REVISED DIRECT TESTIMONY

OF

JENNIFER L. HINMAN

ECONOMIC ANALYST

ENERGY DIVISION—POLICY PROGRAM

ILLINOIS COMMERCE COMMISSION

PETITION FOR APPROVAL OF AN ALTERNATIVE RATE REGULATION PLAN PURSUANT TO SECTION 9-244 OF THE PUBLIC UTILITIES ACT

COMMONWEALTH EDISON COMPANY

DOCKET NO. 10-0527

NOVEMBER 9, 2010

TABLE OF CONTENTS

I. WITNESS QUALIFICATIONS 1
II. PURPOSE OF TESTIMONY AND GENERAL CONCLUSIONS 2
III. ANALYSIS OF THE PROPOSED ELECTRIC VEHICLE PILOT PROGRAM 3
A. CONCERNS ABOUT EMPLOYING A BUDGET FOR THE ALT REG INCENTIVE PROGRAM IN GENERAL AND THE EV PILOT IN PARTICULAR 3
B. OVERVIEW OF THE PROPOSED ELECTRIC VEHICLE PILOT PROGRAM 4
C. THE ELECTRIC VEHICLE PILOT BUDGET ..... 5~~6~~
D. BENEFITS OF THE ELECTRIC VEHICLE PILOT TO RATEPAYERS ..... 20~~21~~
IV. SUMMARY OF CONCLUSIONS 22

I. Witness Qualifications

Q. What is your name and business address?

A. My name is Jennifer L. Hinman. My business address is Illinois Commerce Commission, 527 East Capitol Avenue, Springfield, Illinois 62701.

Q. By whom and in what position are you employed?

A. I am employed as an Economic Analyst in the Energy Division's Policy Program under the Bureau of Public Utilities at the Illinois Commerce Commission ("ICC" or "Commission").

Q. What are your responsibilities within the Energy Division's Policy Program?

A. I provide testimony in Commission proceedings on behalf of the Staff of the Commission ("Staff"). I monitor, review, and analyze utility and party filings in docketed Commission cases. I identify and initiate discovery to support research into economic policy issues.

Q. Describe your educational background.

A. In May of 2010, I graduated from Illinois State University with a Master of Science degree in Applied Economics with a specialization in the Electricity, Natural Gas, and Telecommunications Economics Regulatory sequence. In May of ~~2004~~2008, I earned a Bachelor of Arts degree in Economics with a Financial Certificate and graduated summa cum laude from the University Honors Program at Armstrong Atlantic State University in Savannah, Georgia.

Q. Describe your professional experience.

A. Since April of 2010, I have been employed as an Economic Analyst in the Policy Program of the Commission's Energy Division. While employed by the Commission, I have been involved in energy efficiency and electric vehicle related issues among other topics, and have provided testimony on behalf of the Commission at an Illinois Senate Energy Committee Hearing regarding the ICC's Plug-in Electric Vehicle Policy Initiative.

While attending Illinois State University from August of 2008 through May of 2010, I worked as a full-time Graduate Assistant to Dr. David Loomis in the Applied Economics Department.

During summer of 2009, I was an intern in the Regulatory Department at AT&T Illinois in Chicago. During my time at AT&T, I analyzed, compiled, graphed, and provided detailed recommendations on AT&T Illinois' Alternative Regulation Plan on individual service margins. In addition, I reviewed the tariffing process and filed wholesale tariffs.

II. Purpose of Testimony and General Conclusions

Q. What is the subject matter of this proceeding?

A. This case concerns the filing by Commonwealth Edison Company ("ComEd" or "Company") of an Alternative Regulation ("Alt Reg") Plan which seeks, among other things, to place into effect the Accelerated Customer Enhancements Pilot ("Rate ACEP") tariff, pursuant to Section 9-244 of the Illinois Public Utilities Act ("PUA" or "Act") (220 ILCS 5/9-244).

Q. What is the purpose of your direct testimony in this proceeding?

A. The purpose of my testimony is to provide an analysis of the Company's proposed Electric Vehicle ("EV") Pilot program in terms of its proposed budget and the purported customer benefits of the program.

Q. What conclusions have you reached?

A. I find that the budget proposed by ComEd is not as fully specified as might have been expected at first glance. Upon doing an independent investigation including receiving additional information based on data request responses; I find the budget contains several items that appear to be overpriced.

Additionally, I find the purported informational benefits ascribed to the program to be poorly specified and of questionable value.

III. Analysis of the Proposed Electric Vehicle Pilot Program

A. Concerns About Employing a Budget for the Alt Reg Incentive Program in General and the EV Pilot in Particular

Q. Are you concerned about using a budget for an Alt Reg incentive program?

A. Yes. The Company has every incentive[1] to inflate the budget proposed to the Commission to stay far enough under budget to complete the program and thereby profit substantially. Ratepayers would be harmed by these inflated budgets because they would have to pay the resulting higher rates.

