Inverger Technology

Kathryn Miles

Eetrex Incorporated

EEtrex
Energy Efficient Transportation Technologies

Eetrex Incorporated

- Xcel Energy's Utility Innovation partner in SmartGrid City
- Vehicle-to-Grid (V2G) Technology Leader (Inverger™)
- Escape PHEV systems, CARB Certified, FMVSS
- Prius PHEV systems
- Core Battery Technologies
- Staff of 30 in 5,900 ft2 in Boulder, CO, founded in 2006
- Received two grants from the Colorado Governor’s Energy Office
- 56 PHEV Conversions to date over 650,000 miles
- Manufacturing Partner is Methode Electronics Inc., (MEI)

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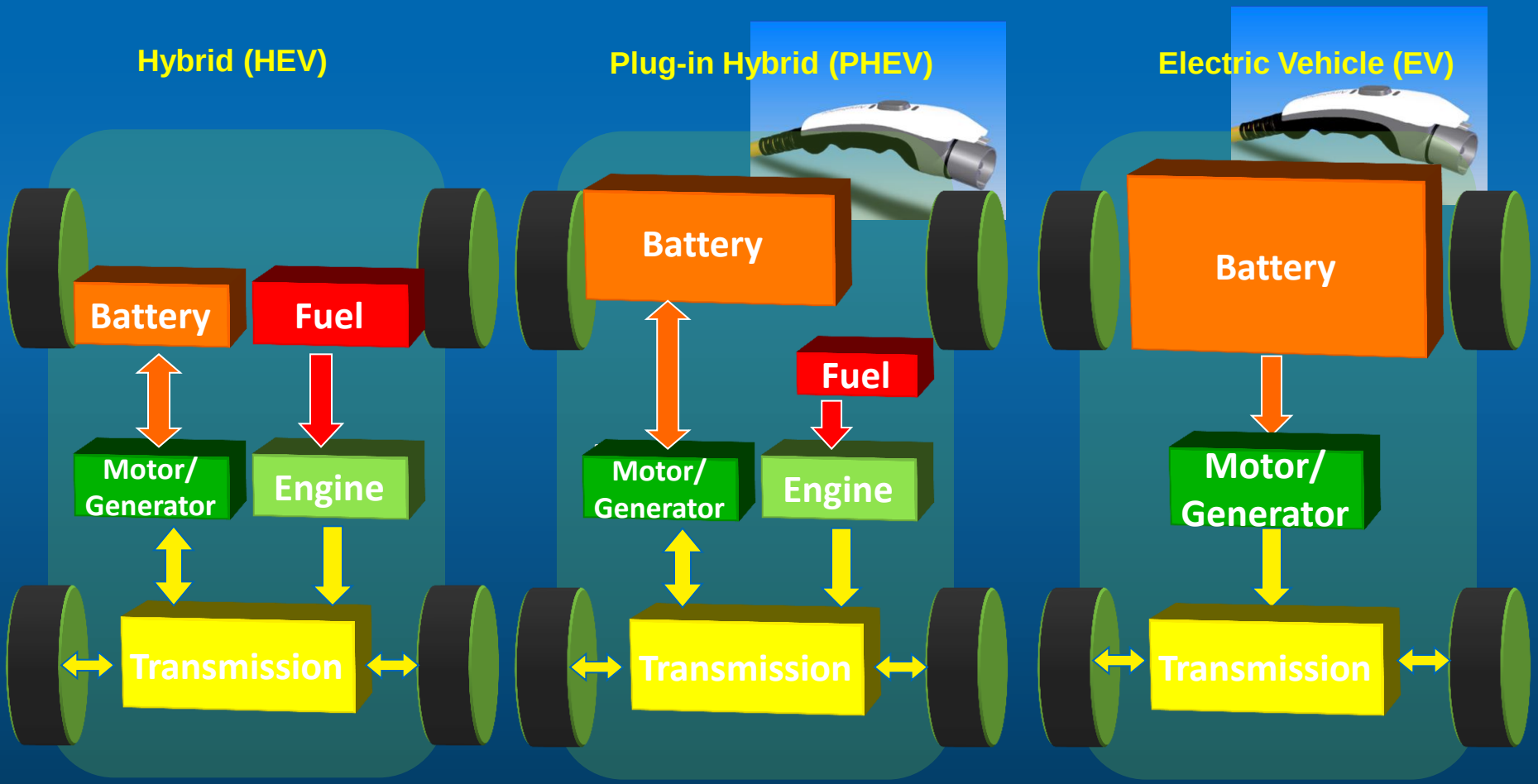
Electrification



