

PHEVs – The Next Frontier for Utilities

Presented to
UWIG

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by

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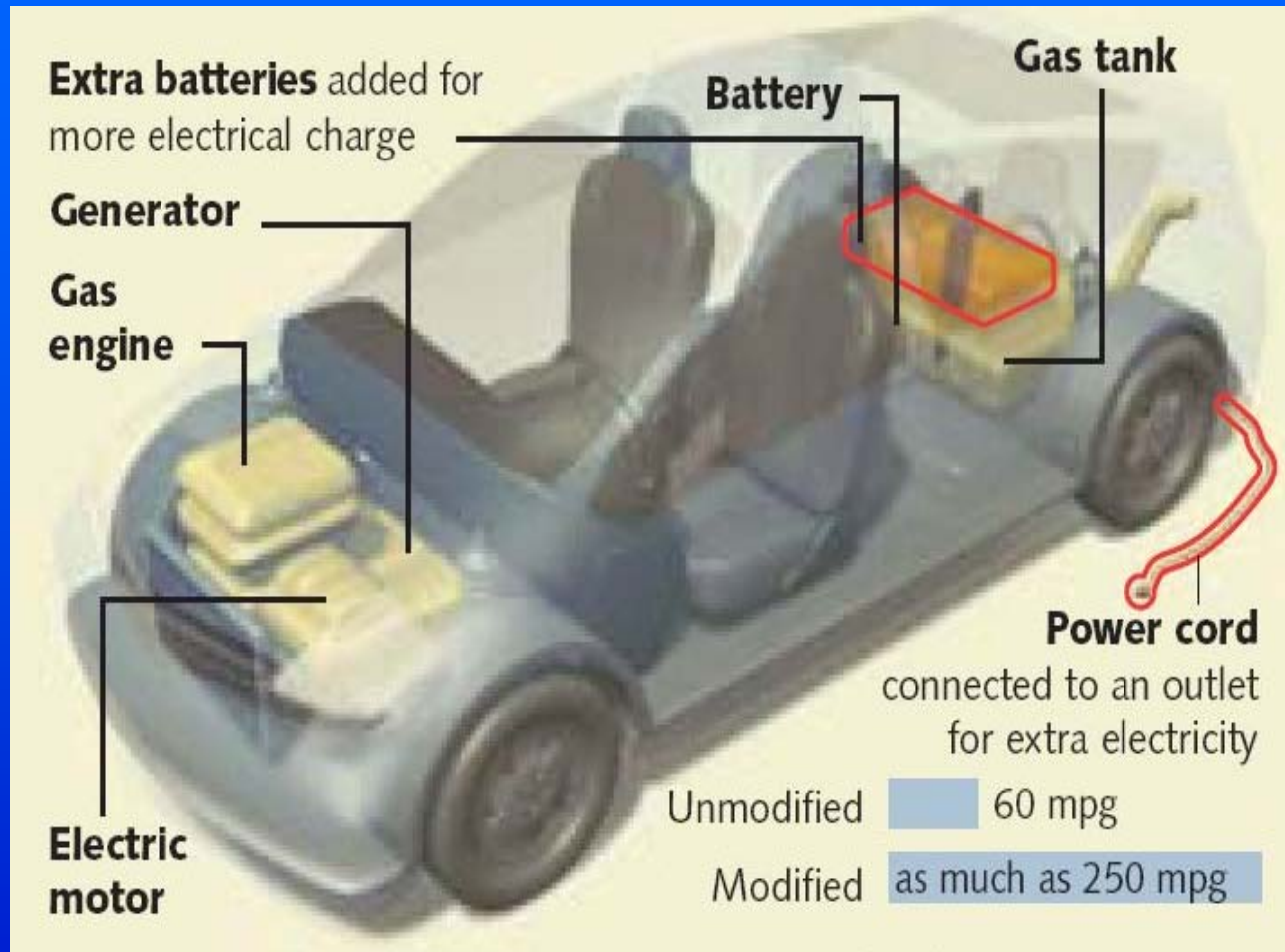
Emerging Energy Systems



Where is Manitoba Hydro?



