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SOAH DOCKET NO. 473-24-13232 PUC DOCKET NO. 56211

APPLICATION OF CENTERPOINT	§	BEFORE THE STATE OFFICE
ENERGY HOUSTON ELECTRIC, LLC	§	\mathbf{OF}
FOR AUTHORITY TO CHANGE RATES	§	ADMINISTRATIVE HEARINGS

May 6, 2024

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ENVIRONMENTAL DEFENSE FUND REQUEST NO.: EDF-RFI01-01

QUESTION:

Refer to the direct testimony of Rina Harris (page 9, lines 3-4): "The Electrification group works closely with commercial customers that have displayed interest in electrifying their fleet." What initiatives does the Company take to better understand the overall market needs and interests of other commercial fleets of medium- and heavy-duty (MHDV) fleets, beyond those customers that have reached out to the utility?

ANSWER:

CenterPoint Houston collaborates with industry research institutes, state and federal electric vehicle policy organizations, as well as trade organizations like Electric Power Research Institute (EPRI), Edison Electric Institute (EEI), Alliance for Transportation Electrification (ATE), Electric Drive Transportation Association (EDTA), Texas Electric Transportation Resources Alliance (TxETRA), Texas Department of Transportation (TXDOT) and EVOLVE Houston to better understand the timeline and location of deployment of fleet electrification. In addition, CenterPoint Houston has invested in research studies and web based tools to anticipate fleet conversion, examples of which are provided in response to EDF-RFP 01-01.

SPONSOR:

Rina Harris

RESPONSIVE DOCUMENTS:

ENVIRONMENTAL DEFENSE FUND REQUEST NO.: EDF-RFI01-02

QUESTION:

Refer to the direct testimony of Rina Harris (page 10, lines 15-18): "As the charging infrastructure continues to grow and, in some cases, begins to cluster in certain areas, the Company may begin to realize grid constraints that make it costly to upgrade service to the customers." Please explain how the Company:

- a. Identifies such clusters of charging infrastructure;
- b. Determines the grid constraints attributable to such clusters;
- c. Develops measures to address such grid constraints.

ANSWER:

- a. CenterPoint Houston currently identifies locations of charging infrastructure based on new service requests submitted by customers. Information from these requests is used in Distribution Planning studies. In addition, as referenced in response to EDF RFI 01-01 and EDF RFP 01-01, CenterPoint Energy has invested in research studies and web based tools to anticipate EV conversion.
- b. CenterPoint Houston's Distribution Planning department performs planning studies to determine any violations to the Company's distribution design criteria. The planning models used for these studies include anticipated loading information for any commercial charging infrastructure for customers that submitted a new service request. Loading impacts from existing commercial and residential charging infrastructure are embedded in the meter data that is used to develop planning load models. The Company is also working to leverage forecasts for the studies referenced in response to EDF RFI 01-01 and EDF RFP 01-01 to determine areas that create potential constrains and implement proactive measures.
- c. Any violations to the Company's distribution design criteria identified through planning studies are addressed through distribution system modifications or upgrades.

SPONSOR:

Rina Harris

RESPONSIVE DOCUMENTS:

ENVIRONMENTAL DEFENSE FUND REQUEST NO.: EDF-RFI01-03

QUESTION:

Refer to the direct testimony of Eric Easton (page 8, lines 8-10). To the extent the Company publishes such list of projects identified by Distribution Plan and High Voltage Planning needed to support growth and interconnections expected in the upcoming years, or such list is otherwise readily available, please provide such list. Please include the following information for each project:

- a. Project name, size, and cost;
- b. The extent to which the project is intended to serve electric MHDV loads;

ANSWER:

- a. For information on transmission projects and some distribution projects that requires changes to transmission topology, refer to ERCOT Transmission Project and Information Tracking list published on ERCOT's website (https://www.ercot.com/gridinfo/planning). See attached document "EDF-RFI01-03 Distribution_Projects.pdf" for list of future distribution projects supporting load growth.
- b. CenterPoint Houston only knows of one distribution project for future EV load on its system. The planned additional load is 400 kVA and is scheduled for 2024. There is no known cost associated with this project at this time.

SPONSOR:

Eric Easton

RESPONSIVE DOCUMENTS:

EDF-RFI01-03 Distribution Projects.pdf

Plan Year	Project Substation	Туре	Load Addition	Pla	nned Cost
2024	ADDICKS	New Load	7750 kVA	\$	424,000
2024	ADDICKS	New Load	7750 kVA	\$	600
2025	ALDINE	DDP		\$	2,465,100
2025	ALEXANDER ISLAND	DDP		\$	103,200
2024	ALMEDA	DDP		\$	1,708,279
2024	ALTA LOMA	New Load	2888 kVA	\$	294,500
2024	ALTA LOMA	New Load	300 kVA	\$	67,900
2024	ALTA LOMA	New Load	2133 kVA	\$	272,800
2024	ALVIN	New Load	536 kVA	\$	853,500
2024	ARCOLA	New Load	486 kVA	\$	699,500
2024	ARCOLA	New Load	824 kVA	\$	324,250
2024	ARCOLA	New Load	546 kVA	\$	223,530
2024	ARCOLA	New Load	990 kVA	\$	734,960
2024	ARCOLA	New Load	528 kVA	\$	130,200
2024	ARCOLA	New Load	828 kVA	\$	329,250
2024	ARCOLA	New Load	762 kVA	\$	66,600
2024	ARCOLA	New Load	4100 kVA	\$	638,805
2024	ARCOLA	New Load	1933 kVA	\$	39,600
2024	ARCOLA	New Load	576 kVA	\$	357,000
2024	ARCOLA	DDP		\$	10,127,050
2024	ATASCOCITA	New Load	210 kVA	\$	600
2024	ATASCOCITA	New Load	113 kVA	\$	126,875
2024	BAYTOWN	DDP		\$	8,325,125
2024	BAYWAY	DDP		\$	
2024	BIG CREEK	DDP		\$	1,100,800
	BRAZOS VALLEY	New Load	1940 kVA	\$	2,063,000
	BRAZOS VALLEY	DDP		\$	1,221,600
	BRITMOORE	DDP		\$	6,600
	BUSCH	New Load	4000 kVA	\$	89,250
	BUSCH	New Load	1592 kVA	\$	244,000
-	BWest	New Load	1228 kVA	\$	5,889,500
	CAMPBELL	DDP		\$	1,432,855
	CEDAR BAYOU	DDP	200 10 200 100 1 1 100000	\$	894,000
	CLINTON	New Load	9100 kVA	\$	2,245,300
	CLINTON	New Load	3900 kVA	\$	753,500
	COLLEGE	DDP	0001:::	\$	1,109,600
	CROSBY	New Load	888 kVA	\$	67,900
	DEER PARK	DDP	ļ	\$	206,950
	DEWALT	DDP	ļ	\$	1,042,550
	DUNLAVY	Special Project	-	\$	51,000
	ECHO	DDP		\$	203,000
	FAIRMONT	DDP	442124	\$	7,619,025
	FLEWELLEN	New Load	112 kVA	\$	34,600
	FLEWELLEN	New Load	570 kVA	\$	395,500
-	FLEWELLEN	New Load	3600 kVA	\$	357,275
2024	FLEWELLEN	New Load	3600 kVA	\$	244,400

DDP	2024	FLEWELLEN	DDP		\$	1,676,550
2024 FREEMAN DDP S 1,972,520						
2025 FREEPORT DDP						
2025 FRIENDSWOOD DDP \$ 2,757,075			DDP		\$	-
2024 FRY	2025	FRIENDSWOOD	DDP			2,757,075
2024 FULSHER New Load 476 kVA \$ 226,950	2024	FRY	New Load	708 kVA		
2024 GALENA PARK New Load 11000 kVA \$ 594,275	2024	FULSHER	New Load	476 kVA		226,950
2024 GARDEN VILLAS New Load 834 kVA \$ 60,500	2024	GALENA PARK	New Load	11000 kVA	\$	594,275
DDP	2024	GARDEN VILLAS	New Load	834 kVA	\$	60,500
2025 GRANT DDP \$ 563,010	2025	GARROTT	DDP			3,393,650
2024 HOCLARKE DDP \$ 949,000	2024	GARTH	DDP			507,400
2024 HANEY DDP	2025	GRANT	DDP			_
2024 HEIGHTS Special Project \$ 255,000	2024	H O CLARKE	DDP			563,010
2024 HEIGHTS Mini DDP \$ 110,700	2024	HANEY	DDP			949,000
2024 HIDDEN VALLEY DDP \$ 11,343,633		THE PARTY OF THE P	Special Project			255,000
2024 HIGHLANDS DDP \$ 5,828,677						· · · · · · · · · · · · · · · · · · ·
2024 HOCKLEY New Load 14 kVA \$ 202,000						11,343,633
Dec	-					
New Load 210 kVA \$ 34,000						202,000
2024 HOCKLEY New Load 8500 kVA \$ 620,720 2024 HOCKLEY New Load 4500 kVA \$ 461,600 2024 HOCKLEY New Load 855 kVA \$ 1,023,500 2025 HOLMES DDP \$ 398,100 2024 HYDE PARK Special Project \$ 103,800 2025 INDUSTRIAL DDP \$ 600 2025 INTERCONTINENTAL DDP \$ 1,487,760 2024 INTERMEDIATE DDP \$ 15,600 2025 JACINTOPORT DDP \$ 102,600 2024 JORDAN New Load 650 kVA \$ 66,000 2024 JORDAN New Load 1404 kVA \$ 294,500 2024 JORDAN New Load 603 kVA \$ 600 2024 JORDAN New Load 696 kVA \$ 246,075 2024 JORDAN New Load 696 kVA \$ 717,450 2024 JORDAN New Load 1400 kVA \$ 143,000 2024 JORDAN New Load 1400 kVA \$ 143,000 2024 KATY New Load 1053 kVA \$ 836,150 2024 KATY						-
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The second secon	2024	LIBERTY	New Load	2870 kVA	\$	797,500

2024	LIBERTY	New Load	2870 kVA	\$	679,000
	LIMBURG	DDP	2070 KV/	\$	2,766,300
	LOUETTA	DDP		\$	36,600
	LWest	New Load	308 kVA	\$	573,800
2024	LWest	New Load	997 kVA	\$	168,000
2024	MANCHESTER	DDP		\$	30,561,080
2024	MANVEL	DDP		\$	22,371,870
2025	MARY'S CREEK	DDP		\$	330,300
2025	MEMORIAL	DDP		\$	728,250
	MISSOURI CITY	New Load	2874 kVA	\$	1,410,000
	MISSOURI CITY	New Load	4300 kVA	\$	70,400
	MONT BELVIEU	DDP		\$	3,247,700
	MYKAWA	New Load	516 kVA	\$	147,000
	MYKAWA	New Load	480 kVA	\$	1,200
	NEEDVILLE	New Load	264 kVA	\$	933,300
	NEEDVILLE	New Load	1700 kVA	\$	991,500
	NEWPORT	New Load	552 kVA	\$	87,675
	NORTHSIDE	DDP		\$	65,200
	OBRIEN	DDP		\$	3,663,730
	P H ROBINSON	DDP		\$	5,240,975
	PASADENA	DDP		\$ \$	156,530
	PEARLAND PILGRIM	DDP DDP		\$ \$	396,300 199,800
	PINEHURST	New Load	345 kVA	\$	2,892,375
	PINEHURST	New Load	894 kVA	\$	2,245,300
	PINEHURST	New Load	180 kVA	\$	80,400
	PLEAK	New Load	1212 kVA	\$	320,000
	PLEAK	New Load	1200 kVA	\$	94,250
	PLEAK	DDP		\$	30,860,462
	POLARIS	DDP		\$	472,100
2024	READING	New Load	918 kVA	\$	244,925
2025	READING	DDP		\$	154,300
2024	RED BLUFF	DDP		\$	400
2025	ROARK	DDP		\$	-
2024	ROSENBERG	New Load	360 kVA	\$	482,825
	ROSENBERG	New Load	318 kVA	\$	142,400
2025	ROSENBERG	DDP		\$	103,200
	ROSHARON	New Load	676 kVA	\$	206,100
	ROSHARON	DDP		\$	6,106,950
	SANDY POINT	DDP		\$	153,000
	SCENIC WOODS	DDP		\$	5,921,190
	SEABROOK	DDP		\$	8,137,050
	SIENNA	DDP	276 1474	\$	533,800
	SOUTH CHANNEL	New Load	376 kVA	\$	262,500
	SOUTH CHANNEL	DDP DDP		\$ ¢	464,500
-	SOUTHWYCK		9091 IA/A	\$ \$	1,535,750
2024	SPENCER	New Load	8981 kVA	Ş	435,500

