mecalac	E12		
Mini excavator (Compact Excavator)	Caterpillar	301.9 Electric Mini Excavator		
Mini excavator (Compact Excavator)	CASE	CX15 EV		
Mini excavator (Compact Excavator)	Doosan	DX17Z-5		
Mini excavator (Compact Excavator)	Doosan	DX220/225		
Mini excavator (Compact Excavator)	Doosan	DX19		
Mini excavator (Compact Excavator)	Green Machine/Takeuchi	e210		
Mini excavator (Compact Excavator)	GreenMachine/Takeuchi	e240	10 hours to fully recharged with 220V outlet. 9 hours of operating hours at 65% of full load, on a full charge.	
Mini excavator (Compact Excavator)	Takeuchi	TB220e		
Mini excavator (Compact Excavator)	Suncar HK	TB216E		
Mini excavator (Compact Excavator)	Wacker Neuson	EZ17e		
Mini excavator (Compact Excavator)	Sherpa / cratos	CMX18		
Mini excavator (Compact Excavator)	Kato	9vxe		
Mini excavator (Compact Excavator)	Kato	17VXE		
Mini excavator (Compact Excavator)	Bobcat	E10 e	Electric Micro-Excavator	
Mini excavator (Compact Excavator)	Bobcat	E32 e	3.9-ton battery-powered Electric Excavator	O
Mini excavator (Compact Excavator)	Kobelco	SK17SR		
Mini excavator (Compact Excavator)	Bobcat	E17e		
Mini excavator (Compact Excavator)	JCB	19C-1 E-TEC		
Mini excavator (Compact Excavator)	Komatsu	PC30E-5		
Mini excavator (Compact Excavator)	HR E&I Co Ltd.	1.7e	1.7 ton mini excavators	
Mini excavator (Compact Excavator)	HR E&I Co Ltd.	3.5e	3.5 ton mini excavators	
Mini excavator (Compact Excavator)	HR E&I Co Ltd.	1.2e	Mini electric excavators	
Mini excavator (Compact Excavator)	Hyundai/Cummins		3.5-ton Hyundai excavator prototype with Cummins BM4.4E flexible battery modules	
Mini excavator (Compact Excavator)	XCMG/Cummins		Battery-powered XE35U-E, 3.5-tonne excavator, with Cummins BM5.7E battery modules	
Graders	HBM-NOBAS	BG 120 TA-E	Electric grader	
Graders	MEDATech	Conversion of CAT 12M3	Mining application in Canada. A converted version of CAT 12M3.	
Graders	Maclean Engineering	GR5		
Graders	Miller Technology	Low profile road grader		
Graders	Elphinstone	motor grader	in development of 2024 commercial release	

Equipment Type	Make	Model	Description	CORE Eligibility
Off-Highway Trucks	XEMC	Retrofitted 120 ton electric truck (XEMC SF31904 conversion)	A conversion of 108 t class XEMC SF31904 AC drive rigid truck to 120t mining haul truck	
Off-Highway Trucks	BELAZ	7558E 90 t class prototype	7558E 90 t class prototype	
Off-Highway Trucks	SAEAN	30-ton articulated electric dump truck	Prototype	
Off-Highway Trucks	Komatsu	eDumper		
Off-Highway Trucks	Epiroc	Minetruck MT42 Battery	low profile articulated haul truck 42T	
Off-Highway Trucks	Sandvik (Artisan)	50T underground haul truck	Interchangeable battery pack equipped	
Off-Highway Trucks	epiroc	Minetruck MT42 Battery	low profile articulated haul truck 42T	
Off-Highway Trucks	Breton (BOLAIDUN)	95ton mining dump truck		
Off-Highway Trucks	Medatech/western star	4900XD EV	heavy dump truck based on On-Road heavy chassis, 26ton cap	
Off-Highway Trucks	IVI Quevbec/western star	6900XD	heavy dump 40 ton cap	
Off-Highway Trucks	RDH-Scharf	Haulmaster 800-20EB	underground mining dumptruck	
Off-Highway Trucks	RDH-Scharf	Liftmaster 600EB	utility mining truck with scissor lift body	
Dumper	Mecalac	ed6	6-ton ed6 dumper	
Rollers (Compact)	Hamm	HD CompactLine	fully electric tandem asphalt compactors	
Rollers (Compact)	Dynapac	Z.ERA CC900 e	Z.ERA Electric 35" Dual Drum Asphalt Roller	O
Rollers (Compact)	Dynapac	Z.ERA CC1000 e	Z.ERA Electric 40" Dual Drum Asphalt Roller	O
Rollers (Compact)	Dynapac	D.ONE trench roller		
Rammers	Dynapac	Dynapac Rammers		
Mis spreader	Dynapac	S100 walk behind, self-propelled mix spreader		
Rollers	BOMAG	BW 120 AD-5 E	2hr intended operation to match observed rental use	
Rollers	BOMAG	BW 100 AD-5 E	2hr intended operation to match observed rental use	
Rollers	Volvo CE	DD25	electric asphalt compactor	
Rollers	BAM Infra	BAM electric road roller	World's first electric road roller / 3wheel static roller, Diesel chassis converted to BEV, 73L/day fuel savings	
Rollers	HAMM / Wirtgen / JohnDeere		multiple (8) models of twin roller	
Rollers	Green Road Equipment	Conversion	3wheel static roller, Diesel chassis converted to BEV, KWS already using 4 of these, others using as well	
Rollers	XCMG	26tonne PTR	Electric rubber tired pavement roller	
Rollers	Dynapac	CC900e "Z.ERA"		
Rollers	Jingong Machinery		Battery electric road roller	
Rollers	Changlin	8226EV	Battery electric vibratory roller articulated single roll	
Rollers	Ammann	eARX-26-2	Battery electric compact twin roller compactor	
Rollers	Wacker Neuson	RD28e	battery electric compact twin roller compactor, 120cm width 2.8ton wt	
Rubber Tired Loaders	Schaeffer	23E		

