**PHEVAmerica**

**U.S. Department of Energy Advanced Vehicle Testing Activity**

**Base Vehicle Description**
- **Make:** Ford
- **Model:** Escape
- **Year:** 2007
- **VIN:** 1FMYU59H37KA77842
- **Number of Passengers:** 5
- **Hybrid Configuration:** Series/Parallel

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**VEHICLE SPECIFICATIONS**

**Weights**
- Design Curb Weight: 3792 lbs
- Delivered Curb Weight: 4102 lbs
- Distribution F/R: 51.8%/48.2%
- GVWR: 4720 lbs
- GAWR F/R: 2,440/2,255 lbs
- Payload: 618 lbs
- Performance Goal: 400 lbs

**Engine**
- Model: Duratec 2.3 L4 Atkinson cycle
- Output: 155 HP @ 6000 RPM
- Configuration: 4 Cylinder In-line DOHC
- Displacement: 2.3L
- Fuel Tank Capacity: 15 gal
- Fuel Types: Unleaded Gasoline

**Electric Drive System**
- Battery Manufacturer: Electrovaya
- Battery Type: Li-ion Polymer
- Number of Cells: 288
- Nominal Cell Voltage: 3.7 V
- Nominal System Voltage: 360 V
- Nominal Pack Energy: 12.0 kWhr
- Measured Useable Energy: 4.6 kWhr

**Charge System:**
- Input Voltages: 120V/230V
- Required Breaker Current: 15-Amp
- Charger Power Output: 1 kW
- Charger Plug Type: NEMA 5-15
- 80% Charge Time: 9.6 Hrs
- 100% Charge Time 120V: 12 Hrs
- 100% Charge Time 230V: 8 Hrs

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**VEHICLE TEST RESULTS**

**Charge Depleting:**
- **Acceleration 0-60 MPH**
  - Time: 11.7 seconds
- **Acceleration 1/4 Mile**
  - Time: 19.5 seconds
- **Maximum Speed:** 78.8 MPH

**Charge Sustaining:**
- **Acceleration 0-60 MPH**
  - Time: 11.4 seconds
- **Acceleration 1/4 Mile**
  - Time: 19.4 seconds
- **Maximum Speed:** 80.1 MPH

**Brake Test @ 60 MPH**
- Distance Required: 142.2 ft

**Fuel Economy with A/C Off:**
- Fuel Economy: 39.3 MPG
- AC kWh Consumed: 0.169 kWh/mi

**Fuel Economy with A/C On:**
- Fuel Economy: 37.8 MPG
- AC kWh Consumed: 0.235 kWh/mi

**UDDS Fuel Economy**

<table>
<thead>
<tr>
<th>Distance (miles)</th>
<th>Fuel Economy (mpg)</th>
<th>AC Energy Consumed (kWh)</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>20</td>
<td>45.0</td>
<td>3.81</td>
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<tr>
<td>40</td>
<td>44.3</td>
<td>6.70</td>
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<tr>
<td>60</td>
<td>41.9</td>
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<td>7.93</td>
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<tr>
<td>200</td>
<td>34.6</td>
<td>7.93</td>
</tr>
</tbody>
</table>

**HWFET Fuel Economy**

<table>
<thead>
<tr>
<th>Distance (miles)</th>
<th>Fuel Economy (mpg)</th>
<th>AC Energy Consumed (kWh)</th>
</tr>
</thead>
<tbody>
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<tr>
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<td>37.3</td>
<td>3.63</td>
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<tr>
<td>80</td>
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<td>3.63</td>
</tr>
<tr>
<td>100</td>
<td>36.2</td>
<td>3.63</td>
</tr>
<tr>
<td>200</td>
<td>35.3</td>
<td>3.63</td>
</tr>
</tbody>
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**TEST**

1. Cumulative fuel economy over EPA standard urban drive cycle.
2. Vehicle soaked at ambient temperature while off for a minimum of 12 hours prior to testing.
3. Average non-cold start charge depleting fuel economy.
4. Value determined from average charge sustaining fuel economy tests with appropriate energy correction calculations.
5. A/C on coldest setting with full blower power.
6. Calculated cumulative fuel economy values, includes cold start.
7. Cumulative AC energy based on measured charge efficiency.
8. Test was not completed due to vehicle malfunction.

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Values in red indicate the Performance Goal was not met. All Power and Energy Values are DC unless otherwise specified.