2025	SPENCER	DDP		\$ 582,475
2024	SPRINGWOODS	Special Project		\$ 2,111,102
2024	SPRINGWOODS	DDP		\$ 174,200
2024	SPWest	New Load	420 kVA	\$ 817,500
2024	SPWest	New Load	6000 kVA	\$ 176,100
2024	STL	New Load	368 kVA	\$ 50,166,685
2024	STL	New Load	324 kVA	\$ 361,000
2024	STL	New Load	600 kVA	\$ 2,245,300
2024	STL	New Load	4546 kVA	\$ 34,000
2024	TELEPHONE	New Load	351 kVA	\$ 206,100
2024	THOMPSONS	New Load	2600 kVA	\$ 110,000
2024	THOMPSONS	DDP		\$ 20,000
2024	THWest	New Load	6365 kVA	\$ 75,600
2024	TRINITY BAY	New Load	376 kVA	\$ 750,750
2024	TRINITY BAY	New Load	210 kVA	\$ 594,275
2024	TRINITY BAY	DDP		\$ 911,000
2025	TRINITY BAY	DDP		\$ 265,500
2024	TWestN	New Load	2600 kVA	\$ 66,600
2024	VILLAGE CREEK	New Load	749 kVA	\$ 34,600
2024	VILLAGE CREEK	New Load	272 kVA	\$ 344,200
2024	VILLAGE CREEK	New Load	528 kVA	\$ 925,200
2024	VILLAGE CREEK	New Load	528 kVA	\$ 120,855
2024	VILLAGE CREEK	New Load	628 kVA	\$ 222,210
2024	VILLAGE CREEK	New Load	564 kVA	\$ 442,750
2024	VILLAGE CREEK	New Load	654 kVA	\$ 336,500
2024	VILLAGE CREEK	New Load	378 kVA	\$ 401,500
2024	VILLAGE CREEK	New Load	496 kVA	\$ 998,795
2024	VILLAGE CREEK	New Load	408 kVA	\$ 166,760
2024	VILLAGE CREEK	New Load	336 kVA	\$ 777,950
2024	VILLAGE CREEK	New Load	2543 kVA	\$ 281,850
2024	VILLAGE CREEK	DDP		\$ 14,638,200
2024	WALLISVILLE	DDP		\$ 17,734,600
2025	WEBSTER	DDP		\$ 350,400
2024	WestA	New Load	5459 kVA	\$ 682,350
2024	WESTFIELD	DDP		\$ 9,947,535
2024	WestL	New Load	153 kVA	\$ 17,000
2024	WestO	New Load	5306 kVA	\$ _
2024	WestZ	New Load	2899 kVA	\$ 68,000
2024	WestZ	New Load	1140 kVA	\$ 68,000
2025	WIRT	DDP		\$ 161,315
2025	WITTER	DDP		\$ 67,800
2024	ZENITH (Future)	DDP		\$ 31,294,020
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ENVIRONMENTAL DEFENSE FUND REQUEST NO.: EDF-RFI01-04

QUESTION:

Refer to the direct testimony of Eric Easton (page 8, lines 10-13). Please explain how stakeholder input influences project prioritization, including:

- a. The Company's process for engaging with stakeholders;
- b. How the Company incorporates engagement into its distribution planning and deployment.

ANSWER:

- a. As part of the Company's Asset Investment Strategy (AIS) process, project sponsors from each functional area (Substation, Transmission, Major Underground, Distribution, and Telecom) submit their projects and programs for the coming years in the AIS tool and answer a common set of questions to score the project. Each functional area also has a representative on the AIS Review Committee (ARC) to review all projects and programs submitted in AIS, provide input, and ensure consistency in the project scoring prior to approval. If project deferrals or reductions are needed to meet financial targets, the project prioritization and optimization results for the capital portfolio are shared with the stakeholders for review and input before recommendations are presented to senior leadership.
- b. Distribution planning engages with internal stakeholders from each functional area during the planning process to inform and align on the priority of the project. During the design plan each stakeholder can provide input for the project, and at the end of each design plan each applicable stakeholder's review and signature is required before the plans are finalized.

SPONSOR:

Eric Easton

RESPONSIVE DOCUMENTS:

ENVIRONMENTAL DEFENSE FUND REQUEST NO.: EDF-RFI01-05

QUESTION:

Refer to the direct testimony of Eric Easton (page 10, lines 11-14 and lines 16-19). Please describe and provide the methods, data, and assumptions used to estimate load growth from MHDV electrification in the Distribution Development Plan, DDP.

ANSWER:

Currently, for the purpose of estimating load growth in the Distribution Development Plan, electrification impacts from EVs are only considered for commercial EV loads that have been submitted by customers as service additions or service expansions. CenterPoint Houston does not distinguish these commercial EV projects as MHDV or non-MHDV.

SPONSOR:

Eric Easton

RESPONSIVE DOCUMENTS:

ENVIRONMENTAL DEFENSE FUND REQUEST NO.: EDF-RFI01-06

QUESTION:

Refer to the direct testimony of Eric Easton (page 28 lines 14-16, and 13-14): "New system engineering and planning processes had to be developed to support changing customer expectations," and "Load forecasts need to account for this increased penetration of distributed energy resources (DERs) and EVs." Please describe:

- a. The new system engineering and planning processes that were developed;
- b. For each year 2020 through 2029, the results from load forecast attributable to each:
- i. Projected penetration of DERs
- ii. Projected penetration of EVs
- iii. Projected penetration of electric MHDVs.

ANSWER:

- a. The processes for performing studies and interconnecting DERs is different from traditional loads. Studies should include analyzing the impact of DER operation on power quality of adjascent customers on the same circuit or in some cases connected circuits. Considerations must be made on the type of DER (storage vs non-storage) and technology used. In addition to meeting requirements of applicable PUCT substantive rules, CenterPoint Energy's standards, specifications, and design criteria, applicable ERCOT criteria has be evaluated as well. For instance, recent changes in ERCOT market rules now require Distribution Generation Resources and Distribution Energy Storage Resources to be connected to non-load shed circuits. See Eric Easton's direct testimony at Bates page 249, line 1 through Bates page 254, line 15, which decribes the interconnection study process for various DER types.
- b. Forecast is done by applying a growth factor to prior year's base peak load that is temperature normalized for consistency, and adding new load requests (which includes commercial EV chargers) that have been submitted by customers as service additions or service expansions. To account for impact of DERs, where generation value for a DER during the prior year's peak load can be determined, adjustment is made to the forecast to account for the reduction in load from DER output. Impact of DERs, EVs, and MHDVs on load forecast beyond the data provided below is currently not known.

i.	Year	# of DER's (residential and commercial)
	2020	4883
	2021	7257
	2022	14935
	2023	11782
	2024	1902
		·

ii.	Year	# of Commercial EV Chargers
	2018	5
	2019	1

2020	2
2021	7
2022	25
2023	38
2024	14

iii.	Year	# of MHDV Chargers
	2021	3
	2022	3
	2023	2
	2024	1

SPONSOR: Eric Easton

RESPONSIVE DOCUMENTS:

ENVIRONMENTAL DEFENSE FUND REQUEST NO.: EDF-RFI01-07

QUESTION:

Refer to the direct testimony of Eric Easton (page 44, line 11 through page 45, line 11). Please provide, for each year 2020 through 2029:

- a. A breakdown of actual or projected (as applicable) distribution load growth by customer type (residential, commercial, industrial, etc.);
- b. The amount of actual or projected (as applicable) distribution load growth attributable to EVs;
- c. The amount of actual or projected (as applicable) distribution load growth attributable to electric MHDVs.

ANSWER:

a. Forecast is done by applying a growth factor to prior year's base peak load that is temperature normalized for consistency, and adding new load requests that have been submitted by customers as service additions or service expansions. Currently, for the purpose of load forecasting, there are no distinctions being made for customer type. See table below for actual distribution load by customer type. Breakdown by customer type for projected distribution growth is not known at this time.

		Load KVA		
	Industrial	Commercial	Residential	
2020	20,504	250,862	192,439	
2021	15,660	148,938	201,676	
2022	49,652	179,920	217,875	
2023	52,210	119,670	211,573	

b. Currently, for the purpose of estimating load growth for Distribution Development Plans, electrification impacts are only separately considered for commercial EV loads that have been submitted by customers as service additions or service expansions.

Year	EV Load (kVA)
2018	650
2019	500
2020	2600
2021	9870
2022	17361
2023	36132
2024	18932

C.

Year	MHDV Load
2021	3627
2022	2856

2023	8482
2024	400

SPONSOR:

Eric Easton

RESPONSIVE DOCUMENTS:

ENVIRONMENTAL DEFENSE FUND REQUEST NO.: EDF-RFI01-08

QUESTION:

Refer to the direct testimony of John Durland (page 54-58, line 12, through page 58, line 18) with respect to Premium Service (PS). Please provide, for each calendar year 2021 through 2023:

- a. The number of customers billed on Rate PS;
- b. The number of customers billed on Rate PS operating DERs;
- c. The total costs of the Company's facilities for which the customers billed on Rate PS were held responsible pursuant to Rule 6.1.2.3.3.

ANSWER:

- a. Fifteen customers are currently billed on Rate PS. A few of those 15 customers take service at more than one location.
- b. Two customers among the fifteen operate DERs.
- c. Table below shows the annual amount billed for year 2021 through 2023 based on the reserve capacity being allotted for these customers.

2021	2022	2023
\$824,408.68	\$832,391.28	\$832,391.28

SPONSOR:

John R. Durland

RESPONSIVE DOCUMENTS:

ENVIRONMENTAL DEFENSE FUND REQUEST NO.: EDF-RFI01-09

QUESTION:

Refer to direct testimony of John Durland (page 54, line 12, through page 58, line 18) with respect to Premium Service (PS). Does the Company use any methods other than Rate PS to charge customers for the costs of additional Company equipment needed to serve the customer's service requirements? If so, please provide, for each calendar year 2021 through 2023:

- a. The tariff provision(s) under which the Company issued such charges;
- b. The number of customers subject to such charges;
- c. The number of customers subject to such charges operating DERs;
- d. The total amounts of such charges.

ANSWER:

- a. Yes. Please see the Facilities Extension Policy and Facilities Extension Agreements in Exhibit JRD–09, page 74 and pages 228 236.
- b. Please see CenterPoint Houston's response to Request No. EDF-RFI01-08. Only one customer among the 15 mentioned in that response had construction costs identified during year 2021 through 2023 that required the customer to be billed based on the Facility Extension Policy.
- c. None.
- d. The total amount determined for the customer referenced in part b. was \$2,283,367.

SPONSOR:

John R. Durland

RESPONSIVE DOCUMENTS:

ENVIRONMENTAL DEFENSE FUND REQUEST NO.: EDF-RFI01-10

QUESTION:

Refer to direct testimony of John Durland (page 54, line 12, through page 58, line 18) with respect to Premium Service (PS). Where a customer's operation of a DER would trigger a need for modification or construction of Company facilities, what option(s) does the Company provide the customer to avoid or mitigate the need for such facility modifications or construction? For example, under what circumstances does the Company allow customers to use DER software (such as inverter or EV charger settings) as an alternative to modification or construction of Company facilities? Please provide any relevant rules, procedures, standards, or other related documents.

ANSWER:

- For a generator that is paralleled with the grid for 100 milliseconds or less (High Speed Closed Transition), CenterPoint Houston does not require a communication channel for transfer trip
- For synchronous generator technology, CenterPoint Houston allows the use of Reverse Power Element (32P) of the protective relay to trip the generator's main breaker; thus avoiding the installation of a communication channel for transfer trip
- For inverter-based generator technology, CenterPoint Houston allows a limited export threshold to be set by the generator thus avoiding the installation of a communication channel for transfer trip
- For battery energy storage projects, CenterPoint Houston allows limited charging capacity to not exceed allowable substation transformer capacity thus mitigating the need to upgrade an existing substation transformer

Please refer to the following:

- PUC Substantive Rules 25.211 and 25.212.
- CenterPoint Houston's Distributed Generation Specification documents attached to this response.
- CenterPoint Houston's Distribution Planning Criteria, filed as Exhibit EDE-1 to Eric Easton's direct testimony.
- IEEE Standard 1547: IEEE SA IEEE 1547-2018 .