Equipment Type	Make	Model	Description	CORE Eligibility
Rubber Tired Loaders	Schaeffer	24E		
Rubber Tired Loaders	Kramer	5055e		
Rubber Tired Loaders	Aramine	L140b		
Rubber Tired Loaders	epiroc	Scooptram ST14 Battery	mining Load Haul Dump articulated	
Rubber Tired Loaders	Sandvik	LH518B	self battery swapping 18T load haul dump	
Rubber Tired Loaders	Caterpillar	R1700XE	load haul dump. OEM conversion of existing machine design.	
Rubber Tired Loaders	GE Fairchild	AC LHD	load haul dump	
Rubber Tired Loaders	GE Fairchild	35C-WH-AC	mining scoop	
Rubber Tired Loaders	LiuGong	856H-EV	Purpose built battery electric wheel loader with CATL 423 kWh LFP battery pack, coupled to a LiuGong EAT700 transmission.	O
Rubber Tired Loaders	RDH-Scharf	Muckmaster 300EB	load haul dump	
Rubber Tired Loaders	RDH-Scharf	Muckmaster 600EB	load haul dump	
Rubber Tired Loaders	Komatsu	Joy 22HD	Load haul dump mining loader, up to 950hp equivalent from combined battery and diesel	
Rubber Tired Loaders	Komatsu	Joy18HD	Load haul dump mining loader, up to 950hp equivalent from combined battery and diesel	
Rubber Tired Loaders	Komatsu		wheel loader, direct electric actuators; 2022 concept	
Rubber Tired Loaders	ESDI EV / Leibherr	580	wheel loader conversion	
Rubber Tired Loaders	Everrun	erel04	wheel loader	
Rubber Tired Loaders	Everrun	erel06	wheel loader	
Rubber Tired Loaders	Scoma	3.5 ton wheel loader	wheel loader	
Rubber Tired Loaders	Scoma	5 ton wheel loader	wheel loader	
Rubber Tired Loaders	Scoma	HNL-18EL	1.8ton wheel loader	
Rubber Tired Loaders	Scoma	HNL-50EE	5 ton wheel loader	
Rubber Tired Loaders	scoma	3ton wheel loader	3ton wheel loader	
Rubber Tired Loaders	Lonking	LG855N-E	5 ton wheel loader	
Rubber Tired Loaders	Xinhai (Yantai) Mining Engineering Co., LTD	Electric LHD WJD-2	4ton Load Haul Dump	
Rubber Tired Loaders	Xinhai (Yantai) Mining Engineering Co., LTD	Electric LHD WJD-3	6ton Load Haul Dump	
Rubber Tired Loaders	Xinhai (Yantai) Mining Engineering Co., LTD	Electric LHD WJD-1.5	3ton load haul dump	
Rubber Tired Loaders	Xinhai (Yantai) Mining Engineering Co., LTD	Electric LHD WJD-1	2ton load haul dump	
Rubber Tired Loaders	Xinhai (Yantai) Mining Engineering Co., LTD	Electric LHD WJD-0.6	1.2ton load haul dump	
Rubber Tired Loaders	Jingong Machinery	JGM757HEV	5ton wheel loader concept	
Rubber Tired Loaders	Jingong Machinery	JGM857E	5500kg capacity	
Rubber Tired Loaders	Wings Machinery	5.0t Electric Wheel Loader	5ton wheel loader	
Rubber Tired Loaders	Changlin	955EV		
Rubber Tired Loaders	Changlin	960ev		
Rubber Tired Loaders	Forload	H906D electric mini wheel loader	half ton wheel loader	
Rubber Tired Loaders	Ensign Heavy Industries LTD	YX656EV		

Equipment Type	Make	Model	Description	CORE Eligibility
Rubber Tired Loaders	Highland Machinery	LHD	Load Haul Dump in 1.5,2,3,4,5,6 yard models	
Rubber Tired Loaders	Highland Machinery	model 280	mining scoop	
Rubber Tired Loaders	Highland Machinery	HMC 320dm	mining scoop	
Rubber Tired Loaders	dongfeng	MORV platform	wheel loader, 10,000/yr factory output capacity	
Rubber Tired Loaders	HEVI Greenland Electric	GEL-1800	wheel loader	
Rubber Tired Loaders	HEVI Greenland Electric	GEL-5000	wheel loader	
Rubber Tired Loaders	Danfoss	Wheel Loader	wheel loader design exercise/powertrain product	
Rubber Tired Loaders	SEM	SEM658F	wheel loader 5500kg lift capacity	
Rubber Tired Loaders	Tobroco	G2200E		
Rubber Tired Loaders	MultiOne	EZ7 electric	Articulated loader	
Rubber Tired Loaders	MultiOne	EZ 8 Electric Loader	Articulated loader	
Backhoe	MultiOne	EZ 8 Electric Backhoe		
Top Front End Payloader	MultiOne	EZ 8 Electric General Bucket		
Top Front End Payloader	MultiOne	EZ 8 Electric Dumper		
Top Front End Payloader	MultiOne	EZ 8 Electric Grapple Bucket		
Trencher	MultiOne	EZ 8 Electric Trencher		
Trencher	Ditch Witch	c12e	Chain bar walk behind trencher. An equivalent model uses 12 hp diesel engine	
Pavers	Newindu	Electric Concrete Asphalt Paver RP451L		
Pavers	Dynapac	SD2500CS e "Z.ERA"	asphalt spreader--in action as of 6/2022	
Pavers	Dynapac	SD1800We	asphalt spreader city	
Pavers	Gomaco	CC-1200e	slipform paver, curbs	
Pavers	Topp&Screed, Twin Tec	TS 6100e	screed concrete leveler laser guided	
Pavers	paclite	m900-eco	power trowel, walk behind	
Pavers	CM srl with Tazzari Group	F175 eco (wheeled)	narrow track asphalt paver, wheeled	
Pavers	CM srl with Tazzari Group	F180 eco (tracked)	narrow track asphalt paver, tracked	
Pavers	Wirtgen/BAM Infra		asphalt spreader--in action as of 7/2022	
Pavers	Vogele / John Deere	Mini500e	asphalt spreader (tracked)	
Pavers	Vogele / John Deere	Mini502e	asphalt spreader (wheeled)	
Skid Steer Loaders	Gehl	165E	Concept model	
Skid Steer Loaders	Bobcat & Doosan	T76e	Concept model. Compact Track Loader, non-hydraulic arm actuators, Green Machine eV drivetrain.	
Skid Steer Loaders	Bobcat & Doosan	S70e	Concept model	
Skid Steer Loaders	Bobcat & Doosan	T7X	Electric Skid Steer Loaders	O
Skid Steer Loaders	Sherpa	100 ECO Electric Mini Skid-Steer	Walk behind/ride-on skidsteer	
Skid Steer Loaders	Toro	e-Dingo		
Skid Steer Loaders	Giant	G2200E X-tra	Electric Skid Steer Loader	
Skid Steer Loaders	First Green Industries	eLise 900 Lithium battery	Electric Skid Steer Loader + Lithium Battery	O

