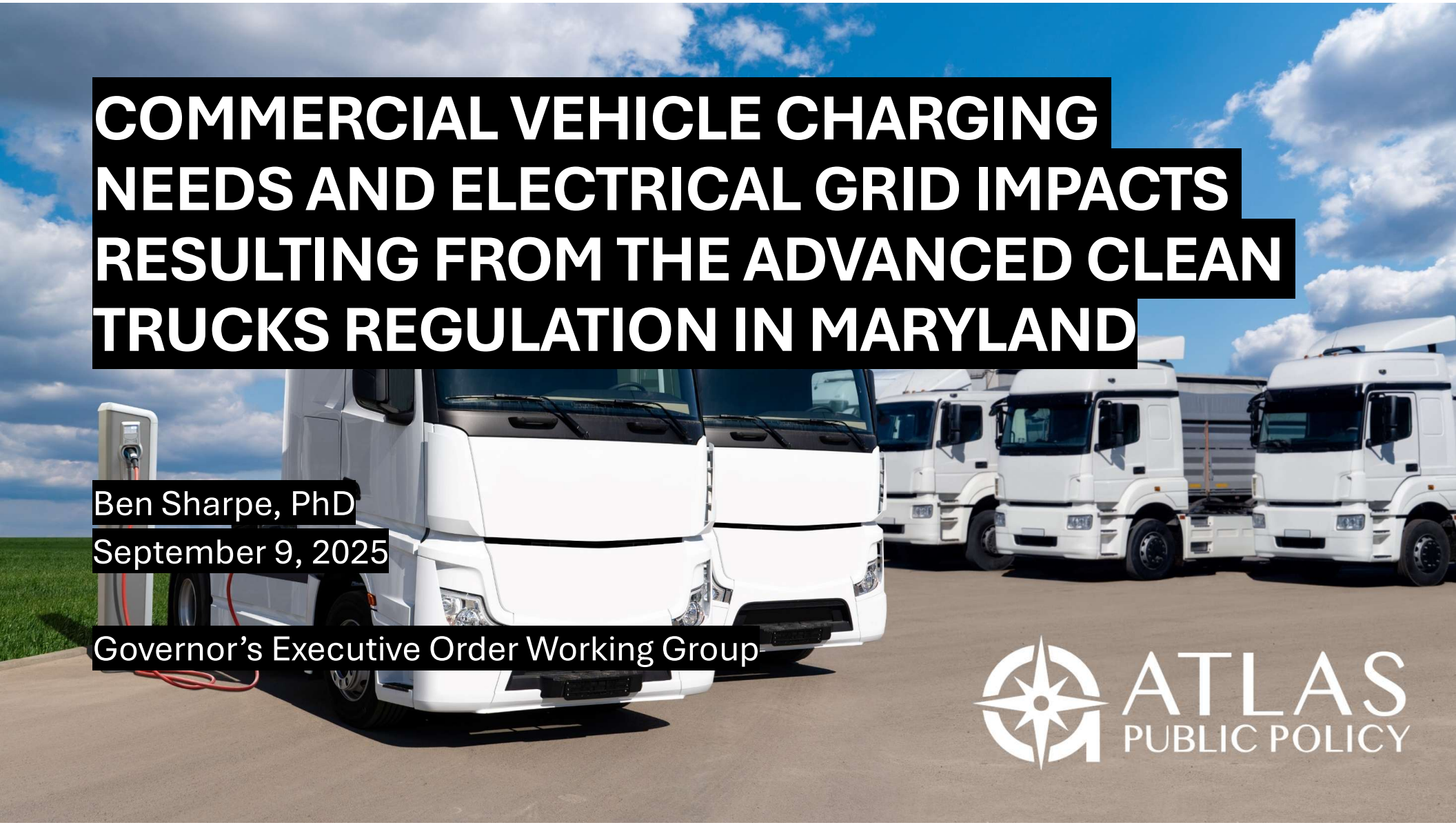


COMMERCIAL VEHICLE CHARGING NEEDS AND ELECTRICAL GRID IMPACTS RESULTING FROM THE ADVANCED CLEAN TRUCKS REGULATION IN MARYLAND

