



Analysis of New Mexico Adopting Advanced Clean Cars II (ACC II) Regulation

June 12, 2023

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The business of sustainability



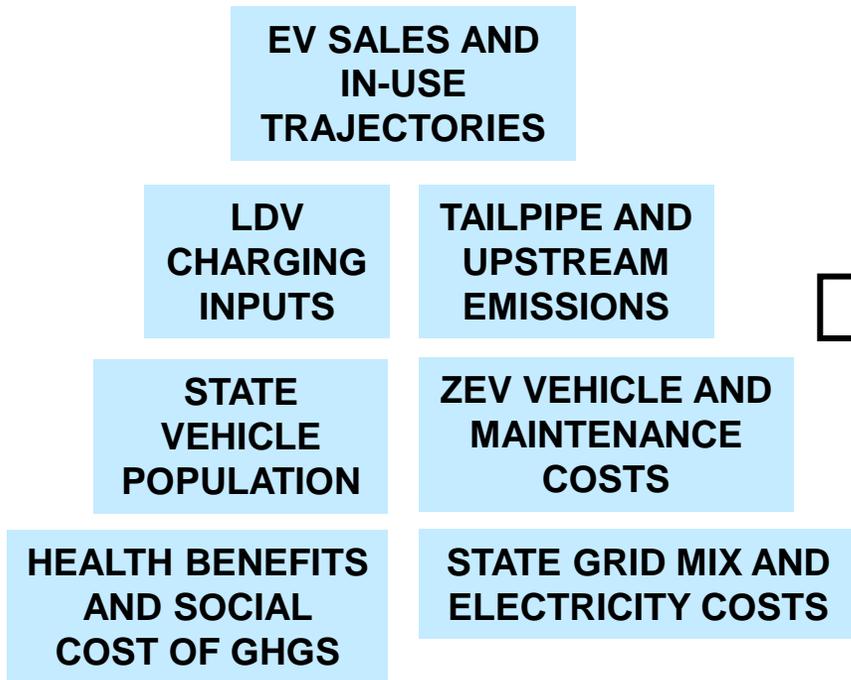
Agenda

- Modeling Framework
- Scenarios
- ZEV Vehicle Population
- Climate Benefits
- Air Quality Benefits
- Cumulative Health Benefits
- Utility Impacts
- Charging Infrastructure
- ZEV Owner Benefits
- Jobs and GDP Impacts
- Cumulative Net Societal Benefits