Equipment Type	Make	Model	Description	CORE Eligibility
Skid Steer Loaders	First Green Industries	eLise 900 240 Ah battery	Electric Skid Ster Loader + Lead Acid Battery	○
Skid Steer Loaders	First Green Industries	eLise 900 400 Ah battery	Electric Skid Ster Loader + Lead Acid Battery	○
Skid Steer Loaders	Toro	e-Dingo	walk behind	
Skid Steer Loaders	MovexInnovation	Minidozer	remote controlled confined space skidsteer	
Skid Steer Loaders	MovexInnovation	Minidozer-High Speed	remote controlled confined space skidsteer	
Skid Steer Loaders	Veemer/Conmeq	AS15	walk behind skidsteer, direct electric propulsion drive with 4 wheel motors	
Skid Steer Loaders	Scoma	skid steer	skidsteer wheeled loader	
Wheel Loader (Compact)	Caterpillar	Cat 906		
Wheel Loader	Caterpillar	Cat 950 GC		
Wheel Loader	JCB	403E	First fully electric wheeled loader	
Wheel Loader	GreenFox	GreenFox 500		
Wheel Loader	Poclain Hydraulics	miniZEV		
Wheel Loader	BRETON	BRT956EV	5000kg electric wheel loader with Lithium Iron Phosphate Battery	
Wheel Loader	BRETON	BRT956EV	5000kg electric wheel loader with Lithium Iron Phosphate Battery	
Wheel Loader	Volvo CE		L90H based conversion. 15 ton wheel loader with interchangeable battery packs	
Wheel Loader	Volvo CE		L110H/L120H based conversion. 20 ton wheel loader with interchangeable battery packs	
Wheel Loader	Volvo CE	L20 Electric Compact Wheel Loader	1.8 ton payload and parallel type linkage	○
Wheel Loader	Danfoss Editron	Editron Wheel Loader		
Wheel Loader	Hitachi	ZW220HYB-5 Hybrid Wheel Loader		
Wheel Loader	Kramer	KL25.5e Electric Wheeled Loader		
Wheel Loader	Schaffer	24E Electric Wheel Loader		
Wheel Loader	Tobroco	G2200E		
Wheel Loader	Tobroco-Giant	G2500 HD Electric Wheel Loader		
Wheel Loader	Tobroco-Giant	G2500 HDX-TRA00E Electric Wheel Loader		
Wheel Loader	Knikmops	KM130e		
Wheel Loader	Weidemann	1160 eHoftrac		
Wheel Loader	Liebherr	L580		
Wheel Loader	Wacker Neuson	WL20e		
Wheel Loader	Mecalac	es1000	1000-litre es1000 swing loader	
Wheel Loader	Shantui	Le56-X2	5 ton Electric Wheel Loader	
Tractors/Loaders/Backhoes	Wacker Neuson	WL20e		
Tractors/Loaders/Backhoes	Volvo CE	L25	Pallet handling, loading material, grading, sweeping, light infrastructure work, gardening, landscaping and agriculture	
Tractors/Loaders/Backhoes	CASE	580 EV	Electric Backhoe Loader	

Equipment Type	Make	Model	Description	CORE Eligibility
Tractors/Loaders/Backhoes	Fendt	e100-vario	Utility tractor	
Tractors/Loaders/Backhoes	Rino electric	Rino	zero radius landscape maintenance tractor	
Tractors/Loaders/Backhoes	Avant Tenco	Avant e5	mini articulated loader	
Tractors/Loaders/Backhoes	Avant Tenco	Avant e6	mini articulated loader	
Tractors/Loaders/Backhoes	John Deere	310	Frontend loader backhoe	
Tractors/Loaders/Backhoes	Breton (BOLAIDUN)	BRT956EV	wheel loader 1500 unit initial manufacturing run, 5000kg lift capacity	
Tractors/Loaders/Backhoes	Breton (BOLAIDUN)	BRT958	5.5ton capacity wheel loader	
Tractors/Loaders/Backhoes	Breton (BOLAIDUN)	BRT936	3 ton capacity wheel loader	
Tractors/Loaders/Backhoes	Liteng machinery	LT958EV (LW500KV)	5 ton capacity wheel loader	
Tractors/Loaders/Backhoes	Liteng machinery	LT910EV	1 ton capacity wheel loader	
Tractors/Loaders/Backhoes	Liteng machinery	LT906EV	600kg capacity wheel loader	
Tractors/Loaders/Backhoes	JAMA	SBU 800E	mining scaler (wheel loader with hydraulic hammer)	
Tractors/Loaders/Backhoes	JAMA	JMS 7000	mining scaler (wheel loader with hydraulic hammer)	
Tractors/Loaders/Backhoes	Loxley Innovation	Blue.E2	utility ag tractor conversion, orchard use	
Tractors/Loaders/Backhoes	CHN	T4 Electric Power light utility tractor	Autonomous-ready equipment	
Tractors/Loaders/Backhoes	John Deere	SESAM concept	Medium/large BEV tractor	
Tractors/Loaders/Backhoes	John Deere	310 X-Tier Backhoe	22.8 mph max travel speed	
Tractors/Loaders/Backhoes	John Deere	SESAM2	Medium/large BEV tractor	
Tractors/Loaders/Backhoes	First Green Industries	MiniZ	Mini Electric Track Loader	
Drill Rigs (Mobile)	Epiroc	Boomer E2 Battery Face Drill Rig		
Drill Rigs (Mobile)	Epiroc	Boomer E2 Battery drill	Blast hole drill	
Drill Rigs (Mobile)	Epiroc	Boltec E	Rock bolting drill rig	
Drill Rigs (Mobile)	Epiroc	Boltec M	Rock bolting drill rig	
Drill Rigs (Mobile)	Epiroc	SmartROC T35 E	surface blast hole drill	
Drill Rigs (Mobile)	Foundiz / Soilmec	SM-13E micro drilling rig	Full electric micro drilling rig	
Drill Rigs (Mobile)	Liebherr	LB 16 Unplugged	Retrofitted by Suncar, the first battery-powered drilling rig in the world	
Drill Rigs (Mobile)	Liebherr	LB 25 Unplugged		
Drill Rigs (Mobile)	Liebherr	LB 30 Unplugged		
Drill Rigs (Mobile)	Liebherr	LRH 200 unplugged	Battery-powered piling and drilling rigs	
Drill Rigs (Mobile)	Liebherr	LRH 100.1	Battery-powered piling and drilling rigs	
Drill Rigs (Mobile)	Duratherm / WE Engineering / Conrad Stanen	300-E ground-drilling rig	World's first all-electric ground-drilling rig	
Drill Rigs (Mobile)	Epiroc	Boomer E2 Battery drill	Blast hole drill	
Drill Rigs (Mobile)	Sandvik	DD422iE Development drill rig	Blast hole & rock bolting drill	
Drill Rigs (Mobile)	Sandvik	DC300Ri electric	blast hole surface drill rig	
Drill Rigs (Mobile)	Hilti	Jaibot	Semi-autonomous ceiling drill for finishing poured concrete structures (installation holes for electrical/mechanical/plumbing)	
Drill Rigs (Mobile)	BAUER	eBG 33	100-tonne plug-in electric drilling rig	
Drill Rigs (Mobile)	Klemm	KR 606-3	grid-tied electric	

