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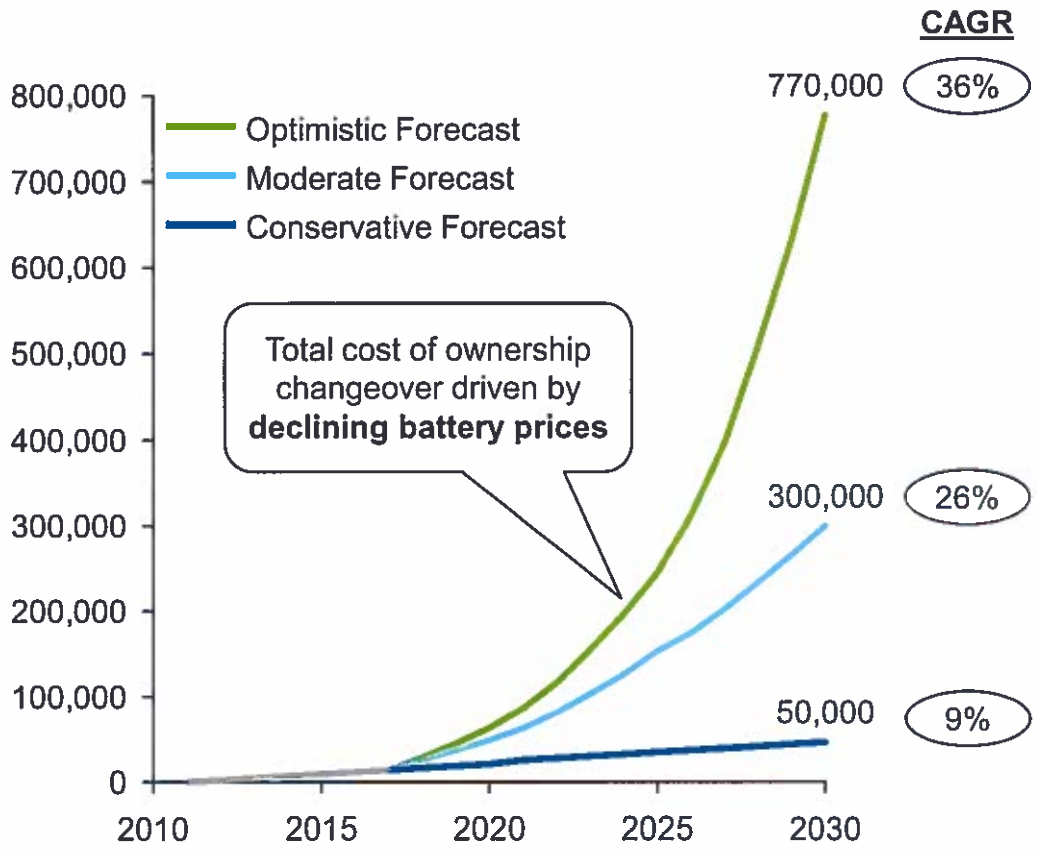
Electric Vehicle Discussion

House Energy Policy Committee

March 13, 2018

EV Adoption Forecast & Benefits

EV Adoption in Michigan, 2011-2030[1]



Benefits of EVs

- ✓ **EV owner** savings through reduced fuel and maintenance costs
- ✓ Load growth and affordability benefits to **utility customers**
- ✓ **Social benefits** of:
  - Reduced CO2 emissions
  - Reduced dependency on foreign oil
  - Economic development in Michigan & local development impact

