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PUBLIC UTILITIES COMMISSION

November 29, 2018

The Honorable Chair and Members of the
Hawai'i Public Utilities Commission
Kekuanaoa Building, First Floor
465 South King Street
Honolulu, Hawai'i 96813

Dear Commissioners:

Subject: Docket No. 2018-0135
Addendum to Hawaiian Electric Companies'
Electrification of Transportation Strategic Roadmap

In their Electrification of Transportation ("EoT") Strategic Roadmap ("Roadmap") filed on March 29, 2018 in Docket No. 2016-0168 (EV-F and EV-U Pilot Extension), the Hawaiian Electric Companies[1] provided an economic analysis of EoT in their service territories using light-duty vehicle electrification on Oahu as an initial case study and indicated that they would file complete analyses for other islands in the near-term future.[2] The Companies have also updated their Oahu results with certain superseding information.[3] Accordingly, the Companies respectfully submit within Exhibits A through C hereto the following figures and tables:

Exhibit A **Updated Oahu Results**	**Exhibit B** **Maui Results**	**Exhibit C** **Hawai'i Island Results**
[redacted]	Figure 19	Figure 19
Figure 20	Figure 20	Figure 20
Figure 21	Figure 21	Figure 21
Figure 22	Figure 22	Figure 22
Figure 23	Figure 23	Figure 23
[redacted]	Figure 33	Figure 33
[redacted]	Figure 34	Figure 34
[redacted]	Figure 37	Figure 37
[redacted]	Table 9	Table 9
Table 11	Table 11	Table 11

[1] The "Hawaiian Electric Companies" or "Companies" are Hawaiian Electric Company, Inc. ("Hawaiian Electric"), Hawai'i Electric Light Company, Inc. and Maui Electric Company, Limited.

[2] *See* EoT Roadmap at 32-37.

[3] The Oahu results were updated for several reasons, including: errors discovered when transferring the E3 model to a more user-friendly tool to be used by the Companies' internal team for future analyses; re-calculated gasoline savings to account for differences in vehicles' miles traveled on different islands; and updated rates due to the final decision in the Hawaiian Electric 2017 test year rate case.

The numbering format for the figures and table in Exhibit A remains the same as in the Companies' March 29, 2018 Roadmap filing. For Exhibits B and C, the presentation of data and analyses mimics those presented for Oahu. For example, Figure 19 in Exhibit A is the personal light-duty electric vehicle adoption forecast for Oahu, while Figure 19 in Exhibits B and C provides corresponding information for Maui and Hawai'i Island, respectively.

The updated results for Oahu do not change the overall trajectory of Hawaiian Electric's EoT plans for Oahu. As shown in the table below, the updated analyses continue to show substantial net benefits from the energy wallet as well as customer perspective for Oahu.[4]

Updated as of:	**Oahu Energy Wallet (Figure 20)**		**Oahu Customer Perspective (Figure 21)**	
	Non-Managed Charging Total Results ($MM 2017)	Smart Charging Total Results ($MM 2017)	Non-Managed Charging Total Results ($MM 2017)	Smart Charging Total Results ($MM 2017)
March 2018	203	311	62	199
December 2018	291	385	358	471

If you have any questions on this matter, please contact Brennon Morioka, Hawaiian Electric's Director of Electrification of Transportation, at (808) 543-7570.

Sincerely,

Kevin M. Katsura
Director
Regulatory Non-Rate Proceedings

Enclosures

cc: Division of Consumer Advocacy (with enclosures)

[4] The net benefits in Figures 20 and 21 of Exhibit A are presented in $/vehicle. The Companies have also scaled up the net benefits (Total Results $MM 2017) over the 2018-2045 timeframe.

Exhibit A

Updated O‘ahu Results

Figure 20: Direct economic costs and benefits to O‘ahu per personal light duty electric vehicle, NPV 2018-2045

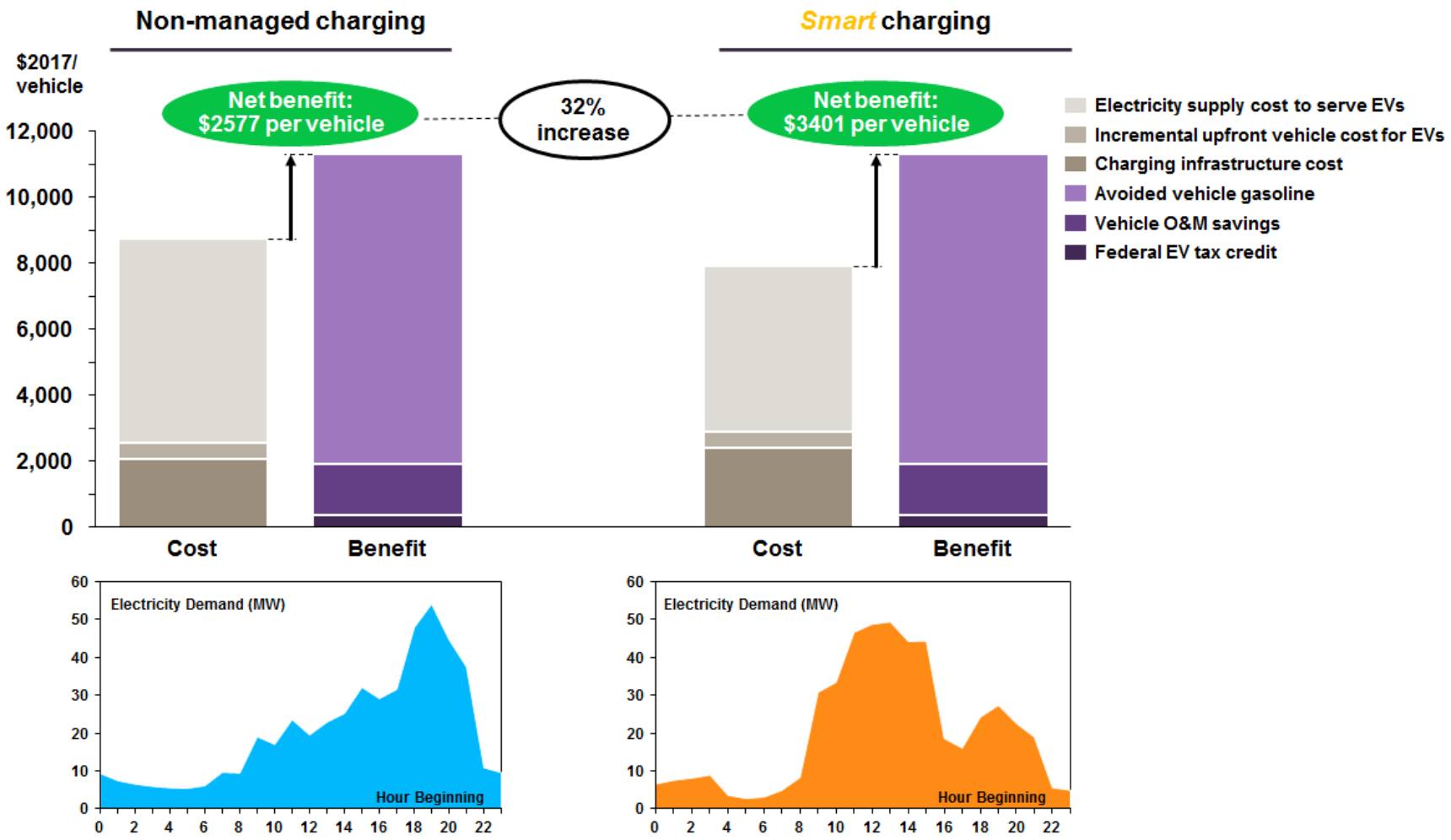


Figure 21: Costs and benefits to Hawaiian Electric customers per personal light duty electric vehicle adopted on O‘ahu NPV 2018-2045

