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CONTACT INFORMATION

Organization Name	Brick Township Municipal Utilities Authority
Organization Address	1551 Route 88 W
City, State Zip Code	Brick, NJ 08724
Contact Person	Daniel Reilley
Title/Position	Supervisor, Buildings, Grounds, Fleet, Reservoir
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PROJECT NAME Sustainable Brick

PROJECT CATEGORY OR CATEGORIES (choose from 1-9 in "Eligible Projects" section above)

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☒ 7 ☐ 8 ☐ 9 ☐

PROJECT PRIORITY Priority # **1** of **1** proposals

If submitting more than one proposal, what is the sponsor's priority of this proposal?

NOTE FOR CATEGORY 9 PROPOSALS:

If your proposal is for Category 9, and you are proposing Level 1 and/or Level 2 electric vehicle charging stations, complete only the following sections of this form: Contact Information, Project Name, Project Category or Categories, and Project Priority. Submit the form without completing the remaining questions.

Then, go to [It Pay\\$ to Plug In – NJ's Electric Vehicle Charging Grants Program](#), and apply for a Charging Grant. Volkswagen funds for Level 1 and Level 2 charging stations will be administered through It Pay\$ to Plug In.

If your proposal is for Category 9, and you are proposing DC Fast Chargers and/or hydrogen fueling stations for light duty vehicles, you must complete all of the questions on this form.

PROJECT BUDGET \$ 600,000.00

Provide total estimated project budget, include source and amount of cost share if applicable.

Estimated project total: \$600,000.00

Source: VW Grant/Brick Township Municipalities

Cost Share: \$ 11,585

PROJECT DESCRIPTION (Briefly describe the project by completing the following questions)

Geographic area where emissions reductions will occur? **Brick, NJ - 32.315 sq. miles**

Estimated size of population benefitting from the emission reductions? **77,000**

Estimated useful life of the project? **7-10 years**

Number of engines/vehicles/vessels/equipment included in the project? **3**

Estimated emission benefits should be expressed in tons per year (TPY) of emission reduced for NOx and for PM 2.5 over the lifetime of the project. Identify methodology used.

Estimated NOx benefits? **0.16** TPY

Methodology Used? **EPA Diesel Emission Quantifier**

Particulate matter (PM 2.5) benefits? **0.08** TPY

Methodology Used? **EPA Diesel Emission Quantifier**

Will the project benefit one or more communities that are disproportionately impacted by air pollution? If so, please describe.

Overall this project will have an annualized health benefit of \$99,000 for Ocean County, NJ over the remaining life of the upgraded project. Health benefits include the reduction of premature mortality, chronic bronchitis, asthma attacks, non-fatal heart attacks, and other health problems.

Project partners, if any?

Motiv Power Systems, Clipper Creek, and Brick Utilities electrician.

Explain how the project will provide cost effective and technically feasible emission reductions. Cost effectiveness should be expressed in dollars per ton per year of emissions reduced for NOx and for PM 2.5.

The Sustainable Brick project will provide a cost effectiveness of approximately \$582,692 \$/sTPY reduction of NOx and \$27,718,248 \$/sTPY reduction of PM2.5

Estimated timeframe for implementation? Include a project timeline that identifies start and end dates, as well as the timeframe for key milestones.

6-8 months from NJDEP award.

Demonstrated success in implementing similar projects?

1. NJ's Clean Energy Smart Buildings Program with which we replaced our parking lot lights and retrofitted our Water Treatment Plant throughout with LEDS.

2. Storm Water Management Program, in which we have and continue to install rain gardens on our properties as well as educate our community on the importance of storm-water management in order to protect our water supply.

3. We have currently contracted with Maser Consulting to provide engineering services for the Energy Savings Improvement program (ESIP). This project will cover lighting, HVAC, Pumps, High Efficiency Transformers and Energy Management Systems. Funding is being secured and work should begin 2020/2021.