Ben Sharpe, PhD

September 9, 2025

Governor’s Executive Order Working Group

ATLAS PUBLIC POLICY

CONTENTS

- Modeling overview
- Vehicles subject to ACT and the evolution of the fleet out to 2050
- Required EV chargers and additional electrical capacity
- Statewide electrical grid impacts

METHODOLOGY OVERVIEW

Today's focus

1. Build the baseline vehicle fleet from MD Motor Vehicle Administration data and estimate how fleet will evolve if ACT is implemented

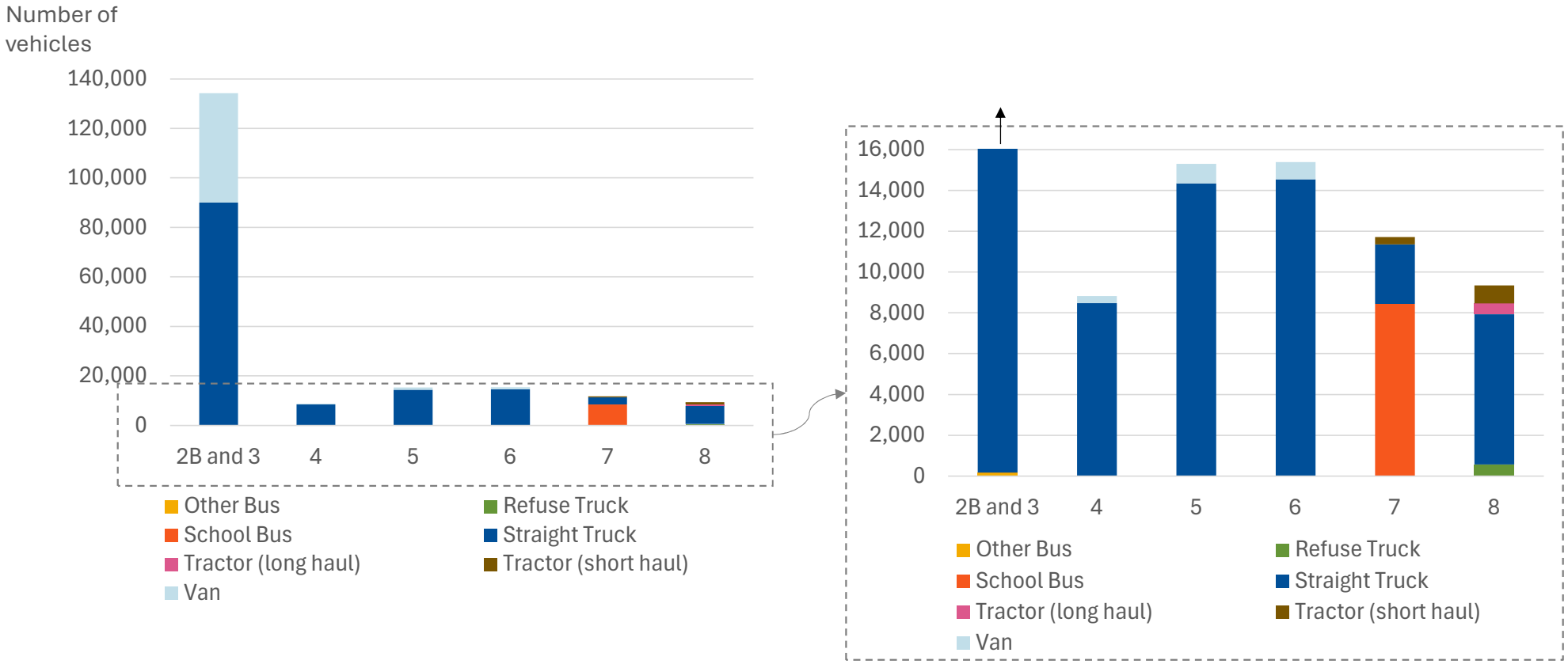
2. Estimate ZEV energy demands and the required number of chargers and hydrogen* stations and the associated costs out to 2050