[1] Dr. David Rearden's direct testimony addresses the Company's incentives under the Alt Reg proposal in ICC Staff Ex. 1.0.

Q. Are these flaws manifested in the proposed EV program?

A. Yes. My analysis, as discussed further below, reveals several weaknesses associated with the proposed EV Pilot program's budget, cost estimates, ratepayer benefits, and uncertainty regarding ComEd's actions in carrying out the program. Despite the fact that at first glance the EV Pilot program seems to be reasonably well specified as compared with other proposed Alt Reg programs, upon investigation, the budgeted amounts are drawn into substantial question.

B. Overview of the Proposed Electric Vehicle Pilot Program

Q. Please describe the proposed Electric Vehicle Pilot Program.

A. ComEd proposes to invest $5 million in EVs for its utility vehicle fleet and associated charging stations. Of that total, Company witness Mr. McMahan states that $4.43 million is allocated to the distribution function and, therefore, identified as ICC-jurisdictional based on ComEd's current approach to jurisdictional splits of transmission and distribution in its current rate case, Docket No. 10-0467 (ComEd Ex. 2.0 at 4:79-83). ComEd has requested that the Commission authorize this investment and provide for its recovery as discussed by Dr. Hemphill (ComEd Ex. 1.0). ComEd is proposing the purchase of the following assets with the unit cost estimates forming a basis for Commission approval of its proposed budgeted amount, as seen in the table below.

ComEd EV Pilot Program Assets	Unit Cost	Quantity	Total ComEd Cost
Plug-in car	$ 36,000	45	$ 1,620,000
Plug-in cargo/service vehicle	$ 135,000	8	$ 1,080,000
Hybrid bucket truck (non-pluggable)	$ 250,000	4	$ 1,000,000
PHEV digger-derrick	$ 350,000	2	$ 700,000
Level 2 charging stations for company vehicles	$ 10,000	55	$ 550,000
Incidental equipment and contingency	$ 50,000		$ 50,000
Total Vehicles:		**59**	
Total Charging Stations:		**55**	
Total EV Pilot Program Investment:			**$ 5,000,000**

(ComEd Ex. 2.0 at 5:86)

Q. During the Biennial Review Proceeding called for by Section 9-244(c) of the PUA, what EV Pilot program objectives are proposed by ComEd for the Commission's review?

A. ComEd described the EV Pilot program's objectives in its response to Staff Data Request JLH 2.02. ComEd states:

> The EV pilot will study EVs' operational, economic, and environmental costs and benefits, and assess EVs' ability to replace carbon-fueled vehicles in the utility fleet. The objective is to fulfill this program within the proposed $5 million budget.

C. <u>The Electric Vehicle Pilot Budget</u>

Q. Please list the manufacturers for the assets that ComEd proposes to purchase as part of ComEd's EV Pilot Program.

A. Plug-in car: Nissan Leaf

Plug-in cargo/service vehicle: Navistar eStar

Hybrid bucket truck: International chassis with Eaton hybrid drive system and Altec TA40 aerial equipment

PHEV digger derrick: IHC chassis with DUECO C4047 plug-in hybrid digger derrick

Coulomb Technologies CT 2100 Level 2 charging station

(ComEd Response to Staff Data Request JLH 1.09b)

Q. Has the Company provided any sources for its cost estimates?

A. The Company provided the information presented in the table below:

Vehicle Costs	**Cost p.u.**	**Quantity**		**Total Cost**
Plug-in Car				
Price based on Nissan Leaf cost estimate	**$ 36,000**	**45**	**$**	**1,620,000**
Plug-in Cargo/Service Vehicle				
Price based on Navistar eStar cost estimate	**$135,000**	**8**	**$**	**1,080,000**
Hybrid Bucket Truck (non-pluggable)				
Price based on existing cost for hybrid bucket truck	**$250,000**	**4**	**$**	**1,000,000**
PHEV Digger Derrick Truck				
Price based on cost of Dueco PHEV digger derrick	**$350,000**	**2**	**$**	**700,000**
				Total Cost
TOTAL VEHICLE COSTS		**59**	**$**	**4,400,000**
Charging Infrastructure Costs	**Cost p.u.**	**Quantity**		**Total Cost**
Level 2 Charging Station				
Coulomb Technologies Smart Charging station	$ 5,000			
Installation (labor, material)	$ 5,000			
Charging Stations for ComEd plug-in vehicles				
Total equipment costs per charge point	**$ 10,000**	**55**	**$**	**550,000**
Incidental equipment and contingency				
Contingency for *unforeseen installation* costs			**$**	**50,000**
				Total Cost
TOTAL PROJECT COSTS			**$**	**5,000,000**

(ComEd Response to Staff Data Request JLH 1.09_Attach 1)

Q. Have you investigated the prices for any of these items?

A. Yes, I have. The Company currently owns assets similar to those being proposed.

Q. What assets does ComEd have that are similar to those being proposed under the EV Pilot?

A. ComEd currently owns nine (9) hybrid electric bucket trucks and ten (10) converted plug-in hybrid electric vehicles (ComEd Response to Staff Data Request JLH 1.10a).