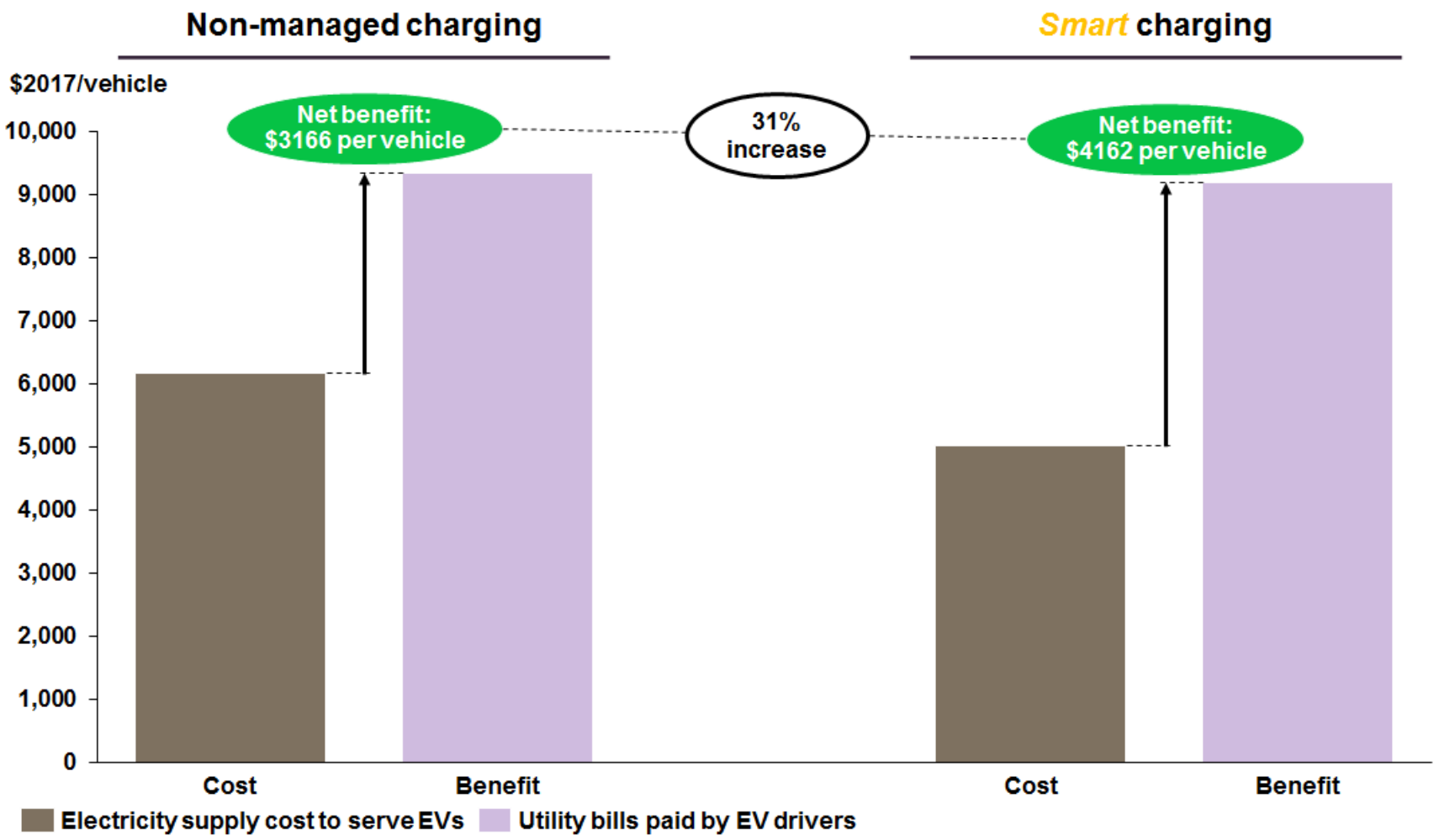


Figure 22: Fossil fuel consumption by O‘ahu light-duty vehicles, assuming Hawaiian Electric’s EV adoption forecast

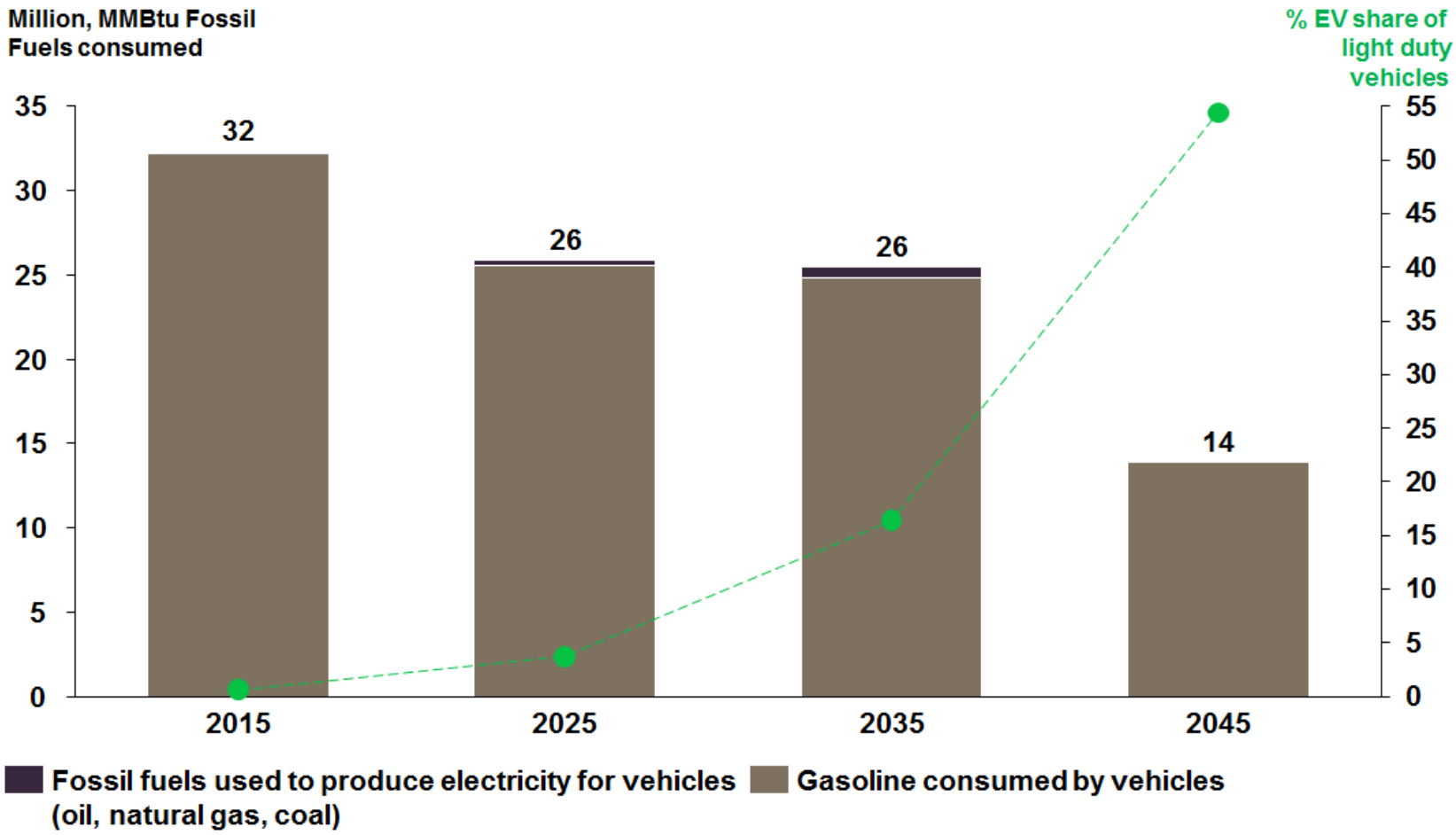


Figure 23: Carbon dioxide emissions by O‘ahu’s light-duty vehicles assuming Hawaiian Electric’s EV adoption forecast

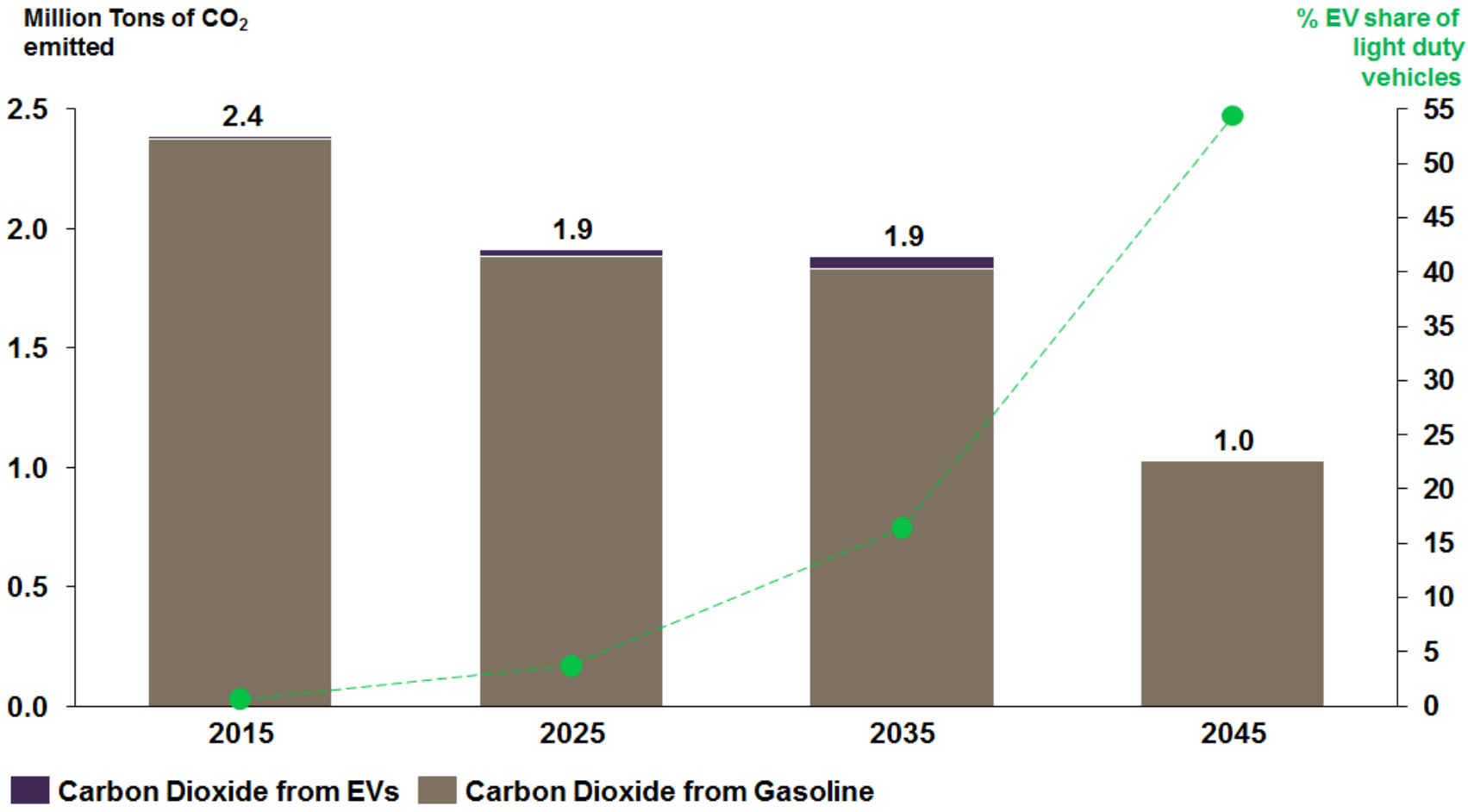


Table 11: Hawaiian Electric rates applied to EV charging at different locations

	O‘ahu
Residential (range indicates differences across years)	91% to 96% Schedule R
	1% to 9% Schedule TOU-RI
	0% to 5% TOU-EV
Workplace Level 2	100% Schedule J
Public Level 2	50% Schedule J
	50% Schedule P
DC Fast Charging	100% Schedule EV-U

