

Docket IR 22-076

Investigation of Whether Current and Tariffs and Programs are Sufficient to Support Demand Response & Electric Vehicle charging Programs

Electric Vehicle DCFC Economic Model Examples

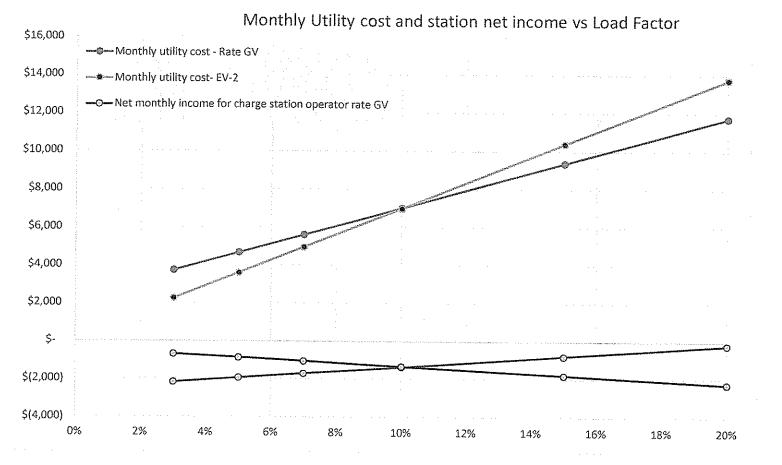
Impact of Capital Expenses and Utility Demand Charges

****Estimates For Illustrative Purposes only****

- 1. 62.5kW: NO Grant, NO Make Ready Funding
- 2. 150kW: NO Grant, NO Make Ready Funding
- 3. 62.5kW: 80% Grant Funded, NO Make Ready
- 4. 150kW: 80% Grant Funded, NO Make Ready

No Grant or Make Ready Example of (2) 62.5 kW DCFC

INPUTS:	•		•	-	na	tes									
# of chargers per station		2													
peak load per charger		62.5	k₩	1	Typical VW RFP hardware										
EV charging cost to customer (on par with gas: \$3.50/Gall		0.65	\$/\	kwhr	vhr Electrify America. Evgo, Tesla \$0.41										
fixed station operating expense per month	Ì	\$200	\$/r	mo	includes insurance, basic O&M, vandalism										
Station capital cost	\$	380,000			Fu	ll cost - no	ost - no grant funding or make ready program								
Station owner annual return: Blank for now			Typical expected ROI on capital												
station electrical efficiency		95%													
Rate GV					ΕV	-2 Deman	d C	harge Alt	terr	ative rate					
Fixed Charge monthly	\$	211				Fixed Charge monthly \$ 211									
Demand Charge (per kW)	\$	16	Demand Charge (per kW)									F	\$		
Distribution charge (per kwhr) incl SBC and stranded cost	\$	0.016			Distribution charge (per kwhr) incl SBC and strar									0.235	
Energy charge (per kwh) January	\$	0.480			Energy charge (per kwh) January									0.480	
peak station load (kW) allowing for efficiency losses Load factor (%) kwhr per month Monthly utility cost - Rate GV Monthly utility cost- EV-2 average # of charge sessions per day (15 min) Gross revenue for charge station operator (month)	\$ \$ \$	132 3% 2,842 3,726 2,243 6 1,755		132 5% 4,737 4,666 3,598 10 2,925	\$	4,953 13		132 10% 9,474 7,015 6,985 19 5,850	\$	132 15% 14,211 9,365 10,372 29 8,775		132 20% 18,947 11,714 13,758 38 11,700			
	*	4		~ **~=	~	0.00¢	~	F (FO	*		*	11 500			
Gross monthly revenue for charge station operator after fixed		1,555		2,725	Ş	-		5,650	Ş	8,575	Ş	11,500			
Net monthly income for charge station operator rate GV	\$	(2,171)		(1,941)		(\$1,711)		(\$1,365)		(\$790)		(\$214)			
Net monthly income for charge station operator rate EV-2	\$	(688)	Ş	(873)		(\$1,058)		(\$1,335)		(\$1,797)		(\$2,258)			
Minimum Annual Required Return on capital investment (ROI		\$0		\$0		\$0		\$0		\$0		\$0			
Annual Revenue Excess/(shortfall) vs required (rate GV)	(\$26,051)		(\$23,289)		(\$20,526)		\$16,383)		(\$9,476)		(\$2,570)			
Annual Revenue Excess/(shortfall) vs required EV-2 rate		(\$8,257)	((\$10,474)		(\$12,691)	(\$16,016)		(\$21,558)		(\$27,100)			



