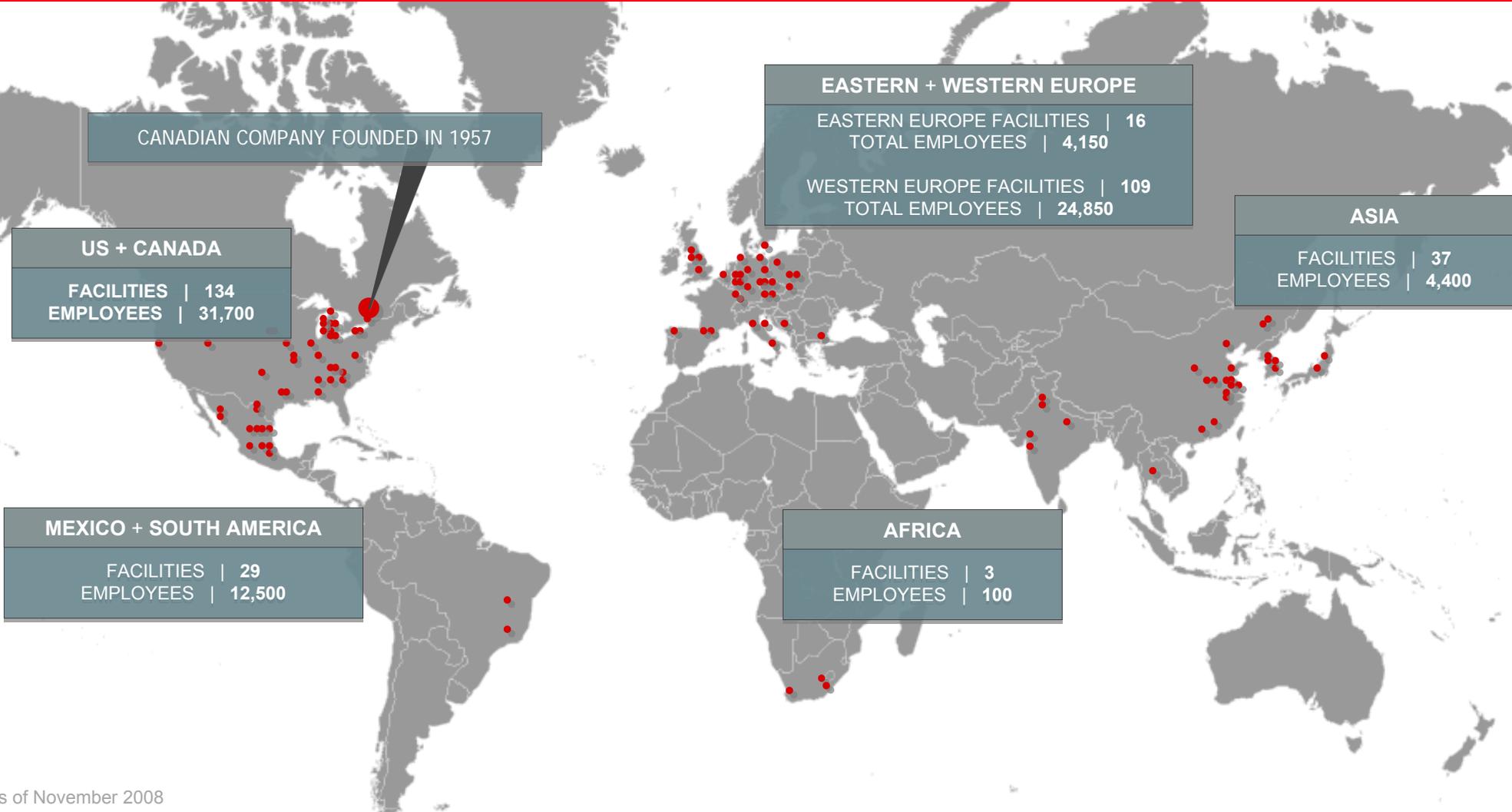




**Magna Overview**  
**City of Rochester Hills, Michigan**  
**March 16, 2009**

# Magna International Global Presence\*



\* As of November 2008

**Global Facilities 328**

**25 Countries | ~ 77,500 People | \$26 Billion**

2007 Sales

# Magna Electronics – Global Presence



Global Facilities - 34

~ 3.000 Employees worldwide

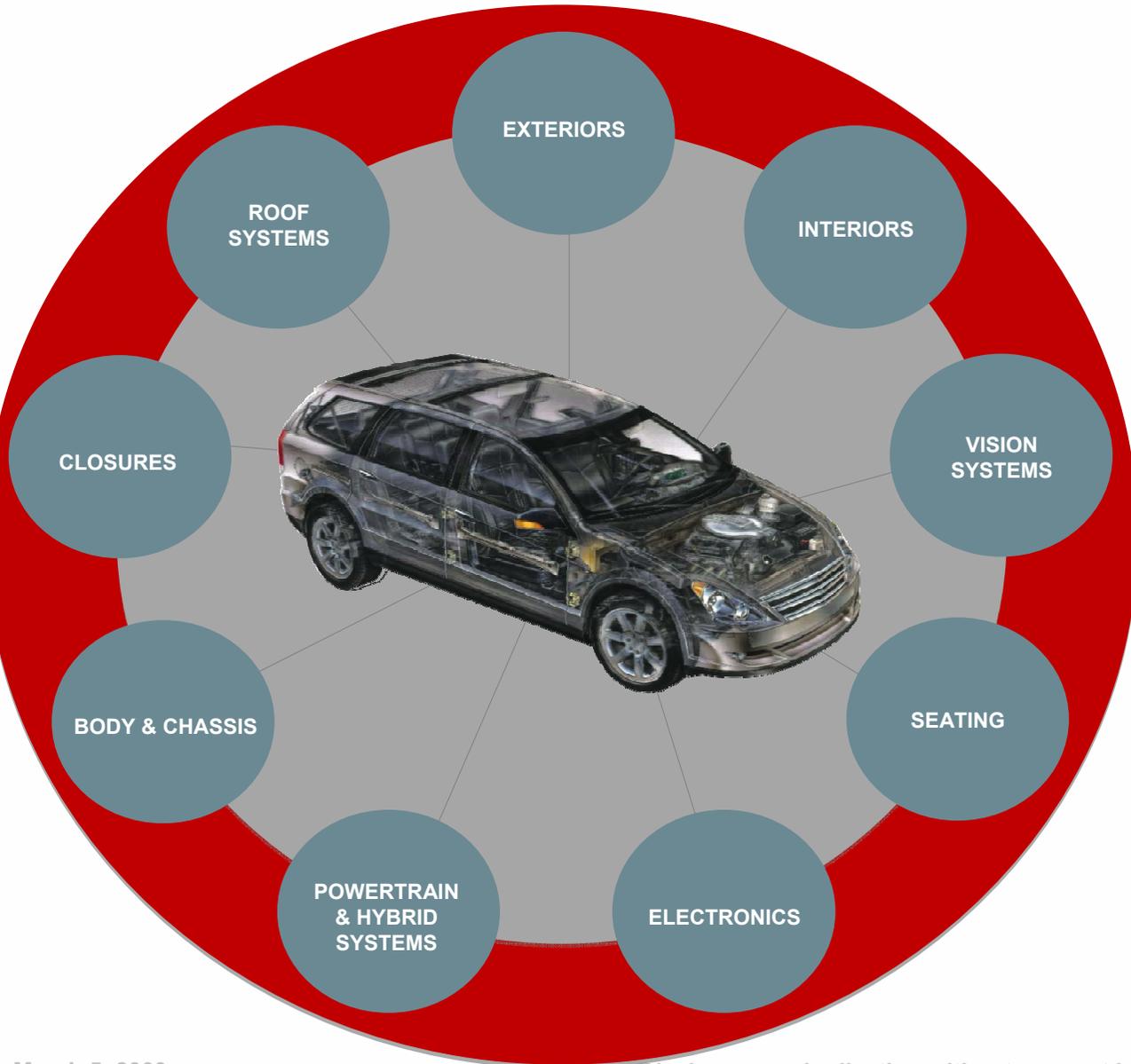
# Magna/BluWāv Systems Integration

- **Founded in 2000 BluWāv Systems LLC, is based in Rochester Hills MI and is a developer and supplier of electric propulsion and energy management systems for Hybrid Electric Vehicles (HEV), Plug-in Hybrid Electric Vehicles (PHEV), and Battery Electric Vehicles (BEV).**
- **In October of 2008 Magna Electronics purchased the assets of BluWāv Systems to enhance Magna Electronics' position in developing and supplying components and systems to the emerging automotive market for electric and hybrid vehicles.**