If your proposed project involves alternative fuels, provide a demonstration of current or future plans to provide adequate refueling infrastructure.

A sub panel will be installed to include 3 circuit breakers 208V-20AMP each. Conduits and electrical line is there, just need to adjust for adequate amperage.

Has your organization been approved to receive and expend any other grant funds related to this project? If so, please provide details.

N/A

Please provide any additional information that supports this project.

Vehicles to be replaced:

- 1: Class 6 -1995-Cummins 5.9L Diesel-2,096 miles PY-275 Idle Hrs. PY-248 gals PY Remaining Life 5 years**
- 2: Class 4 -2003-Ford 6.0L Diesel-5712 miles PY-300 Idle Hrs. PY-595 gals PY Remaining Life 7 years**
- 3: Class 4 -2007-Ford 6.0L Diesel-5,222 miles PY-371 Idle Hrs. PY-760 gals PY Remaining Life 10 years**

Installation of charging infrastructure will be completed by Brick Utilities in-house electrician and chargers will be funded by Brick Utilities. The estimated cost for infrastructure is approximately \$5,000 and there will be a total of three CS-100 Clipper Creek level 2 chargers needed for this project priced at \$2,195 each. The total cost share of this project will be \$11,585. This project is requesting VW grant funding for the Motiv powered electric vehicles.

Our goal as being a certified Audubon International Cooperative Sanctuary is to implement an environmental management plan that improves efficiency, conserves resources, and promotes conservation efforts. Brick Utilities tests its water supply, which includes the Metedeconk River and Brick Reservoir, on a daily basis to ensure high water quality. The Metedeconk River watershed area covers 70 mi², including 2 counties and 7 municipalities. The data collected is shared with the New Jersey Department of Environmental Protection to support State water quality programs. Brick Utilities collaborates with the NJDEP and upstream municipalities to implement water quality improvement projects within its water supply watershed. Brick Utilities also works closely on water quality improvements with the Barnegat Bay Partnership, one of USEPA's 28 Congressionally-designated National Estuary Programs in the United States. We aim to bring our municipality into balance with nature. This project will continue to demonstrate our commitment to the environment, our customers and to serve as an environmental leader to communities at large.

We continue to satisfy definable objectives in the following areas:

- a. Environmental Planning**
- b. Wildlife & Habitat Management**
- c. Resource Conservation**
- d. Storm water Management**
- e. Waste Management**
- f. Outreach and Education**
- g. Watershed Protection**

We strongly believe the next logical step in our commitment towards sustainability is to seize this opportunity to transition our fleet to alternative fuel, zero-emission vehicles.

Two additional pages have been provided as supplemental space to answer any of the questions above.

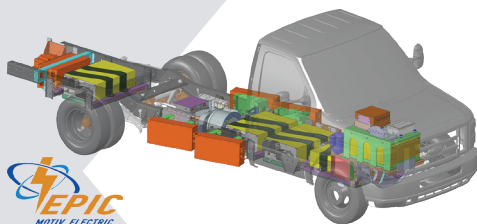


ALL-ELECTRIC WORK TRUCK



EPIC E-450 CHASSIS SPECIFICATIONS

OEM PLATFORM	Ford E-450
MAX GVWR	14,500 lbs
BATTERY TECHNOLOGY	Sodium Nickel
BATTERY CAPACITY	106 or 127 kWh
RANGE	100 miles
PEAK MOTOR POWER RATING	150 kW / 201 hp
PEAK MOTOR TORQUE RATING	1,060 Nm / 780 ft-lbs
GRADEABILITY	17%
MAX SPEED	65 mph
REGENERATIVE BRAKING	Standard
CHARGING TYPE	J1772 / 15 kW Meltric / 3 ϕ 208 VAC / 16.8 kW
50% CHARGE TIME	~2.5 hours
75% CHARGE TIME	~4 hours
100% CHARGE TIME	~8 hours