Equipment Type	Make	Model	Description	CORE Eligibility
Drill Rigs (Mobile)	Klemm	KR 702-2R	grid-tied electric	
Drill Rigs (Mobile)	Aramine	miniDriller DM901HDE	electric drill, diesel traction	
Drill Rigs (Mobile)	Vermeer		Electric grid or genset tied	
Drill Rigs (Mobile)	Terex	HyPower	plug-in hybrid	
Drill Rigs (Mobile)	Skylift	MD6000-E	battery with engine backup	
Drill Rigs (Mobile)	Epiroc / Fortescue Future Industries	D65 conversion	Hydrogen Fuel Cell	
Drill Rigs (Mobile)	Junttan	PMx2e	BEV, 8-14hrs	
Drill Rigs (Mobile)	Woltran/Dieseko	90DR-E	BEV	
Drill Rigs (Mobile)	FES	YTR200AE	BEV	
Drill Rigs (Mobile)	Sumitomo / Hillcon Piling Equipment	HSCX1500GLS-E	BEV	
Telescopic Crawler Crane	Sennebogen	653 Electro Battery electric crane	First ever 50-ton battery-powered telescopic crawler crane	
Material Handler	Sennebogen	825 E-Series material handler	30-ton zero-emission material handler	
Mining quarry vehicle	Kleemann	Mobirex MR 130(i) PRO	all-electric drive concept Impact crusher with the option of an external power supply	
Underground Mining Equipment	Sandvik	LH518B	Self-battery swapping 18T Load/Haul/Dump (LHD)	
Underground Mining Equipment	Sandvik (Artisan)	Sandvik (Artisan)	Electric 4-tonne Load/Haul/Dump (LHD) underground mining vehicle	
Underground Mining Equipment	Sandvik (Artisan)	Sandvik (Artisan)	Electric 10-tonne Load/Haul/Dump (LHD) underground mining vehicle	
Underground Mining Equipment	Caterpillar	R1700XE	<i>Load/Haul/Dump (LHD) underground mining vehicle. Charged by the Cat MEC500 Mobile Equipment Charger, the R1700 XE can be fully charged in 30 minutes—or in 20 minutes when two chargers are used in parallel.</i>	
Underground Mining Equipment	GE Fairchild	AC LHD	Load/Haul/Dump (LHD) underground mining vehicle	
Underground Mining Equipment	GE Fairchild	35C-WH-AC	Mining Scoop (LHD)	
Underground Mining Equipment	Epiroc	Scooptram ST7 Battery Electric Loader	Mining Load Haul Dump articulated	
Underground Mining Equipment	Epiroc	Scooptram ST14 Battery	Mining Load Haul Dump articulated	
Underground Mining Equipment	Epiroc	Scooptram EST1030 Electric Loader	Mining Load Haul Dump articulated	
Underground Mining Equipment	Epiroc	Scooptram EST2D Electric Loader	Mining Load Haul Dump articulated	
Underground Mining Equipment	Epiroc	Scooptram EST3.5 Electric Loader	Mining Load Haul Dump articulated	
Underground Mining Equipment	Epiroc	Minetruck MT2010 Battery	Mining Load Haul Dump articulated	
Underground Mining Equipment	Epiroc	Minetruck MT42	Mining Load Haul Dump articulated	
Underground Mining Equipment	XCMG	TFT125 e Truck	Electric mining wheel dump Truck	
Underground Mining Equipment	Kuhn Schweitz	Elektro Dumper/eDumper	Electric mining wheel dump Truck	
Underground Mining Equipment	Wacker Neuson	DT10e Compact Electric Wheel Dumper	Mini tracked dumper	

Equipment Type	Make	Model	Description	CORE Eligibility
Underground Mining Equipment	Wacker Neuson	DW15e Electric Wheel Dumper	Mini wheeled dumper	
Underground Mining Equipment	Normet	Charmec MC 605 VE SD	Multipurpose mining utility vehicles with two direct drive permanent magnet electric motors	
Underground Mining Equipment	Normet	Charmec MF 605 V Long End SD	Multipurpose mining utility vehicles with two direct drive permanent magnet electric motors	
Underground Mining Equipment	Normet	Utilift MF 540 SD	Scissor lift vehicle. Mining utility vehicles with two direct drive permanent magnet electric motors	
Underground Mining Equipment	Normet	Spraymec 8100 VC SD	Self-propelled, mobile concrete sprayer for tunneling projects. Mining utility vehicles with two direct drive permanent magnet electric motors	
Underground Mining Equipment	Normet	Utimec MF 500 Transmixer SD	Mining utility vehicle specialized at concrete mixing and transportation. Two direct drive permanent magnet electric motors	
Underground Mining Equipment	Normet	Multimec MF 100 SD	Mining utility vehicle with two direct drive permanent magnet electric motors	
Underground Mining Equipment	Normet	Utimec MF 205 PER SD	Mining utility vehicle with two direct drive permanent magnet electric motors	
Underground Mining Equipment	JAMA	SBU 8000E	mining roof scaler	
Underground Mining Equipment	Probst	MM-GREENLINE	tracked load carrier/hoist	
Underground Mining Equipment	Xinhai (Yantai) Mining Engineering Co., LTD	Electric Mobile Rock Splitter SJD-400	articulated rockhammer on wheel loader frame	
Multipurpose Equipment	DANNAR	Mobile Power Station 4.0	Multipurpose off-road equipment with Bucket, Tow, Lift attachments, etc.	○
floor scraper	National Equipment	7700	floor scraper	
Forestry	Regal		tree harvester & forwarder--demo project	
Forestry	Malwa	Electric Combi	tree harvester and processor	

Hydrogen Fuel Cell Construction, Mining, and Industrial Equipment

Equipment Type	Make	Model	Description	CORE Eligibility
Off-Highway Trucks	Komatsu		Komatsu hydrogen mining truck / Retrofitted 930E-4	
Excavators	JCB	20-tonne H2FC Excavator 220X	The first working prototype of an H2FC excavator in the world.	
Excavators	Mourik/Liebherr	H2FC 30-ton Excavator	Converted from Liebherr R926 Generation 8	
Excavators	Hyundai	14-ton hydrogen Excavator HW155H	Advertised as it offers the same operating performance as a diesel-powered excavator. 20 mins refueling time	
Forklifts	Hyundai	5-ton Hydrogen forklift	Up to 5 operation hours, refueling in 5 mins	
Articulate Hauler	Volvo CE	35-ton HX04	H2FC Articulate Hauler	
RTG Crane	Mi-Jack			