What is a PHEV?



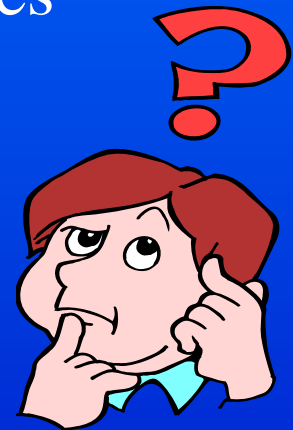
Plug-in
Hybrid
Electric
Vehicle

Other Conversions are Possible!



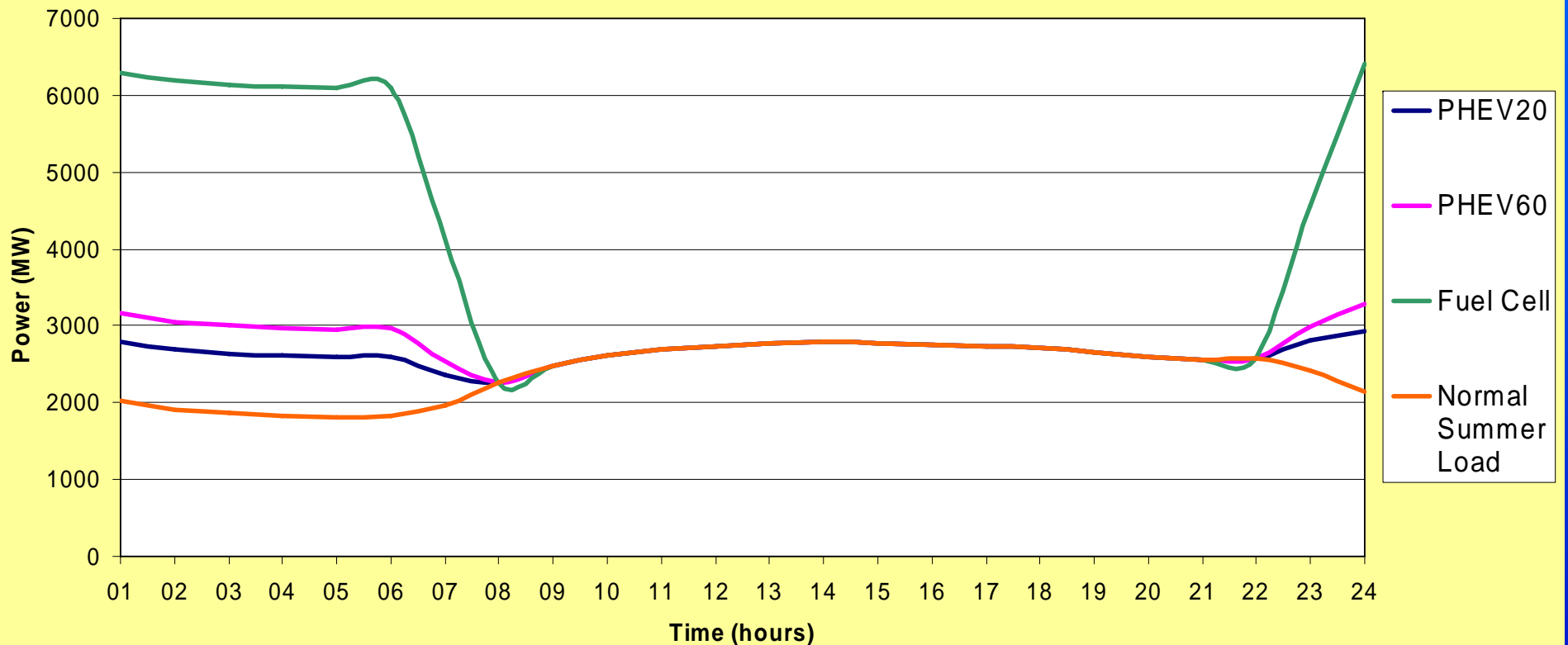
Why Should Utilities be Interested?