SPONSOR:

David Mercado/Eric Easton

RESPONSIVE DOCUMENTS:

EDF-RFI01-10 -- CNP Spec DG-DER Design-Operations-Rev4-Final.pdf EDF-RFI01-10 -- DG Application Reverse Power Addendum Final.pdf

SOAH DOCKET NO. 473-24-13232
PUC Docket No. 56211
EDF-RFI01-10 --CNP Spec DG-DER Design-Operations-Rev4-Final.pdf
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SPECIFICATION FOR

CUSTOMER GENERATION ON THE DISTRIBUTION SYSTEM

CenterPoint Energy Houston Electric, LLC
Electric Engineering
P.O. Box 1700
Houston, Texas 77251

REFERENCE DRAWINGS:

REFERENCE STANDARDS:

Public Utility Commission of Texas Substantive Rules §25.211 and §25.212 CenterPoint Energy Primary Service Specification 600-007-231-458 CNP Service Standards IEEE 1547

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4	4-09-15	Updated	GBR/TRS	MDB	RKW	WRITTEN	2-2	0-81	R.H.	Moffatt
3	3-14-13	Completely Rewritten	GBR	MDB	RKW	CHECKED	2-2	3-81	J.M. I	Denison
2	7-26-88	Completely Rewritten	RWC		LGP	APPROVED	2-2	4-81	F.J.	Meyer
1	6-25-84	Completely Rewritten	LDG	JSH	JSH	Sheet 1 of 15				
NO.	DATE	ITEMS REVISED	BY	СН	APP	SPEC ID.	600	007	231	76

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3.0	APPROVAL	5
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7.0	INDUCTION GENERATORS AND INVERTER SYSTEMS	14
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1.0 SCOPE AND DEFINITIONS

- 1.1 This specification states the requirements and procedures for safe and effective connection and operation of customer-owned generating facilities on the CenterPoint Energy ("CNP") Electric Distribution System. It is emphasized that the requirements outlined in this specification are general and may not cover all details in specific cases. The customer shall discuss project plans with CNP, execute an Interconnection Agreement, and receive approvals before installing devices.
- Pursuant to the Public Utility Commission of Texas ("PUCT") Substantive Rule §25.211(c)(3), the term "Customer" is "any entity interconnected to the company's utility system for the purpose of receiving or exporting electric power from or to the company's utility system."
- 1.3 The term "CNP System" is used in this specification to refer to the CNP Electric Distribution System. Pursuant to PUCT Substantive Rule §25.211(c)(5) and (10), if the installation's capacity is more than ten MW, CNP may require the installation be split into multiple points of interconnection, or recommend connection to the Transmission System.
- 1.4 Pursuant to PUCT Substantive Rule §25.211(c)(7), the term "Interconnection Agreement" is "the standard form of agreement, which has been approved by the commission. The interconnection agreement sets forth the contractual conditions under which a company and a customer agree that one or more facilities may be interconnected with the company's utility system."
- 1.5 The term "installed electric generating facilities kW rated capacity" is the electric generator(s) kVA or kW on the generator nameplate calculated at 100% power factor irrespective of any kW limit imposed by the prime mover rating, control system setting or protection setting. For example, 1600 kW @ 80% PF (2000 kVA) rated capacity on the generator nameplate is calculated at 100 % power factor to be 2000 kW.
- Pursuant to PUCT Substantive Rule §25.212(g), closed-transition switching has specific requirements. CNP defines closed-transition switching as operation of generation that is paralleled with the CNP system for a period of time and is operated separately from the CNP system either before or after such period of parallel operation.

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2.0 POLICY ON CUSTOMER GENERATION

- 2.1 It is the policy of CNP to permit any Customer to operate their generating facilities in parallel with the CNP System, provided that the Customer's generating facilities meet the requirements of this specification.
 - 2.1.1 Customers operating generating facilities in parallel with CNP shall meet the operation requirements of PUCT Substantive Rules §25.211 and §25.212.
 - 2.1.2 Any Customer desiring to operate their facility in parallel with the CNP System must do so without adversely affecting other customers, utilities, or CNP devices or personnel.
 - 2.1.3 Certain protective devices, such as circuit breakers, reclosers, and relays, specified by CNP shall be installed by the Customer at the location where the Customer desires to operate generating facilities in parallel with the CNP System.
 - 2.1.4 Customers receiving primary metered service at 12 kV or 35 kV (phase-to-phase) shall also meet the requirements of the latest version of the Primary Service Specification 600-007-231-458.
 - 2.1.5 Pursuant to PUCT Substantive Rule §25.212(f), in the event that standards for a specific unit or facility are not set out in the rule, CNP and the Customer may interconnect a facility using mutually agreed upon technical standards.
- 2.2 Three-phase and single-phase Customer generating facilities may be connected in parallel with the CNP System, if the requirements of this specification are met and the appropriate approvals are obtained as outlined under "Approval" (Article 3.0) of this specification.
 - 2.2.1 Where multiple generating facilities are connected to the CNP System through a single point of common coupling, the sum of the nameplate ratings of the generating facilities will be used.
 - 2.2.2 Any Customer found operating unapproved generating facilities in parallel with the CNP System, or operating approved generating facilities with required protective devices disconnected or bypassed will be required to immediately disconnect their generating facilities from the CNP System. The Customer will not be allowed to reconnect the generating facilities, until the appropriate review and approval from CNP has been obtained and a signed Interconnection Agreement executed.

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- 2.3 CNP will not assume any responsibility for the protection of the Customer's electrical system.
- Any Customer desiring parallel operation with CNP shall sign an Interconnection Agreement with CNP, prior to parallel operation, specifying the terms and conditions under which the interconnection shall take place.
- 2.5 According to PUCT Substantive Rule §25.211(h), certain aspects of secondary network systems create technical difficulties that may make interconnection more costly to implement. In instances where Customers request interconnection to a secondary network system, CNP and the Customer shall use best reasonable efforts to complete the interconnection, in accordance with the PUCT rule and IEEE 1547. More details are provided in the PUCT's rule.
- 2.6 Pursuant to PUCT Substantive Rule §25.211(n), the owner of a distributed generating facility that is interconnected shall report to CNP any change in ownership of the facility and the cessation of operations of a facility within 14 days of such change.

3.0 APPROVAL

- 3.1 The Customer shall complete, sign, and submit the standard form approved by the PUCT for an application for interconnection and parallel operation ("the Application") with the CNP System to the CNP-designated distributed generation contact person. CNP will use this data to simulate and evaluate the impact of the Customer generating facilities on the CNP System during normal operating conditions and in the event of a disturbance on the CNP System. Any situations that do not meet required system operating conditions shall be corrected by the Customer before interconnection will be approved. If there are changes to the project, an application revision will be required. An additional study fee may also be required.
- 3.2 In addition to the information requested in the Application, the Customer shall submit the following.
 - 3.2.1 The data listed in the Application and study fees addendum.
 - 3.2.2 A detailed electrical system one-line diagram showing the generating facilities, transformers, circuit breakers, disconnect switches and protective relays with respect to the CNP meter.

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- A detailed site plan showing the locations of the generating facilities disconnect device and interconnect disconnect device with respect to the point of common coupling.
- Outline drawings and instruction books, if applicable, of the disconnect switch that isolates the generating facilities from the CNP System.
- 3.2.5 Manufacturer's operating data, such as time-current and time-voltage curves, on the protection relays.
- 3.2.6 Generating facilities' electrical parameters, to include the installed electric generating facilities kW or MW rated capacity.
- 3.2.7 Manufacturer/technical information for any equipment necessary for the interconnection study.
- Prior to interconnection of the Customer's generating facilities, CNP shall 3.3 inspect the Customer's facility and witness the Customer's testing of the protective devices associated with the interconnection.
 - The information on the installed nameplate(s) of the electric 3.3.1 generating facilities must match the information provided in the Application.
- 3.4 The Customer shall not commence parallel operation of their generating facilities with the CNP System until final written approval has been given by CNP.
- 3.5 Any modifications made by the Customer to their facility that may affect the CNP System must be approved by CNP prior to implementation.

4.0 GENERAL OPERATING REQUIREMENTS

- 4.1 CNP's System primary voltages are 12.47 kV and 34.5 kV depending on the geographic location of the Customer's facility. The Customer shall contact the CNP-designated distributed generation contact person for information on the specific circuit that will serve their generating facility.
 - CNP may change the primary voltage of the circuit serving a Customer generating facility. Customers interconnected directly to the CNP System at primary voltage shall make modifications to their facilities to be able to reconnect to the CNP System. The Customer shall be responsible for all costs associated with this reconnection.

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- 4.1.2 Customers interconnected to the CNP System secondary voltages, which is 4 kV and below, may also be subjected to reconnection costs, depending on the service voltage and the generating facility size.
- 4.2 The interconnection of the Customer's generating facilities with the CNP System shall not cause any reduction in the quality of service being provided to other customers. In order to eliminate undesirable interference due to the Customer's parallel generating facilities with the CNP System, the following criteria shall be met by the Customer's generating devices:
 - 4.2.1 Pursuant to PUCT Substantive Rule §25.212(c)(1), the Customer shall operate its generating facilities in such a manner that the voltage levels on the CNP System are in the same range as if the generating facilities were not connected to the CNP System. The Customer shall provide an automatic method of disconnecting the generating facilities from the CNP System if a sustained voltage deviation in excess of +5.0% or -10 % from nominal voltage persists for more than 30 seconds, or a deviation in excess of +10% or -30% from nominal voltage persists for more than ten cycles. The interrupting device's auxiliary contacts shall change state in the required time after the voltage deviation is initiated. The Customer may reconnect when the CNP System voltage and frequency return to normal range and the CNP System is stabilized.
 - 4.2.2 The Customer shall not cause voltage fluctuations on the CNP System in excess of plus or minus 3% as measured at the point of common coupling with the CNP System.
 - 4.2.3 The total distortion factor of CNP's sinusoidal voltage wave as a result of harmonics introduced by the Customer's generating facilities shall not exceed 5% of the fundamental 60 Hz frequency nor 3% of the fundamental for any individual harmonic when measured at the point of common coupling with the CNP System. The total distortion factor is the square root of the sum of the squares of all harmonics to the square of the fundamental.
 - 4.2.4 After its initial cut-in, CNP may periodically monitor the point of common coupling with the CNP System. If the distortion factor measured exceeds the limits specified above, the Customer shall take corrective measures to reduce the impact of harmonics onto the CNP System. If the Customer fails to do so, the Customer shall disconnect the generating facilities from the CNP System.

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4.2.5 Pursuant to PUCT Substantive Rule §25.212(c)(3), the operating frequency of the Customer's generating facilities shall not deviate more than +0.5 Hertz (Hz) or -0.7 Hz from a 60 Hz base, measured at the point of common coupling. The Customer shall automatically disconnect the generating facilities from the CNP System within 15 cycles if this frequency tolerance cannot be maintained. The

- cycles if this frequency tolerance cannot be maintained. The interrupting device's auxiliary contacts shall change state in the required time after the frequency deviation is initiated. The Customer may reconnect when the CNP system voltage and frequency return to normal range and the system is stabilized.
- 4.2.6 The power factor of the Customer's generating facilities shall be between 0.90 lagging to 0.90 leading at the generating facilities' terminals at all times. The Customer shall correct the generating facilities' power factor to meet this criterion.
- 4.2.7 The Customer shall be responsible for disconnecting the generating facilities from the CNP facilities due to an outage caused by short circuits or grounds on the CNP circuit serving the Customer's generating facilities, pursuant to PUCT Substantive Rule §25.212(c).
- 4.2.8 The Customer shall provide negative and zero sequence current protections of their generating facilities.
- 4.3 The Customer shall properly synchronize their generating facilities with the CNP System, as per IEEE 1547.
- 4.4 CNP shall approve all protective devices the Customer installs for distributed generation to prevent the energization of a de-energized CNP circuit.
- 4.5 For generation that is paralleled with the grid for 100 milliseconds or less (closed-transition switching), CNP does not require a communication channel for transfer tripping of the Customer's main breaker, provided that the Customer complies with the following:
 - 4.5.1 Disable any mode in the automatic transfer switch (ATS) that would allow paralleling for more than 100 milliseconds.
 - 4.5.2 Provide a test report completed by a relay testing agent that confirms that closed-transition is limited to 100 milliseconds and a failure scheme is in place and was tested.
 - 4.5.3 In the supplemental terms and conditions that are attached to the Interconnection Agreement, describe the 100 milliseconds closed-transition operation and failure scheme.

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- 4.5.4 Provide control wiring drawings that document the closed-transition and failure scheme.
- 4.5.5 Demonstrate the above requirements during the on-site distributed generation (DG) inspection by CNP.
- 4.5.6 Submit a commissioning test report that documents the on-site testing.
- 4.6 For generation that is paralleled with the grid for more than 100 milliseconds and when the Customer's installed electric generating facilities kW or MW rated capacity is in excess of 2 MW or as determined to be necessary by CNP's DG study for facilities under 2 MW, CNP requires a communication channel for transfer tripping of the Customer's main breaker or generator breaker for the purpose of separating the generation from the grid. This equipment is to be installed at the Customer's expense when determined to be necessary by CNP's DG interconnection study. The channel shall be a part of the relay protection scheme and shall be from the Customer's site to the CNP-designated substation.
 - 4.6.1 CNP will design and specify the necessary relay devices. The components to be installed at the CNP-designated substation will be installed by CNP. The components to be installed at the Customer's site shall be installed and maintained by the Customer.
- 4.7 For generation that is paralleled with the grid for more than 100 milliseconds and when the Customer's installed electric generating facilities kW or MW rated capacity is in excess of 2 MW or as determined to be necessary by CNP's DG study for facilities under 2 MW, CNP requires:
 - 4.7.1 Voltage transformers and a relaying scheme at the CNP-designated substation to be installed by CNP at the Customer's expense to protect against the Customer's generating facilities feeding a transmission fault.
 - 4.7.2 A communication channel for transfer tripping of the Customer's main breaker, as specified in Article 4.6 of this specification will be required at the Customer's expense.
 - 4.7.3 Communication options will be evaluated on a case by case basis.