Exhibit B

Maui results

Figure 19: Maui Electric's personal light-duty EV adoption forecast, Maui 2010-2045

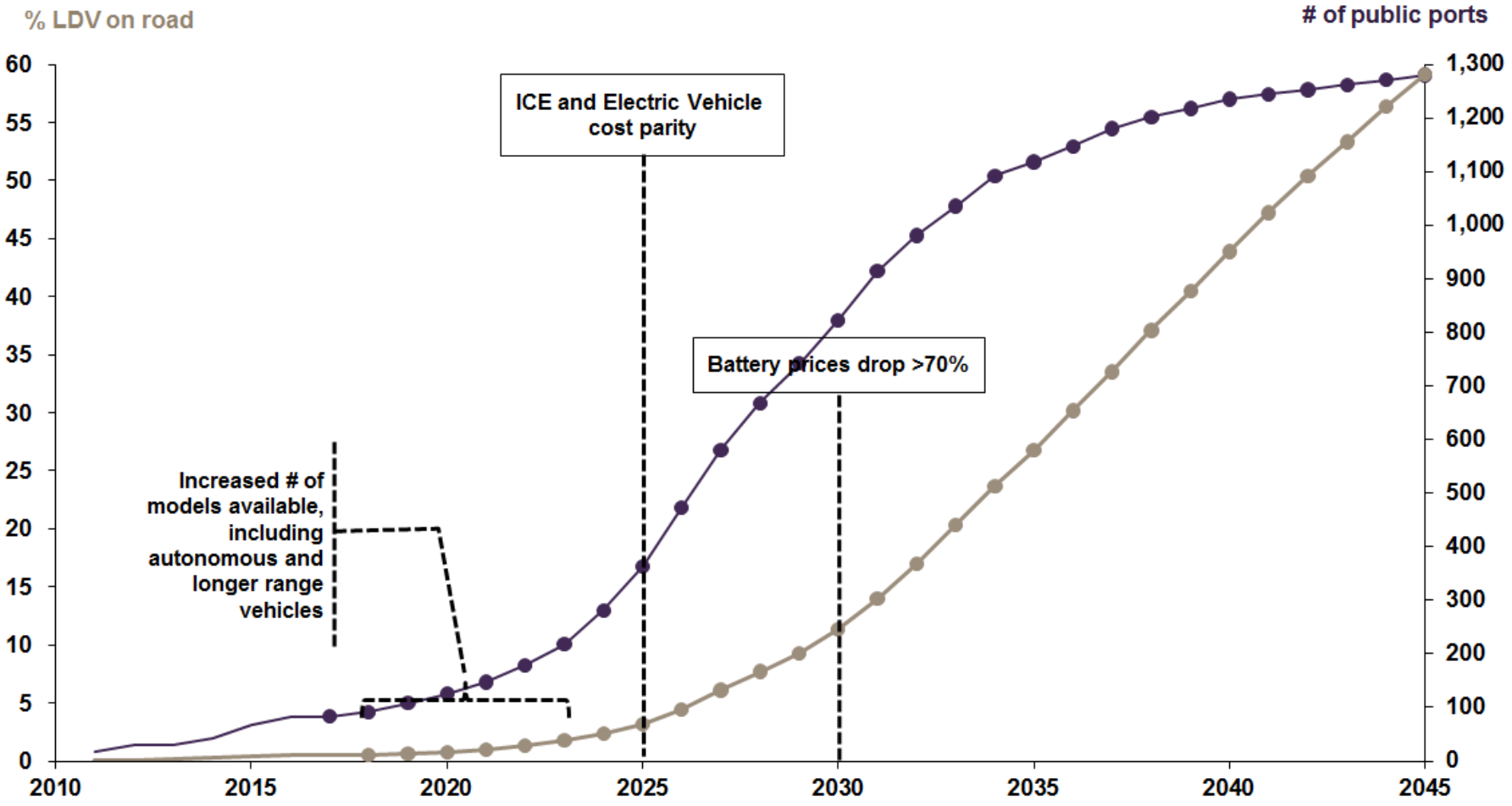


Figure 20: Direct economic costs and benefits to Maui per personal light duty electric vehicle, NPV 2018-2045

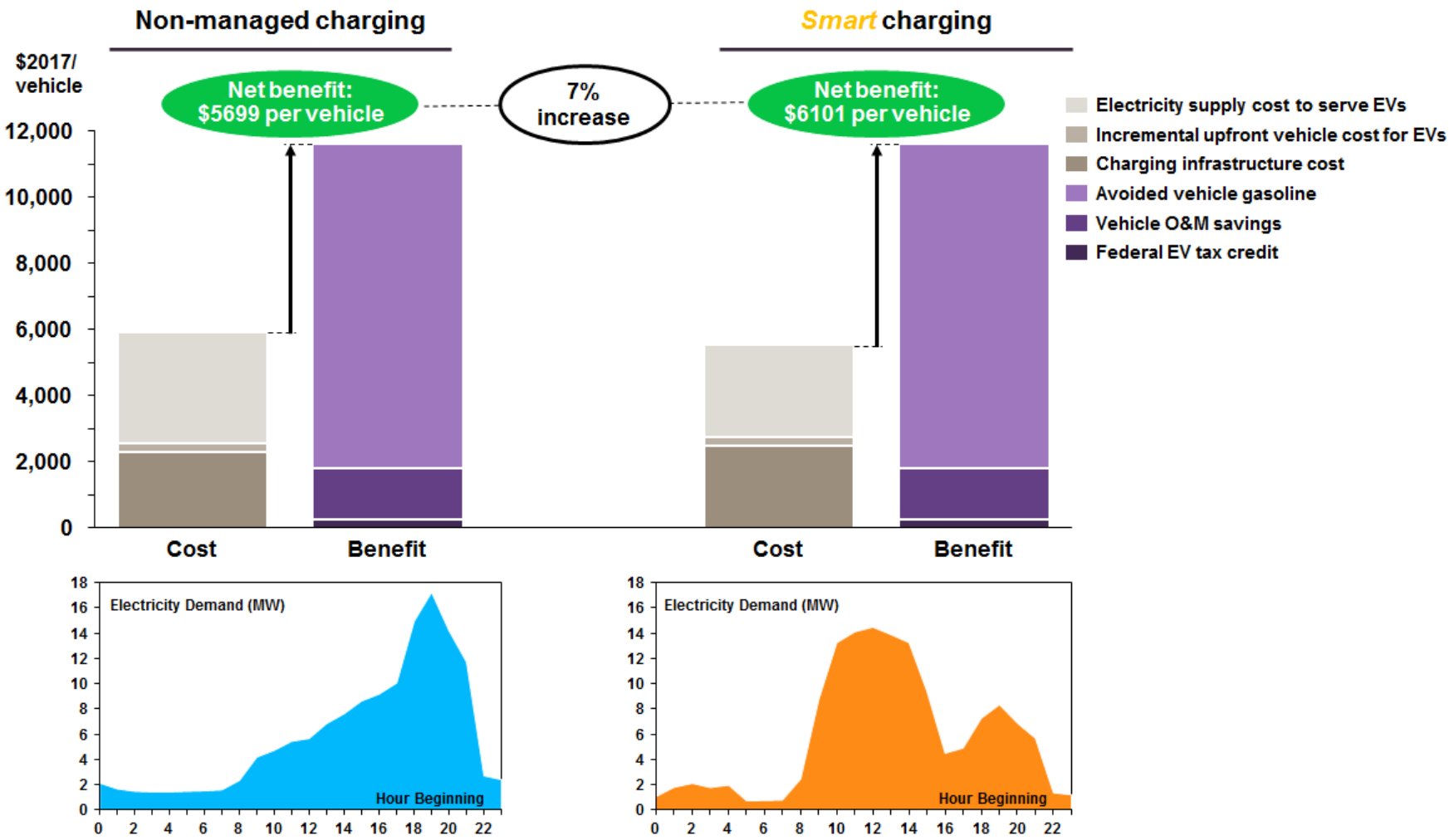


Figure 21: Costs and benefits to Maui Electric customers per personal light duty electric vehicle adopted on Maui NPV 2018-2045