Hybridized Construction and Mining Equipment

Equipment Type	Make	Model	Description	CORE Eligibility
Excavators	Komatsu	HB215LC-3 Hybrid	12-ton hybrid excavator	
Excavators	Komatsu	HB365LC/NLC-3 Hybrid	30-ton The HB365LC-3 is Komatsu's latest generation hybrid excavator, utilizing a Komatsu SAA6D-114E-6 Tier 4 Final engine (36-tonne)	
Excavators	Hyundai	R220-LC Hi-POSS	22-tonne-crawler excavator	
Excavators	Mecalac	12MTX Hybrid		
Excavators	Hitachi	ZH 210LC-5 Hybrid		
Excavators	Hitachi	EX1900E-6	Mining electric drive shovels	
Excavators	Hitachi	EX2600E-6	Mining electric drive shovels	
Excavators	Hitachi	EX3600E-6	Mining electric drive shovels	
Excavators	Hitachi	EX5600E-6	Mining electric drive shovels	
Excavators	Hitachi	EX8000E-6	Mining electric drive shovels	
Excavators	Volvo CE	EC300E	Electro-hydraulic system	
Excavators	Caterpillar	336E H	Hydraulic hybrid excavator	
Excavators	Caterpillar	336F H (L XE)		
Excavators	Kobelco	SK200H-10	20t class excavator	
Mini excavator (Compact Excavator)	Kobelco	SK80H		
Mini excavator (Compact Excavator)	Takeuchi	TB216H dual power		
Mini excavator (Compact Excavator)	Wacker Neuson	803 dual power		
Off-Highway Trucks	Oshkosh/Pierce	Striker Volterra	plugin hybrid Airport firetruck	
Off-Highway Trucks	Oshkosh/Pierce	municipal firetruck	plugin hybrid city firetruck	
Off-Highway Trucks	Rosenbauer	municipal firetruck	plugin hybrid city firetruck	
Off-Highway Trucks	Caterpillar	795F AC	A high-performance engine and best-in-class electric drive system for industry-leading productivity. Modular components and more ground-accessible maintenance points to increase machine availability.	
Off-Highway Trucks	Ditch Witch	HX30	Vacuum Excavator	
Off-Highway Trucks	Ditch Witch	HX50	Vacuum Excavator	
Off-Highway Trucks	Ditch Witch	HX75	Vacuum Excavator	
Skid Steer Loaders	Schibeci	32PE Electric Mini Skid Steer Loader		
Wheel Loader	Volvo CE	LX1		
Wheel Loader	John Deere	644L		
Wheel Loader	John Deere	644K Hybrid	Hybrid Wheel Loaders	
Wheel Loader	John Deere	944K Hybrid	Hybrid Wheel Loaders	
Wheel Loader	Caterpillar	988K XE	Electric Drive Wheel Loader	
Wheel Loader	Komatsu	WE2350-2	Hybrid Wheel Loaders 980E/960E	
Wheel Loader	Komatsu	WE1850-3	Hybrid Wheel Loaders 860E/930E	
Wheel Loader	Komatsu	WE1350-3	Hybrid Wheel Loaders 730E/830E	
Rollers	BOMAG	BW 174 AP tandem roller		

Equipment Type	Make	Model	Description	CORE Eligibility
Rollers	HAMM	9 metric tonne tandem roller	9 metric tonne HD+ 90i PH tandem roller	
Rollers	HAMM / Wirtgen / JohnDeere	HD+90i PH	Diesel hydraulic hybrid Twin roller	
Tracked Dozer (Tractor)	Caterpillar	D6 XE Dozer		
Tracked Dozer (Tractor)	Caterpillar	D7E Hybrid Bulldozer		
Drill Rigs (Mobile)	Normag		Hybrid series electric	
Mining load haul dump (LHD) loader	Komatsu (Joy Global)	Joy 18HD		
Mining load haul dump (LHD) loader	Komatsu (Joy Global)	Joy 22HD		
Compact drill rigs	Aramine	miniDriller DM901HDE		
Mining truck	CCMIE	DF45E	45 ton Hybrid mining dump truck	
Forestry	Logset	12H GTE hybrid	Diesel-electric hybrid tree harvester (super cap)	
Forestry	Logset	8H GTE hybrid	Diesel-electric hybrid tree harvester (super cap)	
Forestry	Ponsse	EV1	Diesel-electric series hybrid log forwarder, 15 ton, 4 axle articulated	
Forklifts	Toyota	Geneo-Hybrid	Hybrid forklift (Diesel/Electric)	
Pavers	Volvo	E+ Screed Heating	Asphalt spreader, D Series (6 Series & above) new or retro	
Tractors/Loaders/Backhoes	Volvo	LX1	Diesel/Electric Hybrid Wheel Loader	
Tractors/Loaders/Backhoes	John Deere	644L	Purpose-built four-speed hybrid-electric transmission with EPA Tier 4/EU Stage V PowerTech™ engine to squeeze the most from every drop of fuel.	
Tractors/Loaders/Backhoes	John Deere	944K	The 944K Hybrid Wheel Loader can provide significant fuel savings over 9-yard ³ (6.88 m ³) loaders with conventional drivetrains.	
Tractors/Loaders/Backhoes	Carraro	"3E22" mild hybrid powertrain	Mild hybrid specialized ag tractor powertrain	
Tractors/Loaders/Backhoes	Carraro	Ibrido	Diesel-electric Hybrid Ag Tractor	
Tractors/Loaders/Backhoes	Huddig	Tigon	Plugin diesel electric hybrid backhoe	
Tractors/Loaders/Backhoes	Doosan	DL-Hybrid	Wheel loader upgrade to DL200-5 11 (diesel electric hybrid),700kg model, 2023 release date	
Tractors/Loaders/Backhoes	Auga	M1	Large Hybrid Electric Ag tractor	