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- 4.8 CNP reserves the right to disconnect the Customer at their point of service from the CNP System for any of the following reasons:
 - 4.8.1 During system emergencies.
 - 4.8.2 To facilitate maintenance, test, or repair of CNP facilities. When there is a planned outage, CNP will give the Customer seven business days prior written notice of the service interruption, due to routine maintenance, repairs, or modifications.
 - 4.8.3 The Customer's generating facilities interfere with operation of other customers' facilities or with the operation of the CNP System.
 - 4.8.4 Inspection of the Customer's generating facilities or protective devices reveals a hazardous condition.
 - 4.8.5 A lack of scheduled maintenance or maintenance records for the Customer's generating facilities and protective devices, as referenced in the Interconnection Agreement and specified in Article 4.12 of this specification.
 - 4.8.6 The Customer's protective devices do not comply with this specification.
 - 4.8.7 The Customer modifies the generating facilities or protective devices without receiving CNP approval for the modification.
 - 4.8.8 A valid Agreement is required by PUCT Substantive Rules §25.211(e)(1) and §25.211(e)(5). Pursuant to PUCT Substantive Rule §25.211(e)(1), upon expiration or termination of the Agreement with the Customer, in accordance with the terms of the Agreement, CNP may disconnect the Customer's generating facilities. Pursuant to PUCT Substantive Rule §25.211(e)(5), the Customer must execute an Agreement on the forms prescribed by the PUCT. CNP may disconnect the Customer's generating facility if the Agreement has not been received and executed.
 - 4.8.9 The communications channel or the protective relay for transfer trip is not functional.
- In the event of an outage to the affected CNP circuit serving the Customer, immediate restoration may not be possible from an adjacent circuit.

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- 4.9.1 Per the Application, the Customer shall inform CNP, if they are participating in ERCOT's Emergency Response Service ("ERS") program.
- 4.10 CNP reserves the right to de-energize and block the Customer's breaker from closing if a section of the circuit connected to the Customer's generation facility is field switched to another circuit that has no operable transfer trip protection.
- 4.11 All costs resulting from future additional protective relaying requirements shall be borne by the Customer.
- 4.12 To ensure safe and reliable operation when operating in parallel with the CNP system, the Customer has the sole responsibility for the routine maintenance of their protective devices and generating facilities.
 - 4.12.1 CNP reserves the right to verify the calibration and operation of the Customer's protective devices. Verification shall include the tripping of the circuit breakers by manually closing the protective relay contacts.
 - 4.12.2 The Customer must maintain their equipment upon initial commissioning and each year thereafter.
 - 4.12.3 The Customer must maintain complete test and maintenance records for each location and provide test and maintenance records to CNP upon request.
 - 4.12.4 Failure of the Customer to provide proper routine maintenance or maintenance records shall result in the Customer being disconnected, as specified in Article 4.8 of this specification.

5.0 <u>SPECIFIC REQUIREMENTS - THREE-PHASE GENERATORS</u>

- 5.1 Customers who desire to install and operate three-phase generating facilities in parallel with the CNP System are required to install certain protective devices. The purpose of these devices is to promptly remove the Customer's generating facilities from the CNP System whenever a fault or abnormal event occurs, so as to protect the general public and CNP personnel and facilities from injury or damage due to fault or load currents produced.
- 5.2 Protective devices at the Customer's location shall be owned, operated, and maintained by the Customer.

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- 5.2.1 The installation, inspection, and testing of protective devices shall be approved by CNP.
- 5.2.2 The set points of all relays used to isolate the Customer's generating facilities from the CNP System in the event of a system disturbance shall be approved by CNP.
- 5.2.3 The Customer has the sole responsibility for the routine maintenance of their protective devices and generating facilities, as specified in Article 4.12 of this specification.
- 5.3 The Customer's generating facilities shall not be connected in parallel with the CNP System through the customer-owned transformers protected by high side fuses for installed electric generating facilities kW or MW rated capacity over 2 MW.
- It is CNP's practice to automatically reclose the substation circuit breakers instantaneously, which is 10 to 15 cycles, after they have tripped. Instantaneous reclosing of three-phase line reclosers located between the CNP substation and the Customer's generating facilities is also practiced. The Customer shall ensure that their generating facilities are automatically disconnected from the CNP System prior to the CNP substation breaker or line reclosers automatic reclose.
 - 5.4.1 The Customer's breakers or reclosers shall not automatically reclose after tripping. The Customer may reconnect when the utility system voltage and frequency return to normal range and the system is stabilized, as specified in Articles 4.2.1 and 4.2.5 of this specification.
- 5.5 The Customer's main and generating facilities' circuit breakers and reclosers shall be three-phase devices with electronic or electromechanical control. Hydraulically controlled breakers and reclosers shall not be used.
 - 5.5.1 The symmetrical current interrupting capability shall be greater than the maximum future system fault duty as specified by CNP.
 - 5.5.2 The Customer's generating facilities' breakers shall be equipped with a breaker failure relay scheme that will trip their main breaker in the event the generating facilities' breaker fails to trip within ten (10) cycles after receiving an initial trip signal from the appropriate relays.
- 5.6 The Customer's generating facilities shall be separable from the CNP System by a visible break disconnecting device.

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- 5.6.1 If the Customer is interconnected directly to the primary distribution system, which is 12.47 kV or 34.5 kV primary metered customers, CNP will install a three-phase gang-operated load break disconnecting device or three single-phase blade disconnects to separate the Customer's generating facilities from the CNP System.
- 5.6.2 If the Customer is interconnected to the secondary distribution system, which is 4kV and below, the Customer shall install a visible break, blade disconnecting device either at the point of service or the generating facilities to separate the Customer's generating facilities from the CNP System. This disconnecting device shall be readily accessible to CNP personnel at all times. The disconnecting device shall be capable of being locked by CNP to keep the switch in the open position.

6.0 SPECIFIC REQUIREMENTS - SINGLE-PHASE GENERATORS

- 6.1 The Customer will be allowed to install and operate single-phase generating facilities that are 50 kW or less in parallel with the CNP System at most locations on the radial distribution system if they meet the requirements of this specification. Depending on the point of connection to the CNP System, single-phase generating facilities larger than 50 kW may be allowed.
- 6.2 The Customer shall install a manual disconnecting visible blade safety switch device that will provide a visible opening between the CNP System and the Customer's generating facilities. The visible blade safety switch device shall be readily accessible to CNP personnel at all times. The disconnecting device shall be capable of being locked by CNP to keep the switch in the open position.
- 6.3 It is CNP's practice to automatically reclose the substation circuit breakers instantaneously, which is 10 to 15 cycles, after they have tripped. Instantaneous reclosing of three-phase line reclosers located between the CNP substation and the customer's generating facilities is also practiced. The Customer shall ensure that their generating facilities are automatically disconnected from the CNP System prior to the CNP substation breaker or line reclosers automatic reclose.
- 6.4 The Customer's generating facilities' controls shall be equipped with a line voltage sensing relay or contactor that will prevent the generating facilities from being connected to a de-energized CNP circuit.

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7.0 <u>INDUCTION GENERATORS AND INVERTER SYSTEMS</u>

- 7.1 The power factor correction devices for induction generating facilities or power inverters shall be approved by CNP.
- 7.2 The step-switched capacitors for induction generating facilities or the other techniques to bring voltage fluctuations to acceptable levels for induction generating facilities shall be approved by CNP.
- 7.3 For inverter systems, the Customer shall provide a one-line diagram showing the relationship of the generating facilities tied into a breaker or breakers in the electrical panel and the CNP meter location. The AC disconnect switch shall be between the inverter and electrical panel and must be a lockable, external handle, visible and readily accessible disconnect switch and typically installed within ten feet of the CNP meter. If the AC disconnect switch is installed more than ten feet of the CNP meter, a weather-resistant, easily read placard must be installed within ten feet from the CNP meter, clearly identifying the location of the AC disconnect switch.
- 7.4 The Customer shall provide manufacturer specifics for the inverter and disconnect switch. The inverter specification sheet shall show that the anti-islanding protection has been certified by IEEE 1547 or UL 1741. Otherwise, the Customer shall test the inverter pursuant to PUCT requirements, as specified in Articles 4.2.1 and 4.2.5 of this specification. CNP shall receive notice and be present for the inverter testing.
- 7.5 If the Customer using an inverter for parallel generating facilities causes any reduction in the quality of service provided to other utility customers due to harmonics, the Customer shall install filtering devices to cause the harmonic output of the Customer's inverter to an acceptable level.

8.0 REVENUE METERING

- 8.1 The revenue metering for the Customer's generating facility shall be as determined by CNP.
- 8.2 Actual metering arrangements must conform with PUCT-approved tariff requirements, which are subject to revision.
- The revenue meter shall be installed by CNP after all documentation and inspections are completed and approved.

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- 8.4 The Customer is responsible for resolving billing issues with their retail electric provider.
- 8.4.1 Commercial meters establish a demand based on import of kW and kVAr.

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Reverse Power Addendum to Application for Interconnection and Parallel Operation of Distributed Generation

This addendum supplements the Application for Interconnection and Parallel Operation of Distributed Generation (the "Application") between {CUSTOMER NAME} ("Customer") and CenterPoint Energy Houston Electric, LLC ("CNP"), entered into on {DATE}.

Direct transfer trip is CNP's standard method of islanding protection for Distributed Energy Resources ("DERs"). Customer must review and agree to this addendum before CNP will evaluate Customer's proposed DER installation for potential utilization of reverse power protection as an alternative method of islanding protection.

- 1. Reverse power protection, as a method of islanding protection, is only acceptable for synchronous and induction generators. Reverse power protection is not acceptable for inverter-based DERs.
- 2. Reverse power protection, as a method of islanding protection, is only acceptable for DERs at a site with aggregate generation less than or equal to 2 MW nameplate at 1.0 pf. All locations with aggregate DER greater than 2 MW at 1.0 pf are required to implement DTT if operating in parallel with CNP distribution system.
- 3. Reverse power protection, as a method of islanding protection, is only acceptable for effectively grounded DERs interconnected through a service transformer of winding type wye(grounded) primary to wye(grounded) secondary.
- 4. Reverse power protection, as a method of islanding protection, is not acceptable for a DER that requires 3V0 protection as a requirement of parallel interconnection. Direct transfer trip is the only CNP-approved method to mitigate the 3V0 concern.
- 5. Customer shall provide sufficient documentation detailing the relaying and protection system utilized. Documentation and test reports shall detail the disconnection of the DER within the specified total clearing time. On-site witness testing shall be observed by CNP prior to permission to energize in parallel operation. On-Site witness testing is not required for future reverse power relay setpoint changes after permission to operate in parallel with CNP distribution system is provided as long as the customer can supply proof of setpoint change within 48 hours (revised settings file is preferred).

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Signed:		
{CUSTOMER SIGNATORY NAME} {CUSTOMER SIGNATORY TITLE} {CUSTOMER NAME}	Date	
{CEHE SIGNATORY NAME} {CEHE SIGNATORY TITLE} CenterPoint Energy Houston Electric, LLC	Date	

ENVIRONMENTAL DEFENSE FUND REQUEST NO.: EDF-RFI01-11

QUESTION:

Please provide service application form(s) applicable to current or prospective customers seeking to:

- a. Energize electric MHDVs that will not inject electricity into the Company's distribution system;
- b. Energize and interconnect electric MHDVs that, either alone or in conjunction with other behind-the-meter equipment, may inject electricity into the Company's distribution system.

ANSWER:

- a. Distribution customers are encouraged to submit projects of 500KVA or less through the Company's Electric Service Request Portal (Electric Service Request Form · Starter Portal (centerpointenergy.com)) and to submit projects of 501KVA and greater through the Company's Major Underground Portal (Sign in · Custom Portal (powerappsportals.com)).
- b. CenterPoint Houston processes all residential and commercial behind-the-meter applications, with an established service, via an electronic portal (https://plus.anbetrack.com/cnp-dg/#/). For green-field customers without a pre-established service, CenterPoint Houston offers a paper copy of the application form, which is attached to this response.

SPONSOR:

Rina Harris/David Mercado

RESPONSIVE DOCUMENTS:

EDF RFI 1-11: CNP DER Application Package-Rev7.1-Final (SODG) - Header.pdf

EDF RFI 1-11: SmallScale DER Project Documentation - Header.pdf



DER Application Cover Letter

If you desire to interconnect and operate a Distributed Energy Resource ("DER") in parallel with the distribution system of CenterPoint Energy Houston Electric, LLC ("CenterPoint Energy"), please complete and sign (1) CenterPoint Energy's "Application for Interconnection and Parallel Operations of Distributed Energy Resource" (the "DER Application") and (2) CenterPoint Energy's "System Impact Study Discretionary Services Agreement" (the "Study Agreement" and together with the DER Application, the "DER Application Package").