- Potential New Load
 - Load Leveling
 - Exiting Infrastructure in Northern Latitudes
- V2G
 - More renewables
- PHEV Vehicles in Utility Fleet
- Climate Change
- Depletion of Fossil Fuels
- Enhance Corporate Image



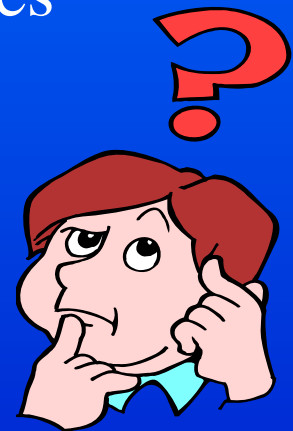
Effects of Nighttime Charging

Charging/Fueling 620,000 Vehicles for Average Daily Driving Range



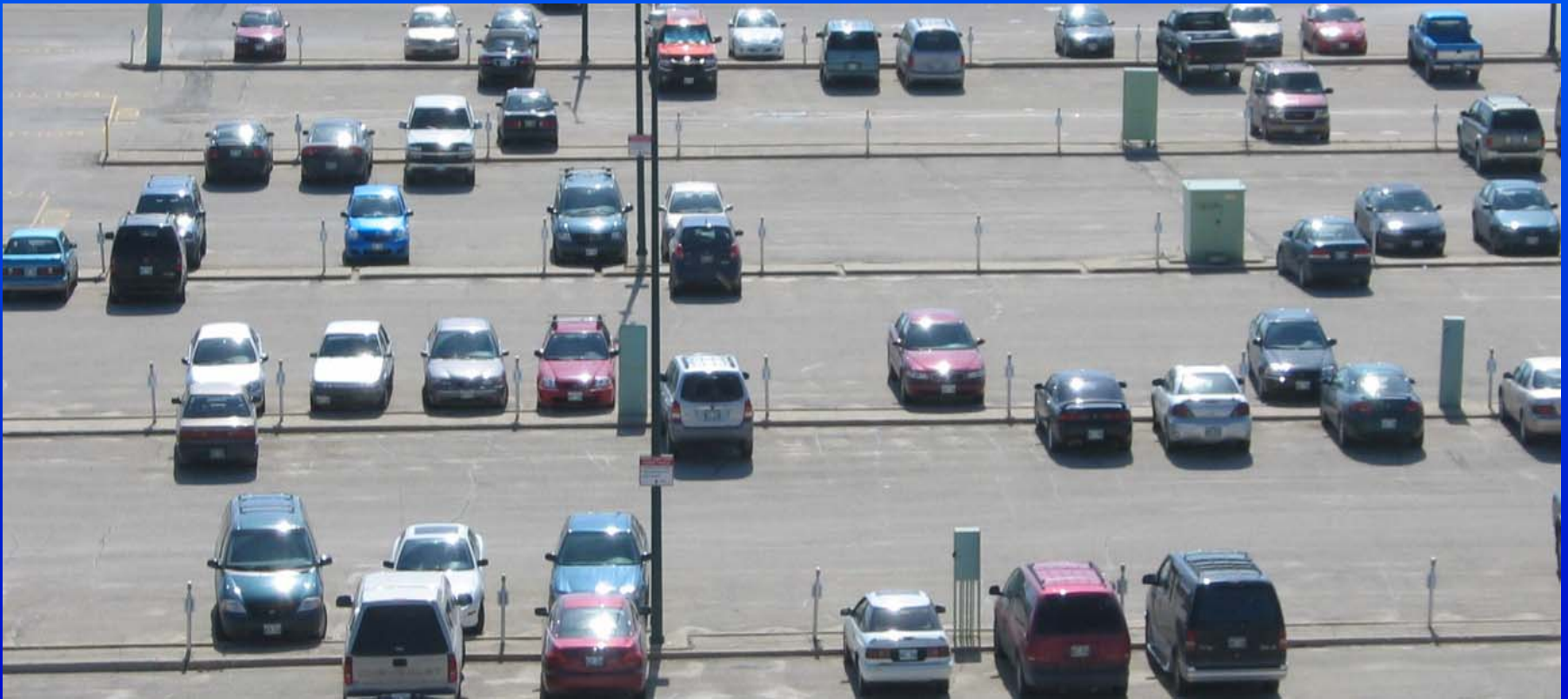
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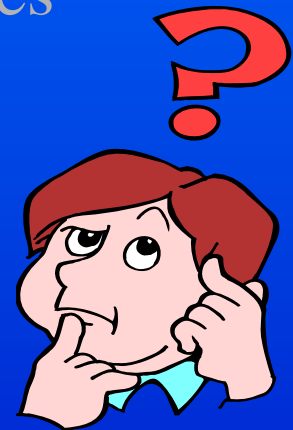
Manitoba PHEV Infrastructure