3. Estimate the overall impacts to the state's electrical grid in terms of additional electricity demand, generation, and peak loads

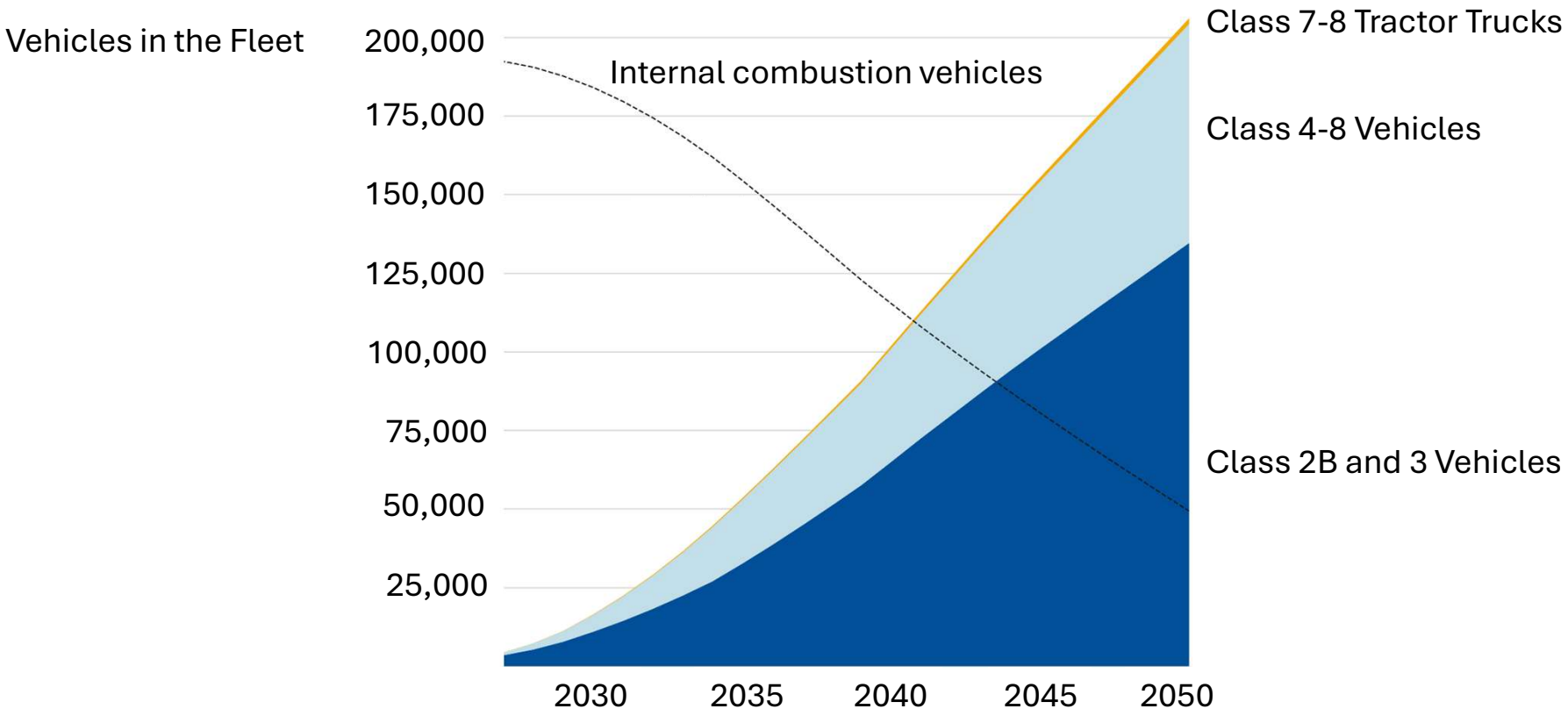
4. Conduct several stakeholder interviews and synthesize findings related to charging infrastructure and grid impacts

* Hydrogen results are not included in this presentation but are provided in the final report

TRUCKS AND BUSES SUBJECT TO ACT RULE



ZERO-EMISSION VEHICLES WOULD OVERTAKE CONVENTIONAL VEHICLES AROUND 2040



CHARGING LOCATION TERMINOLOGY

Home / Private Residence

Charging of a vehicle that primarily resides at a private residence. This is limited to Class 2B through 4 vehicles.