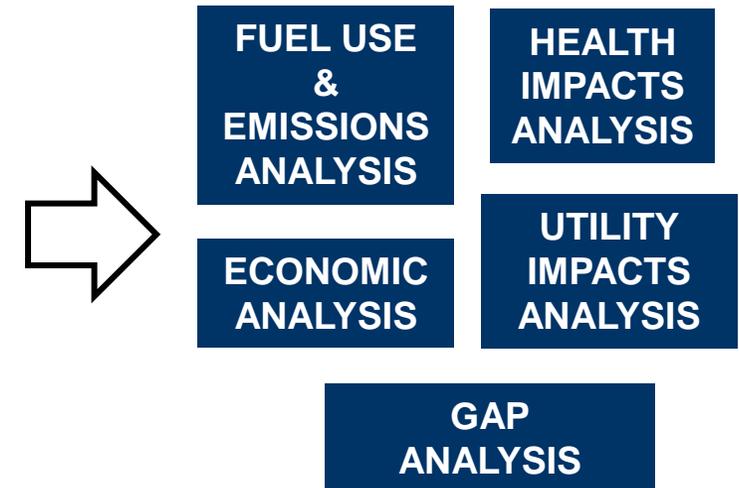
Modeling Framework Schematic

INPUTS



EV COSTS & BENEFITS ANALYSIS

OUTPUTS

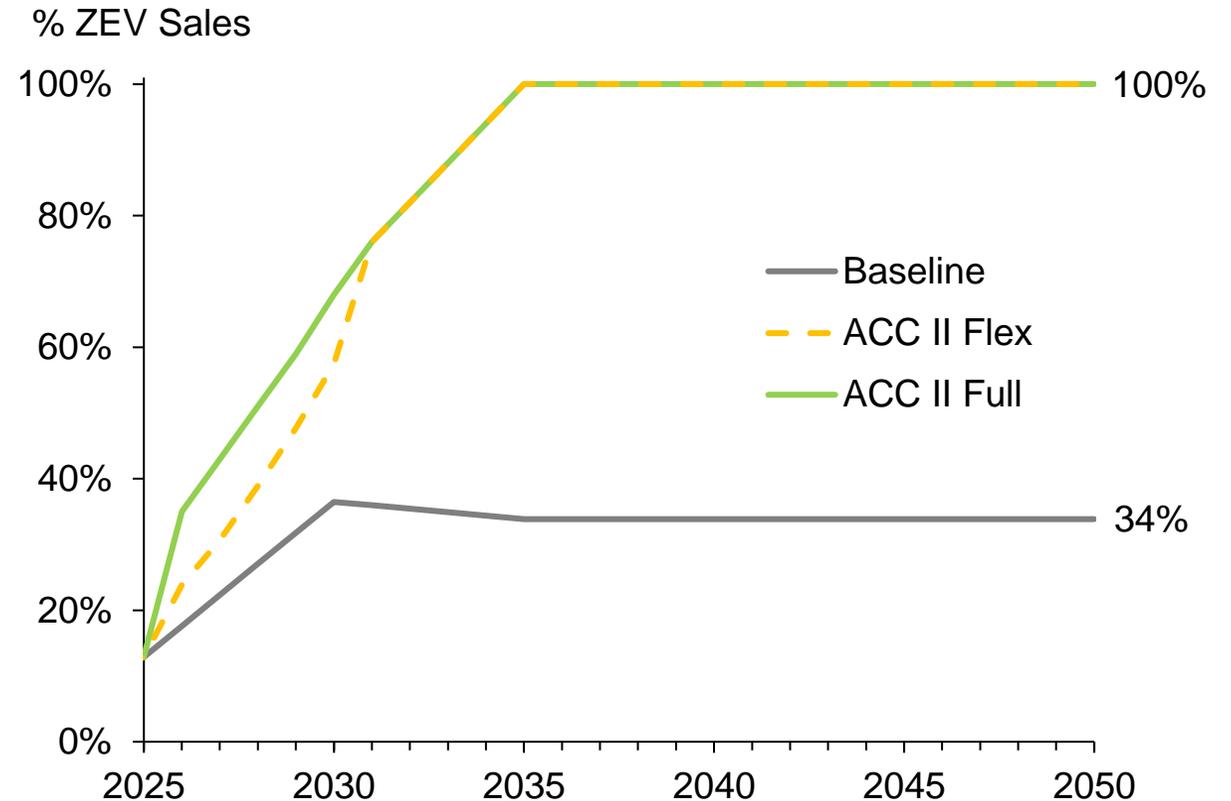


Detailed Model Outputs

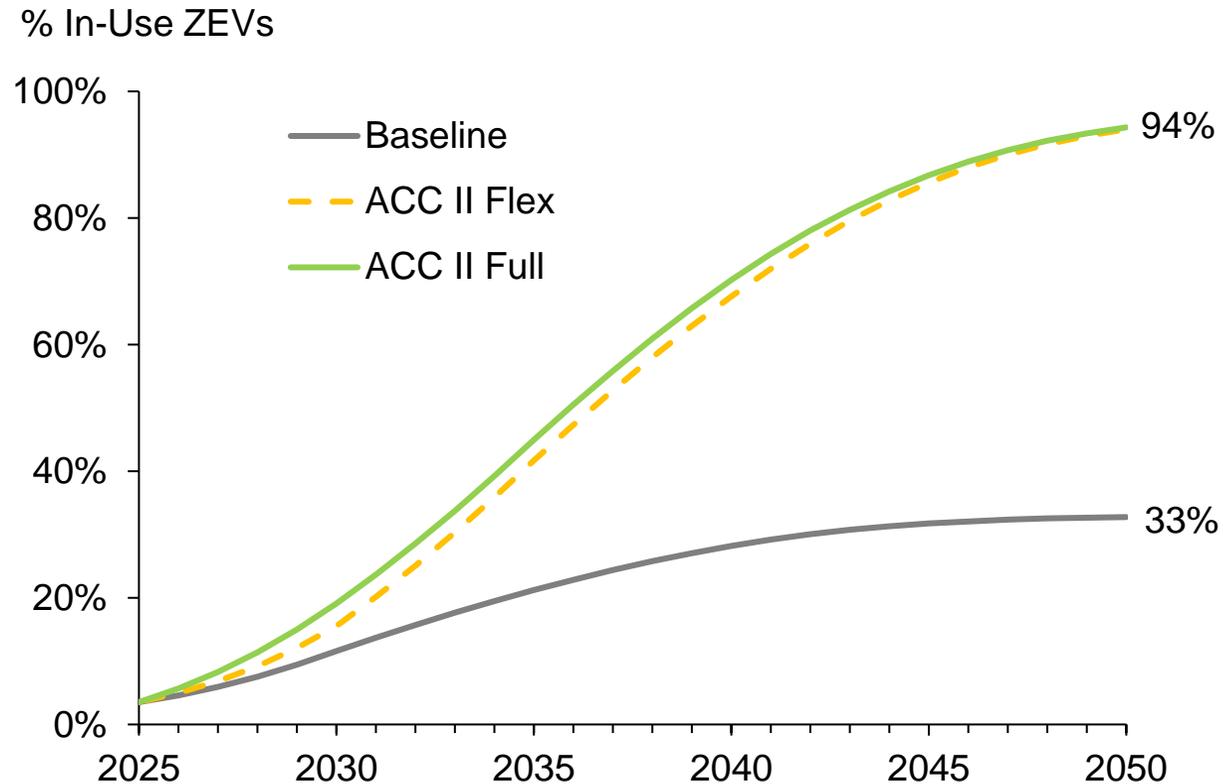
FUEL USE & EMISSIONS ANALYSIS	<ul style="list-style-type: none">▪ Δ Fuel use (diesel, gasoline, electricity)▪ Δ GHG emissions (CO_2, CH_4, N_2O) and criteria pollutants (NO_x, $\text{PM}_{2.5}$), including both tailpipe and upstream emissions▪ Monetized value of net emission reductions
HEALTH IMPACTS ANALYSIS	<ul style="list-style-type: none">▪ Δ Premature deaths due to lower NO_x and PM emissions▪ Δ Hospital visits & asthma incidences due to lower NO_x and PM emissions▪ Monetized value of net health benefits
ECONOMIC ANALYSIS	<ul style="list-style-type: none">▪ Δ Spending on vehicle purchase, fuel, and maintenance▪ Charging infrastructure investments▪ Jobs and GDP Impact
UTILITY IMPACTS ANALYSIS	<ul style="list-style-type: none">▪ Δ Electricity use and load▪ Utility net revenue▪ Impact on electricity rates
GAP ANALYSIS	<ul style="list-style-type: none">▪ Estimate of state-level charging infrastructure needs

Modeled Scenarios

- **Business-As-Usual (BAU)**
 - ZEV sales grow moderately particularly driven by the IRA
- **ACC II Flex**
 - NM adopts ACC II **starting in MY2027**, but manufacturers utilize some of the compliance flexibilities built into the regulation with a BAU Grid
- **ACC II Flex + Clean Grid**
 - Same ZEV adoption as ACC II Flex but the electric grid reaches 100% zero-emitting by 2040 (Clean Grid)
- **ACC II Full + Clean Grid**
 - NM adopts ACC II, but no compliance flexibilities are used; includes a Clean Grid