Note: Graph above does not include ANY return on initial capital investment

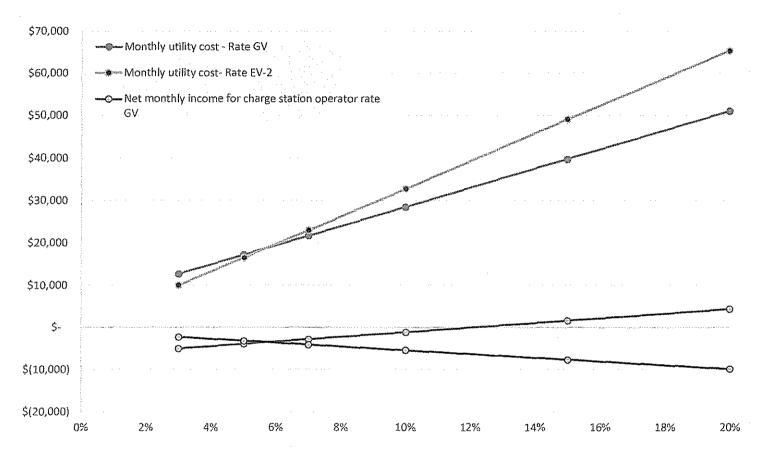
Upper series above is same as Eversource graph below though with linear x axis (and minor rounding errors)

Rate GV breakeven point is approximately 40 years

This does not account for replacing hardware. VW funding only covers 5 years of warranty + O&M.

No grant or make ready. Example of (4) 150kW (NEVI configuration) DCFC

INPUTS:	-		•	•	n	otes				0		,				
# of chargers per station	ļ	4			M	linimum re	equ	ired to re	cei	ve the NEV	/I fe	deral fund	ing			
peak load per charger		150	k۱	N			-						0			
EV charging cost to customer (on par with gas: \$3.50/Gall	0.65 \$/kwhr					Minimum required to receive the NEVI federal funding Electrify America. Evgo, Tesla: \$0.41										
fixed station operating expense per month						includes insurance, O&M, vandalism										
Station capital cost	\$:	1,100,000	1		No Make Ready or NEVI funds.											
Station owner annual return: Blank for now			1		Ту											
station electrical efficiency		95%			,	•										
Rate GV			1		D.	ate EV-2										
Fixed Charge monthly	\$	211			Γc		~ ~ ~	ا ما میں م				r				
Demand Charge (per kW)	\$	211						e monthl	•	A			\$ 211			
Distribution charge (per kwhr) incl SBC and stranded cost		0.016						arge (per		,	<u> </u>		\$ -			
Energy charge (per kwhr) (average through year)	\$	0.010										Cand strar ough year				
	Ŷ	0.100		Ì		Encigy C	la	ge (per ki	W111	/ (average	LIII	ough year	5 0.480			
peak station load (kW) allowing for efficiency loss		632		632		632		632		632		632				
Load factor (%)		3%	÷.	5%		7%		10%		15%		20%				
kwhr per month		13,642		22,737		31,832		45,474		68,211		90,947				
Monthly utility cost - Rate GV	\$	12,662	\$	17,173	\$		\$	28,450	Ś	39,728	\$	51,005				
Monthly utility cost- Rate EV-2	\$	9,965	\$	16,468	\$	22,971		, 32,725		48,982	\$	65,238				
average # of charge sessions per day (15 min)		12		19	·	27	•	38		58	Ŧ	77				
Gross revenue for charge station operator (month)	\$	8,424	\$	14,040	\$		\$	28,080		42,120	\$	56,160				
Gross monthly revenue for charge station operator after fixe	Ś	7,624	\$	13,240	¢	18,856	\$	27,280	ć	41,320	ć	55,360				
Net monthly income for charge station operator rate GV	Ŷ	(\$5,038)	Ŷ	(\$3,933)	Ļ	(\$2,828)	Ŷ	(\$1,170)	Ļ	\$1,592	ç					
Net monthly income for charge station operator rate EV-2		(\$2,341)		(\$3,228)		(\$2,828)		(\$5,445)				\$4,355 (\$0,870)				
		(72,341)		(73,220)		(24,112)		(22,442)		(\$7,662)		(\$9,878)				
Minimum Annual Required Return on capital investment		\$0		\$0		\$0		\$0		\$0		\$0				
												•				
Annual Revenue Excess/(shortfall) vs required (rate GV)		(\$60,452)	(\$47,192)	((\$33,932)	(\$14,042)		\$19,108		\$52,259				
Annual Revenue Excess/(shortfall) vs required (rate EV-2		(\$28,093)	(\$38,734)	(\$49,375)		\$65,336)		(\$91,938)	(\$	\$118,540)				
										-		•				