Grid-electric Construction & Industrial Equipment

Equipment Type	Make	Model	Description	CORE Eligibility
Rope Shovels	Caterpillar	Model 7395	70 Ton Electric Rope Shovel	
Rope Shovels	Caterpillar	Model 7495 HD	90 Ton Electric Rope Shovel	
Rope Shovels	Caterpillar	Model 7495 HF	120 Ton Electric Rope Shovel	
Rope Shovels	Caterpillar	Model 7495	120 Ton Electric Rope Shovel	
Rope Shovels	Komatsu	P&H 1900XPC		
Rope Shovels	Komatsu	P&H 2300XPC		
Rope Shovels	Komatsu	P&H 2800XPC		
Rope Shovels	Komatsu	P&H 4100C		
Rope Shovels	Komatsu	P&H 4100C Boss		
Rope Shovels	Komatsu	P&H 4100XPC		
Rope Shovels	Komatsu	P&H 4100XPC AC-90		
Rope Shovels	Komatsu	P&H 4800XPC		
Drill Rigs (Mobile)	Seattle Traction Co.	historical from 1899	Grid-tied electric	
Rubber Tired Loaders	Aramine	L110E	Loader	
Rubber Tired Loaders	Aramine	L130E	Loader	
Rubber Tired Loaders	Aramine	L150E	Loader	
Mini excavator (Compact Excavator)	Komatsu	PC78USE-11		
Mini excavator (Compact Excavator)	Sunward/Seetao	SWE18 UE	Electric grid-tied mini-tracked excavator 1.8t	
Excavator	Sunward/Seetao	SWE550FE	Electric grid-tied tracked excavator	
Excavator	Hitachi / Nasta	Zeron ZE350LC	Cable reel 38-ton electric track excavator	
Material Handler	Sennebogen	817E	Grid-connected Material Handler	
Material Handler	Sennebogen	818E	Grid-connected Material Handler	
Material Handler	Sennebogen	821E	Grid-connected Material Handler	
Material Handler	Sennebogen	825E	Grid-connected Material Handler	
Material Handler	Sennebogen	830E	Grid-connected Material Handler	
Material Handler	Sennebogen	840E	Grid-connected Material Handler	
Material Handler	Sennebogen	850E	Grid-connected Material Handler	
Material Handler	Sennebogen	855E	Grid-connected Material Handler	
Material Handler	Sennebogen	865E	Grid-connected Material Handler	
Material Handler	Sennebogen	870E	Grid-connected Material Handler	
Material Handler	Sennebogen	875E	Grid-connected Material Handler	
Material Handler	Sennebogen	885E	Grid-connected Material Handler	
Material Handler	Sennebogen	895E	Grid-connected Material Handler	
Material Handler	Sennebogen	8400E	Grid-connected Material Handler	
Underground Mining Equipment	Veemer	TG5000E Tub Grinder	industrial chipper/grinder	
Underground Mining Equipment	Fambition	FL 14E	grid-tied electric	

Clean Agricultural Equipment

Equipment Type	Make	Model	Description	CORE Eligibility
Agricultural Tractors	Solectrac	e25 Backhoe	Compact electric tractor	○
Agricultural Tractors	Solectrac	e25G Utility Tractor	Compact electric tractor	○
Agricultural Tractors	Solectrac	e UT+ Narrow	Narrow Electric Utility Tractor	○
Agricultural Tractors	Kremer-Energie	T4e	High clearance vineyard tractor	
Agricultural Tractors	Voltis	Electric tractor	High clearance vineyard tractor	
Agricultural Tractors	Steyr	Konzept	Med/large ag tractor	
Agricultural Tractors	Fendt	e100 Vario Electric Tractor	All-electric compact tractor	
Agricultural Tractors	John Deere	GridCON / Joker	Automated equipment	
Agricultural Tractors	John Deere	SESAM electric tractor	Conceptual automated ag tractor (Cable-powered)	
Agricultural Tractors	Kubota	Electric Kubota Bx2350		
Agricultural Tractors	Kubota	X tractor	Conceptual automated ag tractor	
Agricultural Tractors	Monarch	Electric Compact Tractor MK-V XLR	ZE Agricultural Tractors	○
Agricultural Tractors	Monarch	Electric Compact Tractor MK-V XLR + Extra Battery (EB) + Swap Station (S)	ZE Agricultural Tractors	○
Agricultural Tractors	Monarch	Electric Compact Tractor MK-V LR	ZE Agricultural Tractors	○
Tractors/Loaders/Backhoes	Rigitrac	SKE50 electric	Utility Ag Tractor	
Tractors/Loaders/Backhoes	Rigitrac	SKE40 electric	Utility Ag Tractor	
Tractors/Loaders/Backhoes	Keestrack	B1e	Utility Ag Tractor	
Tractors/Loaders/Backhoes	Monarch Tractor	MK4	Utility Ag Tractor	
Tractors/Loaders/Backhoes	Knegt	Knegt 304G2e	Utility Ag Tractor	
Agricultural Tractors (Compact)	Escorts	Farmtrac 26E	Compact vineyards and horticulture Tractor	
Agricultural Tractors (Compact)	Rigitrac	Rigitrac SKE 50	Compact Ag Tractor	
H2FC Agricultural Tractors	H2Trac	EOX 175	H2FC Ag Tractor	
H2FC Agricultural Tractors	New Holland	NH2 fuel cell tractor	Hydrogen fuel cell powered	
Hybrid Agricultural Tractors	CLAAS		Hybrid diesel/electric off-road equipment	
Hybrid Agricultural Tractors	Carraro Agritalia	Ibrido	Hybrid diesel/electric off-road equipment	
Hybrid Agricultural Tractors	Ruselprom	Belarus-3023	Hybrid diesel/electric off-road equipment	
Electric Spray Truck	MM srl	M2204011	Self-propelled ag sprayer	
Sprayer	TRS		Orchard sprayer	
Planter	John Deere	EXACTSHOT	Agricultural Robot Planter	
Harvester	Orchard Machinery Corporation / Terzo Power Systems	Nut Tree Shaker	CNG / Electric hybrid	