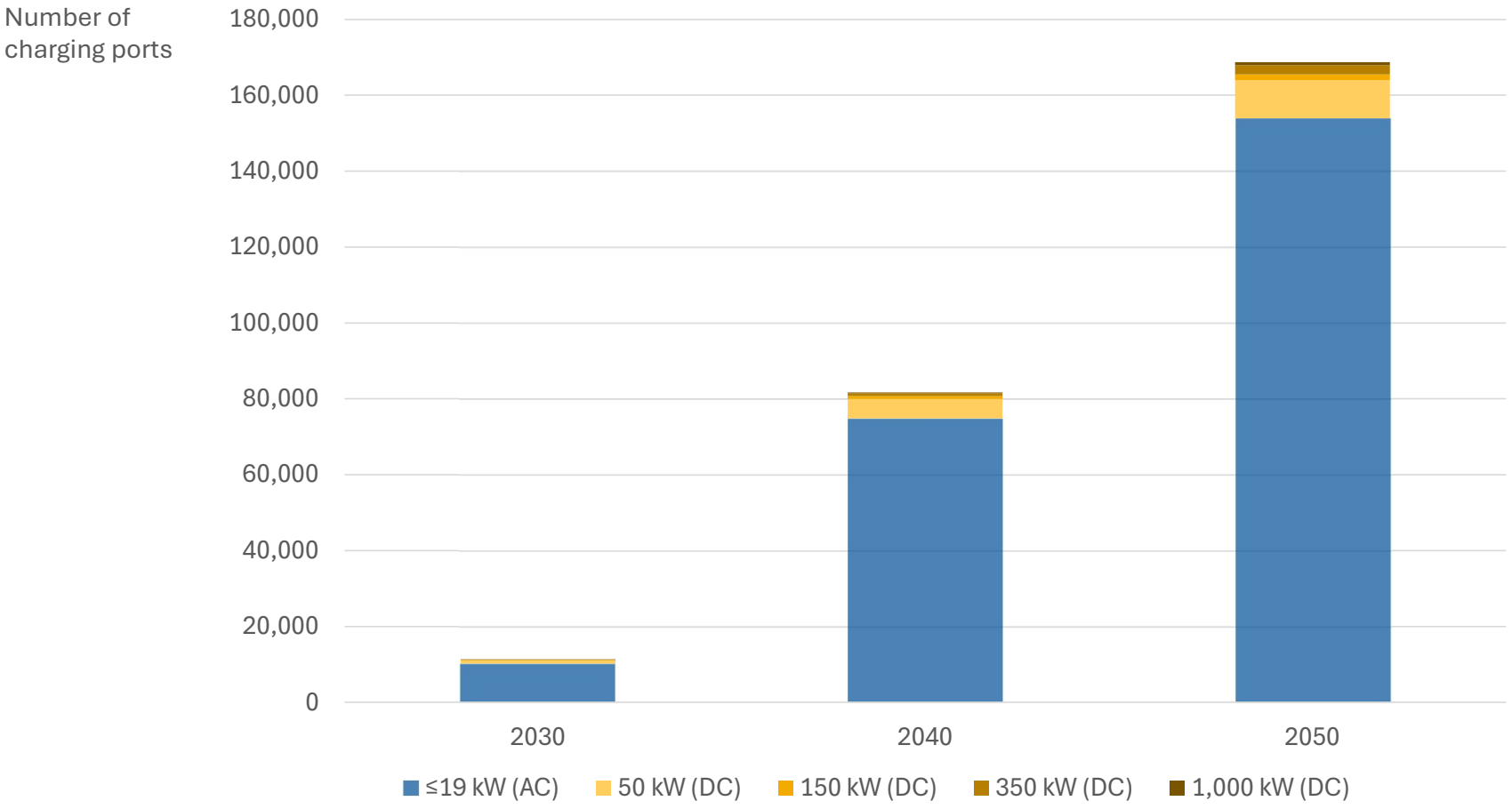
Depot

Charging of a vehicle that primarily resides at a private depot or parking facility.

