PHEV–B100 Bus Demonstration

PHEV2007
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Winnipeg, Manitoba, Canada
by
Tom Molinski, P.Eng.
Emerging Energy Systems
Potential Stakeholders

- New Flyer
- University of Manitoba
- Manitoba Hydro
- Canadian Canola Growers Association
- City of Winnipeg
- Province of Manitoba
- Government of Canada
- Others
Proposed Testing

- One year:
  - Bus usage
  - Fuel economy
  - Total maintenance cost per mile
  - Total operating cost per mile
  - Emissions performance
  - Noise pollution
  - Develop simulation tools
  - Battery performance
## Budget

<table>
<thead>
<tr>
<th>Source</th>
<th>Purpose</th>
<th>Estimated cost</th>
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</thead>
<tbody>
<tr>
<td>Funding contribution from green funds</td>
<td>PHEV design, batteries, retrofit, components, testing, and simulation</td>
<td>$675,000</td>
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<tr>
<td>Hybrid bus purchase</td>
<td>Purchase of New Flyer DE40LF hybrid bus (40 passenger)</td>
<td>$400,000</td>
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<tr>
<td>Contribution from New Flyer</td>
<td>Shop space, part of design, and labour for fabrication</td>
<td>$200,000</td>
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<tr>
<td>Contribution from Manitoba Hydro</td>
<td>Testing and monitoring of battery performance, and cash contributions</td>
<td>$75,000</td>
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<tr>
<td>Contribution from University of Manitoba</td>
<td>Simulation of duty cycles</td>
<td>$50,000</td>
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<tr>
<td>TOTAL</td>
<td></td>
<td>$1,400,000</td>
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</tbody>
</table>
Your Potential Participation

• Buy in at low cost for report
• Potential to test bus at your location
Thank You
Any Easy Questions?

Tom Molinski, P.Eng.
Summary

- Purpose to evaluate technical & environmental viability of PHEV transit bus
- Demonstrate sustainable transportation
  - Utilize clean Manitoba Hydro electricity
  - 100% biodiesel instead of fossil fuel
- First B100–PHEV in the world
- Resolve cold weather use of B100 fuel
- Compare to regular buses
The Proposed B100–PHEV Bus

- Based on New Flyer Hybrid City Bus
  - Model DE40LF
  - Parallel hybrid power train
- Upgrade NiMH battery to Li-ion (3x kWh)
- Charge overnight using 3φ, 208V ac
- 100% biodiesel cold weather testing
  - Insulated fuel tank & lines
- Bus equipped with diagnostic equipment