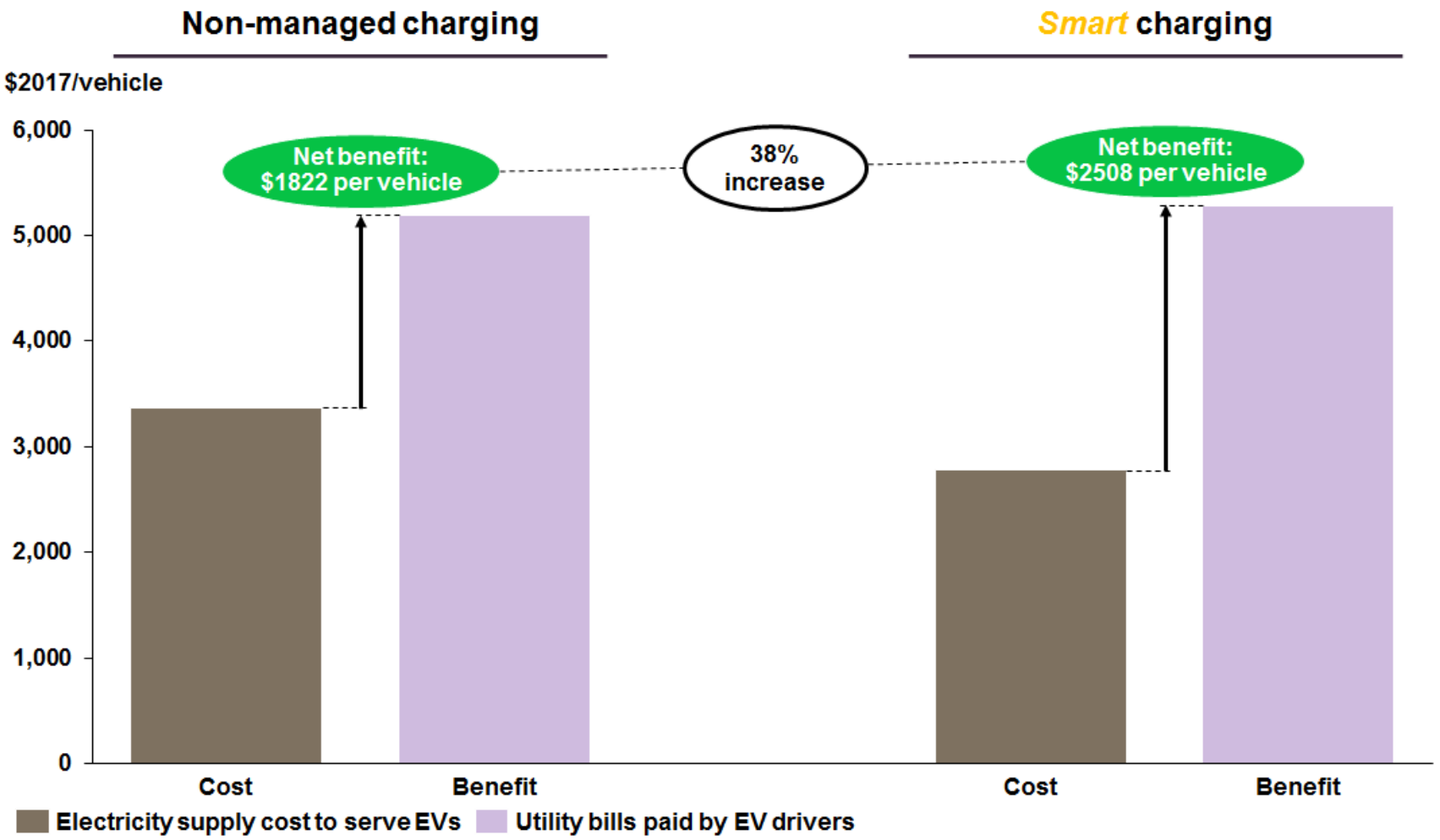


Figure 22: Fossil fuel consumption by Maui light-duty vehicles, assuming Maui Electric's EV adoption forecast

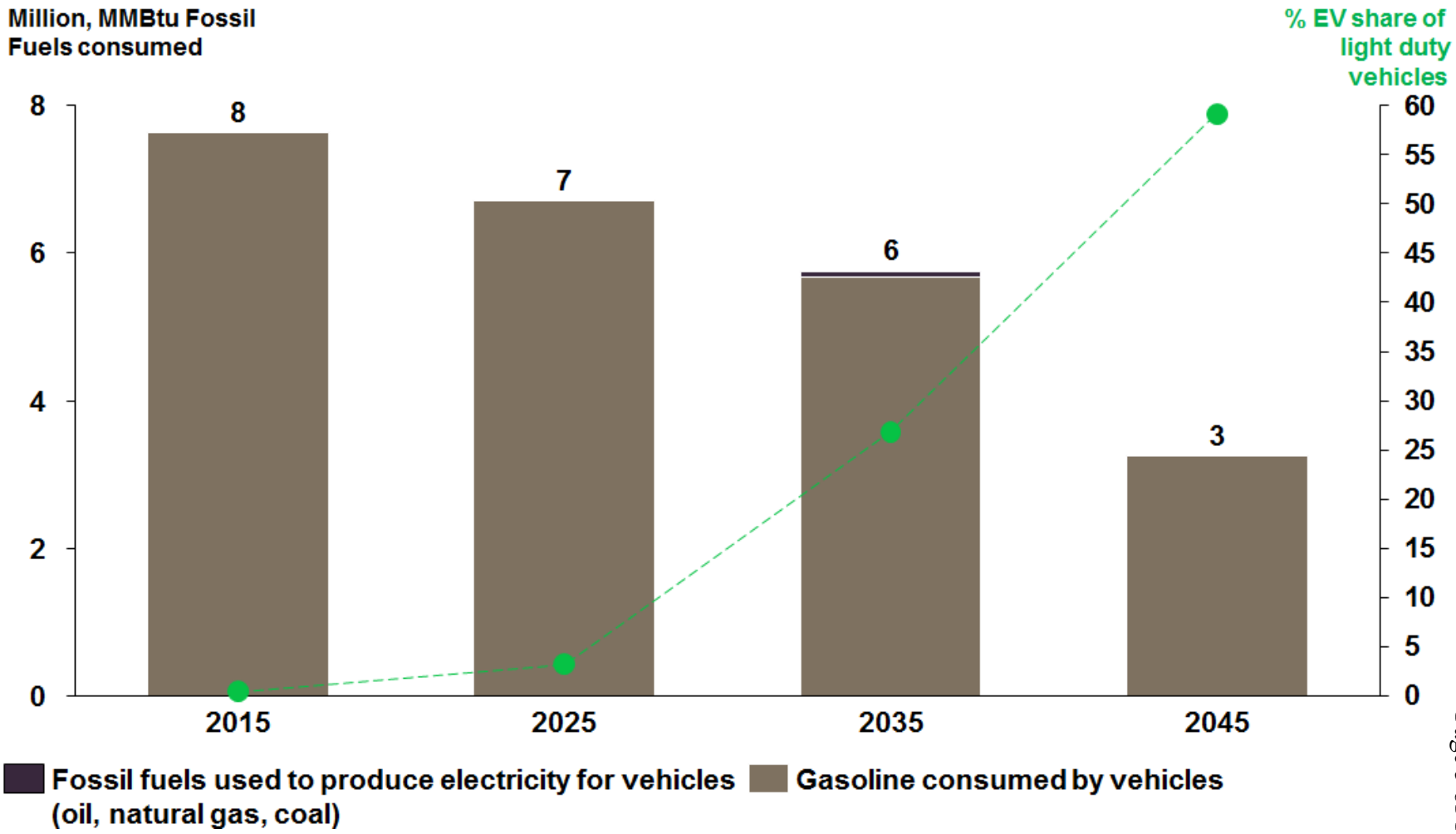


Figure 23: Carbon dioxide emissions by Maui light-duty vehicles assuming Maui Electric's EV adoption forecast

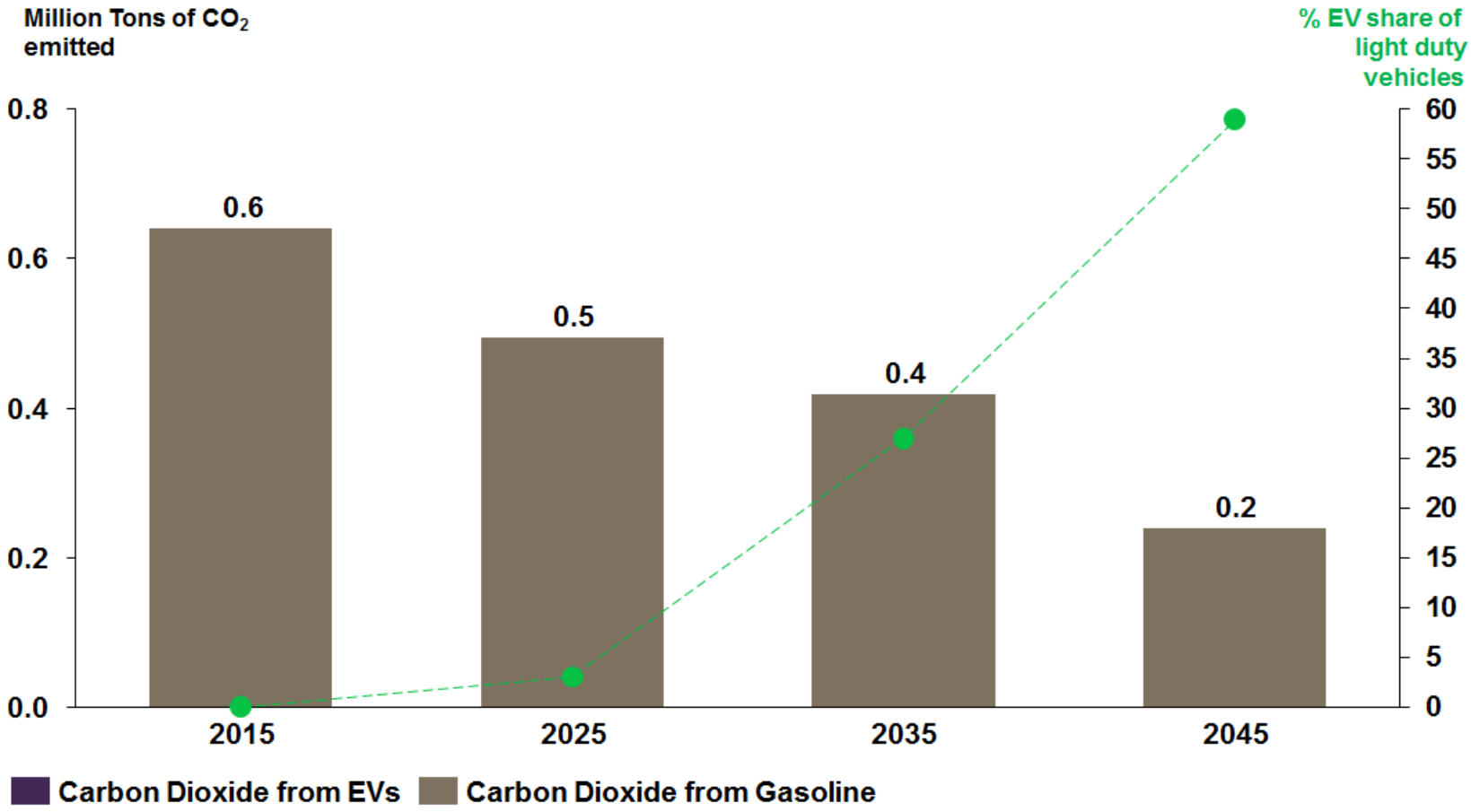


Figure 33: Average weekday charging load for personal, light-duty EVs, Non-Managed Charging and Smart Charging case, 2030 (Maui)