To operate any DER device that is connected to the CenterPoint Energy system, you are first required to complete an application. This can be done through our web portal located at address: https://plus.anbetrack.com/cnp-dg.

If the premises on which the DER will operate does not have an established electrical service, a paper-based DER Application Package will be required. Please send an email to Commercial_DG@CenterPointEnergy.com to initiate the interconnection process by requesting a DER Application Package.

CenterPoint Energy will review the customer-submitted DER Application Package for completeness after receipt and, if found to be complete, will commence the System Impact Study after receiving the applicable study fee. The study fee schedule for System Impact Study is noted in the 'Pre-Interconnection Study Fee' in the Tariff.

A System Impact Study report, along with the estimated costs for CenterPoint Energy to interconnect the DER with the company's distribution system (Construction Estimate Package), will be sent to the customer for review. Design and construction work per the System Impact Study will begin after the customer signs and returns Construction Estimate Package and provides the construction estimate fees to the company along with an e-mail indicating Notice to Proceed.

Once construction is completed there are (2) possible options depending on the system size:

- 1st Typically not required for residential or small commercial projects (sized 50 kW AC or less), CNP may require photos for visual inspection/review (if there are outstanding questions, etc.). It is our understanding that the installer/designer adheres to all applicable Standards, Specifications, and Code requirements for the project and has a licensed master electrician overseeing the project installation.
- 2nd For large commercial projects (sized over 100kW AC), CNP requires the Customer to demonstrate the protective functions through a third-party testing agency (hired by the Customer) to prove compliance with the CenterPoint Energy's Distributed Generation Specification and Public Utility Commission of Texas rules, 25.211 and 25.212. CenterPoint Energy may witness the testing and commissioning procedure.

After successful testing and commissioning, CenterPoint Energy will send the Interconnection Agreement (IA). Once the interconnection agreement is fully executed, CenterPoint Energy will send a Permission to Operate (PTO) letter via email to the Customer, completing the interconnection process.

To be commercially operable in the ERCOT market, ERCOT requires additional technical information for modeling, testing for commissioning. Refer to <u>ERCOT Resource Integration</u> webpage for details.

PUCT substantive rules web site is included here.

Sheet No. 6.20.1 Page 1 of 1

CenterPoint Energy Houston Electric, LLC Applicable: Entire Service Area

CNP 8031

6.1.2.4 DISTRIBUTED GENERATION SERVICE - RATE DGS

Company shall interconnect distributed generation pursuant to Public Utility Commission of Texas Substantive Rules 25.211 and 25.212.

A customer seeking interconnection and parallel operation of distributed generation with Company must complete and submit the Application for Interconnection and Parallel Operation of Distributed Generation and enter into an Agreement for Interconnection and Parallel Operation of Distributed Generation. The form of the application is set out in Section 6.3.2 of this Tariff. The form of the agreement is set out in Section 6.3.3 of this Tariff.

PRE-INTERCONNECTION STUDY FEE SCHEDULE

Pre-certified distributed generation units that are up to 500 kw that export not more than 15% of the total load on a single radial feeder and contribute not more than 25% of the maximum potential short circuit current on a radial feeder are exempt from any pre-interconnection study fees. For all other DG applications, the study fees in the following table will apply.

Non-Exporting	0 to 10 kW	10+ to 500 kW	500+ to 2000 kW	2000+ to 10,000 kW
Pre-certified, not on network	\$0	\$0	\$3,273	\$3,520
Non pre-certified, not on network	\$312	\$581	\$3,947	\$4,194
Pre-certified, on network	\$272	\$1,075	\$6,269	\$6,516
Non pre-certified, on network	\$525	\$1,150	\$6,943	\$7,190

Exporting	0 to 10 kW	10+ to 500 kW	500+ to 2000 kW	2000+ to 10,000 kW
Pre-certified, not on network	\$75	\$570	\$3,520	\$3,767
Non pre-certified, not on network	\$312	\$792	\$4,194	\$4,441
Pre-certified, on network	\$272	\$1,286	\$7,175	\$7,422
Non pre-certified, on network	\$495	\$1,645	\$7,849	\$8,096



System Impact Study Discretionary Services Agreement

	ment ("Agreement") is made and entered into this date, E. Energy Houston Electric, LLC ("Company"), and to collectively as the "Parties."
to interconnect the DER described in the DER Application	mpleted DER Application dated [insert date of the Application] n with Company's distribution system. Before Company can nnection, Company must conduct a System Impact Study (as
In consideration of the mutual covenants set forth herein, t	the Parties agree as follows:
design requirements for interconnecting Customer's DER, a distribution system, including a steady-state power flow circuit analysis, flicker analysis, rapid voltage change analysis, and any additional transmission sensitivity analysis.	rees to conduct various studies to determine the technical and as described in the Customer's DER Application, to Company's and voltage drop analysis, equipment rating analysis, shortalysis, transfer trip and ground fault overvoltage protection is (collectively, the "System Impact Study"). The Company's constitutes the provision of discretionary services under the of Texas ("PUCT").
	rdance with Electric Reliability Council of Texas protocol IEEE standards, and the Company's own specifications and
Customer as a non-refundable payment for the Com	by the tariff study fee schedule) to be paid by the npany to perform the System Impact Study. Company omer's execution and delivery of this Agreement and will ner's study fee payment.
This Agreement becomes effective upon execution and paruntil the discretionary services described above have been	yment of the study fee and will thereafter continue in effect completed.
	established CenterPoint Energy's internal design and the interconnection option studied will also be provided to pleted.
•	ny or Customer of any obligation accrued or accruing prior in writing, the non-refundable discretionary service charge on study and construction cost estimate.
	ess and until it is signed by an authorized representative of mpany to provide, or entitle Customer to receive, any
Any modifications to the technical information and/or the must be submitted to CenterPoint Energy for re-study at ac	
IN WITNESS WHEREOF, the Parties have caused this Agauthorized representatives. CenterPoint Energy Houston Electric, LLC	greement to be signed by their respective duly
mythili chaganti BY:	RV.
PRINTED NAME: Mythili Chaganti TITLE: Manager, Distributed Energy	BY:



APPLICATION FOR INTERCONNECTION AND PARALLEL OPERATION OF DISTRIBUTED ENERGY RESOURCE

Customers seeking to interconnect on-site DER with the Company's Delivery System must complete and file with the Company the following Application for Interconnection and Parallel Operation of Distributed Energy Resources (DER).

Choose one

Return Completed Application to	0:
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Commercial_DG@centerpointenergy.com

CenterPoint Energy Houston Electric, LLC

Attention: Mythili Chaganti | Manager, Distributed Generation

Will	this	inter	conne	ction	/appl	icatio	n
		be	regis	tered	with	Ercot	?
			More	infor	matic	on her	e

Customer Information:

e:	Customer's Name:
):	Customer ESI ID:
s:	Business Address:
e:	Customer's Designated Representative:
s:	Customer Email Address:
r:	Telephone Number:
):	Service Point Address (GPS coordinates):
	Information Prepared and Submitted By: (Name and Address)
e:	Signature:

The following information shall be supplied by the Customer or Customer's designated representative. All applicable items must be accurately completed in order that the Customer's generating facilities may be effectively evaluated by CenterPoint Energy Houston Electric, LLC for interconnection with the utility system.

Date:



Generator Information:

Number of Units	
Inverter:	
Synchronous:	
Induction:	
Battery (Integrated):	
Manufacturer:	
Type (Synchronous, Induction, or Inverter):	Choose one
Fuel Source (Solar, Natural Gas, Wind, etc.):	Choose one
AC Kilowatt Rating (95° F at location):	
AC Kilovolt-Ampere Rating (95° F at location)	
Inverter:	
Synchronous:	
Induction:	
Battery (Integrated):	
Power Factor (PF):	
Voltage Rating (primary service metering) (kV):	Choose one:
Number of Phases:	Choose one



Do you plan to export power? (YES/NO)	Choose one
If Yes, maximum amount exported in kW at PCC:	
Do you wish CenterPoint Energy Houston Electric, LLC to report excess generation to your REP? (YES/NO)	Choose one
Pre-Certification Label or Type Number (e.g., UL-1741 Utility Interactive or IEEE 1547.1) (Check Box):	
Expected Energization and Start-up Date: (Drop-down Calendar or enter manually)	
Normal operation of interconnection (examples: provide power to meet base load, demand management, standby, back-up, sell excess, other (please describe):	
One-line diagram attached (YES/NO):	Choose one
For systems not using pre-certified inverters (e.g., inverters certified to UL- 1741 or IEEE 1547.1), does CenterPoint Energy Houston Electric, LLC have the generator specifications from the generator manufacturer? (YES/NO)	Choose one
If not, please explain: (Note: For pre-certified equipment the answer is Yes. Otherwise, applicant must provide the generator	
specifications if they are available. Layout Sketch showing lockable, "visible" disconnect device is attached (YES/NO):	Choose one
Has the customer specified conductor information and lengths on the One-line diagram? (YES/NO):	Choose one



Authorized Release of Information List

By signing this Application in the space provided below, Customer authorizes CenterPoint Energy Houston Electric, LLC to release Customer's proprietary information to the extent necessary to process this Application to the following persons:

	Name	Phone Number	Email Address
Project Manager			
Electrical Contractor			
Consultant			
Other			

(CenterPoint Energy Houston Electric, LLC)	(Customer Portion)
By: CenterPoint Energy Houston Electric, LLC	By:
Printed Name: Mythili Chaganti	Printed Name:
Title: Manager, Distributed Generation	Title:
Date:	Date:

Customer Signature	
Customer Signature	i

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If there are any questions, please call us at 713-945-4155
To submit applications via email, please use Commercial_DG@centerpointenergy.com

Commercial_DG@centerpointenergy.com

Application Addendum

Please provide	the	following	information	for the	aeneratina	facility:
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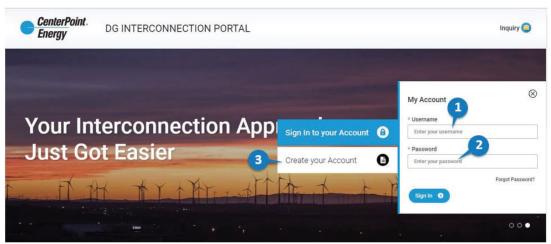
ESI ID (if applicable, found on electric bill):		
(For Solar (PV)	Only)	
Panel Wattage (Watts):		
Number of Panels / PV Arrays:		
Inverter Capacity (kW):		
Inverter Peak Efficiency Rating (%):		
Generation Capacity (DC kW Rating):		
Solar Generation Maximum Outputs (kW AC):		
Check if applicable) Maximum Request Export at PCC:		
<u> </u>		
(For Synchronous & Induc	tion Generators)	
Generation Maximum Output (PF):		
Generation Maximum Output (kW AC):		
Check if applicable) Maximum Request Export at PCC:		
(For Battery with Integrated Inverter	or Battery Energy Storage)	
Inverter Capacity (kW):		
Inverter Peak Efficiency Rating (%):		
Generation Capacity (DC kW Rating):		
Generation Maximum Output (kW AC):		



PUBLIC - Small Distributed Generation Project Application Submission Information

Login Page:

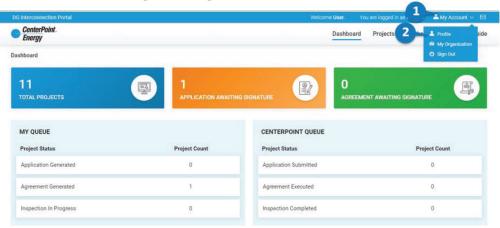
This will be the launching, Portal Page.



- 1. Enter Username.
- 2. Enter Password.
- 3. Create New account if not registered before.

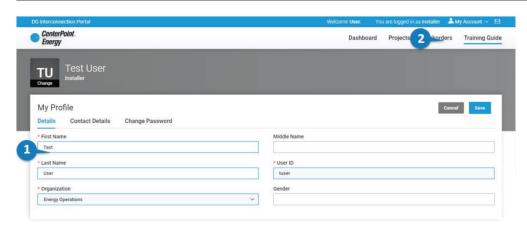
My Account Page:

This will be the launching Portal Page



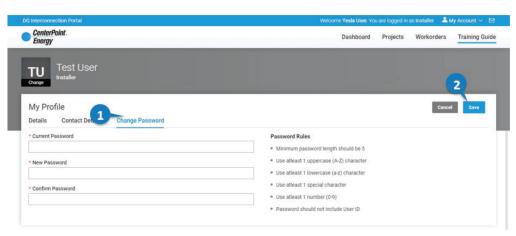
- 1. Click on the "My Account."
- 2. From the dropdown click on "Profile."

My Account - Profile Page:



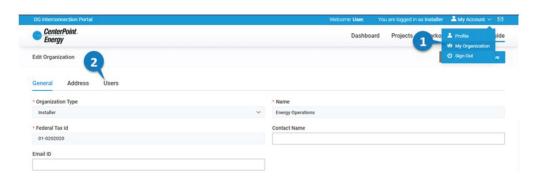
1. Users can change their First, Middle and Last name but UserID cannot be changed.