ALL-ELECTRIC EPIC E-450

FEATURES AND BENEFITS

- 85% reduction in operating costs and 66% reduction in maintenance costs
- Utilizes industry-proven EV batteries validated through millions of real world miles to ensure long life and inexpensive replacement costs
- Independent battery control improves reliability and performance
- No range degradation -40° to 120°F
- Acceleration and hill climbing performance comparable to combustion-powered vehicles
- Over-the-air software updates for new features and functionality
- High power accessory support for bed dump functions, AC power support, and other power accessories



MOTIV-POWERED WORK TRUCK

ABOUT MOTIV POWER SYSTEMS

Founded in 2009, and headquartered in the San Francisco Bay Area, Motiv Power Systems is committed to freeing fleets from their dependence on fossil fuels. EPIC (Electric Powered Intelligent Chassis) are CARB certified, GSA approved, and available for configurations including step vans, box trucks, school buses, shuttle buses, work trucks, trolleys, and specialty vehicles.

An EPIC all-electric chassis offers uncompromised performance and functionality without the pollution, noise, heat, and vibration of gasoline or diesel power.

Motiv is the only Ford eQVM approved provider of all-electric chassis for commercial trucks and buses and benefits from engineering insights and support from Ford to ensure safety and reliability.

With hundreds of thousands of miles logged among several of the largest fleet operators in the United States, the EPIC family eliminates 100% of vehicle emissions, dramatically reduces operating and maintenance costs, and creates a healthier environment for riders and communities while also reducing driver fatigue

CTEC

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PROUDLY ENGINEERED AND ASSEMBLED
IN THE USA

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Motiv-Powered All-Electric Delivery Vehicles

Introduction

At Motiv Power Systems (est. 2009 in California), we have taken a unique approach to bring our electric vehicle technology to market. Instead of designing our own chassis and bodies from scratch, we have partnered up with industry-leading OEMs and vehicle body builders to leverage their reliability, decades of experience, and after-sales service networks. Today we offer a family of all-electric chassis built on proven Ford chassis platforms. We then work with vehicle builders / body partners who are able to build on top our electrified Ford chassis. In the last few years we have successfully deployed Class 4-6 all-electric vehicles, including: school buses, shuttle buses, step vans, work trucks, box trucks, and specialty vehicles.

CHASSIS	VEHICLE APPLICATIONS	BODY PARTNERS
Ford E-450 (Class 4)	School Bus, Shuttle Bus, Box Truck, Work Truck, Specialty Applications	Collins, Trans Tech, Utilimaster, Champion, Rockport, CTEC
Ford F-550 (Class 5)	Shuttle Bus, Box Truck, Stake Bed Truck, Work Truck	Rockport, Utilimaster, CTEC, Champion
Ford F-59 (Class 6)	Step Van, Shuttle Bus, School Bus, Specialty Applications	Utilimaster, Starcraft Bus, Summit Bodyworks
Ford F-53 (Class 6)	Trolley, Mobile Medical, Mobile Education, other Specialty Applications	Winnebago, Hometown Trolley

We are proud to be the first and only all-electric chassis to receive eQVM (Qualified Vehicle Modifier) approval from Ford for Class 4-6 applications. Compared to other medium-duty EV solutions, our patented control system architecture provides more power with a smoother driving experience. Our chassis come equipped with commercially-proven battery packs validated by millions of real-world miles, and our modular approach to battery packs and controllers provide higher reliability while significantly reducing maintenance costs. Last but not least, Motiv chassis are supported with the highest level of customer care and are proudly engineered and assembled in the USA.



Motiv-powered delivery vehicles are becoming a popular choice for the largest fleets in the country. AmeriPride Linen and Uniform Services, subsidiary of Aramark Corporation, deployed (10) electric Motiv F-59 step vans in 2017. High uptime and significant O&M savings resulted in AmeriPride deploying an additional (20) in 2018. United States Postal Service also ordered a pilot unit in 2018. After a rigorous validation and acceptance process, USPS is now taking delivery of 6 additional Motiv electric trucks. In addition to AmeriPride and USPS, Bimbo Bakeries and FedEx Ground have also placed orders for pilot vehicles to be delivered in the coming months.

