U-MD APPs Workshop:
Observations and Possible Next Steps

January 16, 2015

Jacob Ward
Vehicle Technologies Office
Office of Energy Efficiency and Renewable Energy
vehicles.energy.gov
# Today’s Presentations

<table>
<thead>
<tr>
<th>Scale</th>
<th>Study/Presentation</th>
<th>Driving Factors (and associated uncertainties)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MACRO (U.S./national)</td>
<td>• Economic, demographic, and transportation-specific incumbent scenario (Greene, Pickrell)</td>
<td>• Vehicle Ownership&lt;br&gt;• Mobility Needs/Preferences&lt;br&gt;• WTP (CAVs and more generally)&lt;br&gt;• Technology Experience (Cherchi)</td>
</tr>
<tr>
<td>MESO (city/region)</td>
<td>• Air quality and school bus transportation (Gao)</td>
<td></td>
</tr>
<tr>
<td>MICRO (individual)</td>
<td>• CAV WTP (Daziano)&lt;br&gt;• Household vehicle use (Cirillo)&lt;br&gt;• PEV experience (Cherchi)</td>
<td></td>
</tr>
</tbody>
</table>
# Transportation and “Activation Energy”

*Common theme: barrier(s) to transition (details below...)*

<table>
<thead>
<tr>
<th></th>
<th>MACRO</th>
<th>MESO</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>National policy/technology intervention</td>
<td>Regional policy/technology intervention</td>
<td>GHG</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Petroleum</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vehicle/HH</td>
<td></td>
</tr>
</tbody>
</table>

3
Transportation and “Activation Energy”

<table>
<thead>
<tr>
<th>Level</th>
<th>Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MACRO</td>
<td>Changing national trends (economy, preferences)</td>
</tr>
<tr>
<td>MESO</td>
<td>Changing regional needs/preferences (i.e. income geog. distribution)</td>
</tr>
<tr>
<td>MICRO</td>
<td>Changing individual preferences/experience</td>
</tr>
</tbody>
</table>

but, as $\Delta t$...

Exogenous $\Delta$end-state—
• i.e. grid decarbonization
DOE Transportation Analysis Tools

Models and Tools:

- VISION, NEAT
- ADOPT, LV Choice, MA$^3$T, ParaChoice, StoCo, TRUCK
- GREET
- Autonomie, FASTSim, HTEB
- TEDB, Market Report, xEV data, TREND

Integrated Analysis

- Macro-econ. Accounting
- Market Penetration
- Emissions and Environmental Modeling
- Vehicle Modeling and Simulation
- Technology and Market Data
Opportunities for Future Study/Collaboration (?)

- Academic interest(s)
- Policy relevance

- Models, Observations, Conclusions

- Data (especially, re: $\Delta t$)
Jacob Ward
jacob.ward@ee.doe.gov

Vehicle Technologies Office
vehicles.energy.gov

Presented to:
U-MD APPs Workshop

January 16, 2015