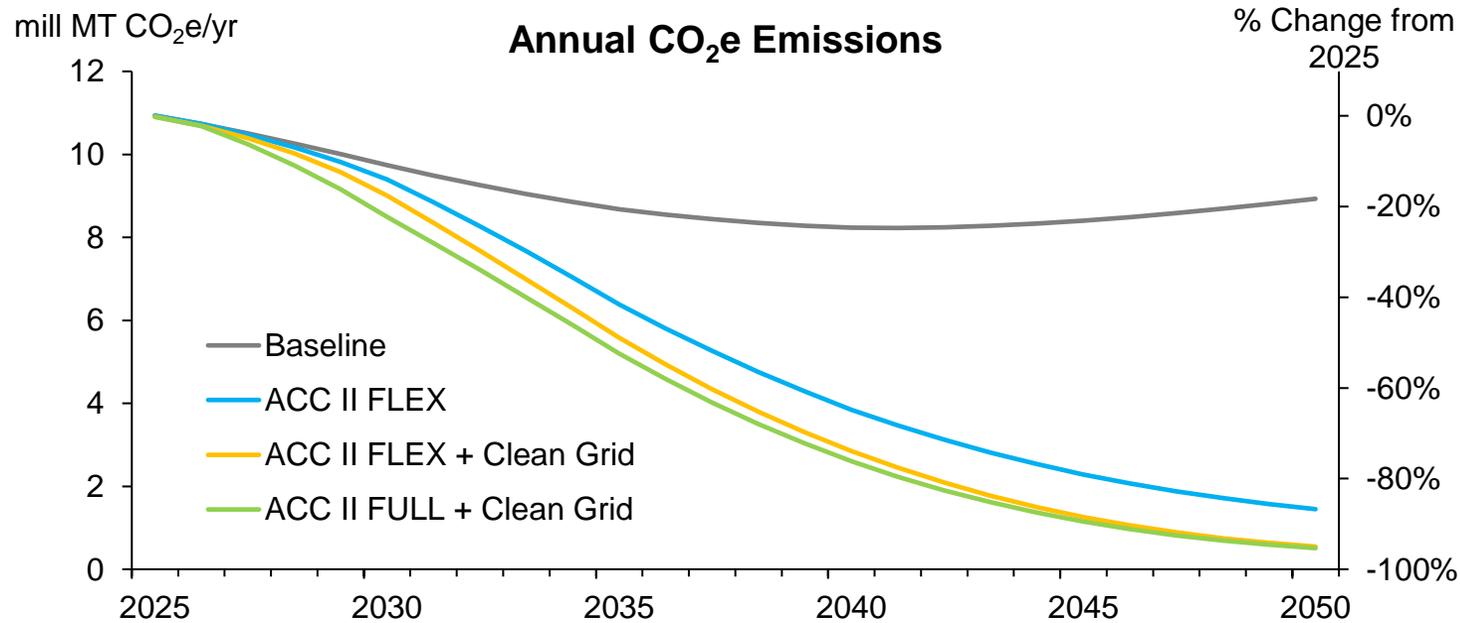


ZEV Population

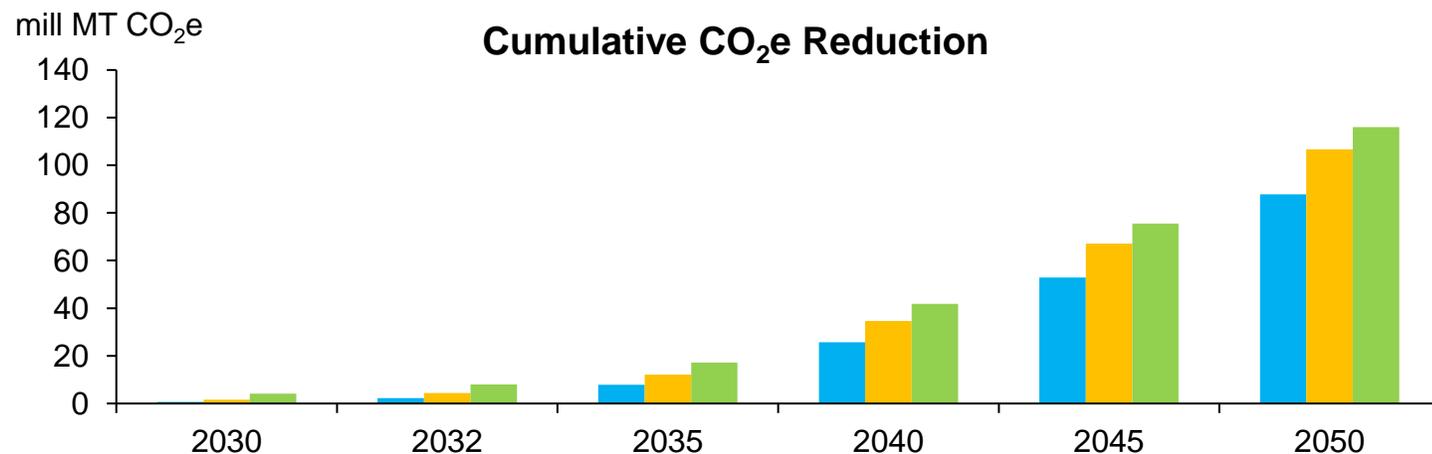


- The ZEV vehicle population is derived from a fleet turnover model that incorporates vehicle survival rates as well as projected growth
- Emissions are based on vehicle miles travelled (VMT) which is vehicle age dependent in the model. As a result, a slightly higher percent of VMT compared to vehicle population is zero-emitting since those vehicles skew younger
 - For example, in 2030 under the ACC II Full scenario, 18% of vehicles but 22% of VMT are zero-emission