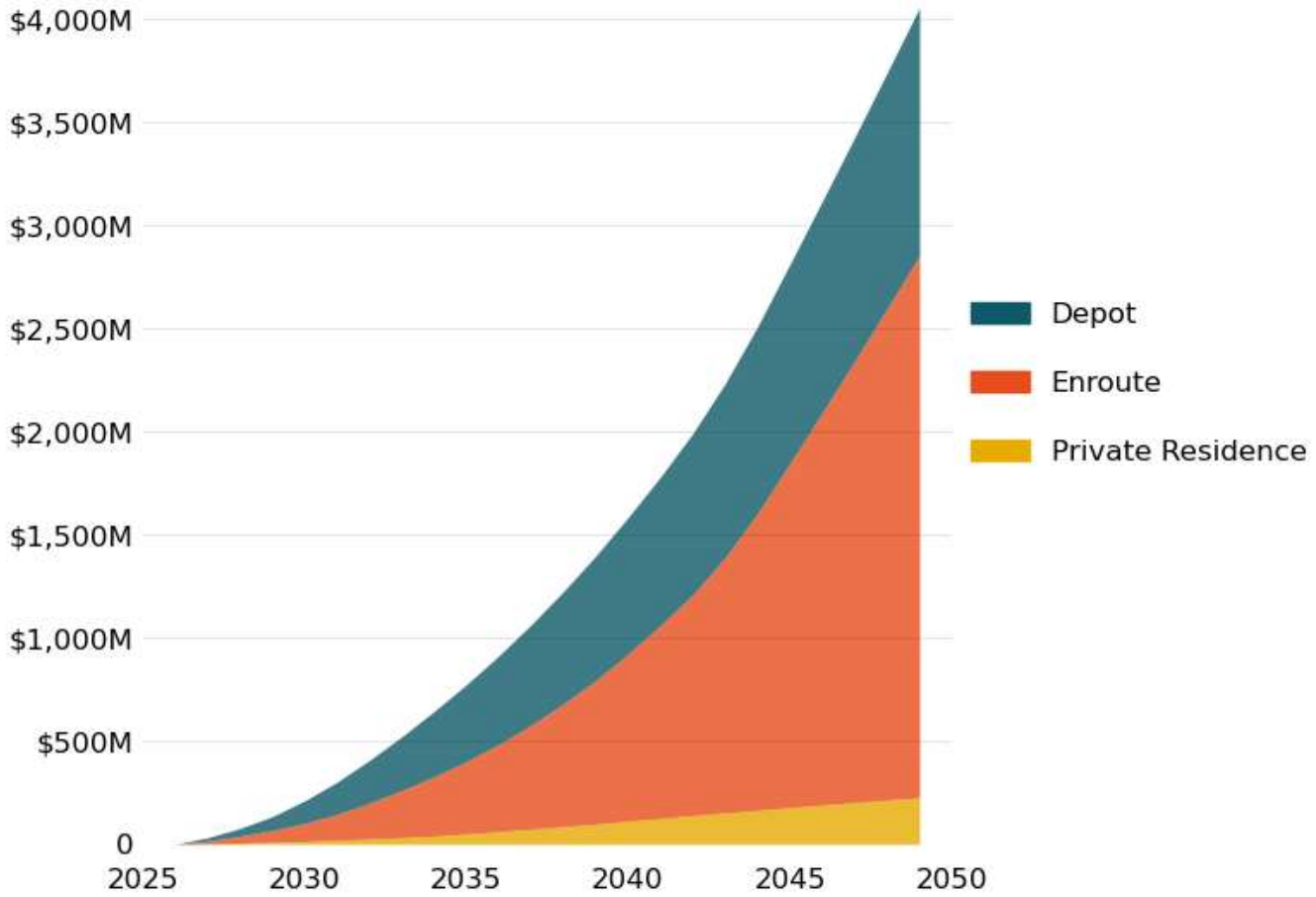
Enroute

Charging of a vehicle at any charging station that is not at home or a depot. Enroute chargers serve vehicles without home bases and provide incidental charging for depot and home-based fleets.