Q. Is ComEd proposing to purchase any vehicles that are of the same model and type as ComEd already owns?

A. Yes. In particular, the four (4) hybrid bucket trucks: International chassis with Eaton hybrid drive system and Altec TA40 aerial equipment. ComEd has budgeted $250,000 each for the hybrid bucket trucks. Below is a table showing the prices that ComEd paid for vehicles of this type back in 2009.[2]

	Order Date	Invoice Date	Company	Model	Price	Price + Taxes+Title	ComEd Truck #	Invoice #
Chassis		4/23/2009	International	2010 Model 4300	$114,353	$123,988	649164	33083
Aerial	3/6/2009	8/26/2009	Altec	TA40 fully configured FA model	$85,272	$90,602	649164	8087284
					$199,625	**$214,590**		
Chassis		4/23/2009	International	2010 Model 4300	$114,353	$123,988	649165	33084
Aerial	3/6/2009	9/1/2009	Altec	TA40 fully configured FA model	$85,727	$91,085	649165	8087442
					$200,080	**$215,073**		
Chassis		4/23/2009	International	2010 Model 4300	$114,353	$123,988	649166	33085
Aerial	3/6/2009	8/26/2009	Altec	TA40 fully configured FA model	$85,272	$90,602	649166	8087283
					$199,625	**$214,590**		
Chassis		4/23/2009	International	2010 Model 4300	$114,353	$123,988	649167	33086
Aerial	3/6/2009	8/31/2009	Altec	TA40 fully configured FA model	$85,272	$90,602	649167	8087450
					$199,625	**$214,590**		

Q. Do you believe that the projected costs for hybrid bucket trucks in the budget should reflect their 2009 prices?

A. Not necessarily. These costs reflect what ComEd paid for the vehicles and even current list prices of these vehicles were not available to me.[3] The exact model of the hybrid bucket truck that ComEd is proposing as part of the EV Pilot cost

[2] Data in table generated from ComEd Response to Staff Data Request JLH 1.10_Attach 1.

[3] The manufacturers' websites have the prices of new vehicles protected such that only members/previous customers can view the prices.

ComEd between $214,589.50 and $215,072.94 including taxes and title in 2009 (*Id.*). ComEd estimates the unit cost for a generic hybrid bucket truck equals $250,000 in its budget. Thus, there is roughly a $140,000 [=($[Price in Budget] — $215,000)*4] difference[4] in terms of just the hybrid bucket trucks in the EV Pilot budget. However, it is conceivable that hybrid electric bucket truck prices have risen or fallen since 2009. This demonstrates another weakness of the Company's proposal: it is difficult, at best, to evaluate a budget that is to be used as a standard for measuring performance.

Q. How did the costs of the other hybrid bucket truck models compare with the model the Company is proposing?

A. Below is a table showing the other prices of the hybrid bucket trucks that ComEd has purchased over the years.[5] As can be seen, the range in price varies with time and model number.

	Order Date	Invoice Date	Company	Model	Price	Price + Taxes+Title	ComEd Truck #	Invoice #
Chassis		11/30/2005	International	2006 Model 4300 SBA 4X2	$106,885	$114,853	649133	12582
Aerial	4/26/2005	4/28/2006	Altec	TA45	$62,385	$66,284	649133	8041863
					$169,270	**$181,138**		
Chassis		12/19/2008	International	2009 Model 4300 Cab and Chassis			899326	4364456
Aerial		12/19/2008	Altec	TA50			899326	4364456
Purchased from Global Rental Co., Inc. (partner of Altec)					**$197,000**	**$213,122**		
Chassis		4/23/2009	International	2010 Model 4300	$116,341	$126,120	899327	33081
Aerial	3/4/2009	7/30/2009	Altec	TA45M fully configured FA model (2010)	$85,424	$90,763	899327	8086841
					$201,765	**$216,883**		
Chassis		4/23/2009	International	2010 Model 4300	$116,341	$126,120	899328	33082
Aerial	3/4/2009	7/30/2009	Altec	TA45M fully configured FA model (2010)	$85,424	$90,763	899328	8086842
					$201,765	**$216,883**		
Chassis		4/23/2009	International	2010 Model 4300	$116,341	$126,120	899329	33080
Aerial	3/7/2009	8/31/2009	Altec	TA50 non configured FA model	$131,763	$139,998	649169	8087449
					$248,104	**$266,118**		

The minimum cost of a hybrid bucket truck was $181,138 (*Id.*). The most expensive hybrid bucket truck purchased by ComEd cost $266,118, but it

[4] This results in roughly a $35,000 difference in cost per vehicle, which is enough money to purchase an extra electric vehicle.