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Adding The Plug Opens Possibilities

- Remote Power
- Mobile Power
- Smart Grid Power
- Independent Power
- Quiet Power

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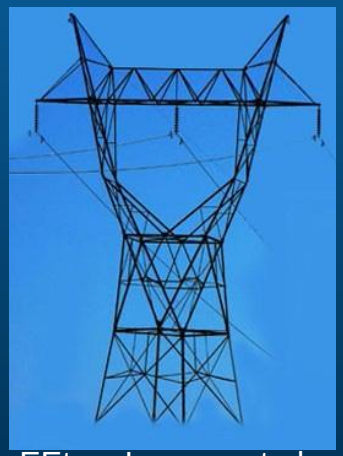
Inverger™

- **Bi-directional battery charger/inverter**
- **Intelligent Charger uses Wind/Solar to Charge**

Mobile, Distributed Power

- V2H or V2W
  - **Turn vehicle into clean and quiet generator, powering "critical" home/work components for 2+ days**
  - **Strong interest from vehicle OEM's**
- V2X
  - **Vehicle is "mobile power"**
  - **On-demand energy, anywhere**
- V2G
  - **Storage for renewable**
  - **Provide regulation**



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Inverger™ Specs

- AC Connection
  - 6.6 kW
  - Voltage Range: 110 – 240 Volts
  - Current Range: 12 – 30 Amps
  - Ground Fault Outlet
- AC Connector – Per Customer
  - E.g. 110/240V, 50A, 3-Pole,
  - 4-wire, Grounding, Locking, Corrosion Resistant
- DC Connection
  - Voltage Range: 100 – 400 Volts
  - Current Set by AC Connection
- Communication
  - CAN Bus
  - Cellular Modem