My Account – Change Password Page:

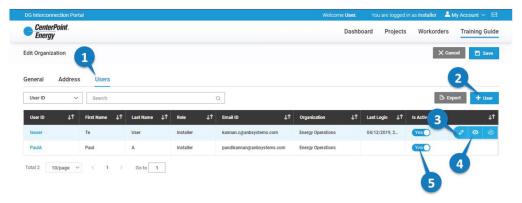


- 1. Navigate to "Change Password" to change your password.
- 2. Click on "Save" button to save your changes.

My Account – My Organization Page:



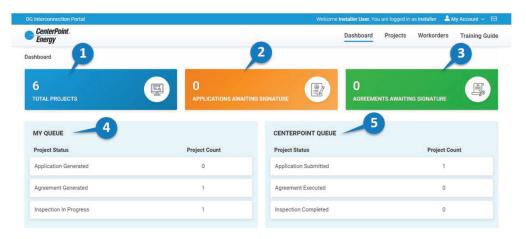
- 1. Click "My Organization" submenu from "My Account" menu.
- 2. Navigate to "Users" tab to see the list of users in the organization.



- 1. Navigating to "Users" tab to see the list of users in the organization.
- 2. New User can be added by clicking on "User" button.
- 3. User details can be modified using pencil icon.
- 4. User details can only be viewed using "eye" icon.
- 5. Users can be made active and inactive using this switch button.

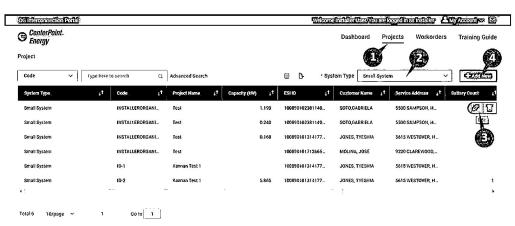
Dashboard Page:

This will be Installers Dashboard.



- 1. Total number of projects with respect to Installer's organization.
- 2. Total number of Tariff Applications awaiting Signatures.
- 3. Total number of Interconnection Agreements awaiting Signatures.
- 4. Action required from Installer for Projects (status wise).
- 5. Action required from CNP for Projects (status wise).

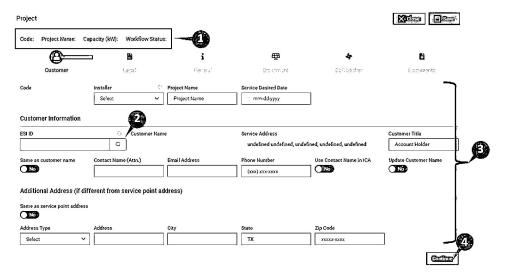
Project List Page:



- 1. After clicking on "Projects" Tab it will be redirected to Projects List Page.
- 2. System will allow Installer to choose type of system to be Installed (Small/Large Systems).
- 3. "Edit & Delete" icons will allow Installers to edit & delete Applications.
- 4. "Add New" button will allow Installers to create new applications.

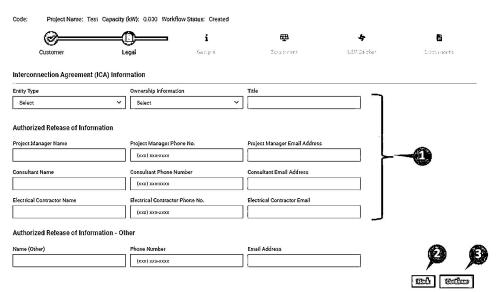
Customer Tab:

After clicking "Add New" it will redirect to Application page.



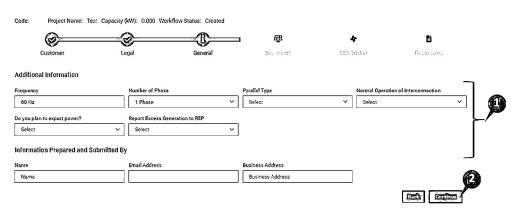
- Only after filling Customer's tab we will be getting the following details such as Name, Code, Status and Capacity.
- 2. Installer must enter ESI ID, House address and Service Zip Code of the customer to get the customer details.
- 3. Fill in all the mandatory details.
- 4. Click on "Continue" button to save all the details and proceed with consecutive tab.

Legal Tab:



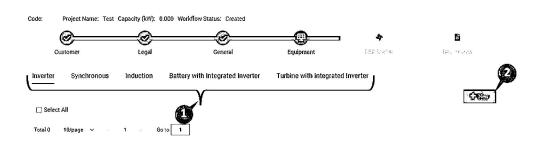
- 1. Fill in all the mandatory details.
- 2. Click on "Continue" button to proceed with consecutive tab.
- 3. Click on "Back" button to proceed with previous tab.

General Tab:

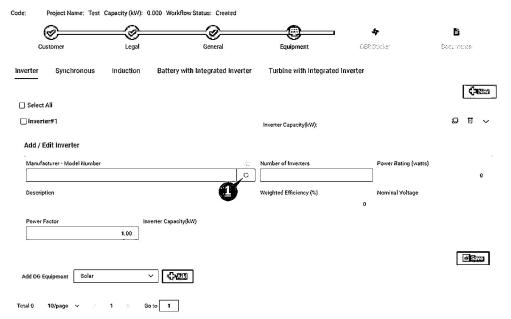


- 1. Fill in all the mandatory details.
- 2. Click on "Continue" button to save and proceed.

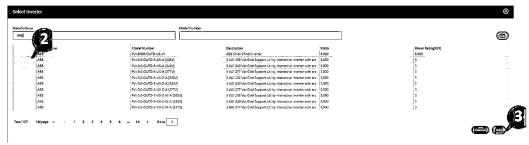
Equipment Tab:



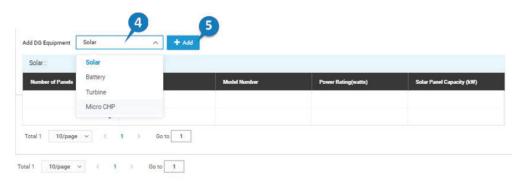
- 1. Select the Technology type.
 - a. Inverter
 - b. Synchronous
 - c. Induction
 - d. Battery with Integrated Inverter
 - e. Turbine with Integrated Inverter
- 2. Click on "New" button to add device.



1. Click on the Inverter search icon to select the type of Inverter to be added.



- 2. Select Inverter type.
- 3. click on "Add" button.

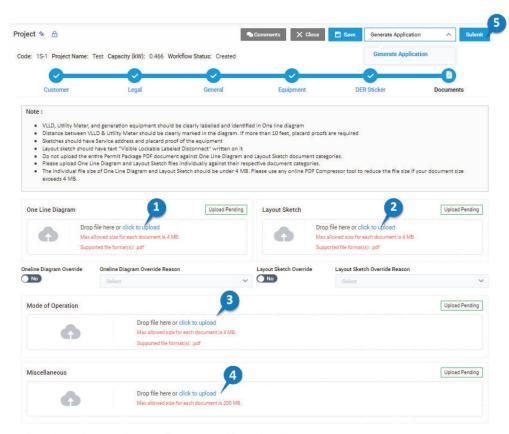




- 4. Select DC equipment such as Solar, Battery, Turbine, and Micro CHP (if required).
- 5. Click on "Add" button.
- 6. Click on "Continue" button to save and proceed.

Documents:

This information is required to submit a project application. This information and process must be authorized before further action can be planned.



- 1. Attach mandatory document One Line Diagram.
- 2. Attach mandatory document Layout Sketch.
- 3. Attach Mode of Operation depending on equipment used.
- 4. Attach optional Miscellaneous document.

- 5. Click on "Submit" button.
- One Line Diagram Please provide a one-line diagram illustrating the points of connection with components. Label the VLLD, Utility Meter, and generation equipment.
- Layout Sketch Please provide a layout sketch illustrating the birds eye view of the resident's property with the included equipment layout. Additionally, indicate the location VLLD/AC disconnect distance and additional components.
 - Sketches should include the Service address.
 - o <u>NOTE</u>: The VLLD/AC disconnect must be within 10 feet of the CNP utility meter.
 - NOTE: If VLLD/AC disconnect is farther than 10 feet and/or out of the line of sight of the Utility Meter please provide a placard.
- Attached below are visual examples for One Line Diagrams, Layout Sketch, and referenced PUC rules for residential applications:



Residential One Line Diagram Examp



Residential Layout Example Sketch EH.

<u>Electric Substantive Rules - Chapter 25 - 25.211 - Interconnection of On-Site Distributed Generation (DG)</u> (texas.gov)

- Mode of Operation Please provide contain information specific to the battery/batteries or Energy Storage System (ESS) and should describe how the battery inverter(s) and the batteries will operate with the electric utility grid (e.g., Backup only, partial backup, Self-Consumption, Savings/TOU, etc.).
 - o NOTE: Required for the use of batteries in the system
- Placard Should be permanent (not degraded in rain, sun, etc.), typically made of red phenolic material with white lettering. Including the below information.
 - Location of the Utility Meter.
 - o Location(s) of all AC disconnect switches (i.e., VLLD's).
 - An overview diagram of the property showing how to get from the Utility Meter to the AC disconnect, including all obstructions (e.g., gate/fence) as applicable.

Application Verification Process:

Used to verify the accuracy on documentation.

- Demonstrates excellent accuracy, resulting in smooth and rapid application.
- O Demonstrates decent accuracy, resulting in moderate application.
- ② Demonstrates the possible significant inaccuracy, resulting in a possibly concerning application.

Application Statuses Defined:

- Application Rejected:
 - The application needs to be revised to meet Standard, Specification, and Code requirements in order to be moved to the next step.

- May require a change to the One Line Diagram and/or Layout Sketch, and if so, the application can be resubmitted along with the revised design.
- If there is a change to the equipment (e.g., models, amounts), the application will also need to be regenerated & resigned after the application's design plans are revised.
- Application Submitted:
 - The application is officially in CNP's queue and is recognized to be reviewed.
 NOTE: Any application before this step is considered null (not yet submitted).
- Inspection In Progress:
 - The construction is ready to move forward. Installer should submit the application forward once more after: Construction is complete, City/AHJ inspection is complete (if applicable to location), and the design plans (i.e., both layout and line diagram) match the installation "as built".
- Inspection Submitted:
 - The application has been resubmitted to CNP's queue for review by the Installer, confirming the design plans (i.e., both layout and line diagram) match the installation "as built".
- COS/TPOS Agreement Awaiting Signature:
 - The e-Signature has <u>not</u> been signed by the customer. <u>NOTE</u>: For COS (Customer Owned System) interconnection agreements, the Interconnection Agreement (ICA) is only sent to the Customer's email for signature (not both Installer and Customer).

Inspection Submitted:

• For projects needing clarification and/or being self-installed, we require Inspection Photos of the projects to be submitted prior to proceeding with the inspection process. Please submit these under the "Documents" tab.



- 1. Attach photos to the correlating labels (House Number, Overview of Equipment, Utility Meter, etc.).
- Attach photos of labeled components from the one line (e.g., AC disconnect, combiner box, generation panel, gateway, junction box, etc.).
 NOTE: Provide photos of the inside and outside of the labeled components from the one line.

ATS information:

- For your safety and the safety of our employees, the automatic transfer switch (ATS) used by the generator must be reviewed and approved by CenterPoint Energy before installation of the standby generator. If you are working with a dealer, licensed electrician, or licensed contractor, they can help you get the correct documents for approval.
- Please follow this link for more information on the ATS: <u>Emergency Standby Generator Transfer</u>
 Switch Approval Application (centerpointenergy.com)

Misinterpretation:

- Separate ATS approval is required only for locations with a backup generator operating in open transition via Automatic Transfer Switch (ATS) which does <u>not</u> parallel/interconnect with the electric grid, transferring from/off the grid to the backup generator, as a replacement for grid service (e.g., in the event of a service outage).
 - A separate ATS approval is not required for solar/DG backup gateway devices that parallel with the grid and are incorporated in the solar/DG interconnection approval process.

SOAH DOCKET NO. 473-24-13232
PUC Docket No. 56211
EDF-RFI01-11 SmallScale DER Project Documentation - Header
Page 11 of 11

- Once the installation is complete, the meter does <u>not</u> need to be replaced.
 - Most all CNP meters are bi-directional and are programmed remotely to capture the
 <u>excess</u> generation from the home.
- Common issues that void an Interconnection Agreement (approval) after approval is already issued:
 - o If the Customer switches Retail Electric Provider (REP) <u>and</u> indicates, they are a moving in as a new homeowner (True Move-In).
 - If the service account holder (Customer) name on the account changes to an updated name, whether belonging to same/previous account holder or to a different/new account holder.

CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC PUC DOCKET NO. 56211 SOAH DOCKET NO. 473-24-13232

ENVIRONMENTAL DEFENSE FUND REQUEST NO.: EDF-RFI01-12

QUESTION:

Please describe the Company's service application process for current or prospective customers seeking to:

- a. Energize electric MHDVs that will not inject electricity into the Company's distribution system;
- b. Energize and interconnect electric MHDVs that, either alone or in conjunction with other behind-the-meter equipment, may inject electricity into the Company's distribution system.