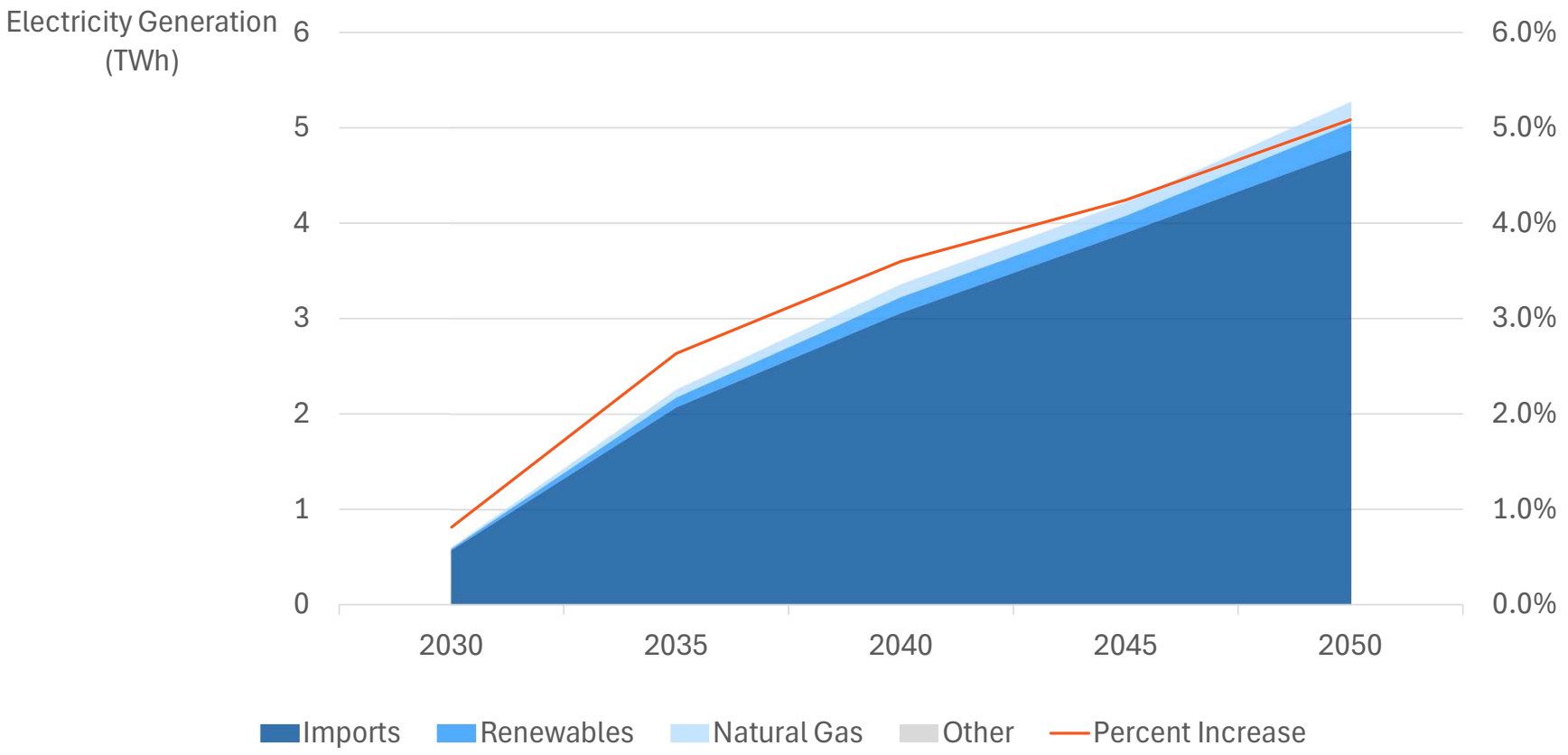
~90% OF CHARGERS CAN BE LOW POWER (L2 CHARGERS ≤19 KW)