Electric Industrial Equipment & Forklift & Airport GSE

Equipment Type	Make	Model	Description	CORE Eligibility
Ice Resurfacers	Zamboni	552AC Li-ion		
Yard Trucks	BYD	Q1A Yard Truck	Logistic tractors	
Yard Trucks	BYD	Q1M Yard Truck	Logistic tractors	
Yard Trucks	Kalmar Global and TransPower		Battery-electric yard truck	
Top handlers	Taylor Machine Works and BYD		Battery-electric top handlers	
Crane 35ton or more	Zoomlion	ZTC250N-EV	Concept 25-ton ZEV truck telescopic crane	
Crane 35ton or more	Liebherr-Werk Nenzing	LR 1130.1 unplugged	Electric Crawler Crane	
Crane 35ton or more	Liebherr-Werk Nenzing	LR 1160.1 unplugged	Electric Crawler Crane	
Crane 35ton or more	Liebherr-Werk Nenzing	LR 1200.1 unplugged	Electric Crawler Crane - maximum lift capacity of 220 tons (200 metric tonnes)	○
Crane 35ton or more	Liebherr-Werk Nenzing	LR 1250.1 unplugged	Electric Crawler Crane - up to 275 tons (250 metric tonnes).	○
Crane less than 35ton	Galizia	GF600	60-ton crane	
Crane less than 35ton	Manitex	18 Series	Light Cranes. Max lifting capacity: 1,990 lbs	
Crane less than 35ton	Manitex	25 EL	Light Cranes. Max lifting capacity: 4,950 lbs	
Crane less than 35ton	Manitex	25E	Light Cranes. Max lifting capacity: 5,500 lbs	
Crane less than 35ton	Manitex	35 EVO	Light Cranes. Max lifting capacity: 7,715 lbs	
Crane less than 35ton	Manitex	V 90R	Medium Cranes. Max lifting capacity: 18,000 lbs	
Crane less than 35ton	Manitex	160 SE	Carry deck crane. Max lifting capacity: 36,000 lbs	
Crane less than 35ton	Manitex	220 SE	Carry deck crane. Max lifting capacity: 48,500 lbs	
Crane less than 35ton	ZEECRANE	4500	4.5-ton Carry deck crane	
Crane less than 35ton	ZEECRANE	9000	9 ton Carry deck crane	
Crane less than 35ton	Jekko	SPX312C+	Jekko Battery Mini Crane	
Crane less than 35ton	Jekko	SPX424C+	Jekko Battery Mini Crane	
Crane less than 35ton	Jekko	SPX429C+	Jekko Battery Mini Crane	
Crane less than 35ton	Jekko	MPK20	Minipickers: Pick & carry self-propelled electric crane	
Crane less than 35ton	Jekko	MPK50	Minipickers: Pick & carry self-propelled electric crane	
Crane less than 35ton	Victron	Towercrane		
Crane less than 35ton	Bailey	BC-18		
Crane less than 35ton	Bailey	retrofit		
Concrete Mixer	Liebherr	Concrete truck body	Readimix truck body	
Concrete Mixer	Liebherr	ETM1005	BEV mixer body & chassis conversion	
Concrete Mixer	Liebherr	ETM1205	BEV mixer body & chassis conversion	
Concrete Pump	Liebherr	70E	Pump trailer	
Forklifts	scoma	25ton forklift	25ton Battery electric forklift	
Rough Terrain Forklifts / Telehandler	Deutz/JLG	G5-18A		
Rough Terrain Forklifts	Merlo	e-Worker 25.5-90	4-wheel drive version	
Rough Terrain Forklifts	Merlo	e-Worker 25.5-60	2-wheel drive version	

Equipment Type	Make	Model	Description	CORE Eligibility
Rough Terrain Forklifts	Galizia	multis 636 6t electric		
Telehandler	Deutz	G5-18A		
Telehandler	Manitou	MT 1135	Electric telehandler	
Telehandler	Manitou	2260e	rotating telehandler 22m 6ton	
Telehandler	Manitou	2660e	rotating telehandler 26m 6 ton	
Telehandler	JCB	505-20E	Telescopic Forklift Handler Lithium-ion	O
Telehandler	JCB	525-60E	Has two electric motors – one for driveline, the other for lifting operations – powered by a 96-volt lithium-ion battery.	O
Telehandler	Faresin	Faresin 6.26	The Eco Telehandler from Faresin is an environmentally friendly option for single-shift or multi-shift materials handling operations.	
Telehandler	Merlo	e-Worker 25.5-90	Telehandler (4-wheel drive)	
Telehandler	Merlo	e-Worker 25.5-60	Telehandler (2-wheel drive)	
Telehandler	AUSA	T164E	telehandler 4m, 1600kg	
Telehandler	Snorkel	SR5719e	Telehandler 5732lbs	
Telehandler	JCB	525-60E		
Telehandler	FARESIN	TELEHANDLER 6.26 FULL ELECTRIC	1. The battery pack powers two electric motors, a 51kW motor for the transmission and a 23kW motor that is dedicated to the machine's services. 2. 45.36kWh high-voltage lithium-ion battery pack at 435V	
Boom Truck	Maclean Engineering	BT3 BOOM TRUCK EV		
Aerial lift	GENIE	Aerial Pros	Large mining utility vehicles, Concrete spraying, manlift, palletized vocational body carrier, etc.	
Aerial Boom Truck	Altec	Aerial Boom Vehicle with JEMS		
Aerial Boom Truck	Hyster	Ascender AWP		
Aerial Boom Truck	JLG	Aerial Lift		
Aerial Boom Truck	Lion Electric Co.	LION8 All-Electric Class 8 Bucket Truck		
Aerial Boom Truck	Yale	AEREO AWP		
Airport GSE	Vestergaard Company	Plug-in Hybrid BETA Deicer	Vestergaard Elephant® aircraft deicers	
Lift Truck	Daewoo	BC30S		

Hybrid Industrial Equipment Categories

Equipment Type	Make	Model	Description	CORE Eligibility
Crane less than 35ton	Manitex	50E /D Medium Crane	Max lifting capacity: 11,020 lbs	
Crane less than 35ton	Manitex	75E /D Medium Crane	Max lifting capacity: 16,530 lbs	
Crane less than 35ton	Manitex	90E /D Medium Crane	Max lifting capacity: 19,840 bs	
Crane less than 35ton	Manitex	120E /D Heavy Crane	Max lifting capacity: 26,450 lbs	
Crane less than 35ton	Manitex	180E /D Heavy Crane	Max lifting capacity: 39,680 lbs	
Crane less than 35ton	Manitex	250E /D Heavy Crane	Max lifting capacity: 55,110 lbs	
Crane less than 35ton	Manitex	400E /D Heavy Crane	Max lifting capacity: 88,180 lbs	
hybrid (diesel-electric) RTG cranes	Paceco-Mitsui / ZPMC	Paceco-Mitsui Rubber Tired Gantry Cranes	The Lithium-battery Hybrid Rubber-Tired Gantry Crane (RTG) Dynamic System	
Shuttle Carrier	Kalmar	Kalmar FastCharge Shuttle Carrier FSH 240 & 250		
Shuttle Carrier	Kalmar	Kalmar Hybrid Shuttle Carrier HSH 240 & 250		
Rope Shovels	Caterpillar	Model 7295	50 Ton Electric Rope Shovel	
Telehandler	Manitou / Deutz	MT 1135		
Telehandler	Manitou / Deutz	MT 1335		
Reach Stacker	Konecranes	Hybrid reach stacker		
Reach Stacker	Sany Europe	SRSC45H9 Hybrid Reach Stacker		
Material Handling Equipment	Sennebogen	855e hybrid Stage 5		
Material Handling Equipment	Sennebogen	855e hybrid Stage 3a		