Note: Graph above does not include ANY return on initial capital investment

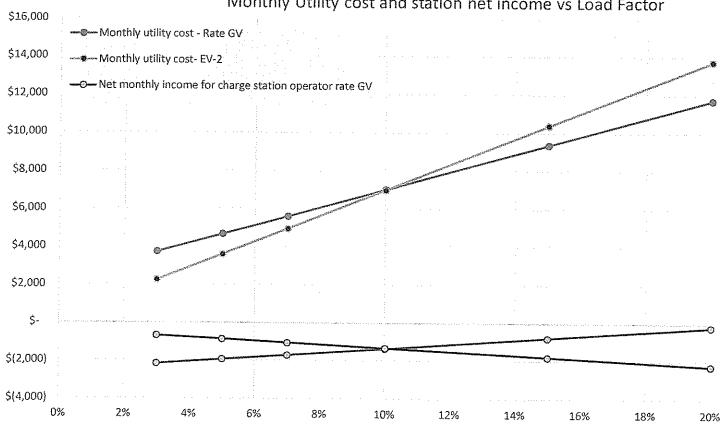
EV-2 lowers the annual loss at low utilization

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Neither rate allows owner to acheive positive income, let alone return on initial investment, until ~15% Load factor (>60 charge sessions per day!) This does not account for replacing hardware. NEVI funding only covers 5 years of warranty + O&M.

80% Grant Funded, No Make Ready Example of (2) 62.5 kW DCFC

INPUTS:					no	tes										
# of chargers per station	· · ·	2														
peak load per charger		62.5			Typical VW RFP hardware											
EV charging cost to customer (on par with gas: \$3.50/Gall		0.65			Electrify America. Evgo, Tesla \$0.41											
fixed station operating expense per month		\$200	\$/r	mo	includes insurance, basic O&M, vandalism											
Station capital cost		\$90,000				0% grant funding, No make ready program										
Station owner annual return: Blank for now		Typical expected ROI on capital														
station electrical efficiency		95%				· · · · · · · · · · · · · · · · · · ·										
Rate GV					EV	-2 Deman	d C	harge Alt	err	native rate						
Fixed Charge monthly	\$	211			Fixed Charge monthly \$ 211											
Demand Charge (per kW)	\$	16										Į	\$			
Distribution charge (per kwhr) incl SBC and stranded cost	\$	0.016			Distribution charge (per kwhr) incl SBC and s								\$	0.235		
Energy charge (per kwh) January	\$	0.480										Ì	\$	0.480		
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Gross monthly revenue for charge station operator after fixed	\$	1,555	\$	2,725	\$	3,895	\$	5,650	\$	8,575	\$	11,500				
Net monthly income for charge station operator rate GV	\$	(2,171)	\$	(1,941)		(\$1,711)		(\$1,365)		(\$790)		(\$214)				
Net monthly income for charge station operator rate EV-2	\$	(688)		(873)		(\$1,058)		(\$1,335)		(\$1,797)		(\$2,258)				
Minimum Annual Required Return on capital investment (ROI		\$0		\$0		\$0		\$0		\$0		\$0				
Annual Revenue Excess/(shortfall) vs required (rate GV)	(\$26,051)		(\$23,289)		(\$20,526)	•	\$16,383)		(\$9,476)		(\$2,570)				
Annual Revenue Excess/(shortfall) vs required EV-2 rate		(\$8,257)	(\$10,474)	((\$12,691)	(:	\$16,016)		(\$21,558)		(\$27,100)				