[5] Data in table generated from ComEd Response to Staff Data Request JLH 1.10_Attach 1.

included the Altec TA50 aerial equipment as opposed to the Altec TA40 aerial equipment. Thus, details such as model numbers and technical specifications that are missing from the proposed budgets may have significant impacts on ComEd's final investment expenditure amounts. ComEd appears to be able to choose to complete a program under budget, especially if it overestimates the cost to purchase assets and ends up purchasing different cheaper models.

Q. Why do these differences in price based on time and model number matter?

A. It is very difficult to accurately evaluate the future costs of items when the cost estimates are used as benchmarks. Different models and manufacturers of virtually the same type of vehicle have significant differences in costs.

When the monetary incentive is tied to a budget, the Company will have an incentive to spend under budget. The more inflated the budget, the greater the profit opportunities are, and the more likely it is that ratepayers will be paying higher rates under the Alt Reg mechanism than they would otherwise pay under traditional rate of return regulation.

Q. Has ComEd purchased alternative fueled vehicles[6] (AFV) and put them in rate base under traditional rate of return regulation?

A. Yes. A hybrid bucket truck that was put in service in 2006 is currently in rate base (ComEd Response to Staff Data Request JLH 1.10b). In addition, ComEd's website states that its green fleet is currently comprised of the following vehicles:[7]

[6] ComEd defines an Alternative-Fuel Vehicle as "Any vehicle fully or partly powered by an energy source other than 100% petroleum." <https://www.comed.com/sites/Environment/Pages/greenvehicles.aspx>

[7] <https://www.comed.com/sites/Environment/Pages/greenvehicles_fleetdetails.aspx> (11-~~10~~08-10)

1,774 trucks that use biodiesel fuel (20% soybean oil, 80% diesel)
250 E85 flex-fuel vehicles capable of being fueled with ethanol
91 hybrid Ford Escape SUVs
40 Prius hybrids
10 Prius Plug-in hybrid electrical vehicles (PHEV)
2 biodiesel-electric hybrid bucket truck
1 liquid petroleum gas (LPG) bucket truck
Alternative-fuel vehicles represent 63 percent of ComEd's total fleet of cars and trucks.

Thus, it appears that ComEd has not needed an Alt Reg incentive mechanism in order to deploy alternative fueled vehicles on a widespread basis. This is contrary to Mr. McMahan's statement that ComEd "cannot prudently deploy them on a widespread basis without first piloting them" (ComEd Ex. 2.0 at 3:60-61).

Q. Are there any vehicles similar to those proposed in ComEd's EV Pilot that are proposed to be included in rate base in ComEd's current rate case in Docket No. 10-0467?

A. Yes, ComEd has proposed to include eight (8) hybrid electric bucket trucks and ten (10) plug-in hybrid electric vehicles in rate base (ComEd Response to Staff Data Request JLH 1.10b).

Q. Has ComEd installed charging stations for the plug-in electric vehicles that it currently owns?

A. No. The ten (10) 2009 Toyota Prius plug-in hybrid electric vehicles use standard 120 volt (V), 20 ampere outlets for charging a 5 kilowatt-hour (kWh) battery, which takes a maximum of 3.5 hours to charge. In addition, no distribution system upgrades were necessary to accommodate the additional load from these vehicles (ComEd Response to Staff Data Request JLH 1.10d and 1.10e).

Q. The Company stated that it intends to purchase Nissan Leafs; has Nissan announced the price it intends to charge for the Leaf?

A. Yes. The Manufacturer Suggested Retail Price (MSRP) is $32,780,[8] and if the federal tax credit of $7,500 is still available, the buyer's net price could be as low as $25,280.[9] Thus, the plug-in car component of the budget may be inflated by almost $500,000. More precisely, it is inflated by $482,400 [= ($[Price in Budget] — $25,280)*45][10]. It should be recognized that this estimate is based on the MSRP for a single vehicle. My understanding as a consumer is that discounts from the MSRP are typically available as are fleet discounts for purchase of multiple vehicles. These factors tend to make the almost $500,000 overstatement of cost conservative.