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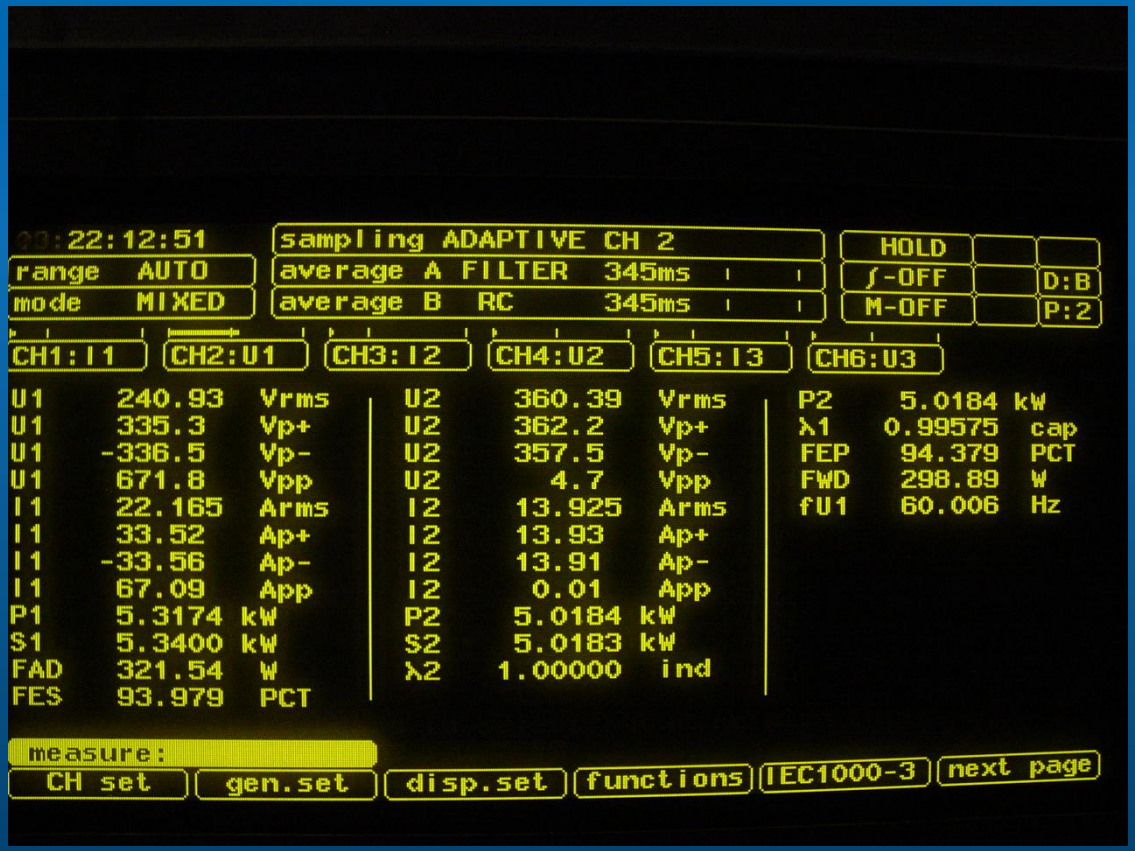
Inverger™: Charging at 5kW