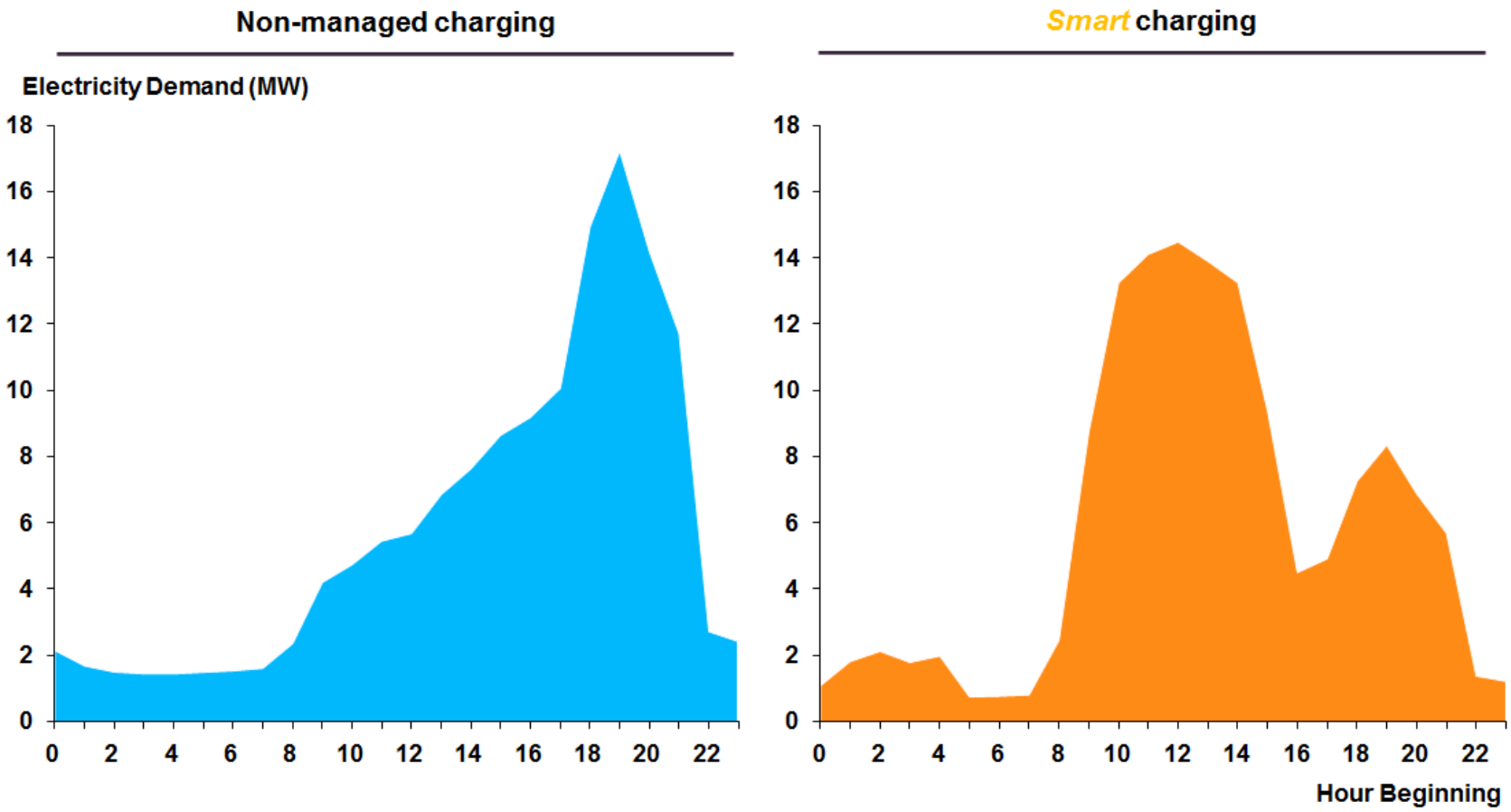


Figure 34: Forecasted electricity sales and electricity demand for Non-Managed and Smart Charging cases during peak from 2018 to 2045 (Maui)

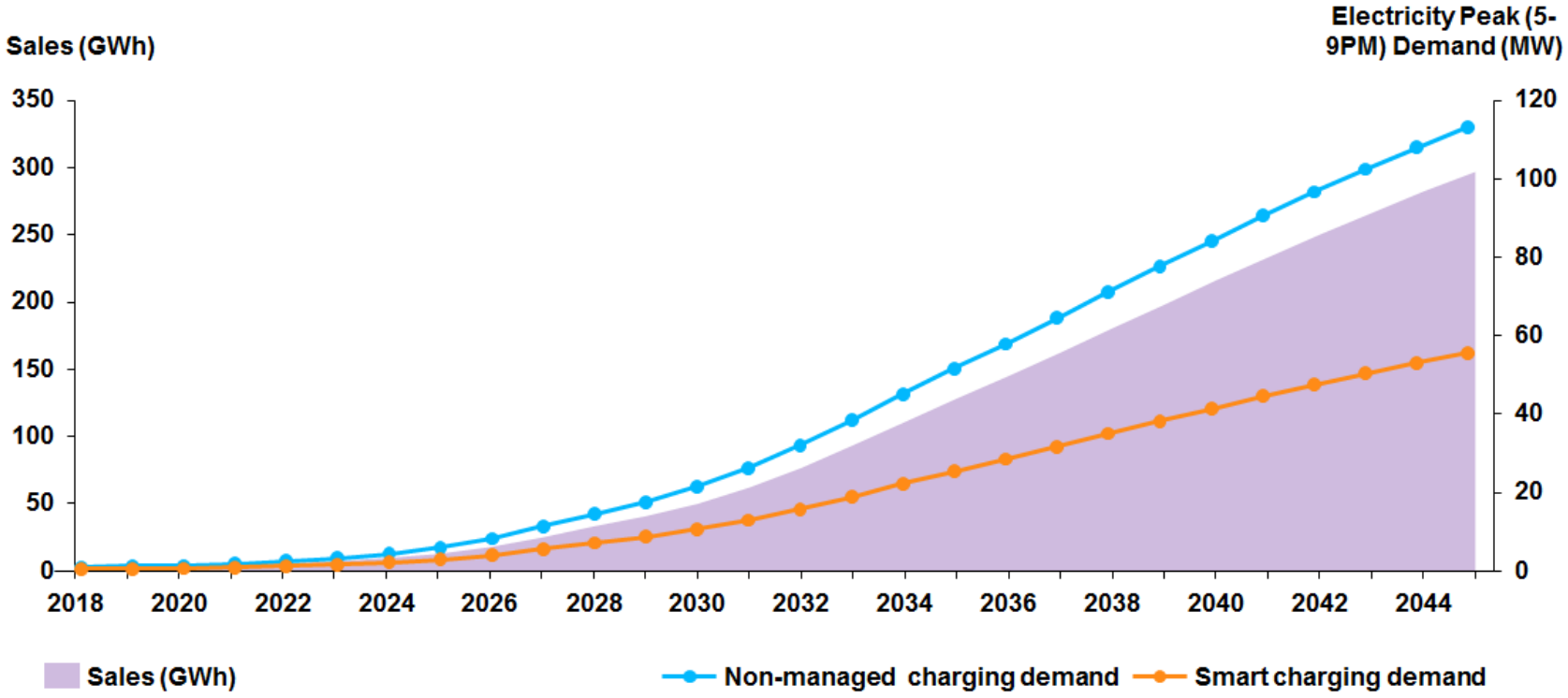


Figure 37: Gasoline price forecast, net of state and local taxes (Maui)