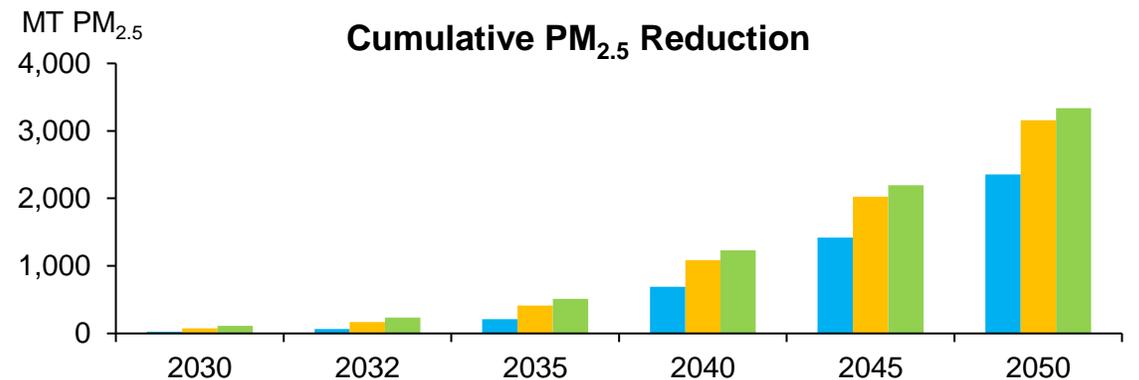
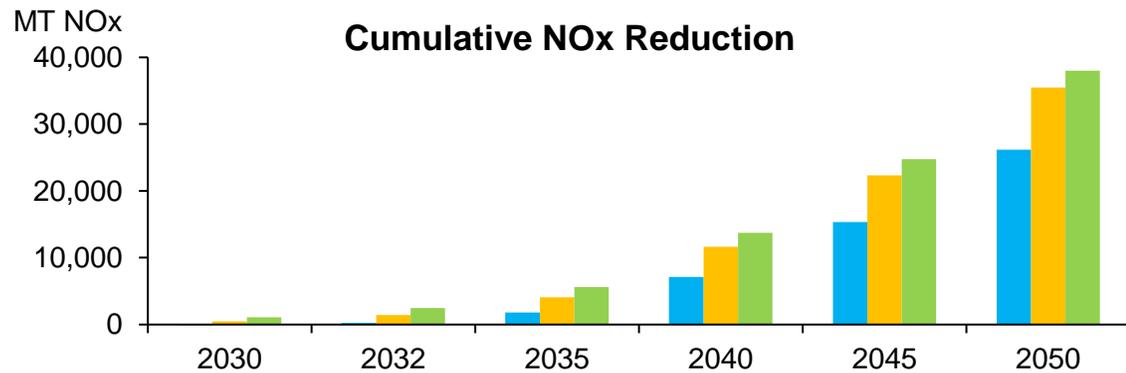
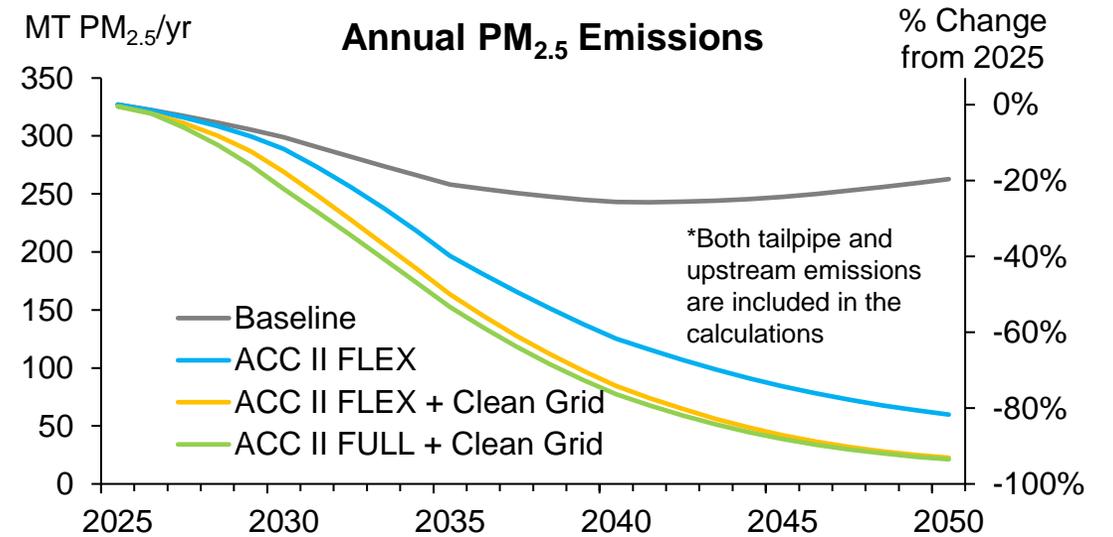
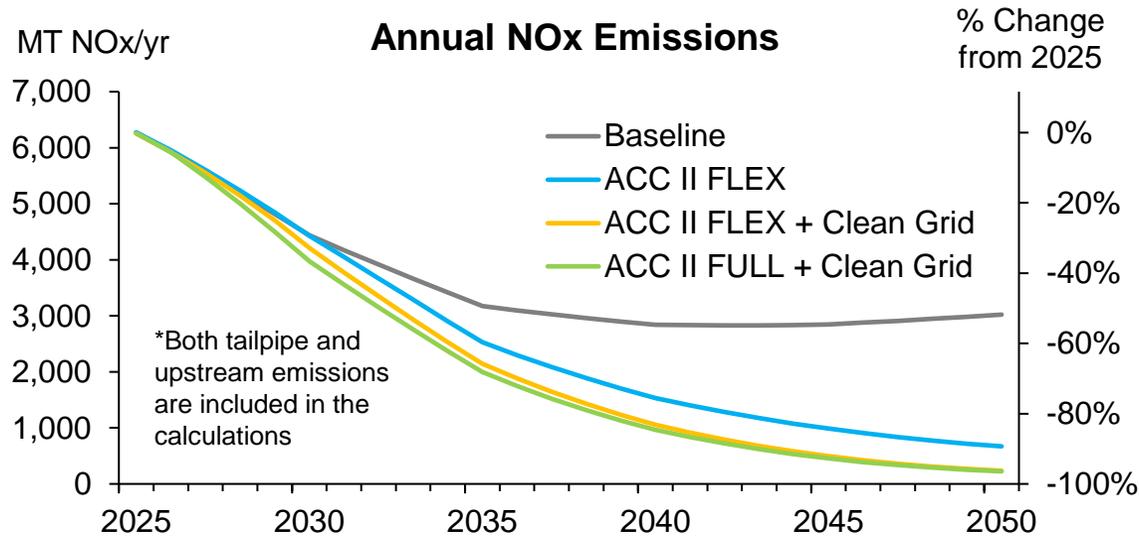
Climate Benefits



- New Mexico's adoption of ACC II would greatly reduce GHG emissions from the on-road transportation sector within the state.
- Under the Baseline scenario, annual CO₂e emissions are cut by around 18% in 2050 compared to 2025 as the LDV fleet turns over to more efficient ICE vehicles and the ZEV population grows to roughly 1/3rd of the fleet.
- Under the ACC II scenarios, cumulative reductions reach between 88 and 116 million MT of CO₂e (2027 through 2050) providing a benefit of \$7.1 to \$9.3 billion.



Air Quality Benefits



Under the ACC II scenarios, criteria pollutant emissions approach 100% reduction by 2050 with a cumulative reduction between 26,200 and 38,000 MT of NO_x and 2,400 and 3,300 MT of PM_{2.5} between 2027 and 2050 compared to the Baseline.