Q. If the federal tax credit of $7,500 is still available when and if the electric vehicles are purchased, how does ComEd intend to account for the tax credit in Rate ACEP?

A. Currently, ComEd is not making any provision for these tax credits in Rate ACEP. This $7,500 tax credit would potentially apply to the plug-in cars and plug-in cargo/service vehicles shown in the ComEd EV Pilot Program Assets table presented on line 86 of page 5 of Company witness, Mr. McMahan's testimony (ComEd Ex. 2.0). In addition, it is possible that state tax credits or incentives for

[8] At an 8% sales tax rate, the unit cost increases to $35,402. Assuming the cost of the car title is $150, the unit cost estimate increases to $35,552 (these assumptions were based on rough estimations from the Prius invoices provided in ComEd Response to Staff Data Request JLH 1.10_Attach 1).

[9] Assuming an 8% sales tax rate and a car title cost of $150, the buyer's net price could be as low as $28,052

[10] Assuming an 8% sales tax rate and a car title cost of $150, the budget is inflated by $357,660 [=45*($[Price in Budget] — $28,052)] just from the plug-in car portion of the program.

fleets of alternative fueled vehicles become available. For example, the "Illinois Alternate Fuels Rebate Program provides a rebate for 80% of the incremental cost of purchasing an AFV (up to $4,000), 80% of the cost of federally certified AFV conversions (up to $4,000), and for the incremental cost of purchasing alternative fuels."[11]

In its corrected response to Staff Data Request JLH 1.08b, ComEd states:

> ComEd would be receptive to a proposal in Staff's direct testimony that recommends including provisions in Rate ACEP – Accelerated Customer Enhancements Pilot (Rate ACEP) to recover any operations and maintenance (O&M) expenses related to the EV Pilot program, which would then be offset by any applicable tax credits that become available and that ComEd receives.

~~Staff witness Ms. Dianna Hathhorn's direct testimony addresses this proposal in ICC Staff Exhibit 5.0.~~

Q. How does ComEd propose to charge its Nissan Leafs?

A. The Nissan Leaf has a 24 kWh lithium-ion battery. According to Nissan's website,[12] it comes with a 120 V portable trickle charging cable as standard equipment, but Nissan recommends a Home Charging Dock (240 V). Starting from a depleted battery, the Nissan Leaf takes less than 20 hours to charge using a standard 120 V outlet. However, ComEd is proposing to use a level 2 charging station[13] (220/240 V), that requires less than 8 hours to completely charge the Leaf. ComEd is budgeting $5,000 for the charger and $5,000 for its installation per charger in

[11] <http://www.afdc.energy.gov/afdc/laws/laws/IL/tech/3270>

[12] <http://www.nissanusa.com/>

[13] Electric vehicle charging stations are also known as Electric Vehicle Supply Equipment (EVSE).

addition to a $50,000 reserve account for unforeseen installation costs (approximately $909 [=$50,000/55 stations] per charging station). In addition, ComEd chose Coulomb Technologies CT 2100 charging stations that include one level 2 connection per port. ComEd chose this charging station for "its ability to be networked and remote communications capability, enabling aggregate management of the electrical load associated with ComEd's fleet of plug-in vehicles" (ComEd Response to Staff Data Request JLH 1.09).

Q. Have you investigated the prices for level 2 charging stations?

A. Yes, I have and a level 2 charger can be purchased for less than $500 before taxes. For example, the residential Voltec™ Charge Station is priced at $490.[14] Thus, from the way this Alt Reg plan is structured, ComEd could purchase 55 of the cheaper charging stations and come in significantly under budget, approximately $245,850 [=($5,000 — $530[15])*55] just for the charging station portion of the budget (excluding the installation costs). However, the cheaper stations have fewer functionalities in terms of load management. This would not appear to be a great concern because the Company likely would be charging the cars in the evening and/or early morning minimizing any load management concerns. Thus, ratepayers could be required to pay an incentive return on half the difference between ComEd's budgeted amount and the price of cheaper units due to the incentive component of Rate ACEP. However, it is unclear exactly how the Company will determine when the EV Pilot program is complete (and a final

[14] <https://www.homecharging.spx.com/volt/Display.aspx?id=7&menu=14> This does not include installation cost.

[15] Assuming an 8% sales tax rate.

investment expenditure amount is determined), and thus the incentive component of Rate ACEP would be calculated. ComEd states:

> The cost of the assets purchased in association with an approved program will be reflected in the final investment expenditure amount for the program. A simple quantitative assessment of the assets purchased or installed may not be the only criterion that should be used to determine when a program is concluded and for which a final investment expenditure amount should be determined.