- Engine block heater outlets
- Manitoba has approximately 500,000 engine block heaters using 133 GWh/year

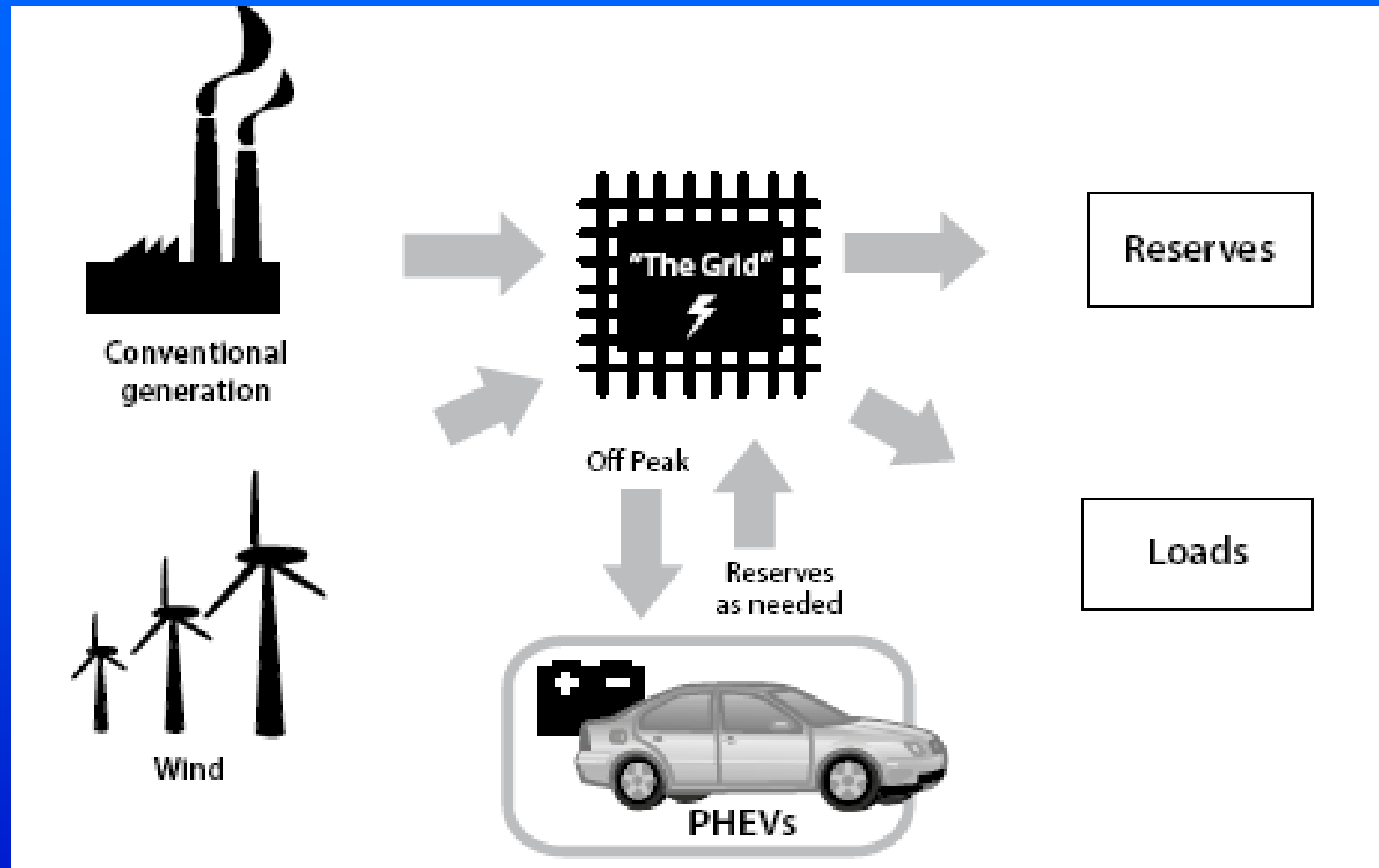


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PHEV and Wind



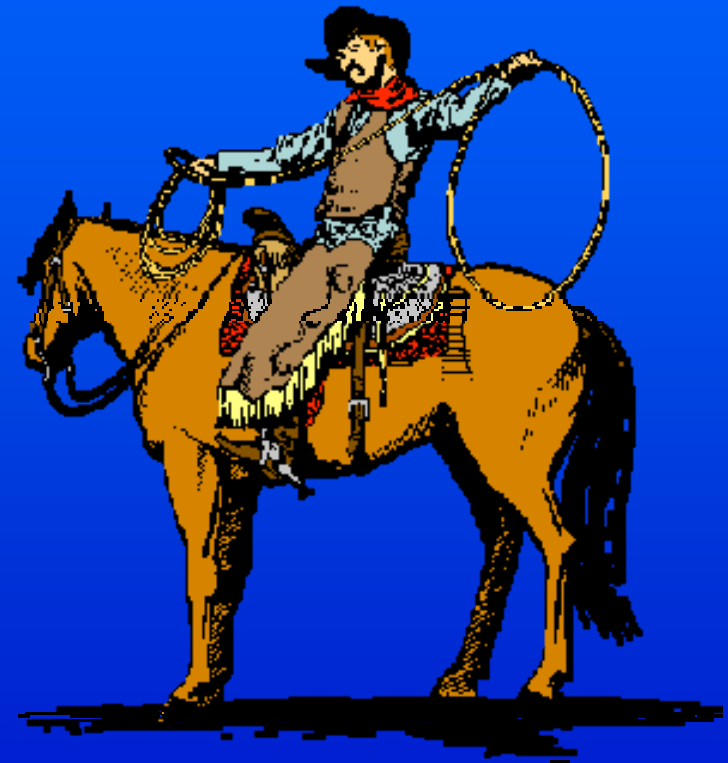
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Cowboy Wisdom

“Good judgement
comes from
experience, and a
lot of that comes
from bad
judgement”



PHEV Retrofits

- Energy CS
- Hymotion
- Hybrids Plus
- OEMTEK
- PHEV School Bus
- PHEV Bucket Truck
- Back Yard Mech