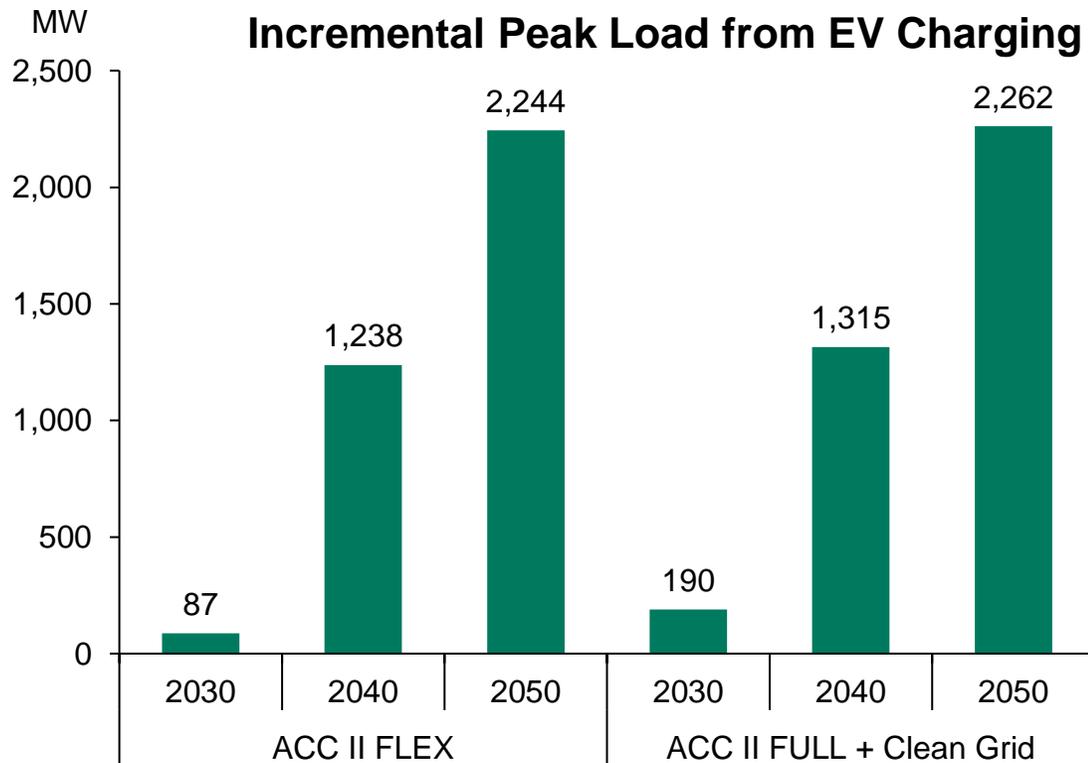
Cumulative Health Benefits

- Reducing criteria pollutant emissions improves air quality and leads to health outcome improvements.
- To convert emission reductions into health benefits, EPA's COBRA was used.
- Between 85 and 93 premature mortalities and 48,290 and 52,480 minor cases would be reduced under the ACC II scenarios. Monetizing these savings results in \$1.04 to \$1.13 billion in cumulative benefits (between 2027-2050).

Scenario	Cumulative Reduction (MT)		Cumulative Reduced Incidents			Monetized Value (2021\$ bill)
	NOx	PM _{2.5}	Mortality	Hospital	Minor	
ACC II Flex	59,000	5,280	85	80	48,290	\$1.04
ACC II Flex + Clean Grid	66,800 (+7,800)	5,950 (+670)	87 (+2)	81 (+1)	49,440 (+1,150)	\$1.07
ACC II Full + Clean Grid	70,800 (+11,800)	6,230 (+950)	93 (+8)	86 (+6)	52,480 (+3,040)	\$1.13

(Incremental Reductions compared to ACC II Flex)