(ComEd Response to Staff Data Request JLH 2.03d)

Q. Are tax incentives available for charging station costs?

A. Yes. In response to Staff Data Request JLH 1.08a, ComEd comments on potential tax credits associated with the electric vehicle charging infrastructure costs where it states:

> The Alternative Fuel Vehicle Refueling Property Credit (IRS Form 8911) currently allows a rebate of 50% (up to $50,000) of vehicle charging infrastructure costs. However, the current tax credit expires 12/31/2010 and it is not known at this time whether or not the tax credit will be extended.

Q. How do you respond to ComEd's response?

A. By waiting until the Alt Reg case is done to purchase the chargers, ComEd may be foregoing cost savings of $137,500 [=($5,000/2)*55] that would have been available with a purchase of the chargers this year under traditional regulation. A similar concern could be offered for the vehicles themselves and the possible loss of the $7,500 per vehicle federal tax credit. Putting the two together would mean that $535,000 in cost savings may be jeopardized by ComEd having not procured the vehicles and stations this year under a traditional regulatory regime.

Q. Have you investigated the installation costs for level 2 charging stations?

A. Yes. A U.S. Department of Energy Study[16] completed in November of 2008 provides an estimate of the costs for level 2 charging stations in addition to the installation costs in a variety of settings:

Table 6-2. Infrastructure costs for Level 2 residential charging.

Level 2 Residential	Labor	Material	Permits	Total
EVSE (32 A wall box)	- -	$650	- -	$650
EVSE (charge cord)	- -	$200	- -	$200
Residential circuit installation(40A branch circuit, 240 VAC/1-Phase)	$455	$470	$155	$1,080
Administration costs	$91	$94	$31	$216
Total Level 2 Cost	$546	$1,414	$186	$2,146

Table 6-4. Infrastructure costs for Level 2 apartment complex charging.

Level 2 Apartment	Labor	Material	Permits	Signage	Total
EVSE (five 32A wall boxes)	- -	$3,250	- -	- -	$3,250
EVSE (five charge cords)	- -	$1,000	- -	- -	$1,000
Apartment complex circuit installation (five, 40A branch circuits, 240 VAC/1-Phase with separate breaker panel)	$1,400	$696	$165	$350	$2,611
Administration costs	$280	$353	$33	$70	$736
Total Level 2 Cost	$1,680	$5,299	$198	$420	$7,597
Total per Charger Cost	$336	$1,060	$40	$84	$1,520

[16] Morrow, Kevin, Donald Karner, and James Francfort. November 2008. U.S. Department of Energy Vehicle Technologies Program – Advanced Vehicle Testing Activity Plug-in Hybrid Electric Vehicle Charging Infrastructure Review Final Report, Battelle Energy Alliance Contract No. 58517. Prepared for the U.S. Department of Energy Assistant Secretary for Energy Efficiency and Renewable Energy Under DOE Idaho Operations Office, Contract DE-AC07-05ID14517. <http://avt.inel.gov/pdf/phev/phevInfrastructureReport08.pdf>

Table 6-5. Infrastructure costs for Level 2 commercial facility charging.

Level 2 Commercial	Labor	Material	Permits	Signage	Total
EVSE (ten 32A wall boxes)	- -	$6,500	- -	- -	$6,500
EVSE (ten charge cords)	- -	$2,000	- -	- -	$2,000
Apartment complex circuit installation (ten, 40A branch circuits, 240 VAC/1-Phase with separate meter and breaker panel)	$3,400	$3,899	$700	$350	$8349
Administration costs	$680	$780	$140	$70	$1,670
Total Level 2 cost	$4,080	$13,179	$840	$420	$18,519
Total per Charger Cost	$408	$1,318	$84	$42	$1,852

(Morrow et al., 2008, at 31-32).

The table shows that depending on the number of vehicles to be charged simultaneously per station, the costs per charge point (including the charging station (EVSE) and installation costs) changes significantly from $1,520 for a 5-vehicle station, $1,852 for a 10-vehicle commercial facility charging station, to as high as $2,146 for a single vehicle residential charger, all significantly less than the $10,000 per charge point budgeted by ComEd. Thus, from the way this Alt Reg plan is structured, it is possible that ComEd could purchase and install charging stations significantly under budget. Based on the estimates above, at a lower cost of approximately $448,140 [=($10,000 — $1,852)*55] for the charging station and installation portion of the budget. I am not aware of any significant changes that have occurred since 2008 that would increase the installation costs of level 2 charging stations. Thus, the installation costs in ComEd's budget may be significantly inflated, though the installation costs are highly dependent on a variety of factors, including location. An installation cost of $5,000 per charging station (closer to $6,000 if the costs of incidental equipment and contingency are allocated

evenly across the stations) seems greatly exaggerated, according to the information available publicly.