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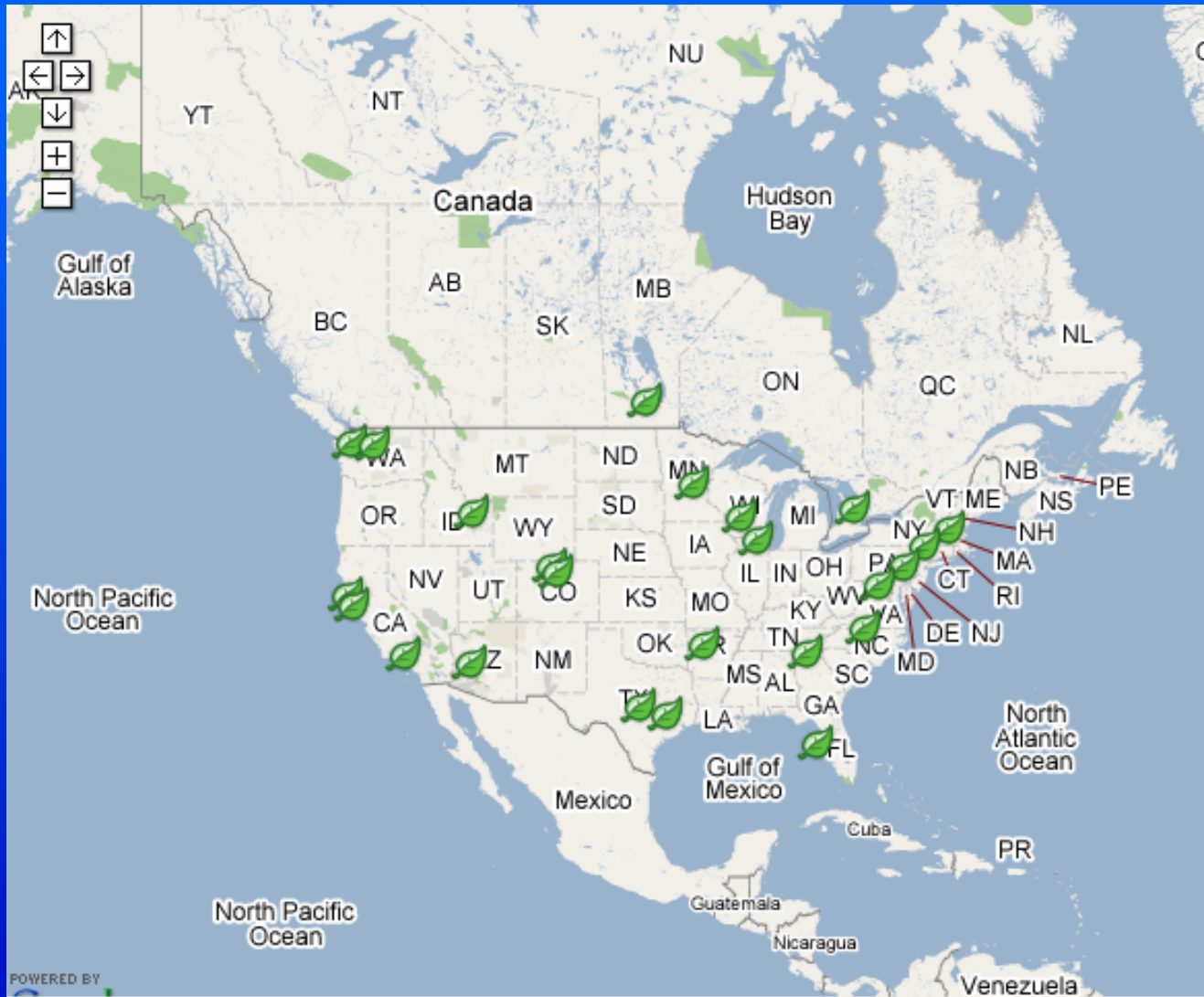