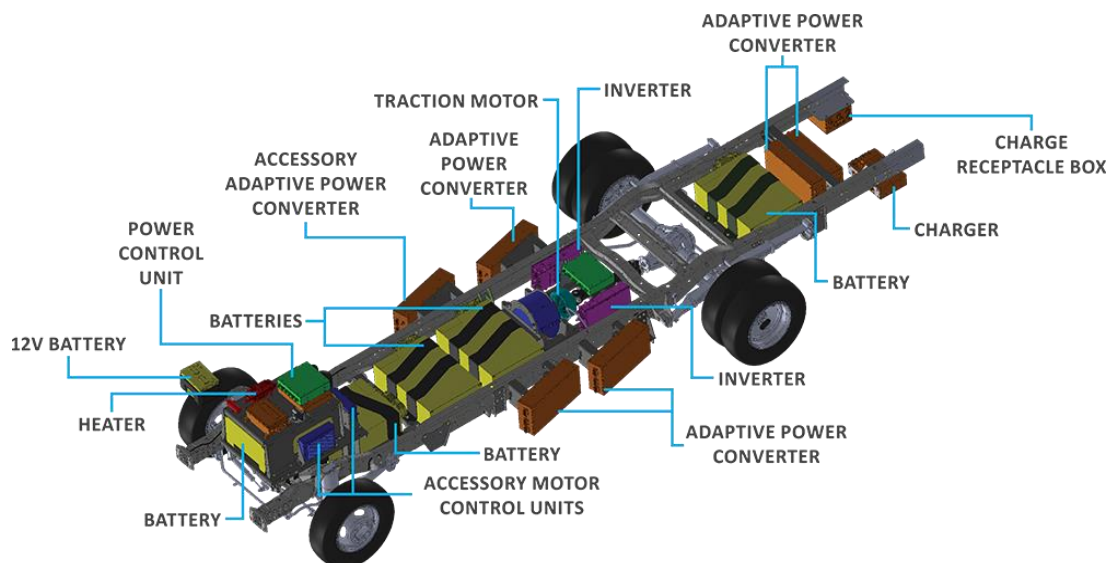
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Our Technology

Electric vehicles have long been of interest to medium-duty fleet owners, but technology advancements have been slow to arrive due to the diverse needs, low production volumes, high power requirements, and lack of scalable solutions. Motiv's technology offers an all-electric solution. Our patented system and deep expertise in dynamic controls, power electronics, and embedded software combine to form an unmatched technology platform on which to produce medium-duty all-electric commercial vehicles. We use the **same core components** in all our vehicles, enabling volumes of scale and ease of serviceability across vehicle applications and sizes.



Motiv's EPIC 4 - Electric Ford Stripped E-450 Chassis

Motiv's all-electric chassis family uses an architecture that is **modular and scalable**. Instead of one large battery, we deploy several modular battery packs, each independently managed by a Motiv controller. This setup not only distributes weight more evenly, it adds redundancy and reliability. **If one battery was to fault while on a route, the system adapts and keeps the vehicle running using the other batteries.** Additionally, fleets are able to choose battery configurations for each application, optimizing cost for each unique route. Batteries can also easily be added in the future if routes change and more range is needed.