- **New Corporate Research and Development facility.**
  - This project is being undertaken to integrate the alternative vehicle operations of BluWāv Systems into Magna Electronics and to expand the alternative vehicle resources for design, development, testing, implementation and commercialization of new propulsion and energy systems product technologies for the automotive industry.
    - Location – Rochester Hill, MI
    - Planned move in - April 2009
    - 53,000 sq. ft.
    - Approximately \$20 million investment over the next 5 years
    - New Michigan Green Jobs
      - **> 90 new employees**





engineering + services

product systems

vehicle assembly



# Magna Electronic Product Capabilities

**Intelligent Power Systems  
Electric/Hybrid Vehicles**



**Intelligent Power Systems Smart  
Actuators**



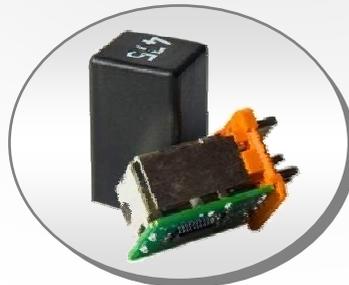
**Driver Assistance & Safety**



**Industrial Products**



**Body Systems & HMI**



**Engine Electronics &  
Liquid Sensors**



**Lighting Systems**

Regional Player N.A.



# EV Product Portfolio

## Alternative Propulsion Systems



### DEVELOPMENT

#### Development of:

- EV / Hybrid Components
- EV / Hybrid Systems
- EV / Hybrid Modules
- Complete EV / HV



### PRODUCTION

#### Planning and Operation of Production Facilities for EV & Hybrid Vehicles

#### Demonstrator:

- Small Volume (PT shop)
- Volume Production (> 5000 veh.)