Q. Is the $10,000 per charger cost reasonable?

A. In response to Staff Data Request JLH 1.09, ComEd provided the following information:

Charging Infrastructure Costs			
Level 2 Charging Station	**Cost p.u.**		
Coulomb Technologies Smart Charging station	$ 5,000		
Installation (labor, material)	$ 5,000		
Total equipment costs per charge point	$ 10,000		
		Quantity	**Total Cost**
Charging Stations for ComEd plug-in vehicles		**55**	**$ 550,000**
Incidental equipment and contingency			**$ 50,000**
Contingency for unforeseen installation costs			
Total Charging Station Costs			**$ 600,000**

(ComEd Response to Staff Data Request JLH 1.09_Attach 1)

ComEd additionally stated the following:

> Deployment locations for plug-in vehicles and the associated charging infrastructure have not been finalized. All locations will be at ComEd facilities and for the sole use of ComEd vehicles. No permitting costs are included in the estimated costs for the charging stations. Installation costs will vary by location based on existing electrical infrastructure, number of charging stations deployed at the site, and any service upgrades needed. Locations will be selected in order to optimize the balance between installation costs and vehicle deployment benefits. The company expects to utilize one or more of its facilities contractors of choice to perform the installations. Expected distribution system upgrades are not known at this time, and will be dependant on the locations selected for deployment of the EVs and the associated infrastructure. However, required upgrades will be one of the criteria used to select deployment locations. Expected costs of electricity to charge the EVs are not bundled into the charging station costs or EV costs, and have not been calculated at this time. ComEd anticipates utilizing its Fleet Services employees to conduct monthly visual inspections of the charging stations for signs of physical damage or wear. The cost of safety inspections is not bundled into the unit cost of the charging stations. The charging stations include a 3-year

> warranty. While charging stations will be designated for specific ComEd plug-in vehicles, they may be used occasionally by other ComEd vehicles, such as those traveling between ComEd regions. It is not anticipated that these charging stations will be made available for public or personal employee use.

(ComEd Response to Staff Data Request JLH 1.09)

ComEd does not justify the need to network the charging stations and the need for remote communications capability to enable aggregate management of the electrical load associated with ComEd's fleet of plug-in vehicles.

Q. What is your conclusion from your evaluation of the budgeted cost of the EV Pilot program?

A. ComEd's plans for the EV Pilot consist of a number of uncertainties, e.g., the number of charging stations per location, the locations for the charging stations, and the distribution upgrades are all unknown. This exacerbates the issue of trying to determine a budget that is the standard against which Company performance would be determined. In doing so, it challenges the proposition that ratepayers would benefit from this program being pursued under ComEd's proposed Alt Reg program.

Q. Please summarize your findings with respect to the budget for the EV Pilot program.

A. The proposed budget for the EV Pilot appears to have inflated unit cost estimates, which ~~unnecessarily~~ could raise rates unnecessarily for ComEd's ratepayers. And because those prices, rates would increase for the EV Pilot more under Rate ACEP than they otherwise would under traditional rate of return regulation for

the services covered by the program. By doing some rough cost calculations based on publically available data, I estimate that the EV Pilot budget is inflated by over $1 million. The table below lists the items in ComEd's budget and compares ComEd's values to mine.

ComEd EV Pilot Program Assets	Budgeted Unit Cost	Quantity	ComEd Budgeted Cost	Potentially Inflated by:
Plug-in car	$ 36,000	45	$ 1,620,000	$ 482,400
Plug-in cargo/service vehicle	$ 135,000	8	$ 1,080,000	?
Hybrid bucket truck (non-pluggable)	$ 250,000	4	$ 1,000,000	$ 140,000
PHEV digger-derrick	$ 350,000	2	$ 700,000	?
Level 2 charging stations for company vehicles	$ 10,000	55	$ 550,000	$ 448,140
Incidental equipment and contingency	$ 50,000		$ 50,000	$ 50,000
Total Vehicles:		**59**		
Total Charging Stations:		**55**		
Total EV Pilot Program Investment:			**$ 5,000,000**	**$ 1,120,520**

ComEd EV Pilot Program Assets	Budgeted Unit Cost	Quantity	ComEd Budgeted Cost	Potentially Inflated by:
Plug-in car	$ 36,000	45	$ 1,620,000	$ 482,400
Plug-in cargo/service vehicle	$ 135,000	8	$ 1,080,000	?
Hybrid bucket truck (non-pluggable)	$ 250,000	4	$ 1,000,000	$ 140,000
PHEV digger-derrick	$ 350,000	2	$ 700,000	?
Level 2 charging stations for company vehicles	$ 10,000	55	$ 550,000	$ 448,140
Incidental equipment and contingency	$ 50,000		$ 50,000	$ 50,000
Total Vehicles:		**59**		
Total Charging Stations:		**55**		
Total EV Pilot Program Investment:			**$ 5,000,000**	**$ 1,120,540**

Q. Would ComEd accepting the lower estimated values you describe above, eliminate your concerns about the budget estimates?