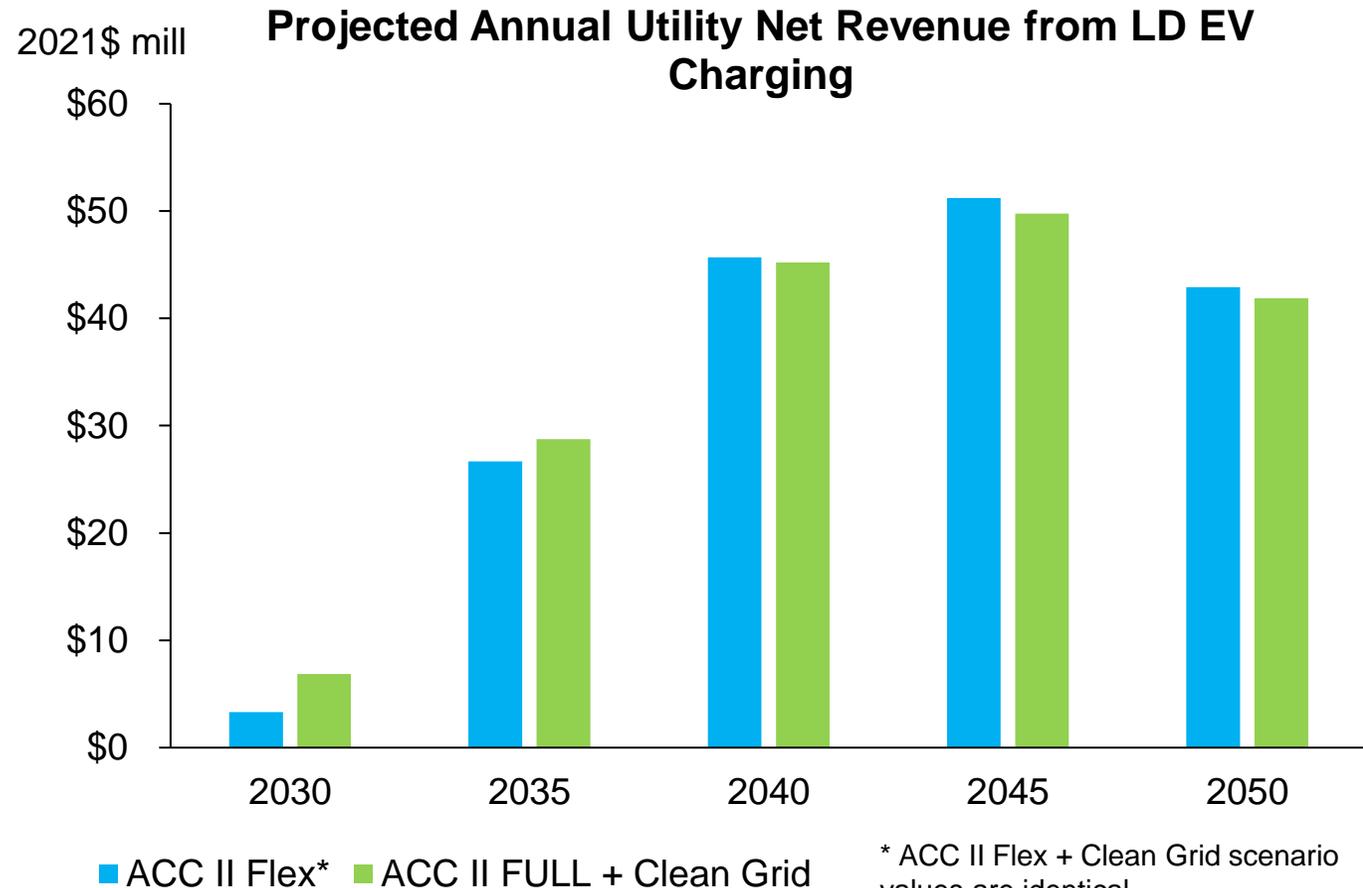
Utility Impacts



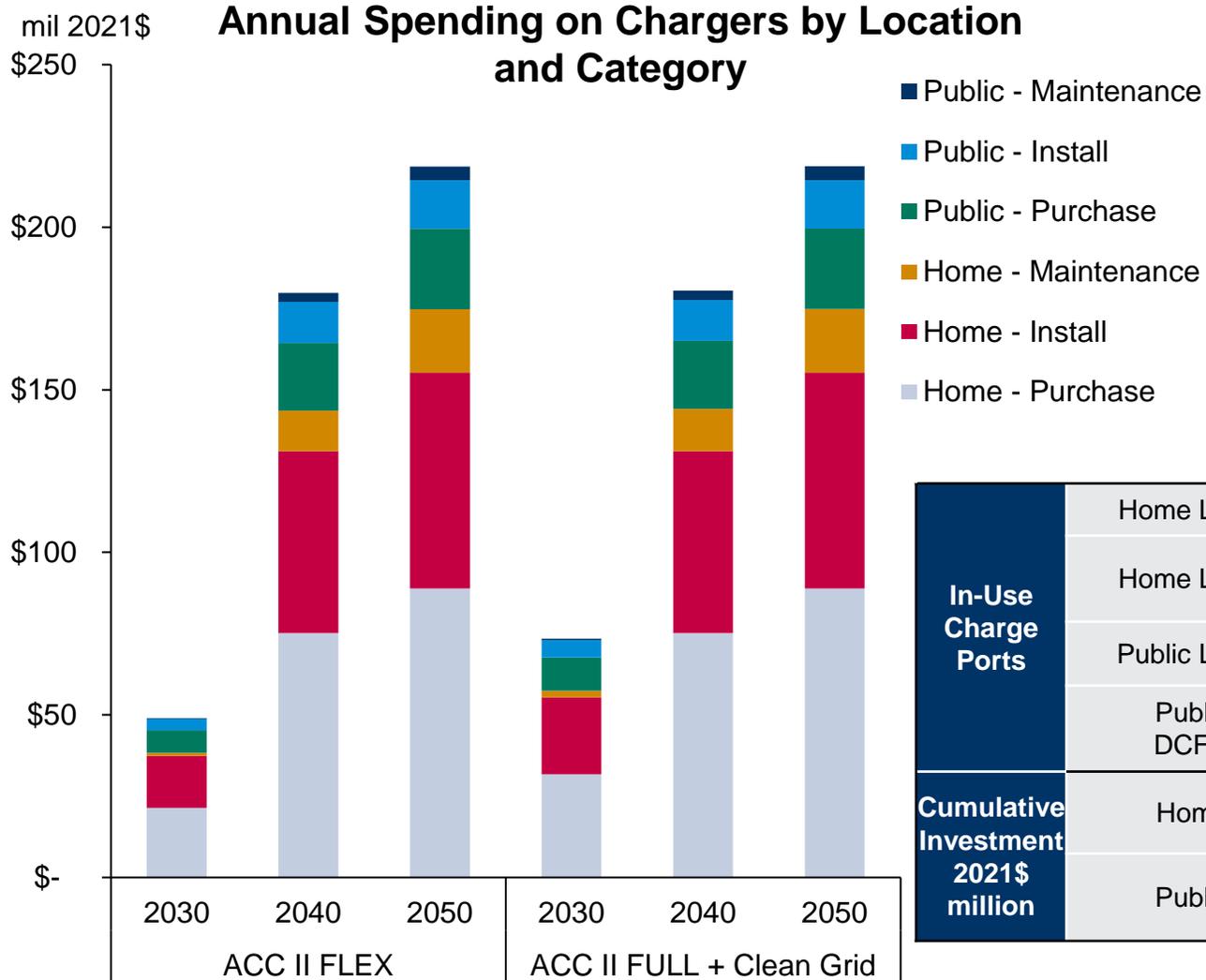
- This analysis assumes widespread managed home charging shifting the majority of home charging (70%) to off-peak hours for the NM electric grid to minimize the grid infrastructure upgrades that would be required.
- However, as the grid decarbonizes and more solar enters the mix, the optimal and least cost time for vehicles to charge may change.
- By increasing the efficiency of the grid, LDV electrification in NM has the potential to reduce rates.

Utility Impacts Continued

- Under ACC II Flex and ACC II Flex + Clean Grid scenarios, annual net utility revenue for LD EV charging is projected to be \$3 million in 2030, \$46 million in 2040, and \$43 million in 2050.
- Under the ACC II Full + Clean Grid scenario, annual net utility revenue is projected to be \$7 million in 2030, rising to \$45 million in 2040 and reaching \$42 million in 2050.