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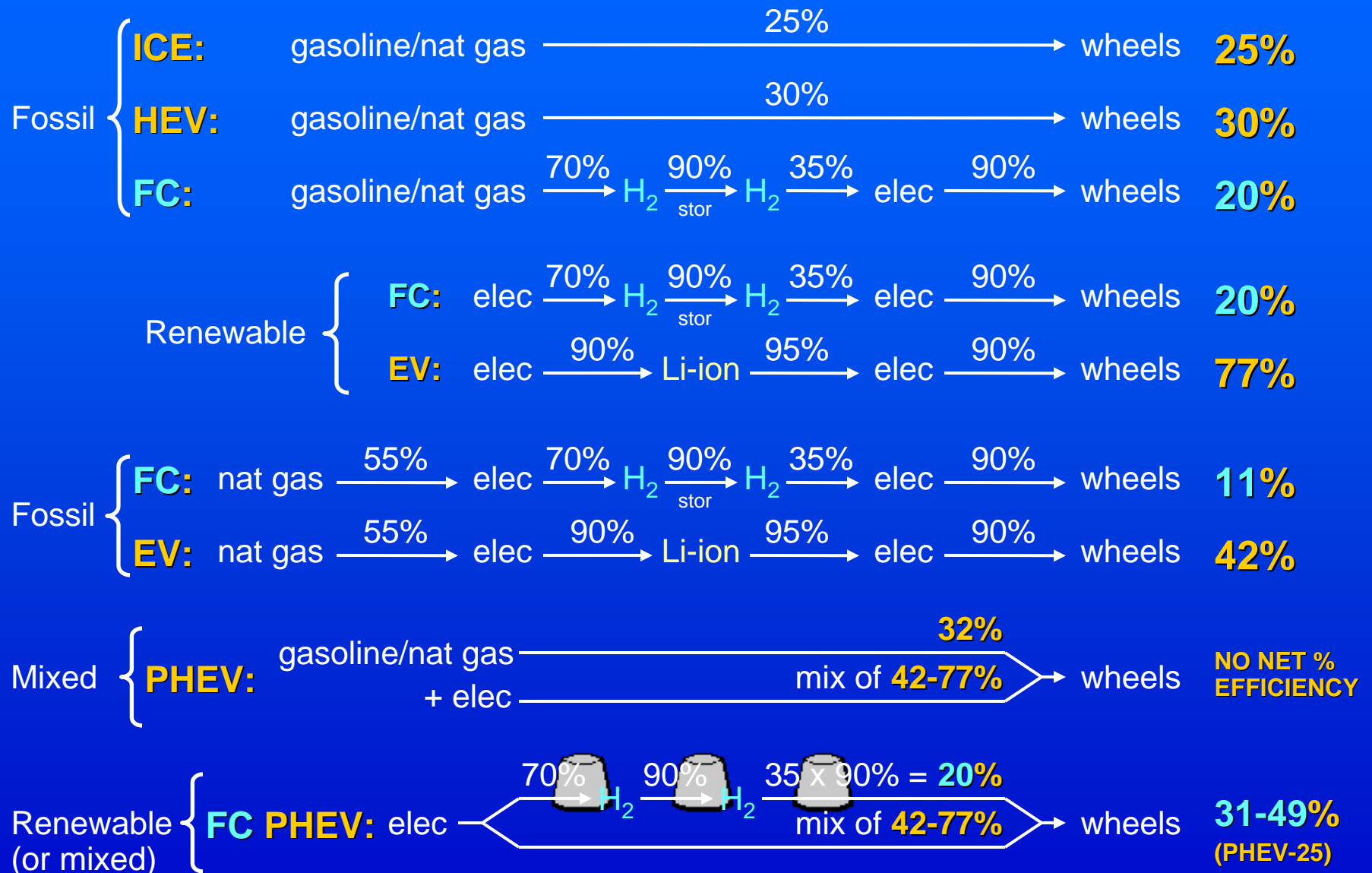