A. No. While the lower values may be more reasonable, it does not solve the intractable problem of providing a fair budget to tie an Alt Reg program to. ComEd may be aware of price discounts that may be available to it. Such discounts would

reward ComEd not for superior efficiency, but rather for its superior knowledge based on its being a participant in the market. This knowledge contrasts with an analyst looking from the outside using public data and without the same access to market participants.

D. Benefits of the Electric Vehicle Pilot to Ratepayers

Q. ComEd witness Mr. McMahan states that the proposed EV Pilot "will provide knowledge of EV lifecycle costs and operational considerations that will be valuable in the operation of our own utility fleet, as well as to customers considering adoption of EVs." (ComEd Ex. 2.0) What evidence has been produced regarding the hybrid bucket trucks and plug-in electric vehicles that ComEd has already deployed and how have ratepayers benefited from the electric vehicles currently deployed?

A. According to ComEd Response to Staff Data Request JLH 1.12, "ComEd states that it has no internal reports based on the electric vehicles or bucket trucks currently deployed by ComEd." Considering that ComEd has had a hybrid electric bucket truck deployed since 2006, it undermines the premise of its EV Pilot program that ComEd has not undertaken to analyze the data from its use. These facts do not support ComEd's position that it is committed to distributing any benefits from information learned to ratepayers, or even that ComEd is committed to the project to gather information.

Q. Are ratepayers paying indirectly for any other EV pilot programs that ComEd is conducting?

A. Yes, ratepayers, through their federal income taxes, and other federal income tax-payers are funding grants that ComEd has received for other electric vehicle pilots. Considering ComEd is planning other EV pilot programs, it is unclear what additional benefits will result from this proposed EV Pilot that will be incremental to the knowledge gained from the other planned pilots that are funded elsewhere.

Q. Has ComEd received any grants for its electric vehicle purchases?

A. Yes. In response to Staff Data Request JLH 1.08c, ComEd states:

> ComEd currently is party to the following two grants:
>
> CFDA No.81.086, "Conservation Research and Development" (the "Clean Cities Project"). The grant awards ComEd $610,000 for vehicles, and $421,480 for infrastructure. A break out of cost estimates and grant share for vehicles and infrastructure is shown in the attached spreadsheet. Under the terms of the grant, all vehicles and infrastructure are required to be in service by December 31, 2011.
>
> DOE FOA-0000428, Transportation Electrification Grant. ComEd is partnering with the Electric Power Research Institute (EPRI), the South Coast AQMD, and several other utilities to demonstrate plug-in hybrid (PHEV) vehicles in a commercial fleet application. Under this grant, ComEd will deploy 25 PHEV bucket trucks. Each utility's cost share is the cost of the base vehicle (approximately $106,000 per vehicle, in ComEd's case) while the grant covers the incremental PHEV cost. All vehicles acquired under this grant are expected to be in service by the second quarter, 2011.

ComEd points out that the assets purchased from these grants are separate from those that it would purchase under its proposed EV Pilot program. However, ComEd notes that

> In the event that ComEd receives government funds for investment expenditures related to the EV Pilot, ComEd would apply a proportionate amount of such funds, as appropriate, as a reduction to the Electric Vehicle Plant (EVP).

(ComEd Corrected Response to Staff Data Request JLH 1.08d)

IV. Summary of Conclusions

Q. Please summarize your testimony.

A. It appears that the Electric Vehicle Pilot's budget is inflated. My review suggests reductions of the budget of over twenty percent. This number may be conservative since I do not have access to the same information as a market participant. In addition, it is significant to note that this program is the most transparent of the proposed Alt Reg programs, in terms of the program listing the assets to be purchased and their respective price estimates. It is also true that assets can be verified fairly easily for this program if implemented, unlike other proposed Alt Reg programs. And, to some extent, market prices can be compared to the budgeted prices.

With respect to ComEd's concerns about putting EV assets in rate base without an Alt Reg Plan, I note that similar vehicles are now in rate base, and the Company is proposing to make similar additions in its current rate case (Docket No. 10-0467). In my opinion, those facts challenge the legitimacy of ComEd's concerns. Finally, ComEd's proposal has not made a compelling case regarding the net benefits customers are expected to receive from the EV Pilot program.

Q. Does this conclude your direct testimony?

A. Yes.