Motiv's EPIC 4 – All-Electric Ford E-450 Chassis as displayed in Ford's booth at Work Truck Show 2018

MOTIV POWER SYSTEMS

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Indicative Pricing

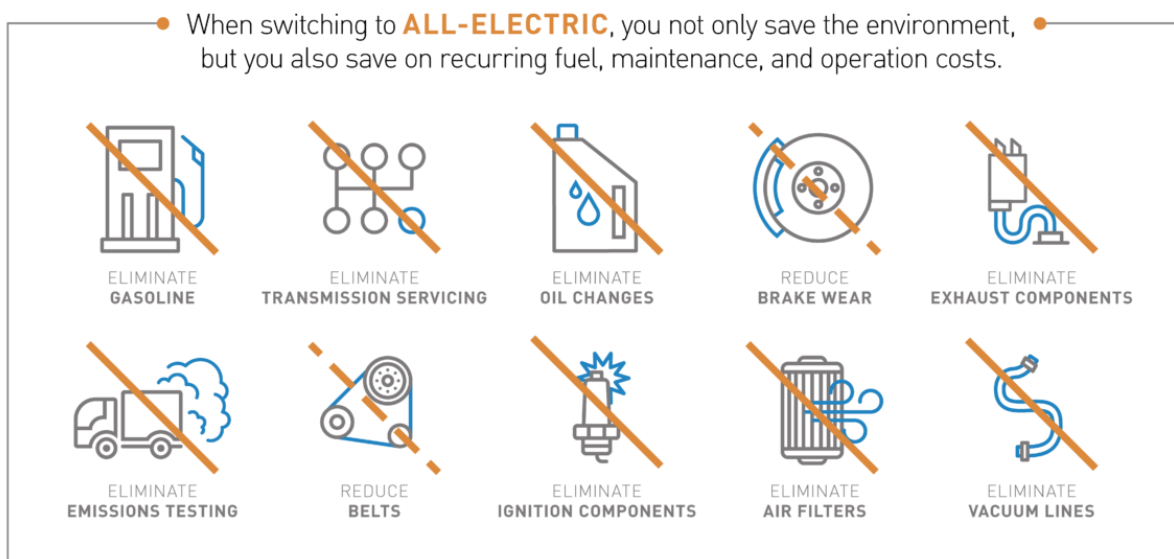
We aim to learn your exact vehicle specifications to be able to provide firm pricing. In the interim, please see the table below for indicative pricing for your application. **Discounts can be provided for larger quantities.**

CHASSIS PLATFORM	Ford F-59 Stripped	Ford F-550	Ford E-450 Cutaway	Ford E-450 Stripped
BODY MANUFACTURER	Utilimaster	Utilimaster & Rockport	Utilimaster & Rockport	Utilimaster
BATTERY CONFIGURATION*	106 kWh – 75 miles 127 kWh – 90 miles	127 kWh - 100 miles	106 kWh – 85 miles 127 kWh – 100 miles	106 kWh – 85 miles 127 kWh – 100 miles
INDICATIVE VEHICLE PRICE** (PRE-INCENTIVE)	106 kWh - \$160,000 127 kWh - \$170,000	127 kWh - \$195,000	106 kWh - \$180,000 127 kWh - \$195,000	106 kWh - \$177,000 127 kWh - \$192,000
TYPICAL INCENTIVES (IN SELECT STATES)	\$100,000	\$100,000	\$90,000	\$90,000

*Range estimates are **conservative values** based on real-world operational data, and **better ranges are possible** with trained drivers, opportunity charging, and/or ideal driving conditions.

**Volume discounts for orders greater than 5 units are available.

Ongoing O&M Savings



Although electric vehicles cost more upfront, fuel costs are significantly lower than fossil fuel powered vehicles. We estimate **each vehicle will save approximately \$11,000 per year in fuel costs**. We are happy to provide an analysis for your unique cost savings. Additionally, since there are considerably fewer moving parts in an EV, less maintenance is required. You can finally say goodbye to regular oil changes, engine replacements, and transmission failures. Since EVs have regenerative braking, brake pads will not be replaced as often. Maintenance savings vary case by case, but generally for delivery vehicles we estimate **each vehicle will save approximately \$5,000 per year on maintenance**.