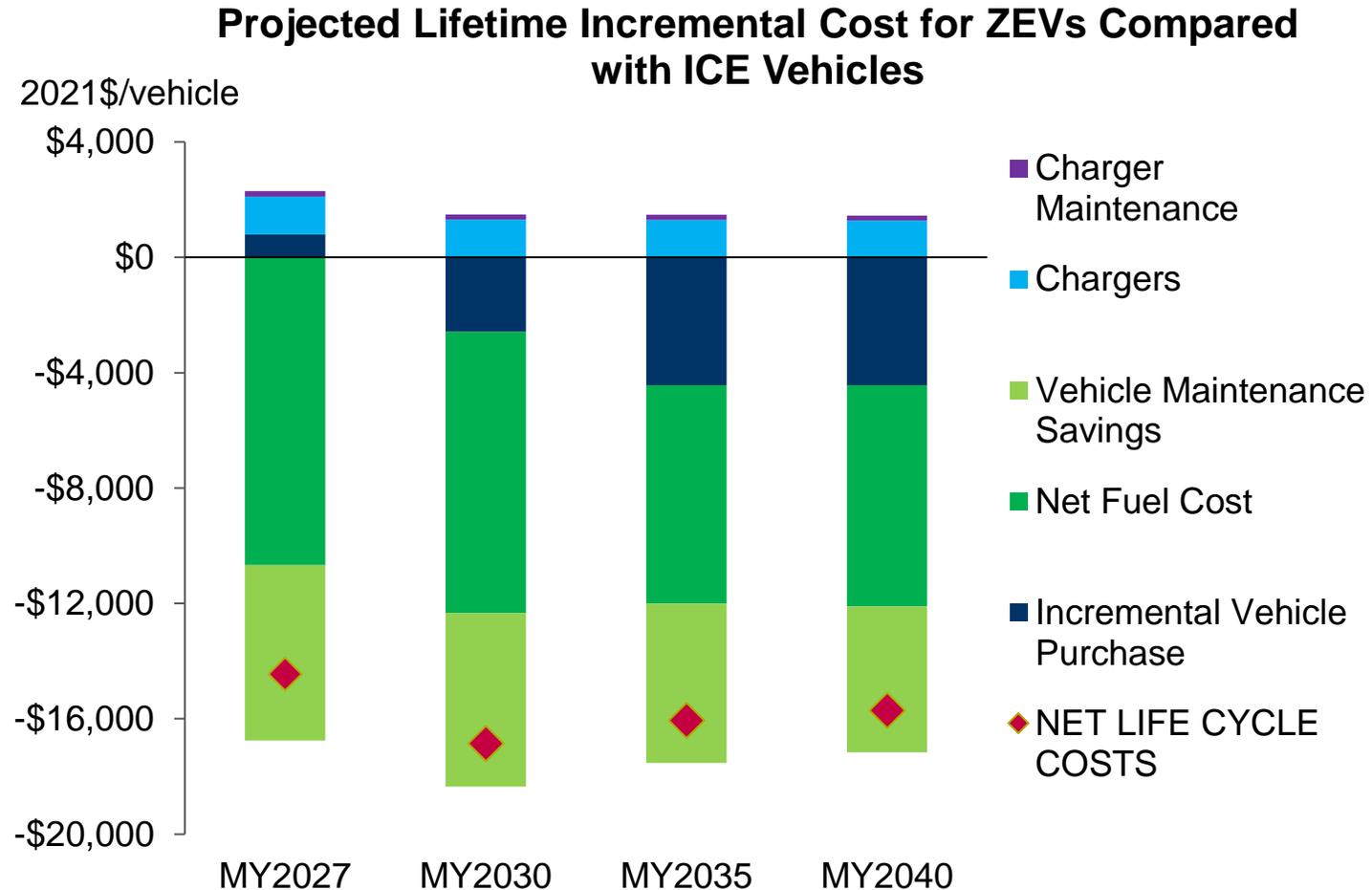
Chargers and Charger Costs



- Most LD ZEV owners are assumed to charge at home and most with L2 chargers.
- The percent of ZEV owners who will rely on public EVSE is related to the percent of multi-unit dwellings in the state.

		ACC II FLEX			ACC II FULL + Clean Grid		
		2030	2040	2050	2030	2040	2050
In-Use Charge Ports	Home L1	1,720	24,350	44,150	3,740	25,880	44,500
	Home L2	61,730	874,390	1,585,450	134,150	929,310	1,597,890
	Public L2	350	4,990	9,040	770	5,300	9,110
	Public DCFC	220	3,140	5,700	480	3,340	5,750
Cumulative Investment 2021\$ million	Home	\$80	\$1,190	\$2,640	\$180	\$1,290	\$2,730
	Public	\$20	\$320	\$690	\$50	\$350	\$710

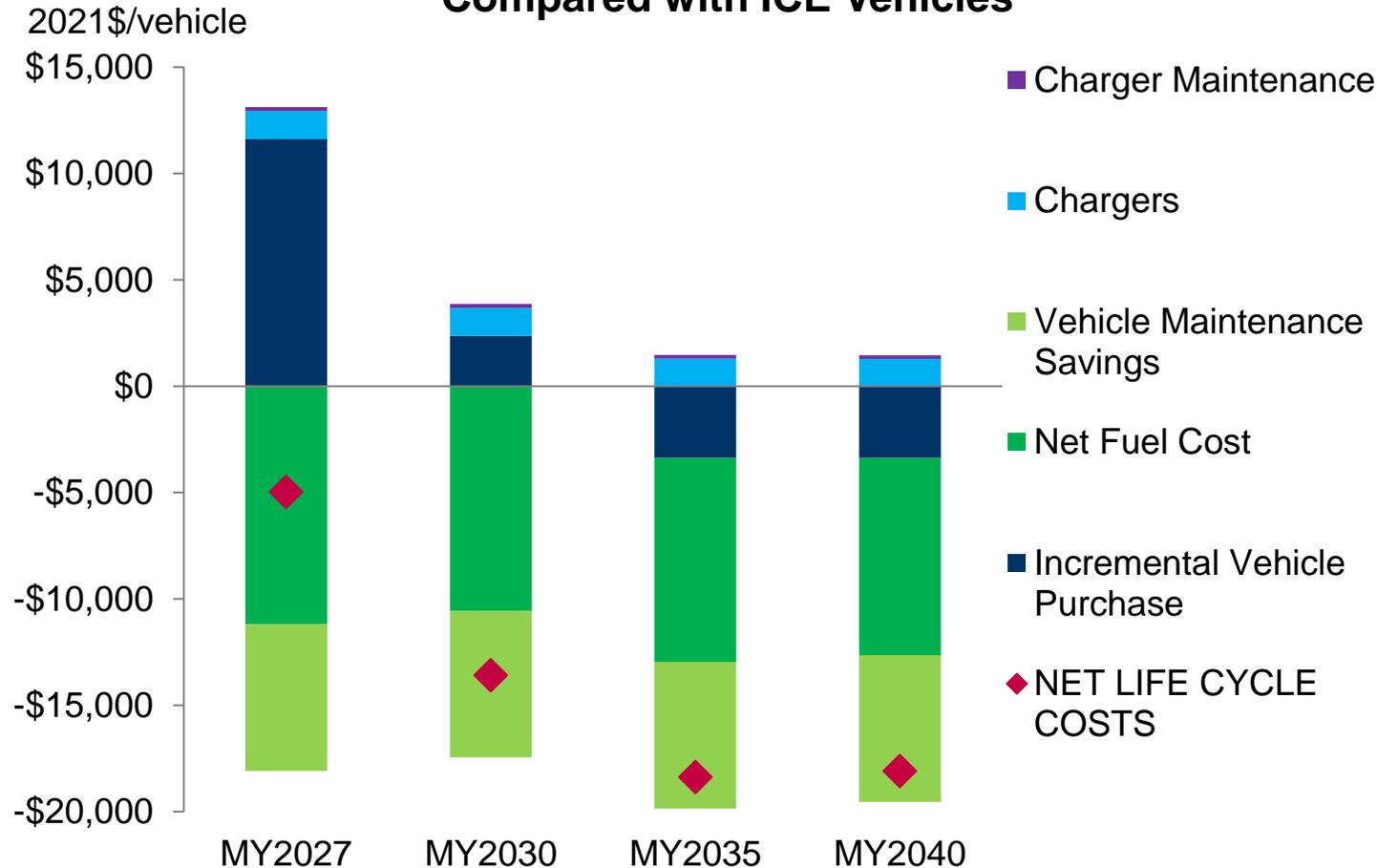
ZEV Owner Benefits



- By MY2030, ZEV owners save more than \$14,000 in lifetime costs as compared to a conventional vehicle.
- Even with MY2027 vehicles when ZEV purchase prices are higher, the decrease in fuel and maintenance costs means lifetime savings for the vehicle owner.
- Assumed 16-year lifetime and 3% discount rate.
- Using a 7% discount rate still results in substantial savings.