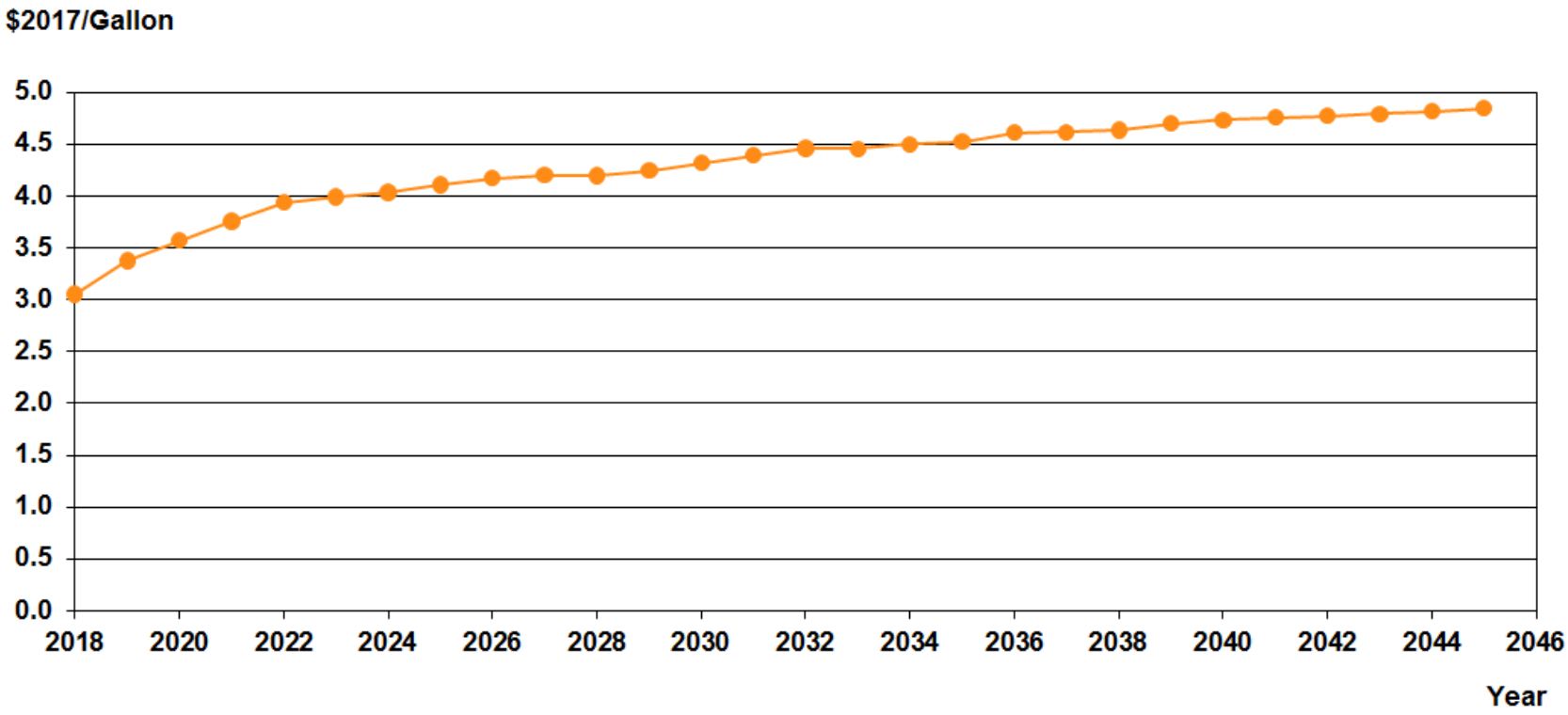


Table 9: EVSE data (Maui)

EVSE Type	Charging Ports per EVSE	Purchase and Installation Cost ($)	Annual Price Reduction
Residential	1	$2,300	1.9 percent
Workplace Level 2	2	$8,000	1.9 percent
Public Level 2	2	$25,000	1.9 percent
DC Fast Charging	1	$193,534	1.9 percent

Table 11: Maui Electric rates applied to EV charging at different locations

	Maui
Residential (range indicates differences across years)	95% to 99% Schedule R
	1% Schedule TOU-RI
	0% to 4% TOU-EV
Workplace Level 2	25% Schedule J
	75% Schedule P
Public Level 2	25% Schedule J
	75% Schedule P
DC Fast Charging	95% Schedule EV-F
	5% Schedule EV-U

Exhibit C

Hawai‘i Island Results

Figure 19: Hawaii Electric Light's personal light-duty EV adoption forecast, Hawai'i Island 2010-2045

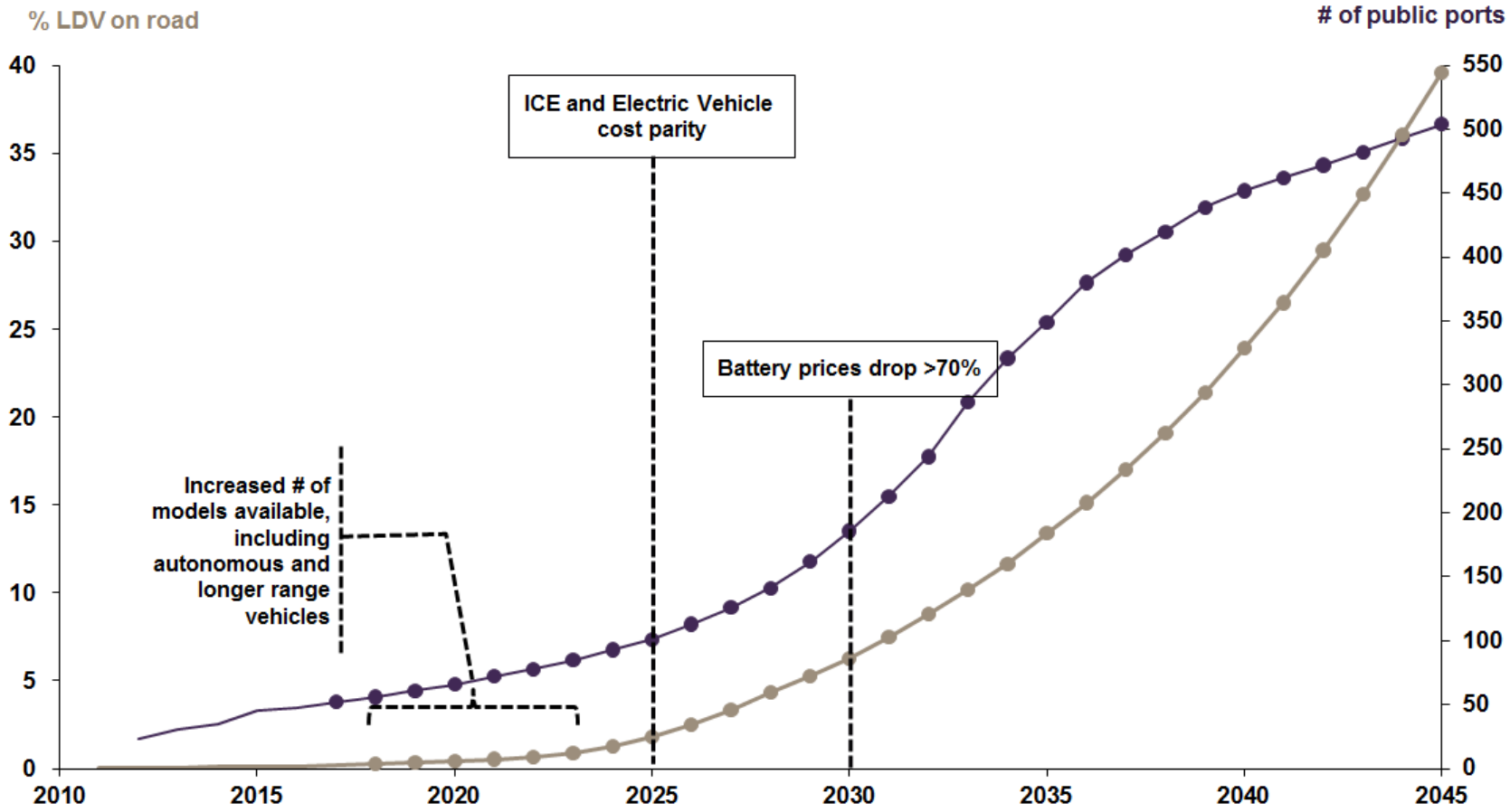


Figure 20: Direct economic costs and benefits to **Hawai'i Island** per personal light duty electric vehicle, NPV 2018-2045

Figure 21: Costs and benefits to Hawaii Electric Light's customers per personal light duty electric vehicle adopted on Hawai'i Island NPV 2018-2045