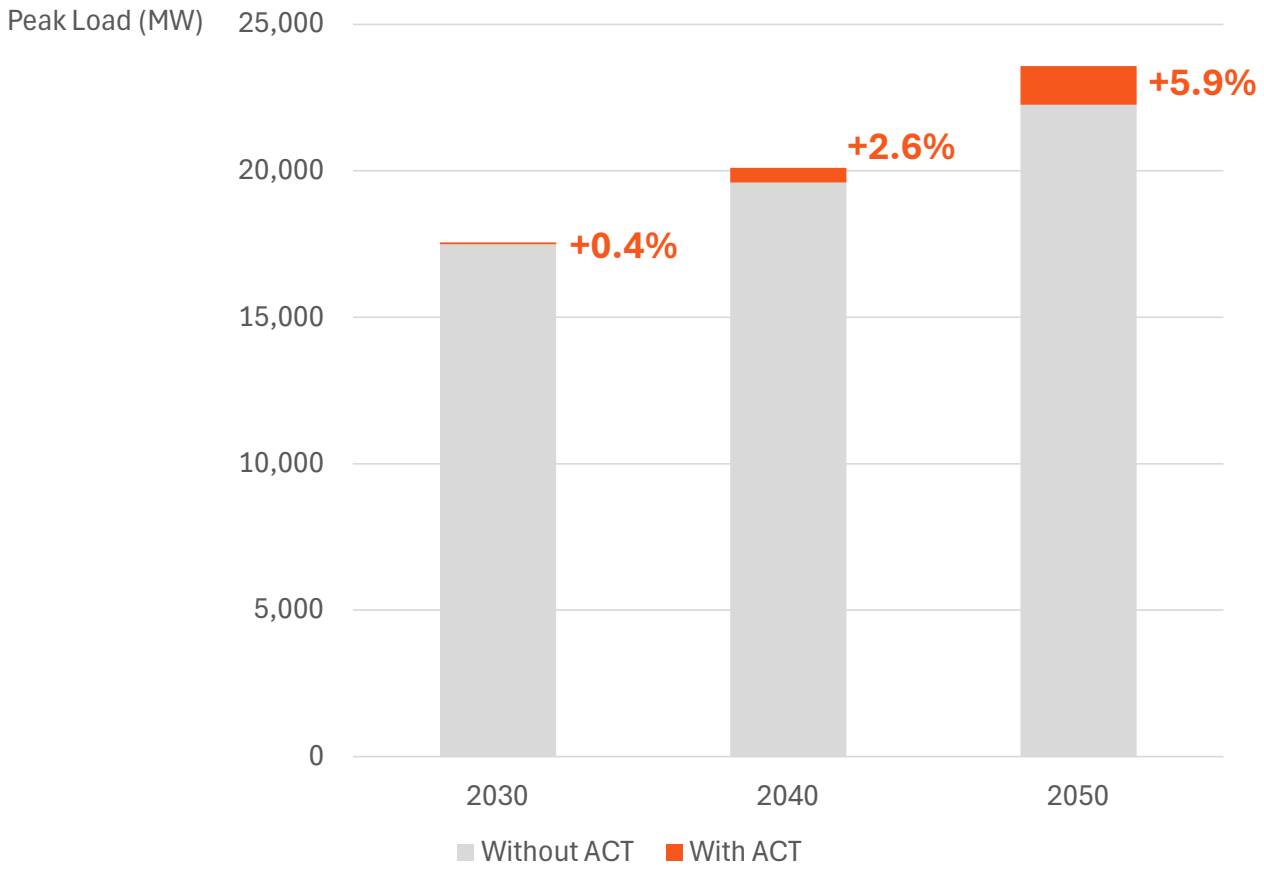
CHARGING INFRASTRUCTURE WOULD COST ~$4B



ACT IMPLEMENTATION WOULD REQUIRE ~5% MORE ELECTRICITY GENERATION BY 2050



ACT IMPLEMENTATION COULD ADD UP TO ~6% TO PEAK LOADS BY 2050



Thank you!

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