ASSESSING SOCIOPOLITICAL CHANGES ON MATURE MARKET ELECTRIC VEHICLE SALES
INTRODUCTION TO ELECTRIC VEHICLES

- Focus on PEVs; BEV versus PHEV
- Varying incentives based on vehicle type

- **Zero Emission Vehicle (ZEV)**
  - Includes BEV and FCEV
  - Ex. Toyota Mirai

- **Battery Electric Vehicle (BEV)**
  - Pure battery electric range
  - Ex. Nissan Leaf

- **Plug-in Hybrid Electric Vehicle (PHEV)**
  - Electric range of ~10-40 miles
  - Ex. Chevy Volt

- **Hybrid Electric Vehicle (HEV)**
  - Gas powered vehicle with supplemental battery
  - Ex. Toyota Prius

- **Plug-in Electric Vehicle (PEV)**
  - Includes both BEV and PHEV
California is the domestic leader in EV sales; Georgia is a southern outlier.

State versus National market share; National EV market share for 2015: 0.726 percent.
# Introduction to International EV Market

<table>
<thead>
<tr>
<th>Country</th>
<th>Percent Market Share Electric Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>0.7%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>5.1%</td>
</tr>
<tr>
<td>Norway</td>
<td>23.5%</td>
</tr>
<tr>
<td>Sweden</td>
<td>3.2%</td>
</tr>
<tr>
<td>USA*</td>
<td>0.73% *2015 data</td>
</tr>
</tbody>
</table>

*CleanTechnica*

---

[Map showing EV market share by country, with Germany, Netherlands, Norway, and Sweden highlighted in blue.]
METHODS

- Mature markets identified; ‘mature’ is used loosely, based on data available for the last ~five years
- Shocks identified based on basic linearizations of data
- Basic modeling using Microsoft Excel, RStudio
- Content analysis using LexisNexis, Crimson Hexagon
- Extensive influence from automotive industry
- Extremely low market share: 0.7 percent
Distinct preference for PHEVs

Linearized shocks show very little growth

NETHERLANDS

Registration tax exemption ends January 1, 2014

Tax break expires Jan. 1, 2016; maximum break: $6,600-$7,700 per year

Fleet incentives for company vehicles expires and receding tax incentives
- Highest EV market share in the world
- Lack of traditional automotive industry
Turbulent EV policies, incentives, and availability of funding

Fewer changes in BEV versus PHEV incentive funding
Extensive history of EV support for the past decade

Only minor changes made to actual incentives and policies beyond renewing commitments

CALIFORNIA

- Executive order for ZEVs (1.5 million by 2025); HOV lane stickers included in incentives
- ZEV mandate renewed; additional infrastructure and emissions standards made; incentives increased for low income buyers and reduced for higher income buyers
- Abrupt changes to EV market and related policies
- Market growth reliant exclusively on financial motivations
Market stability is possible, but requires active consideration of, and commitment to long-term market development.

Gradual expiration of incentives is the most sound method of easing into a self-sustaining EV market.

- Distribution of shocks to the market restricts growth in the long-run.

Consumer engagement with EVs must be expanded to overcome the barrier of uncertainty or unfamiliarity with EVs and existing incentives.
Thank You!

Special thanks to:
National Center for Sustainable Transportation, US Department of Transportation, and the Plug-in Hybrid & Electric Vehicle Research Center—especially Gil Tal and Dahlia Garas.

Maia Moran
mlmoran@ucdavis.edu

Website: ncst.ucdavis.edu

@NCST_Research