ANSWER:

- a. CenterPoint Houston assigns MHDV customers a Distribution Account Consultant as a single point of contact throughout the project planning and service execution timeline to ensure consistent customer experience across service area. In addition, Major Underground Portal publishes a user guide to assist customers interacting with Major Underground Portal.
- b. CenterPoint Houston maintains and operates a complex distribution system that changes dynamically in a safe and reliable manner. The technical and operational information provided in the application form is modeled and studied for safe and reliable interconnection to CenterPoint Houston's distribution grid. The technical system impact study includes steady-state power flow, voltage drop analysis, equipment thermal capacity analysis, flicker analysis, transfer trip, ground fault overvoltage protection analysis, and any additional sensitivity analysis needed. It takes 4-weeks to conduct the technical analysis and provide a technical report and construction cost estimate for network upgrades. Depending on the scope of the project, construction takes about 8 to 12 months and another month for testing the inter-operability of the interconnecting equipment with the existing grid. Successful testing would lead to commissioning of the interconnecting equipment and issuing permission to operate from CenterPoint Houston.

SPONSOR:

Rina Harris/David Mercado

RESPONSIVE DOCUMENTS:

EDF RFI 01-12: MUG Portal - Customer User Guide.pdf

EDF RFI 01-12: 2024 CenterPointEnergy DER-Application Process-Overview.pdf EDF RFI 01-12: 2024 CenterPoint Energy Large DER Process (Over 50kW).pdf

CNP - Basic DER Process

Installations Larger than 50kW

1. Application:

- a. CNP receives completed application with one-line through web portal.
- b. Application is reviewed, and CNP determines if a study fee will be required.

2. Study:

- a. If a study is required, the customer is informed of the study fee cost, and additional information that will be required for the study.
- b. The study begins once CNP receives payment and all requested information.
- c. The interconnection study takes approximately 4 weeks.
 - i. NOTE: Sometimes, there is further information requested extending this timeframe.
- d. Upon completion of the study, CNP will inform the customer of the outcome.
- e. Following the study, (if required) an estimated cost will be provided. This is typically provided within three weeks of study outcome.
 - i. NOTE: CNP will provide the estimated cost for equipment to be purchased and installed by CNP. However, there will be additional equipment required at the customer location. This will need to be procured and installed by the customer.

3. Construction

- a. CNP receives an upfront payment for the estimate provided as well as the signed estimate agreement.
- b. If upgrade to pad mounted transformer is required, there is a lead-time (variable) on these transformers. (Historically 18 to 24 weeks, though this may not be accurate to present day).
- c. If Transfer Trip is required, CNP Telecom performs a path loss study to determine the communication options. CNP begins the equipment procurement process, and construction is scheduled.
 - i. NOTE: The lead time for transfer trip is approximately 12 months.
- d. Customer procures necessary equipment and installs at their location.
- e. Construction is completed.

4. Inspections:

- a. Transfer Trip (if applicable):
 - i. CNP will test the transfer trip scheme with the customer.
- b. Customer relay testing & site inspection:
 - PRIOR TO ACTUAL SYNCRONIZATION WITH THE CNP GRID, a field inspection will be conducted to witness relay testing and confirm that it meets PUC & CNP requirements.
 - ii. CNP will also verify that the installed equipment matches the information provided in the application and study documentation.
 - iii. The customer provides CNP with test report from the third party testing agency documenting the results of the test.

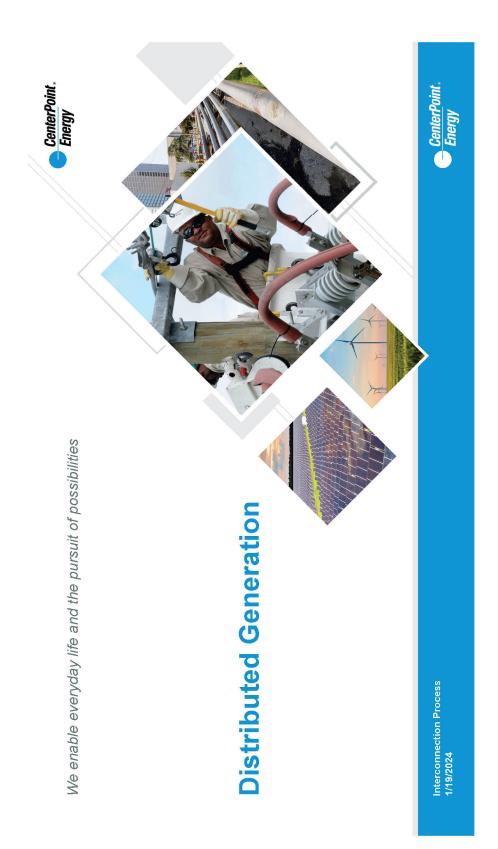
5. Interconnection Agreement

- a. An interconnection agreement will be prepared and must be signed by the customer.
 - i. NOTE: This occurs in parallel with construction.

6. Approval to Run

- a. Upon completion of these steps, CNP will notify/provide the customer with:
 - i. A copy of the fully executed interconnection agreement.
 - ii. A letter stating that the DG is officially granted permission to operate.

2024 CenterPoint Energy Large DER Process (Over 50kW).docx





Inverter	Battery	DG	SODG	DGR/DESR
	Solar	9	SODG	DGR
	Wind	DG	SODG	DGR
	Landfill Gas	90	SODG	DGR
Induction	Natural Gas	8	SODG	DGR
	Hydro	DG	SODG	DGR
ns	Landfill Gas	DG	SODG	DGR
Synchronous	Natural Gas	DG	SODG	DGR
0,	Diesel	9	SODG	DGR
Technology / Fuel Source		ERCOT MW as DER	Self Dispatched	Dispatched by ERCOT
		Unregistered w/ ERCOT Typically, < 1MW/ CNP refers these as DER	Registered w ERCOT Typ. 1MW to 10MW	

SODG – Settlement Only Distribution Generation D not actively participate (no bidsiodiers) in the ERCOT wholesale markets Setf-deployed (can chase prices)	- Can reduce demand charges (4CP) if behind a Load meter on 4CP fariff - Any learn-loogy (including storage) that can rised into the Point of Common Coupling (PCC) on the DPs system.	DGR – Distribution Generation Resource DESR-Distribution Energy Storage Resource (NPRR 995 in flight) - Resource that adverse participates (submits betsofters, teemetry, COP, etc.) in ERCOT witholesale markets.	- Will have Resource Node Settlement Point on the modeled transmission grid - Any technology (induding storage) that can inject into the Point of Common Coupling (PCC) on the OSP-System • Examples of SODG, DGR and DESR technologies:	Reoprocating Engines (Desel or Natural Gas) Community or commercial Solar Li-lion Battery
Distributed Generation	Relevant Definitions from Protocol Section 2 Distributed Generation	An electrical generating likeling located as a consomer's point of delivery (point of common coupling). To megawatts (JAM) or less, and connected is a voltage less than or equal to to blackous (KV, which may be connected in parallel operation to the utility system. Generation Presource Agentatic report of Presource of the Architect of the RROIT system and a registered with EROIT as a Generation Resource Agentatic capable of provide governor.	Distribution Generation Resource (DCR) Advertise Resource corrected to the Calculation System the effect. Consume that All action to expense and not Act of the consumer and PCM is a selectment of 1 General new and fifth that of the expense as a consumer that act of 1 General new and fifth that of the expense is a generator the cours in particular new 1997) measure.	eldresource

Source: https://www.ercd.com/services/rg/re/dgresource

Application Process - Small Scale DG/DER



< 20kW Residential

20 to 500kW Small Business/Commercial

Customer will submit an **initial application** through **web portal** (Need an established service ESLID)

nttps://plus.anbetrack.com/cnp-dg/#/

- If no existing service, e-mail Residential.dg@centerpointenergy.com or commercial dg@centerpointenergy.com for a paper application copy
- CenterPoint Energy will review the application and follow-up with DER Design Specification & Study fees

Refer to Slide 5 for Technical Study Criteria Matrix & Timeline

Renewable - Wind, Solar

Refer to CNP Tariff for Study Fees

- After receiving the study fees, CenterPoint Energy will perform the System Impact Study. The study results along with Construction Cost Estimate will be provided
- A signed construction agreement along with receipt of construction estimate payment will kick-off construction activity

Refer to Slide 5 for Construction Timeline

 After CenterPoint Energy and customer's site construction activity is complete, customer will schedule witness testing

Refer to Slide 5 for Testing Timeline

 CenterPoint Energy will issue Interconnection Connection Agreement (ICA) & Permission to Operate (PTO) after successfully commissioning the project site

¢

Alternate Technology (Storage) – Electric Vehicle, Battery

Application Process - Large Scale DG/DGR/DESR

Renewable - Wind, Solar

文.



Alternate Technology (Storage) – Electric Vehicle, Battery

Unregistered w/ ERCOT yp. < 1MW

Registered w/ ERCOT Typ. < 10MW

CenterPoint.

- Typically, for these requests, a customer requires to establish a service
- E-mail commercial dg@centerpointenergy.com for an initial screening discussion
- screening discussion, review the application process, and follow-up with Pre-screen CenterPoint Energy will schedule a one-on-one virtual Application
- CenterPoint Energy will perform the pre-screen study and will share the results
- After customer indicates to move forward CenterPoint Energy will send a paper application copy, DER Design Specifications, Service Standards & Study fees

Customer will contact Service Center or MUG Engineering for OH/Underground Primary Service

- After receiving the study fees, CenterPoint Energy will perform the System Impact Study The study results along with construction cost estimate, and draft Interconnection Agreement (ICA) will be provided
- receipt of construction estimate payment will kick-off construction activity An executed Interconnection Agreement along with
- After CenterPoint Energy and customer's site construction activity is complete, customer will schedule witness testing
- CenterPoint Energy will issue Permission to Operate (PTO) after successfully commissioning the project site

CenterPoint.	Energy	Witness Testing & Commissioning (Demonstrate	successful performance of protective functions) 4-6 Weeks*	Z	>	>-	>
		Construction (Includes timeline for OH/UG	Primary Service if needed)	0-2 Mo.	2-8 Mo.	8-12 Mo.	12-18 Mo.
	System Impact Study & Cost Estimate (Inc. Sys.		Protection, Stability & Dynamic) 21-24 Weeks*	Z	Potential Y	>-	>
			Feeder Margin	Z	λķ	A A	λίτ
	teria for Small/Large Scale DER (OH/URD) Planning / Loading Device Rating Facility Ratings < 1 Week* 4-6 Weeks*	Series Elements Rating	z	Pre-Screening Study	Z A	Pre-Screening Study	
		P. P.	N/W TR Config & Loading	z	Pre-	Ν	Pre
	riteria for Sm (OH/URD) Device Rating			>-	>	N A	Ψ Z
	Technical Study Crit Grid Connected Capacity		< 20kW Small Scale Residential	20 to 500kW Small Scale Commercial	500kW to 1MW Large Scale	> 1MW upto 10MW Large Scale DG/DER/DGR/DESR	

- Study Criteria Technical Reference Documents:
 ERCOT Nodal Operating Guides/Protocols
 NESC, IEEE 1547 2018, NEC
 PUCT Substantive Rules 25.211, 25.212
 CNP Design Specification Rev 4, CNP Primary Service Standard Rev 9, CNP Service Standards (4/2023), CNP Telemetry Specification Rev 1

Distributed Generation Interconnection Process



SOAH DOCKET NO. 473-24-13232 PUC DOCKET NO. 56211 EDF-RFI01-12 MUG PORTAL CUST User Guide ATTACHMENT Page 1 of 88

MUG Portal External Customer User Guide

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General Information

This document describes how to use the MUG Portal to register users and manage projects, initiating a new project, accepting projects terms, requesting inspections, tracking CenterPoint Energy construction and installations, primary and secondary cable pulls, and energization. It also describes extra features to manage projects from start to finish.

Account Registration and Management

If you do not have a registered account, the first step is registering your user account. Once your user account is registered, you can access the Portal.

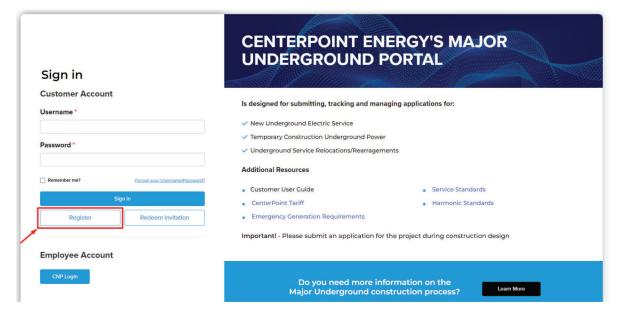
There are two ways to register in the Portal:

- Register an external customer account
- Redeem a user registration invitation

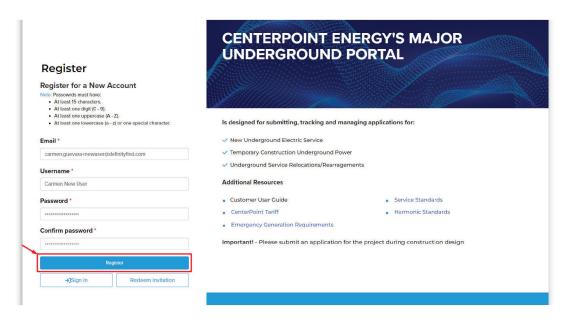
When a user is registered, the default role assigned is External Customer.