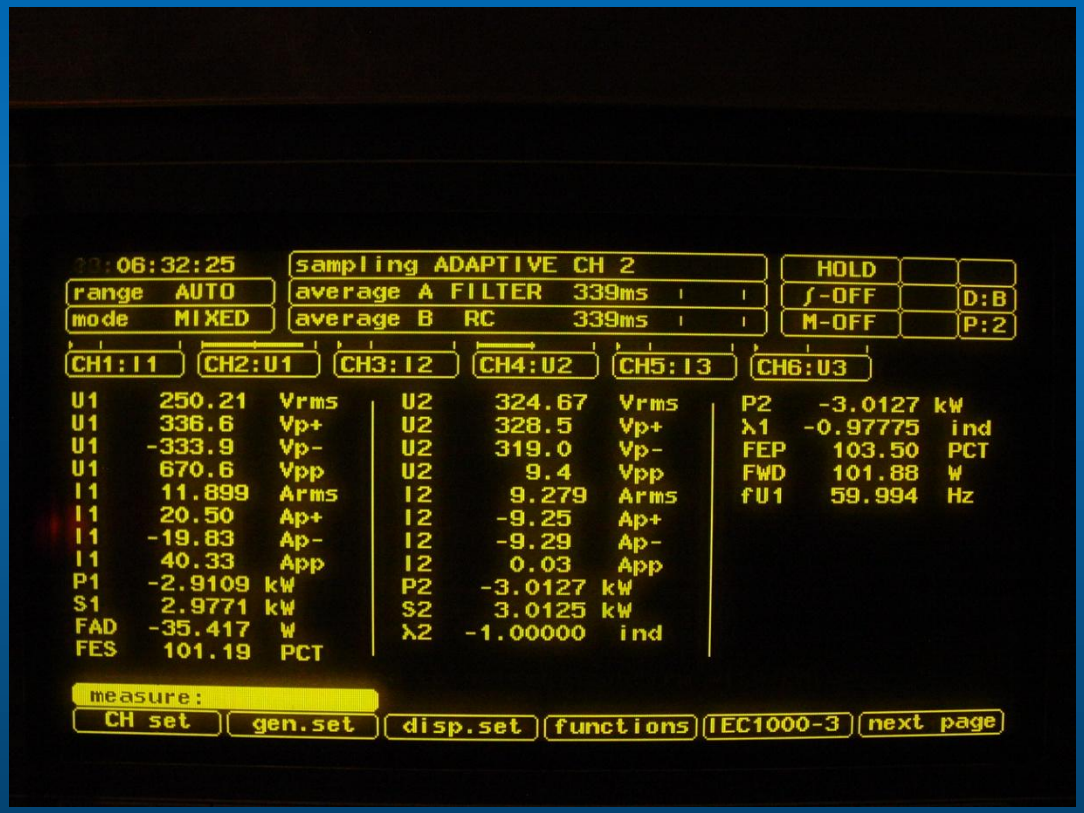
Charging Test Data at 5kW

Charge Mode Power Analysis:
5Kw output
.995 PF line to battery
94.4% Conversion efficiency line to battery
298.89 watts dissipation

AC Line Input:
240.93 Line VAC
5.3174Kw

DC Charge Output:
Battery voltage (controlled load)
360.39 vdc
Charge current 13.925 adc
Output Wattage 5.0184 Kw

Inverger™: Discharging at 3kW



Discharging Test Data at 3kW

Discharge Mode Power Analysis:
3Kw Battery source power
.977 Output PF
96.50 Conversion efficiency battery to line
101.88 watts dissipation

DC Input:
3.012 Kw
324.67 DC battery voltage
9.27 Amps DC RMS battery current
.

AC Line output:
250.21 Line VAC
.977 PF
2.91 Delivered Kw
2.97 KVA

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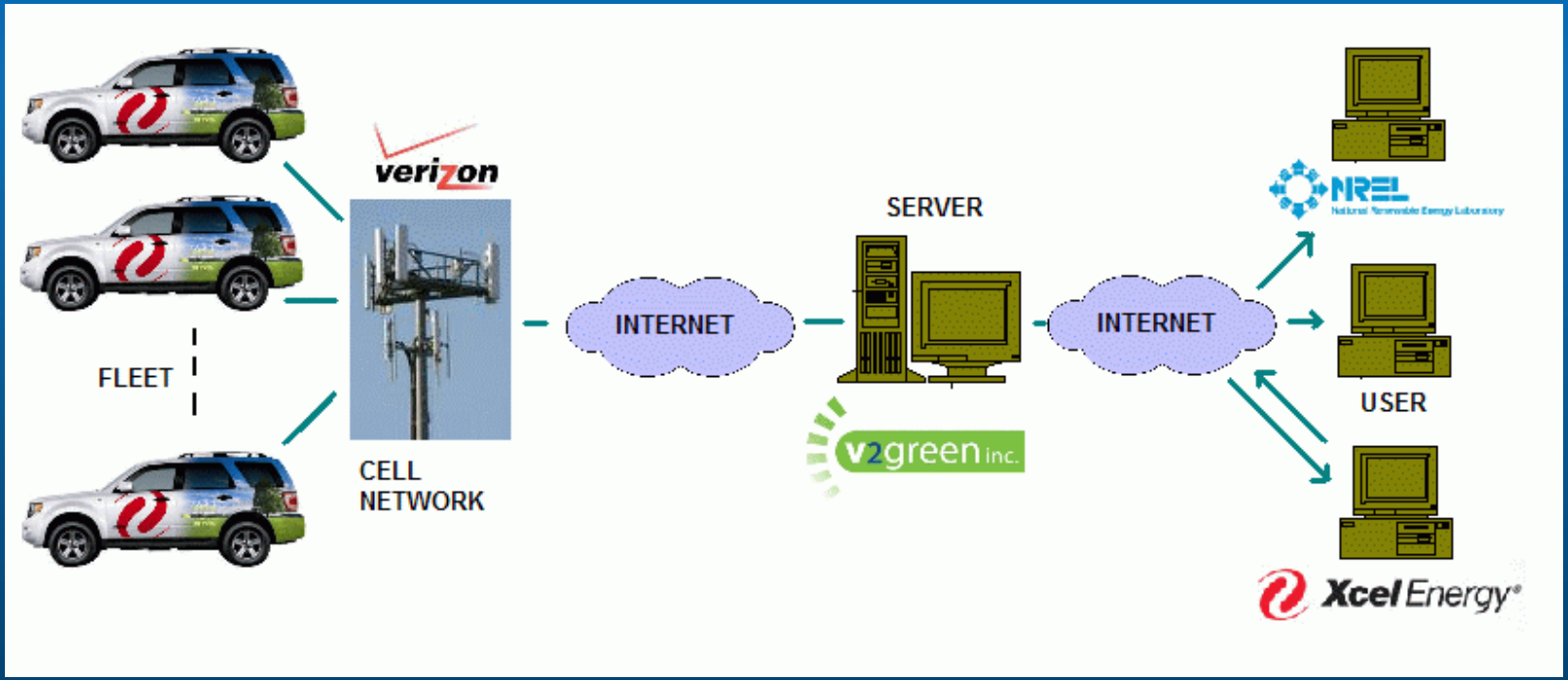
Data Communications & Charge/Discharge Control