ZEV Owner Benefits - Rural

Projected Lifetime Incremental Costs for Rural ZEVs Compared with ICE Vehicles



- After MY2030, savings to more than \$13,500 due to the incremental purchase cost of the ZEV becoming less expensive than a comparable ICE vehicle.
- Even with MY2027 vehicles when ZEV purchase prices are higher, the decrease in fuel and maintenance costs mean lifetime savings for the vehicle owner.
- Assumed 16-year lifetime and 3% discount rate.
- Using a 7% discount rate still results in substantial savings.

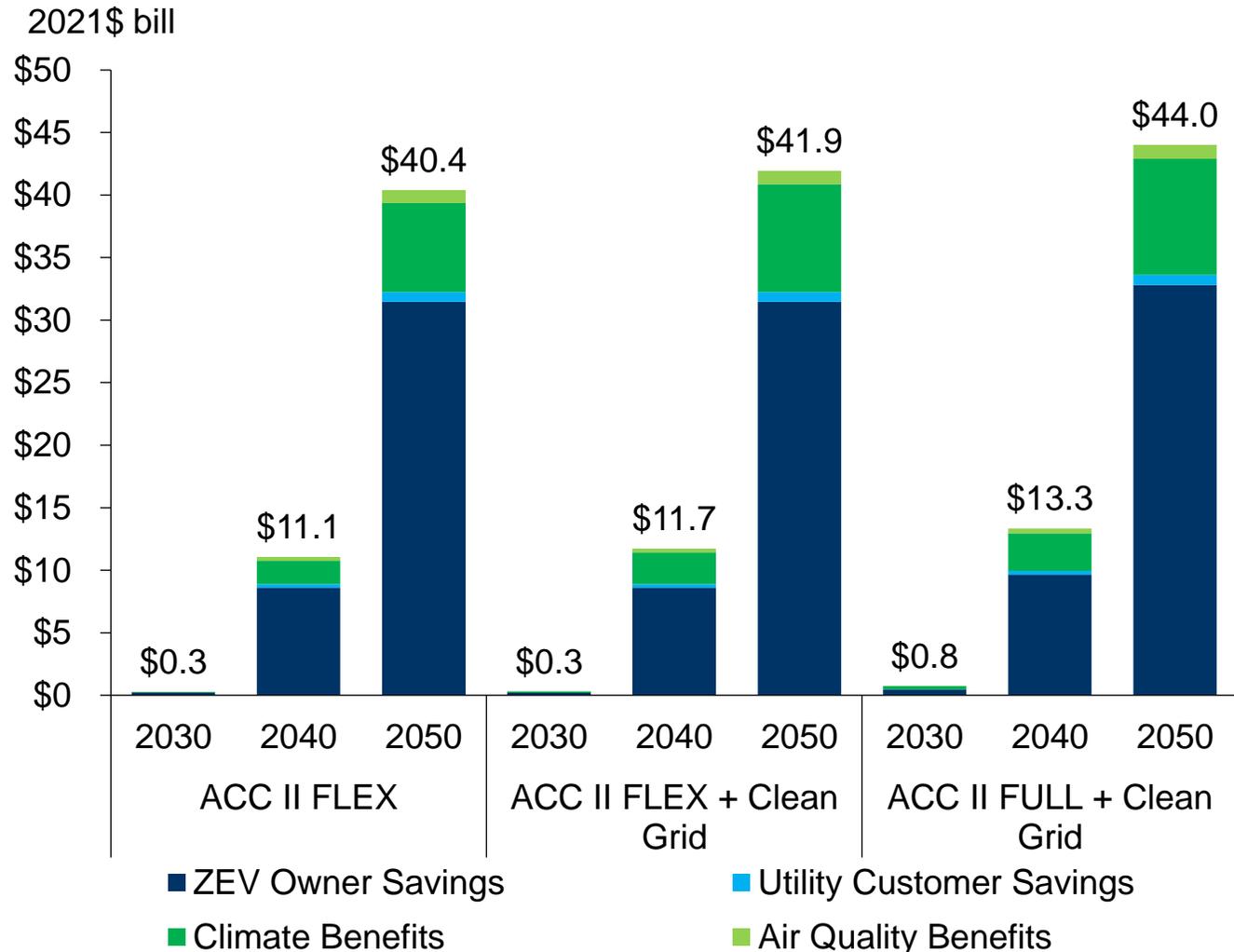
Jobs and GDP Impacts

METRIC	ACC II FLEX*			ACC II FULL + Clean Grid			
	2030	2040	2050	2030	2040	2050	
Net Change in Jobs	3,260	1,561	937	4,690	1,464	917	
Net Change in GDP (2021\$ millions)	\$632	\$546	\$562	\$924	\$541	\$560	
Average Annual Compensation	Added Jobs	\$103,165	\$94,500	\$92,397	\$103,395	\$94,021	\$92,383
	Replaced Jobs	\$66,570	\$62,747	\$61,298	\$66,359	\$62,065	\$61,288

**Represents both the ACC II Flex and ACC II Flex + Clean Grid scenarios due to the equal number of ZEVs assumed under both scenarios.*

Cumulative Net Societal Benefits

- Adopting ACC II will provide significant societal benefits including climate and air quality benefits, utility customer savings, and ZEV owner savings.
- Between 2027 and 2050, the cumulative societal benefits reach between \$40 and \$44 billion.
- ACC II without any compliance flexibilities (ACC II Full) leads to more than double the cumulative benefits in 2030 compared to either of the ACC II Flex scenarios.





Thank you

Dave Seamonds
Principal Consultant, Corporate
Sustainability and Climate Change
Dave.Seamonds@erm.com

Sophie Tolomiczenko
Consultant, Corporate Sustainability
and Climate Change
Sophie.Tolomiczenko@erm.com