Alternative Charging Solutions (Portable Energy Storage System)

Equipment Type	Make	Model	Description (Energy Storage Information)	CORE Eligibility
Hydrogen Generator	Deutz / Westfalen / VOITH / AVS	H2-tank integrated H2 Genset		
Hydrogen Generator	Geopura	H2 Generator	216kWh	
Battery Power Bank	Deutz	Power Tree	126kWh	
Battery Power Bank	JCB	Power pack 1.25Qe	23kWh	
Battery Power Bank	JCB	Power pack 1.50Qe	46kWh	
Battery Power Bank	NULLUTSLIPP AS (NO)	ZE Line	3kWh	
Battery Power Bank	Offgrid Energy	Portable Power Unit / INGENIUM SX (ranges from model 20-100)	5kWh - 15kWh	
Battery Power Bank	Offgrid Energy	Energy Storage system / INGENIUM MX/LX	200kWh	

Equipment Type	Make	Model	Description (Energy Storage Information)	CORE Eligibility
Battery Power Bank	Tadano	E-Pack	32kWh	
Battery Power Bank	Portable Electric	Mobile EV Charger	27kW (Cont. output)/80kWh / 3.5 hours(charging time)	
Battery Power Bank	Boels	The Load Balancer	32A 9 x 230V	
Battery Power Bank	Moxion	MP-75	31~75kW / 600kWh (nominal) (540kWh, usable) / 10 hours for full charge	
Battery Power Bank	Moxion	MP-30	20~40kW / 200kWh (nominal) (180kWh, usable) / 5 hours for full charge	
Battery Power Bank	Caterpillar	Cat XES120	Mobile battery energy storage system	O
Battery Power Bank	Caterpillar	Cat XES60	Mobile battery energy storage system	O
Battery Power Bank	Taylor Machine Works	Taylor ZECS	Portable battery energy storage with integral chargers	O
Battery Power Bank	Taylor Machine Works	Taylor ZESS	Portable battery energy storage	O
Mobile Power Unit	Range Energy, Inc.	Range RA-01 100 kWh	Trailer type driving range extender	O
Mobile Power Unit	Range Energy, Inc.	Range RA-01 200 kWh	Trailer type driving range extender	O
Mobile Power Unit	Southern Beams Builds, Inc	Dragon Wings 223075	Mobile modular renewable generator storage	O
Mobile Power Unit	Viridi Parente	SBR30-150	Mobile Power Unit with up to 33 kVA rated power output	O
Portable Power Station	Generac	Battery energy storage	NMC based stationary battery energy storage systems (BESS) 125kW / 500kWh	
Portable Power Station	Generac	Battery energy storage	NMC based stationary battery energy storage systems (BESS) 250kW / 500kWh	
Portable Power Station	Generac	Battery energy storage	NMC based stationary battery energy storage systems (BESS) 500kW / 500kWh	
Portable Power Station	Generac	Battery energy storage	NMC based stationary battery energy storage systems (BESS) 250kW / 1000kWh	
Portable Power Station	Generac	Battery energy storage	NMC based stationary battery energy storage systems (BESS) 500kW / 1000kWh	
Portable Power Station	Generac	Battery energy storage	NMC based stationary battery energy storage systems (BESS) 1000kW / 1000kWh	
Portable Power Station	Generac	Battery energy storage	Lithium iron phosphate (LFP) based stationary battery energy storage systems (BESS) 125kW / 500kWh	
Portable Power Station	Generac	Battery energy storage	Lithium iron phosphate (LFP) based stationary battery energy storage systems (BESS) 250kW / 500kWh	
Portable Power Station	Generac	Battery energy storage	Lithium iron phosphate (LFP) based stationary battery energy storage systems (BESS) 500kW / 500kWh	
Portable Power Station	Generac	Battery energy storage	Lithium iron phosphate (LFP) based stationary battery energy storage systems (BESS) 250kW / 1000kWh	
Portable Power Station	Generac	Battery energy storage	Lithium iron phosphate (LFP) based stationary battery energy storage systems (BESS) 500kW / 1000kWh	
Portable Power Station	Generac	Battery energy storage	Lithium iron phosphate (LFP) based stationary battery energy storage systems (BESS) 1000kW / 1000kWh	
Portable Power Station	Atlas Copco	ZBP 30-60 208V Energy Storage System	24kW (nominal) / 53.6kWh (net)	O
Portable Power Station	Atlas Copco	ZBP 30-75 208V Energy Storage System	24kW (nominal) / 71.42kWh (net)	O

Equipment Type	Make	Model	Description (Energy Storage Information)	CORE Eligibility
Portable Power Station	Atlas Copco	ZBP 40-60 240V Energy Storage System	32kW (nominal) / 71.42kWh (net)	○
Portable Power Station	Atlas Copco	ZBP 40-75 240V Energy Storage System	32kW (nominal) / 71.42kWh (net)	○
Portable Power Station	Atlas Copco	ZBC 500-250 Energy Storage System	500kW / 246kWh	○
Portable Power Station	Atlas Copco	ZBC 250-575 Energy Storage System	250kW (nominal) / 520kWh (net)	○
Portable Power Station	Wenzlau Engineering	UES-500-BD-5	Bidirectional Power Conversion, simultaneous charge/discharge	○
Portable Power Station	Wenzlau Engineering	UES-500-BD-6	Bidirectional Power Conversion, simultaneous charge/discharge	○
Portable Power Station	Wenzlau Engineering	UES-500-BD-7	Bidirectional Power Conversion, simultaneous charge/discharge	○
Portable Power Station	Wenzlau Engineering	UES-500-BD-8	Bidirectional Power Conversion, simultaneous charge/discharge	○
Portable Power Station	Wenzlau Engineering	UES-500-UD-5	Unidirectional Power Conversion, charge or discharge	○
Portable Power Station	Wenzlau Engineering	UES-500-UD-6	Unidirectional Power Conversion, charge or discharge	○
Portable Power Station	Wenzlau Engineering	UES-500-UD-7	Unidirectional Power Conversion, charge or discharge	○
Portable Power Station	Wenzlau Engineering	UES-500-UD-8	Unidirectional Power Conversion, charge or discharge	○
Portable Power Station	AMPD Energy	Advanced energy storage system		
Portable Power Station	Portable Electric	Voltstack 5k	4.8kW (Cont. output)/5.6kWh / 2 hours(charging time)	
Portable Power Station	Portable Electric	Voltstack 30k	27kW (Cont. output)/80kWh / 3.5 hours(charging time)	○