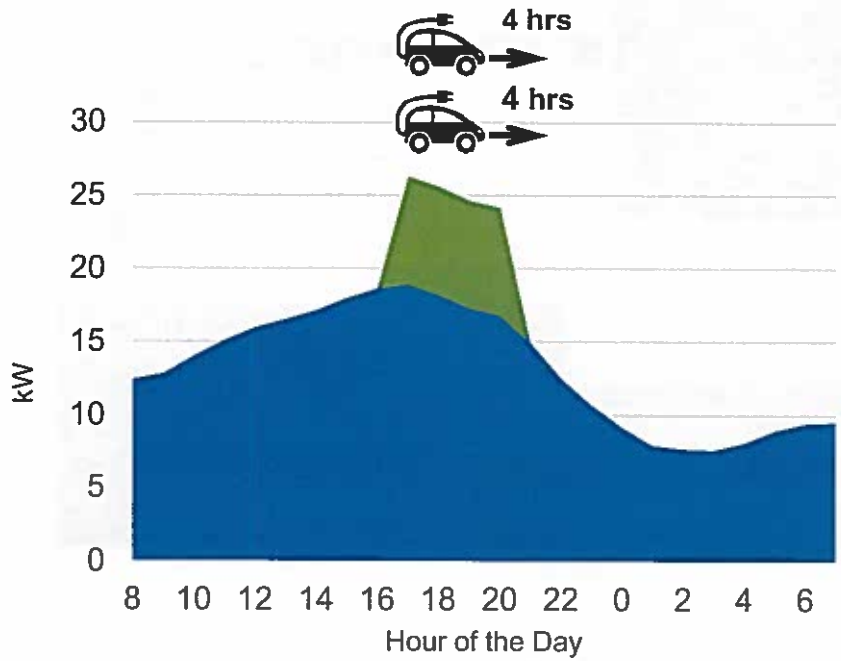
1. Note that this includes both Plug-in Hybrid Vehicles (PHEVs) and Battery Electric Vehicles (BEVs); Conservative: Based on historical growth; Moderate: Average of Barclays, Annual Energy Outlook, and Navigant forecasts for the U.S. and applied to Michigan (EEI method); Optimistic: Based on 2016 BNEF Forecast for the U.S. and applied to MI

Source: ZEV Sales Dashboard, EEI, Bloomberg New Energy Finance (BNEF), DTE team analysis

EVs Interaction with the Grid

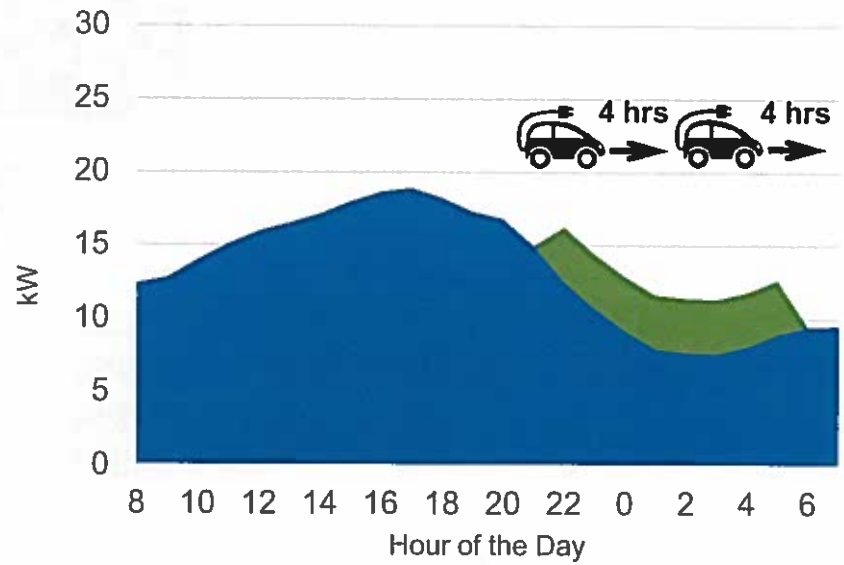
EVs as a grid burden[1]

An unprepared grid will be burdened by increased load demand at peak times, such as when drivers return home in the evenings