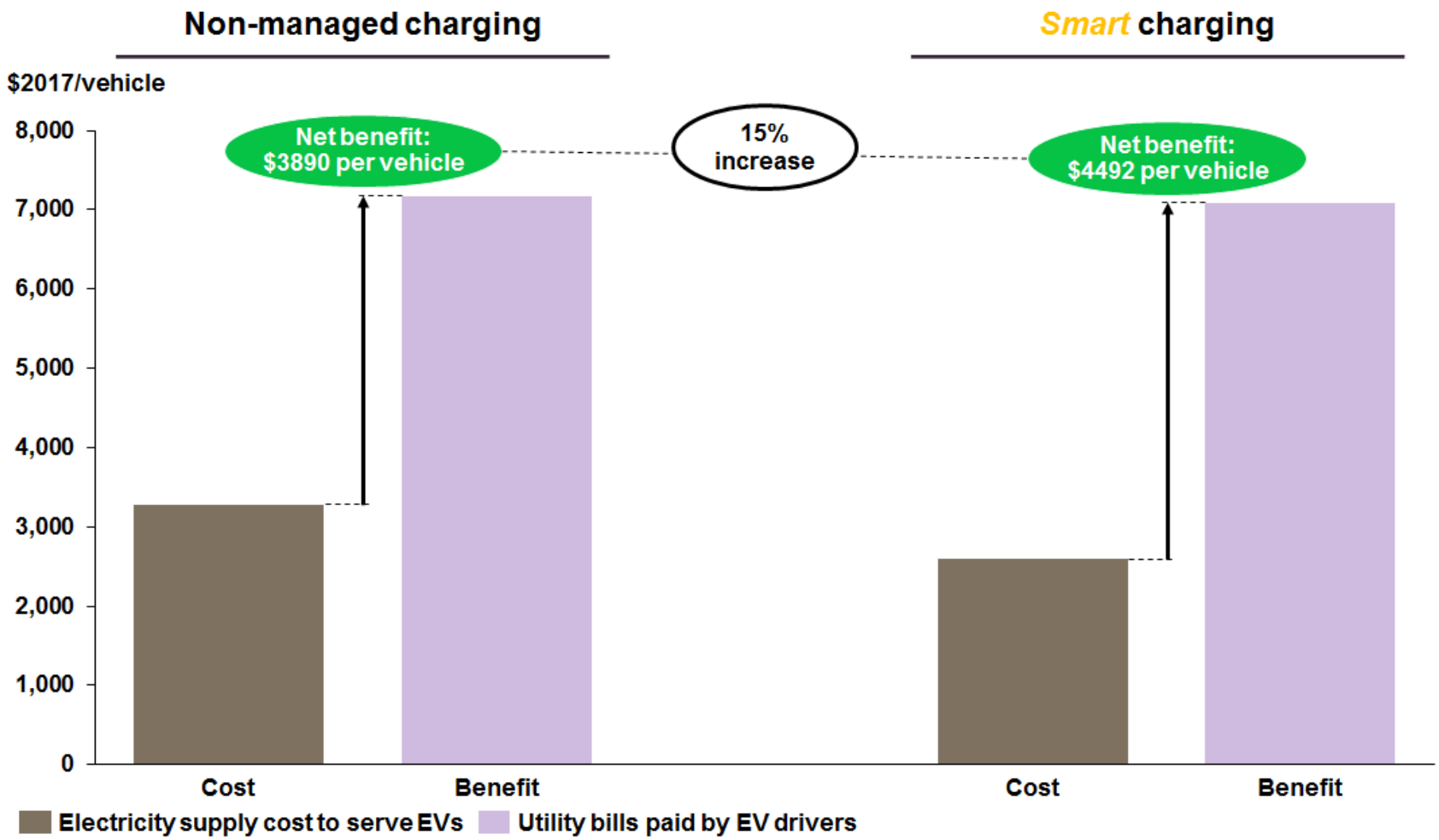
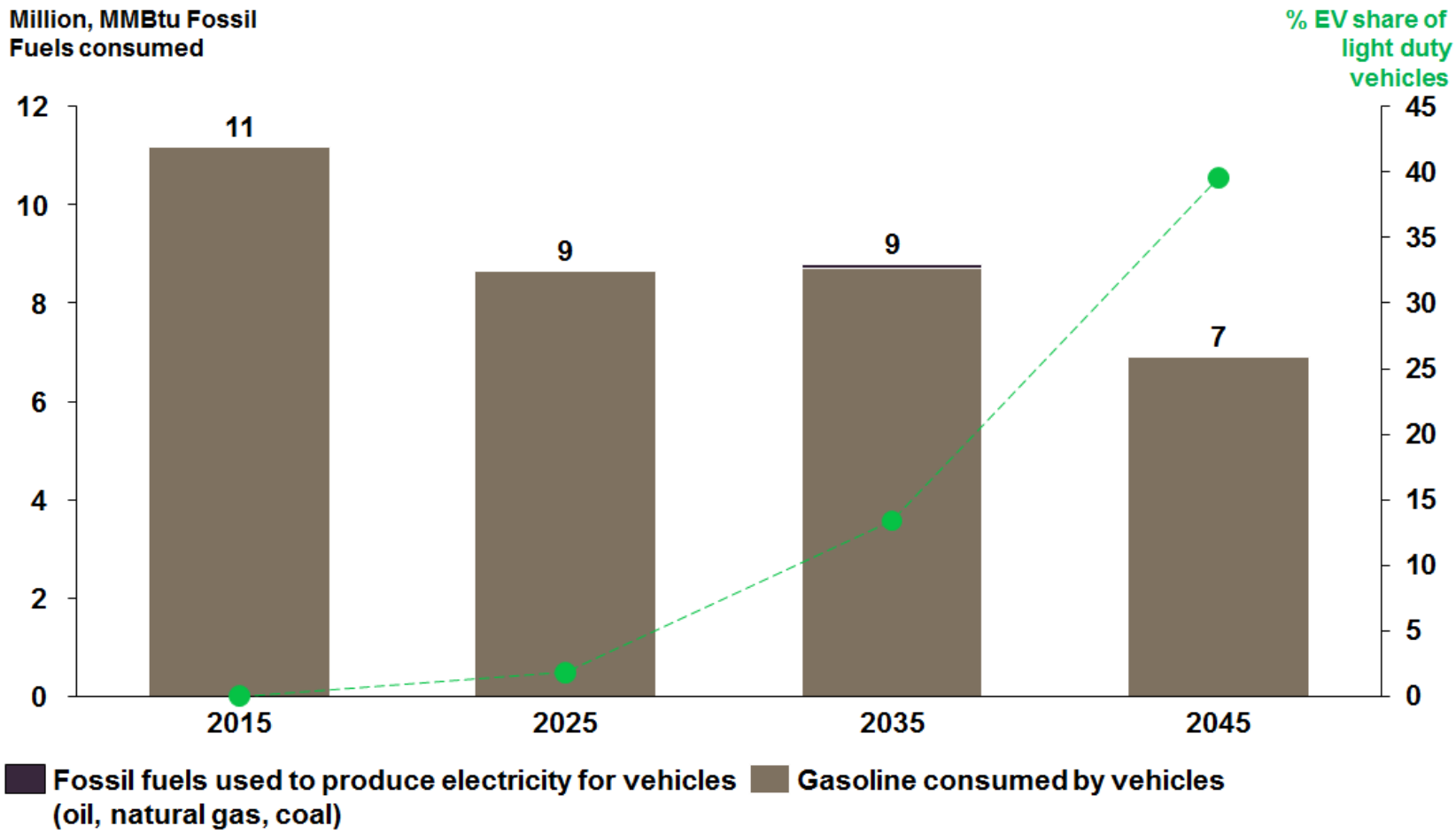


Figure 22: Fossil fuel consumption by Hawai‘i Island light-duty vehicles, assuming Hawaii Electric Light’s EV adoption forecast



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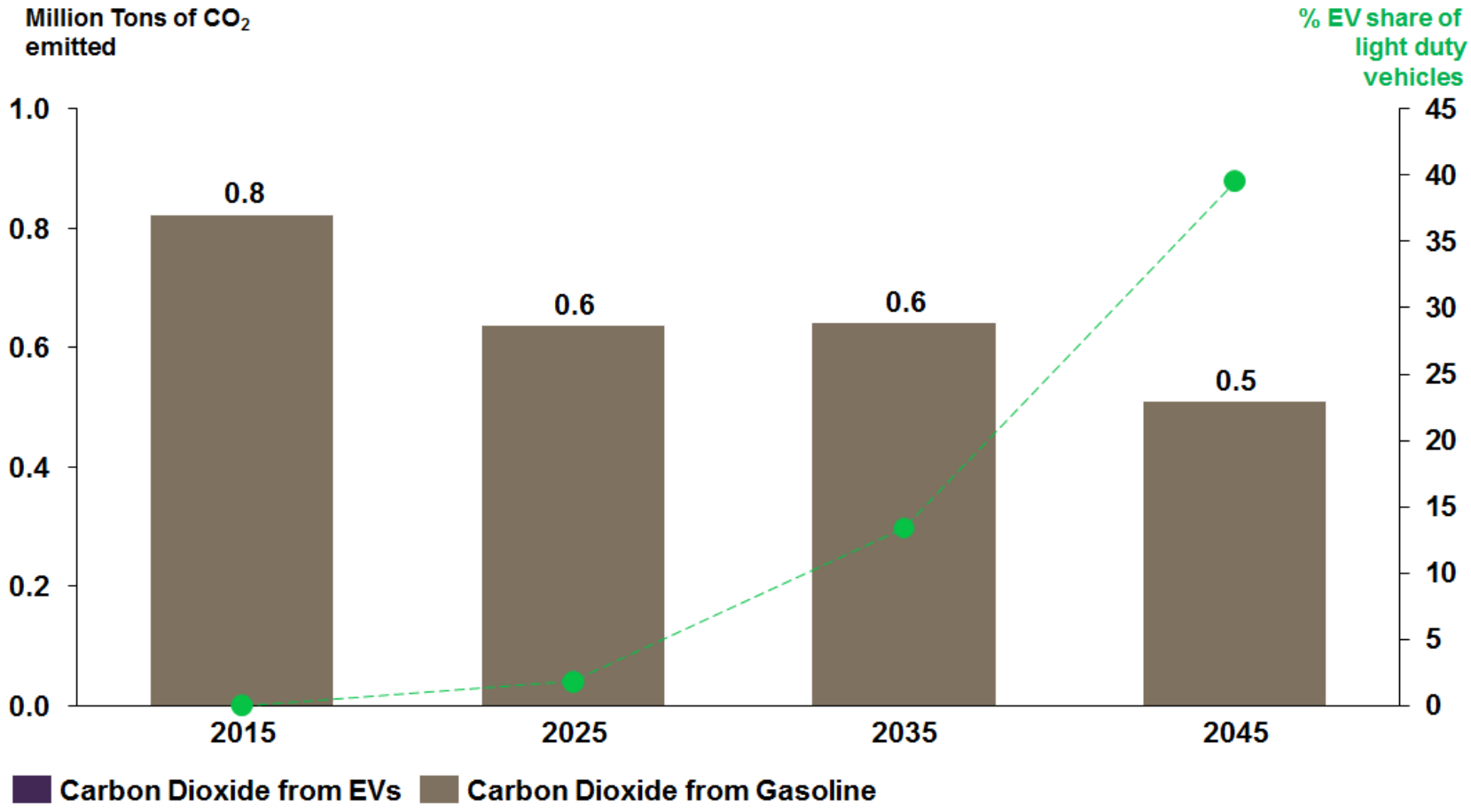