Monthly Utility cost and station net income vs Load Factor

Note: Graph above does not include ANY return on initial capital investment

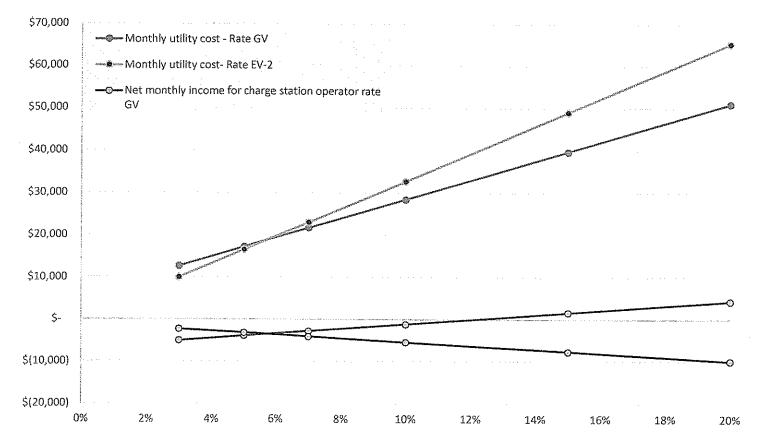
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80% Grant Funded, No make ready. Example of (4) 150kW (NEVI configuration) DCFC

INPUTS:					no	tes										
# of chargers per station		- 4			Mi	nimum re	qu	ired to rea	ceiv	e the NEV	l fe	deral fundi	ng			
peak load per charger		150	k٧	V	Mi	nimum re	qu	ired to red	ceiv	e the NEV	l fe	deral fundi	ng			
EV charging cost to customer (on par with gas: \$3.50/Gall		0.65	\$/	kwhr	Ele	ectrify Am	eri	ca. Evgo, ⁻	Tesl	a: \$0.41						
fixed station operating expense per month		\$800	\$/mo		includes insurance, O&M, vandalism											
Station capital cost	:	\$300,000	,300,000			80% NEVI funds. No Make Ready										
Station owner annual return: Blank for now					Typical ROI expected on capital											
station electrical efficiency	• .	95%		·				,				<u></u>				
Rate GV					Ra	te EV-2										
Fixed Charge monthly	\$	211					arø	e monthly	,			Г	\$	211		
Demand Charge (per kW)	ŝ	9					-	arge (per		ł		ŀ	Ś			
Distribution charge (per kwhr) incl SBC and stranded cost		0.016									SRC	L C and stran	τ	1 2 3 5		
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Crease monthly revenue for charge station exercise ofter five	ج	7 624	ć	12 240	ć	10 050	ć	27 290	ć	41 220	ć	FF 260				
Gross monthly revenue for charge station operator after fixe Net monthly income for charge station operator rate GV	Ş	7,624 (\$5,038)		13,240 (\$3,933)		18,856 (\$2,828)	Ş	27,280 (\$1,170)	Ş	41,320 \$1,592	Ş	55,360 \$4,355				
Net monthly income for charge station operator rate GV Net monthly income for charge station operator rate EV-2		(\$5,038) (\$2,341)		(\$3,228)				(\$1,170)		\$1,592 (\$7,662)		\$4,355 (\$9,878)				
Net monthly income for charge station operator rate EV-2		(22,341)		(\$5,226)		(\$4,115)		(\$3,445)		(27,002)		(22,0/0)				
Minimum Annual Required Return on capital investment		\$0		\$0		\$0		\$0		\$0		\$0				
Annual Revenue Excess/(shortfall) vs required (rate GV)		(\$60,452)		(\$47,192)	((\$33,932)	1	(\$14,042)		\$19,108		\$52,25 9				
Annual Revenue Excess/(shortfall) vs required (rate EV-2		(\$28,093)		(\$38,734)	1	(\$49,375)	ł	(\$65,336)	:	(\$91,938)	(\$118,540)				



Note: Graph above does not include ANY return on initial capital investment

EV-2 lowers the annual loss at low utilization

Neither rate allows owner to acheive positive income, let alone return on initial investment, until ~15% Load factor (>60 charge sessions per day!) This does not account for replacing hardware. NEVI funding only covers 5 years of warranty + O&M.