MID-ATLANTIC ELECTRIC VEHICLE CHARGING INFRASTRUCTURE
Market Update

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Model Availability

[Graph showing model availability globally and in the USA from 2008 to 2018]
Are we done with working on Electrification?

OEMs PEV production Forecasts

- Toyota BEVs
- Toyota PHEVs
- BMW PEVs
- GM BEVs
- GM HEV+PHEV
Batteries and BEVs: the next 10 years

BEV Lithium Ion projected pouch cell parameters

TBS, 2018

BEV driving range trends
US Market
USA PEV sales were growing slower than the rest of the world until 2018, but now will hit 300,000 by the end of the year.
BEV, PHEV, and FCEV Sales - US

Annual Sales

BEV, Tesla BEV, PHEV, FCEV

03 May 2019
2018 Top Selling Models - US

- **Tesla Model 3**: 43%
- **Chevrolet Volt**: 6%
- **Ford Fusion Energi**: 2%
- **Honda Clarity PHEV**: 6%
- **Chevrolet Bolt EV**: 6%
- **Nissan Leaf EV**: 4%
- **Chrysler Pacifica PHEV**: 2%
- **BMW i3 EV / EREV**: 2%
- **BMW 530e**: 3%
- **Tesla Model S**: 7%
- **Model X**: 8%
- **Toyota Prius PHEV**: 8%
- **Kia Niro PHEV**: 1%
- **Mitsubishi Outlander PHEV**: 1%
- **BMW X5 PHEV**: 1%

1st Tesla Model 3
2nd Toyota Prius Prime
3rd Tesla Model X
Growing the EV market will need high numbers of repeat buyers and used PEV buyers

- USA PEV sales were growing slower than rest of world until 2018, but the Model 3 changed the picture.

- PHEV market grew 25% in 2018 but none Tesla BEVs dropped in 20%

- More than half of Californians are not buying new vehicles and 14% are buying half the new vehicles.

- One third of the Chevy Bolt buyers and 25% of the Tesla model 3 buyers are buying their second PEV

- The used PEV market grow faster at the same location and demographic areas as the new PEV market

- Awareness on Evs did not Changed 2014-2018, resent recent studies in canada and the eu showed similar results
Rollout
Medium vehicle priced at $35,000 in 2017

<table>
<thead>
<tr>
<th>Generation</th>
<th>Innovators</th>
<th>Innovators &amp; Followers</th>
<th>Innovators &amp; Followers</th>
<th>Next Purchasers</th>
<th>To be seen...</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>PHEV 10 – 40 mi.</td>
<td>PHEV 15 – 50 mi.</td>
<td>PHEV 50+ mi.</td>
<td>Full-sized vehicles</td>
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<td>BEV 80 – 250 mi.</td>
<td>BEV 150 – 300 mi.</td>
<td>BEV 200+ mi.</td>
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<td></td>
<td>20 – 30 models</td>
<td>30 – 100 models</td>
<td>200+ models</td>
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<tr>
<td></td>
<td>Compact/Subcompacts</td>
<td>Crossover Midsize Sedans</td>
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Battery Costs
$42,000
(Estimated from 60 kWh battery pack from Chevy Bolt/Tesla)

Policies
Max Federal Tax Credit
$7,500 (ends 2019)
CA Rebate for BEVs
$2,500 (uncertain future)
CA ZEV Requirements & Credits (extends to 2025)

5 Year PEV Sales (CA)
2 million total sales in CA in 2017

ZEV goal 15% = 1.5M in 2025

Main Market
3 – 4 million PEVs

2010: 200,000 PEVs
2020: 4 – 500,000 PEVs
2030: 6 – 800,000 PEVs

*Not to scale
Can we electrify the main Market?

US Vehicle per Household

- 1 vehicle available: 37%
- 2 vehicle available: 41%
- 3 vehicle available: 15%
- 4+ vehicle available: 7%
Charging Location of Individual Use

- **Public L2** (2%-10%)
- **Public DC Fast** (5%-10%)
- **Work** (30%-50%)
- **Home** (80%+)

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Thank You!