EVs as a grid benefit

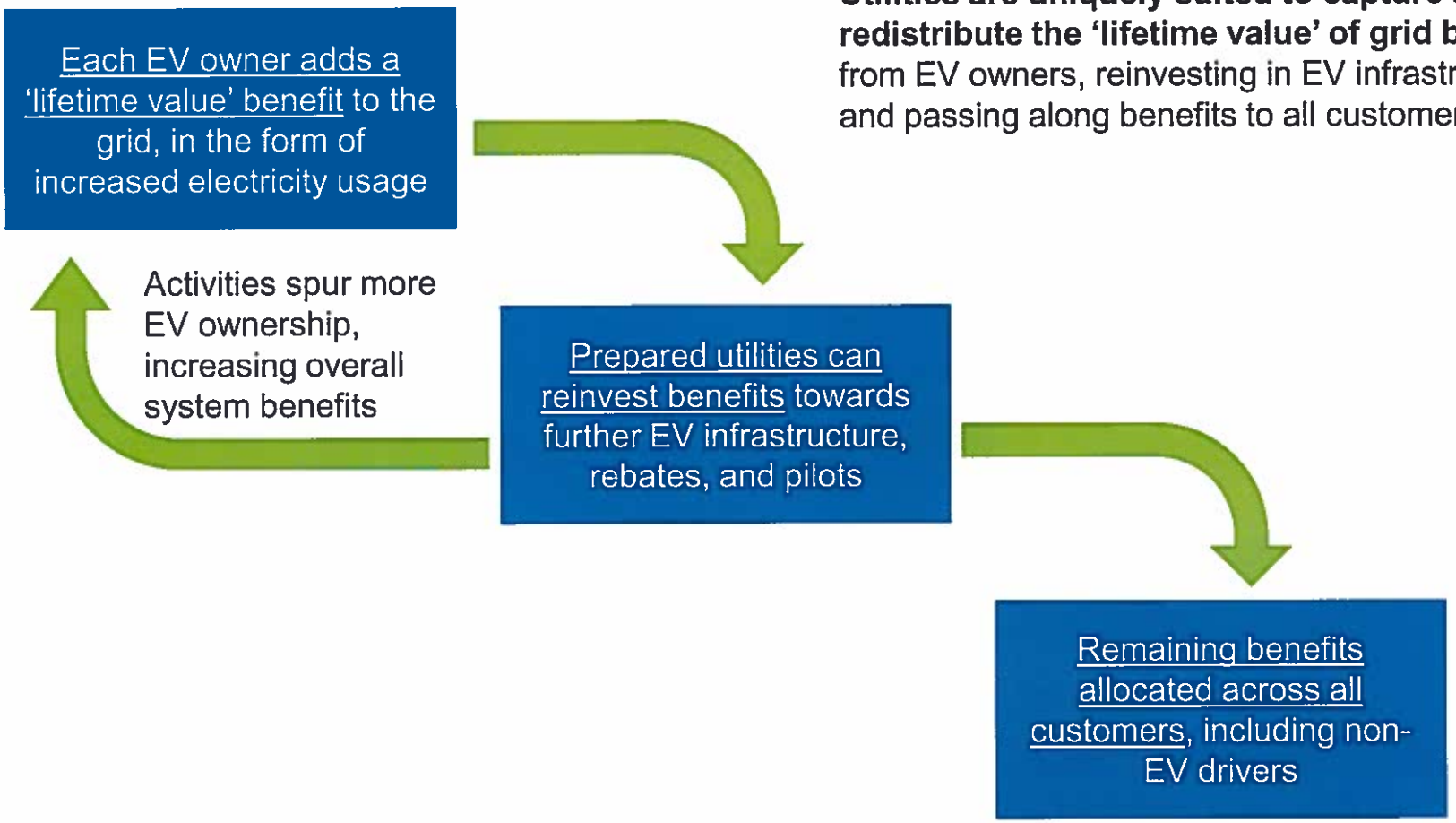
A grid prepared with smart charging and off-peak incentive rates can adjust EV loads to off-peak hours, optimizing the grid[2]