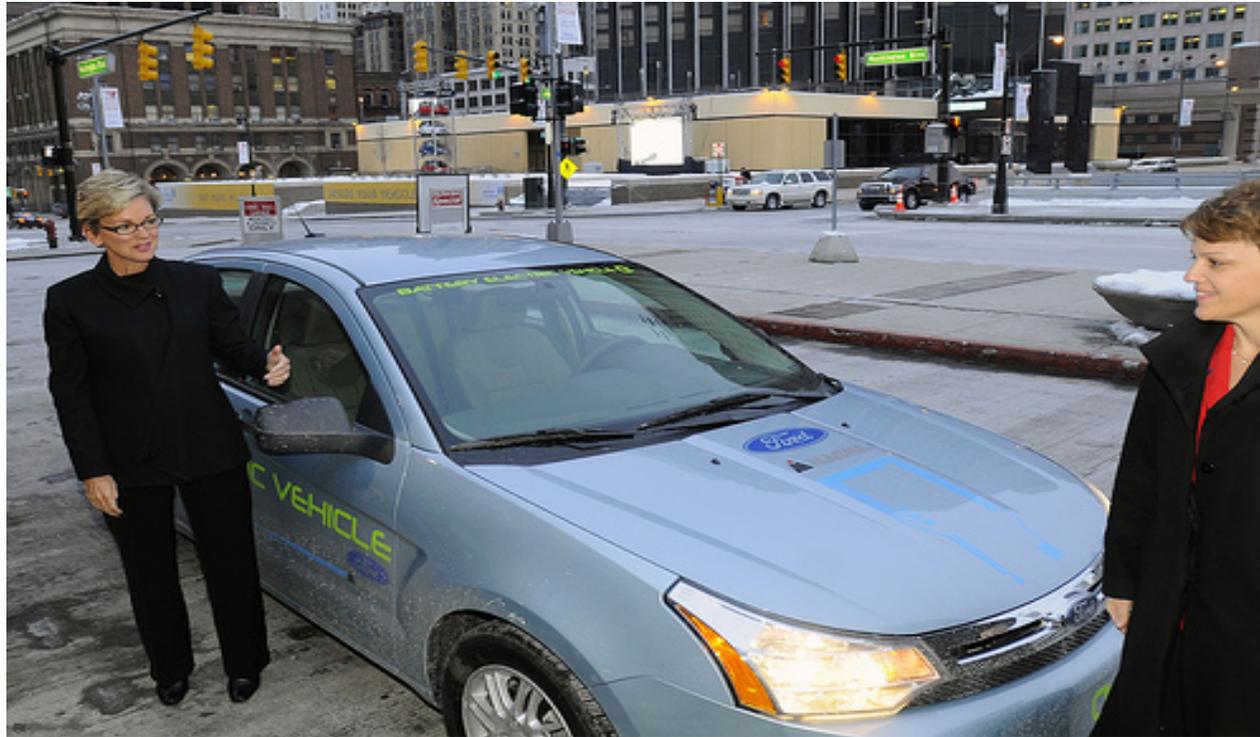
### SYSTEMS & MODULES

- Battery Systems
- EV / Hybrid Drive Systems
- Electric Axle
- LH2 - tank System
- CH2 - tank System
- EV / Hybrid Controls



## Partnership with Ford

- **Jan 11, 2009**
  - **Ford and Magna Announce “Electrifying Alliance” to partner to introduce zero-emission battery electric vehicle.**



# Ford Focus Battery EV – SOP 2011



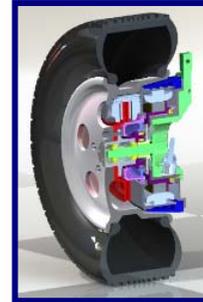
- Collaboration between Ford and Magna
- Four passenger sedan
- 100 mile range
- Performance 0-100kph < 9 sec
- 23KWh split Li-Ion battery
- 100KW peak power PM electric motor @ 97% efficiency
- Dynamic series regenerative braking



# Battery Electric Smart Demonstrator

## • Technology Solution

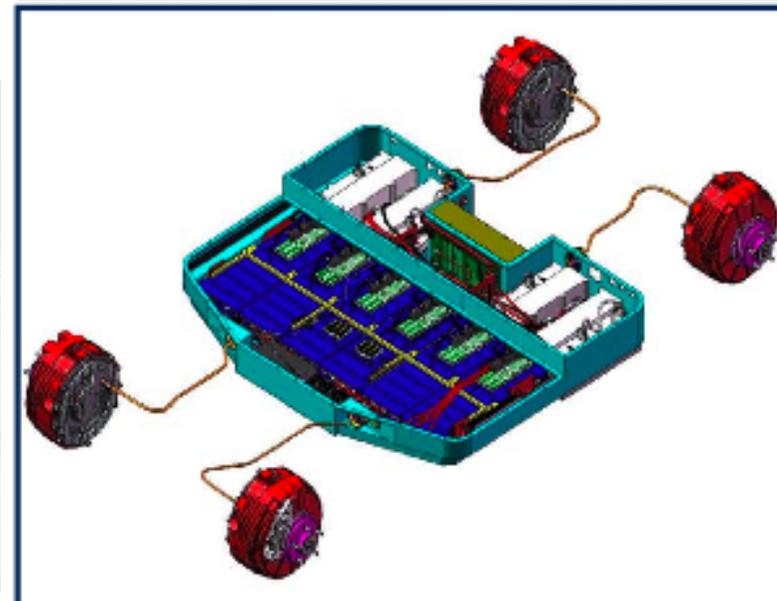
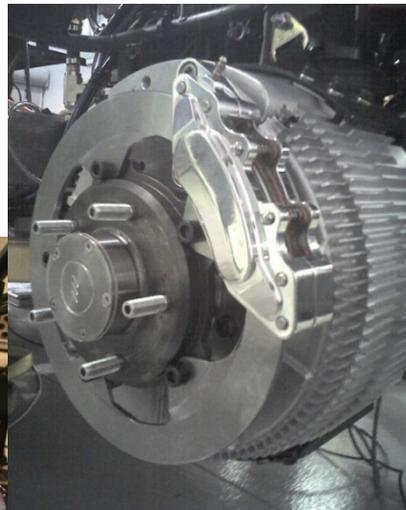
- All-electric implementation
- 12kWh Li-Ion Battery Pack / BMS
- (2) 22kW BLDC Hub Motors (700 Nm ea.)
- Full CAN controlled
- Dynamic Regen Braking
- \* Industry First – Stability Control using Hub-Drive System



# X4 wheel Motor Diesel Series Hybrid

- **Technology Solution**

- Diesel Series Hybrid
- 5.5kWh Li-Ion Battery Pack / BMS
- (4) 46kW BLDC Hub Motors (1200 Nm ea.)
- Dual Voltage Energy storage
- Dynamic Regen Braking, Traction Control
- 30kw Generator





**Thank you**