Charging Infrastructure

A Motiv vehicle can charge via 208V 3 Phase or 240V Single Phase power depending on the configuration. We recommend using a Clipper Creek CS-100-3 (3 Phase) or CS-100 (Single Phase) depending on which type of power is available at your site. These stations both require a 100A dedicated breaker, but lower amperage stations are also available. Charge stations can be purchased through Motiv or Clipper Creek directly. We are also able to conduct initial site visits to evaluate your infrastructure readiness, as well as work with a licensed electrician to install the proper charge stations to suit your needs.

Expected Range and Route Analysis

Please note the expected ranges listed in the table above are for a single charge. Our system charges to 50% in approximately 2 hours and 75% in 4 hours, allowing our customers to get 100 - 150 miles per day assuming there is opportunity charging between shifts or routes. Motiv will provide route analysis services to ensure your route requirements can be met. During this analysis, we will review planned routes, evaluate terrain, and frequency of loops.

Telematics

Motiv offers a monthly subscription data service for all Motiv-powered vehicles. This service allows the fleet to log into the vehicle securely over an internet connection and query its current status. The service also saves data so the fleet operator can review historical vehicle performance. We would be happy to provide an in-person telematics demonstration with typical use cases and real vehicle data.

CS SERIES



PUBLIC CHARGING STATION

A REAL PRODUCT, FOR THE REAL WORLD. The CS Series from ClipperCreek is designed to take the wear-and-tear of everyday use in all environments. Its tough NEMA 4 outdoor rated enclosure and rubber over-molded connector for the CS-60 and above ensures you can install this unit anywhere with confidence.

- **MANY POWER LEVELS** - 16A to 80A charging
- **QUALITY** - Technology that works for the life of your current plug-in vehicle and then some
- **CONVENIENCE** - 25 feet of charging cable for installation and operation flexibility
- **DURABILITY** - Rugged, fully sealed NEMA 4 enclosure for installation anywhere
- **RELIABILITY** - Backed by ClipperCreek's 1-year warranty, and outstanding customer service



PRODUCT OVERVIEW

ELECTRICAL SPECIFICATIONS

- **Service** - 208V to 240V, 20A to 100A, single phase, 2 wire w/ground
- **Charge Current or Output Power** - 208V to 240V, 16A to 80A continuous (3.8kW to 19.2kW)
- **Service Ground Monitor** - Constantly checks for presence of proper safety ground
- **Automatic Circuit Reclosure after minor power faults**
- **Charge Circuit Interruption Device** - Ground Fault Protection with fully automated self-test, eliminates manual user testing
- **Cold Load Pickup** - Time-delayed and randomized to allow seamless re-energizing of unit following power outages
- **External Control Input** - Allows external control from smart meter (AMI), billing or load management device

MATERIAL SPECIFICATIONS

- Indoor/outdoor rated fully sealed (NEMA 4) enclosure
- Operating Temperatures: -22°F to 122°F (-30°C to +50°C)
- 22" H x 17" W x 8" D (559mm H x 432mm W x 203mm D)
- Weight 33 lbs. (15kg) to 45lbs. (20.4kg)
- UL, cUL, ETL, cETL Listed

MULTIPLE CONFIGURATIONS

MODEL:	CS-100	CS-90	CS-80	CS-70	CS-60	CS-50	CS-40	CS-30	CS-20
CIRCUIT BREAKER RATING:	100A	90A	80A	70A	60A	50A	40A	30A	20A
CONTINUOUS CURRENT:	80A	72A	64A	56A	48A	40A	32A	24A	16A

CODES AND STANDARDS

- **UL 2594** Electric Vehicle Supply Equipment
- **UL 2231** Personal Protection Device (i.e., CCID Hardware)
- **UL 1998** Standard for Safety-Related Software
- **UL 991** Standard for tests for Safety-Related Controls Employing Solid-State Devices
- **NEC 625** Electric Vehicle Charge System
- **SAE-J1772™** Electric Vehicle Conductive Charge Coupler