Florida Power and Light

GRIDPOINT

LOG OUT

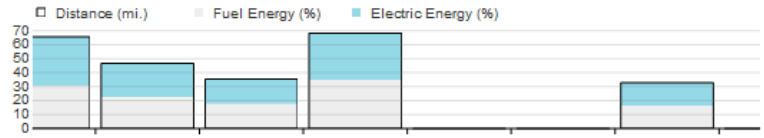
Vehicles

- FP&L 1127
- FP&L 1400
- FP&L 1460
- FP&L 1461
- FPL Escape 2311
- FPL Mariner 2825

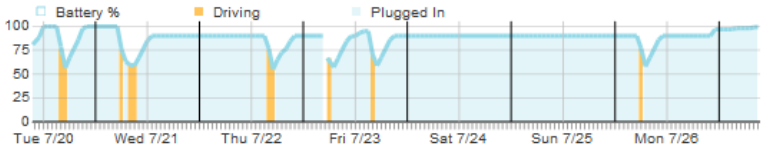
FPL Escape 2311 : Ford Escape Hybrid 4WD 2004-2007 with HybridsPlus kit

State: Plugged In
Fuel Level: 74%
Battery Level: 99%
Location: FP&L Office
AC Power: 0.0kW

Travel by Fuel Source



Battery Level



Performance Report | Timeline | Trips | Charge Sessions

Detailed Statistics

	Today	Last 7 Days	Last 30 Days
Driving			
Trips	0	12	55
Time	0 m	4 h 18 m	21 h 59 m
Distance (mi.)	0.0	183.1	985.5
Fuel (gal.)	0.0	3.6	20.4
DC Energy (kWh)	0.0	-28.9	-125.5
Est. Cost ($)	$0.00	$18.53	$99.46
CO_2e (lbs.)	0.0	85.0	481.1
Charging			
Sessions	1	6	29
Connect Time	1 d 2 h 34 m	5 d 22 h 2 m	24 d 23 h 26 m
Connect Score	279%	95%	88%
AC Energy (kWh)	6.5	32.5	147.6

Fleet Comparision

	Today	Last 7 Days	Last 30 Days
MPG			
FPL Escape 2311	0.0	50.9	48.3
Fleet	53.4	51.9	47.2
National Average	19.8	19.8	19.8
CO_2e (lbs.) / mi.			
FPL Escape 2311	0.0	0.5	0.5
Fleet	0.4	0.5	0.5
National Average	1.2	1.2	1.2
$ / mi.			
FPL Escape 2311	$0.00	$0.10	$0.10
Fleet	$0.10	$0.10	$0.10
National Average	$0.20	$0.20	$0.20

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Done

Internet | Protected Mode: On

100%

Thank You

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