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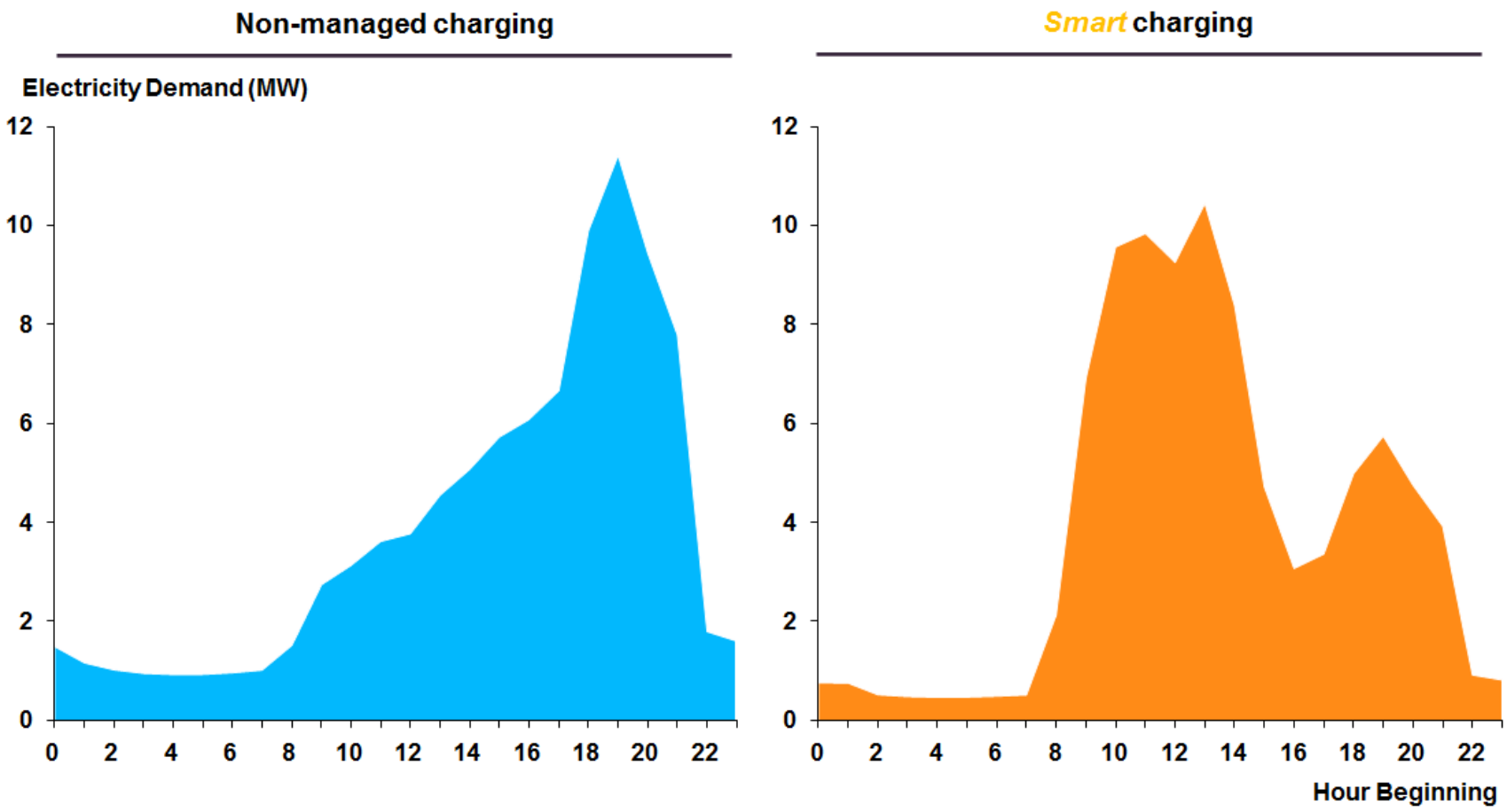

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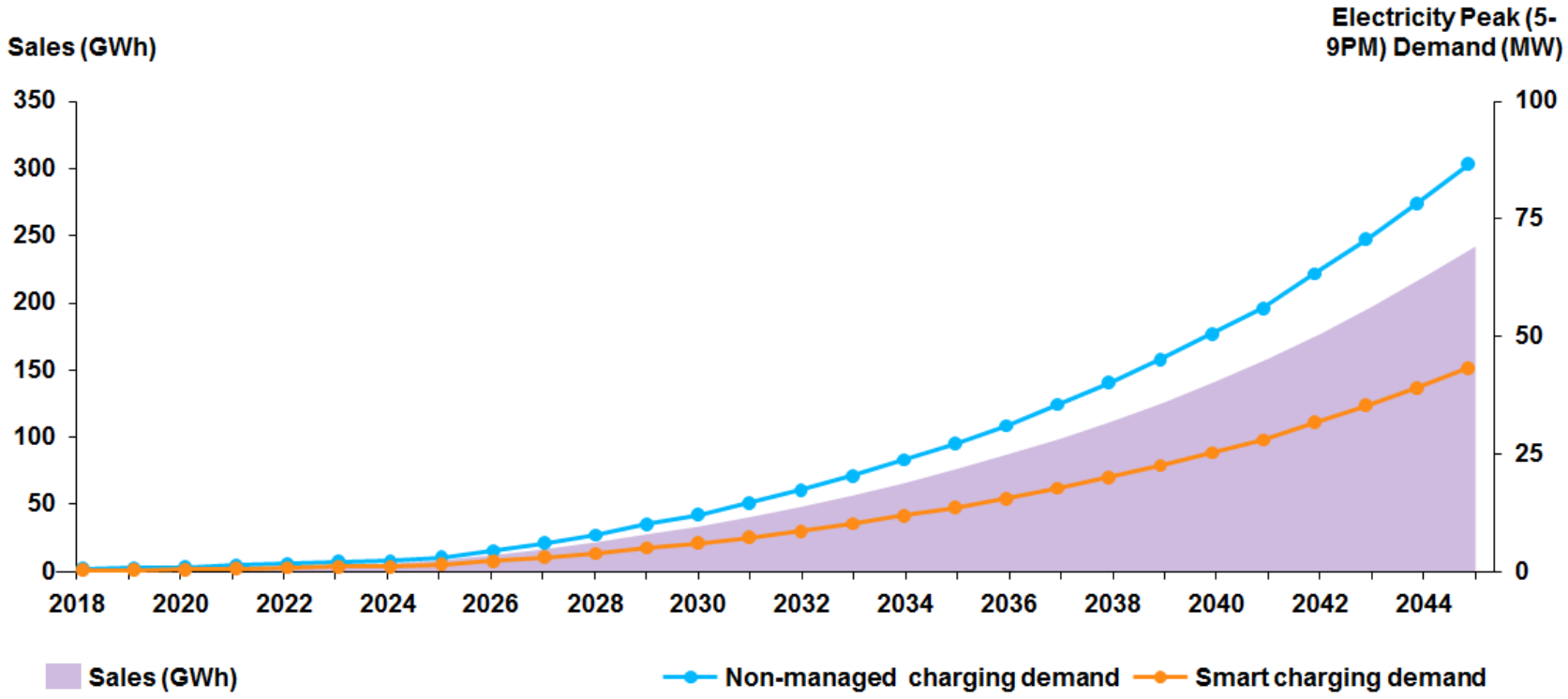
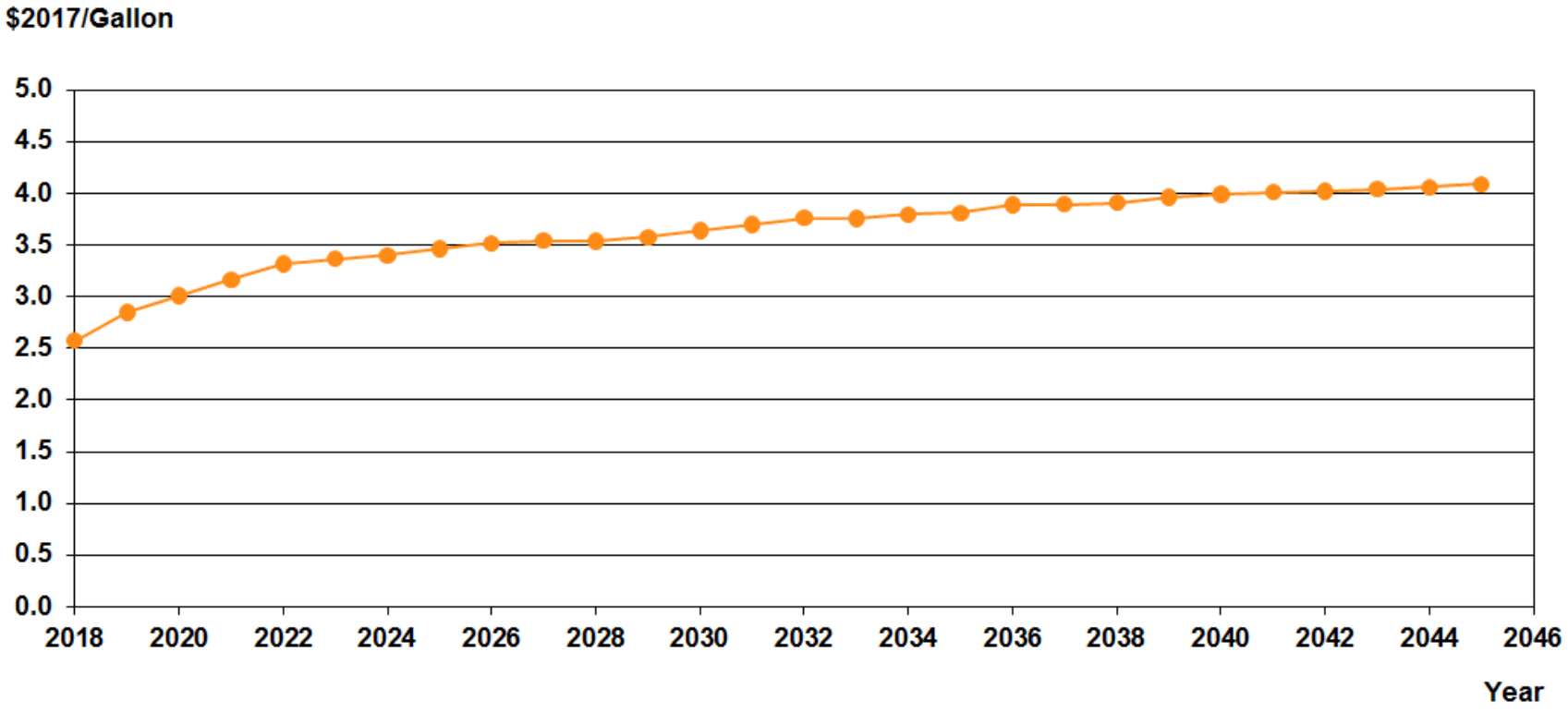


Figure 37: Gasoline price forecast, net of state and local taxes (Hawai‘i Island)



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Public Level 2	50% Schedule J
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