1. Analysis assumes a neighborhood with ten households, two EVs and a 3.6 kW/h vehicle charge rate
2. In theory, vehicle to grid (V2G) capabilities would also increase grid benefits by utilizing EVs as a mobile battery and pulling power when needed; however, there are additional considerations (e.g. grid flow, battery life) that make V2G a longer-term prospect

Grid Benefits from EV Customers

Utilities are uniquely suited to capture and redistribute the 'lifetime value' of grid benefits from EV owners, reinvesting in EV infrastructure and passing along benefits to all customers



Primary Barriers to Adoption

1. Upfront purchase price of EVs
2. Limited model availability across vehicle segments
3. Range anxiety
4. Lack of awareness of EVs and their associated benefits

EV Related Activities

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	Objective	Implementation
1 **Ramp up and refine our current efforts**	**Improve the EV experience** for both residential and commercial customers	2018
2 **Deploy near-term pilots**	**Develop and test concepts and gain key insights** into both EV-grid integration and consumer preferences	2018
3 **Implement a sustainable program**	**Grow EV adoption in Michigan** that benefits all customers	2019-2021

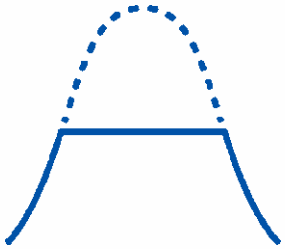
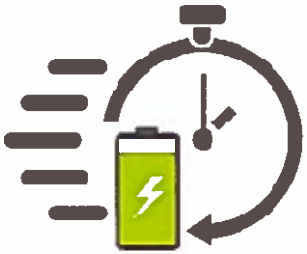
Customer Experience Efforts

DTE Energy®

	Objective
1 **EV Website**	**Redesigned residential and commercial EV websites** providing intuitive information and guidance on rates, charging, and benefits of EV ownership
2 **Education and Awareness**	DTE will execute more than **20 EV marketing campaigns** in 2018 to increase awareness of EVs and the DTE resources available to them
3 **Customer EV Inquiries**	**Dedicated team members, refined processes**, and **new resources** for residential and commercial EV inquiries

1. Example DTE webpages are drafts and subject to change prior to website launch

Near-Term Pilots

	Category	Planned Pilots	Partners
	**Load Management**	• Demand Response • Battery Storage	Ford, EPRI
	Downtown Charging Showcases	• Ann Arbor • Detroit	City of Detroit, Bedrock Detroit, DDA, GM, City of Ann Arbor Michigan
	**Corridor Fast Charging**	• Corridor Station • Extreme Fast Charging	Delta, VT, NextEnergy, MI Energy Michigan Agency for Energy, GM

EV efforts - 2018 plans

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Customer journey phase	Activity
LEARN	**Increasing Customer Awareness** Develop methods to **educate our customers** on EV information that CE is best suited to provide, with initial focus on website resources
ONBOARD	**Home EVSE Installation** Develop a solution that **clarifies installation** in a simple and user-friendly way and takes the pressure off customers
OWN	**Smart Charging** Collaborate with GM on **at-home smart charging** to gather data and track load impact from Bolt owners **IT Integration** Develop in-house capability to transmit residential **charging data** and avoid need for second meter

Proposed Foundational Infrastructure Program

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OBJECTIVE

Enable Michigan drivers to own and use EVs by deploying foundational infrastructure across our territory

OVERVIEW

- **Three-year program** of initial infrastructure investment designed to seed the EV market in the CE territory
- **Run as rebate programs** rather than utility ownership, with rebate terms dictating maintenance, equipment choice, and utility data/demand response access
- **Emphasis on learning;** track utilization, customer behavior, and market response to determine future steps to take

FOUR COMPONENTS:

1. Residential Charging
2. Public / Workplace Charging
3. DC Fast Charging
4. IT Infrastructure