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Urban Driving Cumulative Fuel Economy at Range

Highway Driving Cumulative Fuel Economy at Range
This vehicle meets the following PHEVAmerica minimum requirements:

1. Vehicles shall comply with Federal Motor Vehicle Safety Standards applicable on the date of manufacture and such compliance shall be certified by the manufacturer in accordance with 49 CFR 567. Suppliers shall provide a complete copy of Appendix A and Appendix B with their proposal, providing vehicle specifications and the method of compliance with each required section of 49 CFR 571. If certification includes exemption, the exemption number issued by the National Highway Traffic Safety Administration (NHTSA), the date of it’s publication in the Federal Register and the page number(s) of the Federal Register acknowledging issuance of said exemption shall be provided along with Appendix B. Exemptions for any reason other than non-applicable and not saved.

2. Vehicles shall be certified under current California Air Resources Board (CARB) or Environmental Protection Agency (EPA) regulations.

3. Suppliers shall supply Material Safety Data Sheets (MSDS) for all unique hazardous materials the vehicle is equipped with, including RESS batteries or capacitors, and auxiliary batteries.

4. Suppliers shall provide recycling plans for batteries to be in accordance with the requirements of 49 CFR 571.655, as implemented.

5. All vehicles shall comply with the FCC requirements for unintentional emitted electromagnetic radiation, as identified in 47 CFR 15. Subpart B, "Unintentional Radiators."

6. Vehicles shall have a minimum payload of at least 400 pounds.

7. For conversions, OEM Gross Vehicle Axle Weight Ratings (GAWR) shall not be increased. For conversion vehicles, Suppliers shall specify the OEM gross vehicle weight rating (GVWR).

8. For conversions, OEM Gross Vehicle Axle Weight Ratings (GAWR) shall not be increased. Suppliers shall provide axle weights for the vehicle as delivered, and at full rated payload.

9. Tires shall be subject to the following requirements:
   - Tires provided with the vehicle shall be the standard tire size recommended by the HEV Supplier for the vehicle being proposed.
   - At no time shall the tire’s inflation pressure exceed the maximum pressure imprinted upon that tire’s sidewall.
   - At no time shall the tire’s inflation pressure exceed the maximum pressure imprinted upon that tire’s sidewall.
   - The tire shall be operable across the entire operation load range of that vehicle.
   - Replacement tires shall be commercially available to the end user in sufficient quantities to support the purchaser’s needs.
   - Tires provided as original equipment by the HEV manufacturer shall not have warranty restrictions in excess of those of the tire manufacturer, unless the Supplier is the sole warrantor for the tires.
   - The tire shall be operable across the entire operation load range of that vehicle.

10. Seating capacity shall be a minimum of 1 driver and 1 passenger. Suppliers shall specify seating capacity (available seat belt positions) for their vehicle. For conversion vehicles, if the vehicle’s seating capacity is changed from that specified by the OEM on their FMVSS placed, the seat(s) being added or abandoned shall be modified as required by 49 CFR 571.207, et al, and a new FMVSS placed installed as required by 49 CFR 567, 568 or 571, as applicable.

11. For conversion vehicles, the OEM passenger space shall not be intruded upon by the Rechargeable Energy Storage System (RESS) or other conversion materials.

12. The vehicle shall have a parking mechanism.

13. The controller/inverter shall limit the minimum RESS battery discharge voltage to prevent degradation of battery life, and should limit the maximum regeneration voltage to prevent external gassing of the batteries.

14. Vehicles shall comply with the requirements of 49 CFR 571.105.5.2.1, or alternatively, 49 CFR 571.105.5.2.2 for parking mechanisms.

15. Vehicles shall be equipped with a minimum of two (2) Energized Road Test (ERT) ET-100 (E-100) sensors included (1) driving through standing water without damage and without battery to chassis leakage current exceeding 0.5 MU per UL Standard 2202, and (2) standing for extended periods in extreme temperatures without damage or failure of the vehicle or its systems.

16. Vehicles shall be designed and constructed such that there is complete containment of the flywheel energy storage system during or following frontal barrier, rear barrier and side impact collisions, and rollover requirements of 49 CFR 571.301. Suppliers shall provide verification of conformance to this requirement.

17. Batteries shall comply with the requirements of SAE J1718. Vehicles shall not auto-start the engine to charge the batteries while the vehicle is parked and the key switch is in the OFF position.

18. RESS batteries shall meet the requirements of NEC 625-29(c) or (d) for charging in enclosed spaces without a vent fan. The vehicle shall be labeled as not requiring ventilation for charging (or have the appropriate classification label from a UL-recognized Testing Laboratory).

19. Batteries shall comply with the requirements of SAE J1718, and at a minimum shall meet the requirements of NEC 625-29(c) or (d) for charging in enclosed spaces without a vent fan.

20. Suppliers shall provide Material Safety Data Sheets (MSDS) for all unique hazardous materials the vehicle is equipped with, including RESS batteries or capacitors, and auxiliary batteries.

21. The controller shall not initially energize to move the vehicle with the gear selector in any position other than “PARK” or “NEUTRAL;”

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