PHEVs in North America



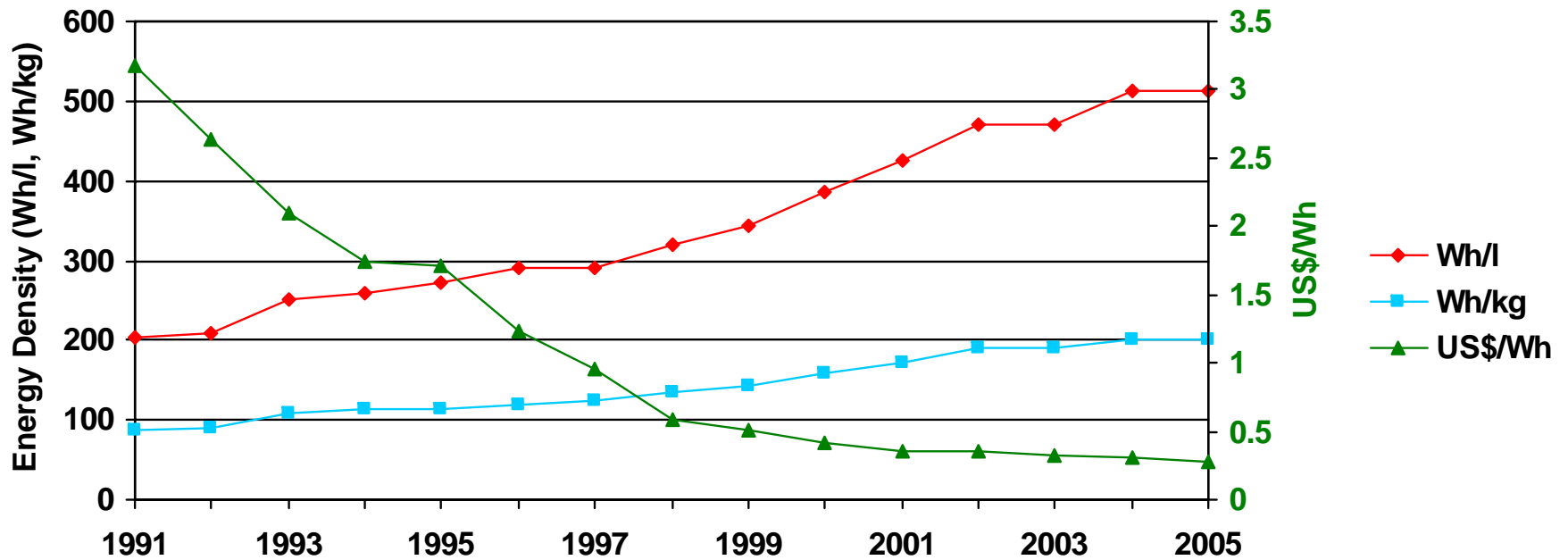
60 PHEVs
on the
road &
counting!

Fuel-to-Wheels Efficiency



Battery Technology

Li-ion Battery Development



Overdue for a new image!

PHEVs Gaining Momentum

- Google
- New York
- California
- UC Davis
- Toronto
- Chicago IIT
- Plug-In Partners
- Plug-In America
- CalCars
- HTUF
- Plug-In Highway
- EPRI
- NREL
- DOE
- PHEV-B100 Bus Demo Project, etc



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PHEV2007 Conference

WHERE THE GRID MEETS THE ROAD

Winnipeg, Manitoba  November 1 & 2, 2007

DOWNLOAD
BROCHURE

Delta Winnipeg
350 St. Mary Ave.

www.pluginhighway.ca

Sponsors

NSERC/Manitoba Hydro
Alternative Energy
Industrial Chair



AT THE UNIVERSITY OF WINNIPEG



Conference highlights include:

- PHEV & PEV research network development,
- Advanced battery technologies,
- Vehicle-to-grid applications,
- PHEV enhancement of renewable energy,
- Review of on-going PHEV and PEV demonstrations,
- Vehicle simulation courses by leading experts,
- Development of a PHEV bus demonstration project,
- Tour of New Flyer hybrid bus manufacturing plant,
- PHEV public education forum.
- Display of PHEVs and batteries.



Thank You



Tom Molinski