Registering an external account

On the login page, click on the "Register" link to register for a new account in the Portal.



- Enter the required information and then click on the "Register" button.
 - o Email
 - Username
 - Password
 - At least 15 characters.
 - At least one digit (0 9).
 - At least one uppercase (A Z).
 - At least one lowercase (a z) or one special character.
 - Confirm password



 A registration notification will be sent to the email provided. Select the CNP Portal URL to visit the MUG Portal Sign In page and start to update your information at the Profile option.

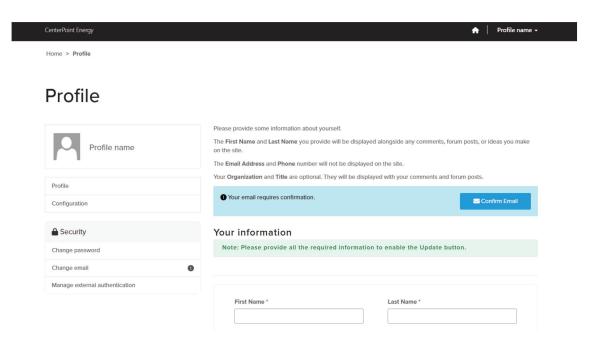
Hi,

Your account now has a role assigned. Click on the link to access to the portal:

CNP Portal.

Best Regards,

CenterPoint Major Underground team



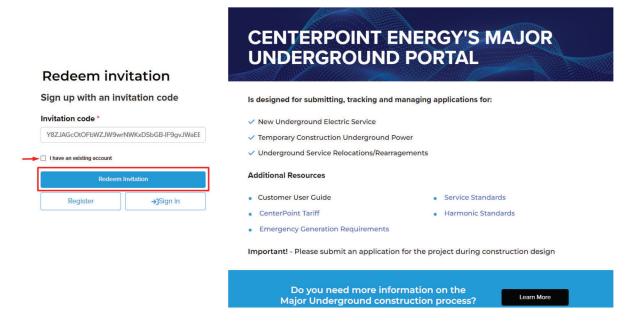
Register a user through an invitation

You can register your user account to the Portal with an invitation, which will be sent by a Manager from the Portal, through the following steps.

Click on the "Redeem your invitation!" link, and it will take you to the Portal.

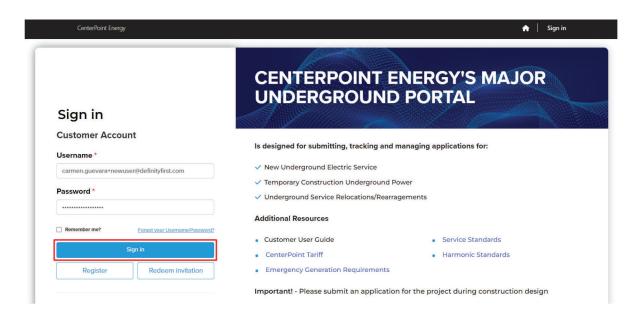


• The invitation code will be already there; click on the Register button to register to the Portal; if you are already registered, select the option "I have an existing account."

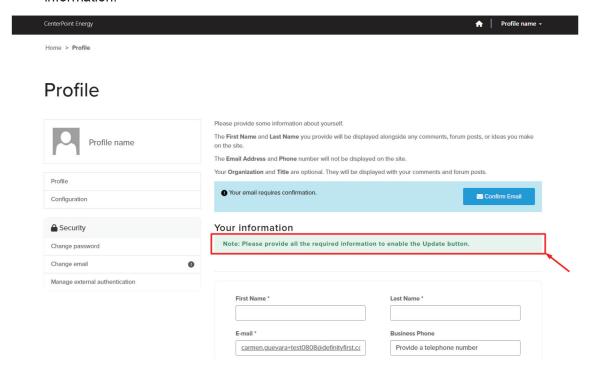


Updating user profile

On the login page, enter the required information and click on the "Sign in" button.

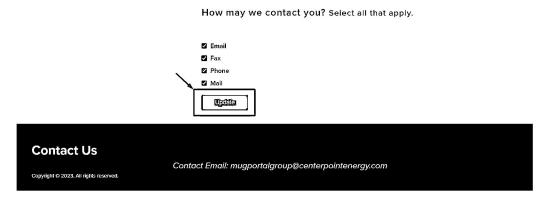


• If you are a new user, a message will be displayed for you to complete your profile information.



Provide the required information and click the "Update" button.

CenterPoint Energy		name +
Home > Profile		
Profile		
TTOTIC		
	Please provide some information about yourself.	
Profile name	The First Name and Last Name you provide will be displayed all on the site.	ongside any comments, forum posts, or ideas you make
U U	The Email Address and Phone number will not be displayed on	the site.
Profile	Your Organization and Title are optional. They will be displayed	with your comments and forum posts.
Configuration	Your email requires confirmation.	Confirm Email
Security	Your information	
Change password	Note: Please provide all the required information to	enable the Update button.
Change email		
Manage external authentication		
	First Name *	Last Name *
	E-mail *	Business Phone
	carmen.guevara+test0808@.definityfirst.cc	Provide a telephone number
	Organization Name	Title
	Nickname	Web Site
	User Name *	
	Carmen Tests	
	A dalua aa	
	Address	
	Street 1	Street 2
	Street 3	city
	State/Province	ZIP/Postal Code
	Public Profile Copy	



- Click the "Confirm Email" button.
- A confirmation notification will be sent to the email provided.
- Use the link provided in the notification to confirm your email registration.

Your account requires confirmation. Please click the following link to complete the registration.

Complete Registration

Or you can copy the following URL and paste it into your web browser.

https://cnpmugportal.powerappsportals.com/Account/Manage/ConfirmEmail?userId=35d69e65-9fa0-ed11-aad1-000d3a190ed5&code=iZjoVsA6Y11RqxuvbRqkHKgO6EEWGf71NnFhREEtwHD1VI6Wn943B0K8VKpLcR7fxMfPs248DnFUX67XnHKdR1elqVrALpbc7acZ8TX15C5cR1VAV9d6AvOYIoVi0FWtKO82aA7d3M3iwwPyyVgrWg5u6%2FHaTFc0mzMG79DaQVIm7SBSsXewjDOxEyVFq%2Bs%2B

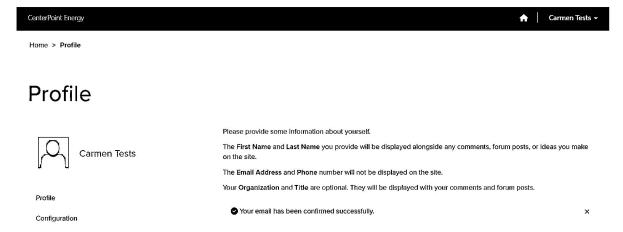
If you believe you received this email in error, please contact Customer Service for assistance.

Please do not reply to this message. This email address is not monitored so we are unable to respond to any messages sent to this address.

Thank You,

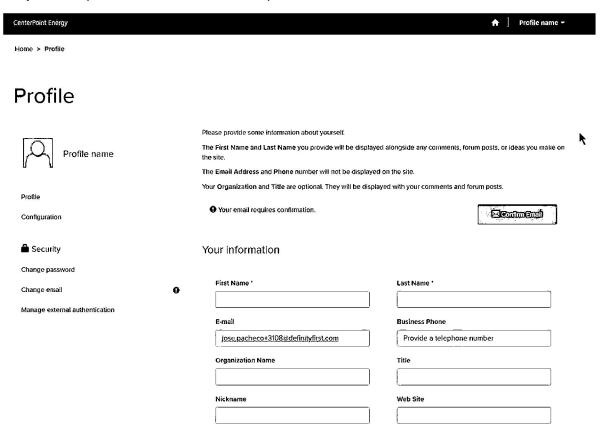
Customer Service

A success message will be displayed upon confirming the email.



Editing a profile

• When the registration is done, you will be redirected to the Profile editing screen, where you must provide all the information required on the tab Profile

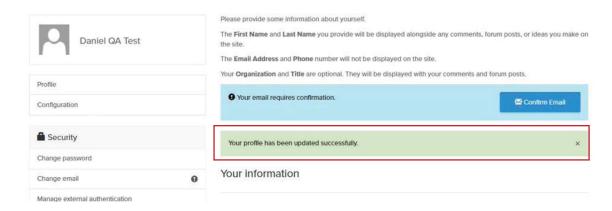


 When all the information required is fulfilled, click on the Update button. A notification will be shown stating that the profile has been updated successfully



A notification will be shown as the profile has been updated successfully

Profile

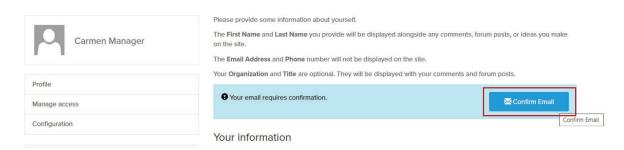


Confirm Email

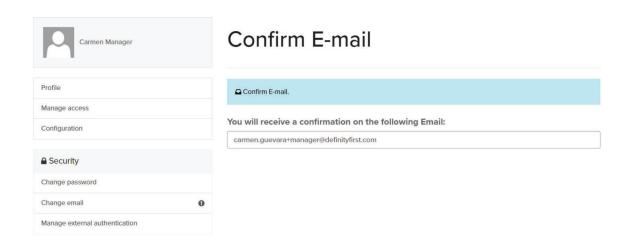
 To confirm your email, go to the Profile editing screen and select the Confirm Email button



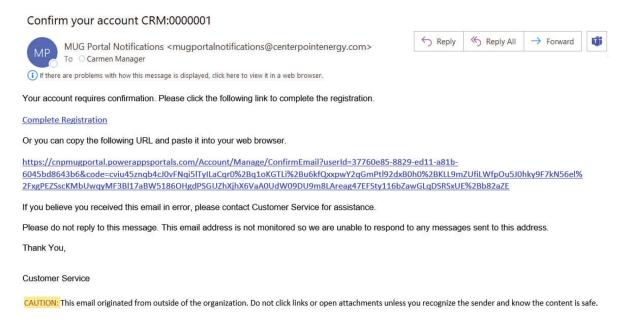
Profile



 You will be redirected to the Confirm E-mail screen. You can confirm where the confirmation email will be sent on this screen.



You will have an email notification where a URL to confirm your email will be shown.



 Click on the Complete Registration URL or copy the URL sent and paste it into the web browser.

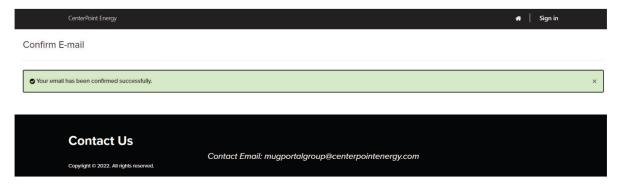
Your account requires confirmation. Please click the following link to complete the registration.

Complete Registration

Or you can copy the following URL and paste it into your web browser.

https://cnpmugportal.powerappsportals.com/Account/Manage/ConfirmEmail?userId=37760e85-8829-ed11-a81b-6045bd8643b6&code=cviu45znqb4cJ0vFNqi5lTylLaCqr0%2Bq1oKGTLi%2Bu6kfQxxpwY2qGmPtl92dxB0h0%2BKLL9mZUfiLWfpOu5J0hky9F7kN56el%2FxgPEZSscKMbUwqyMF3Bl17aBW5186OHgdPSGUZhXjhX6VaA0UdW09DU9m8LAreag47EFSty116bZawGLqDSRSxUE%2Bb82aZE

 You will be redirected to the Profile editing screen, where a message will be shown stating that your email has been confirmed successfully.



Change password

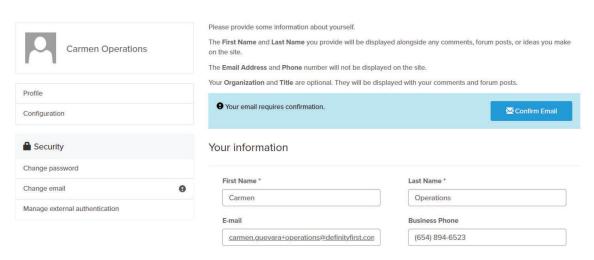
 Log into the account for which you would like change the password. You will be redirected to the Dashboard screen. On the name of the account, select the dropdown arrow menu. The options Profile, Configuration, and Sign out will be shown.



Select the Profile option. You will be redirected to the Profile editing screen.

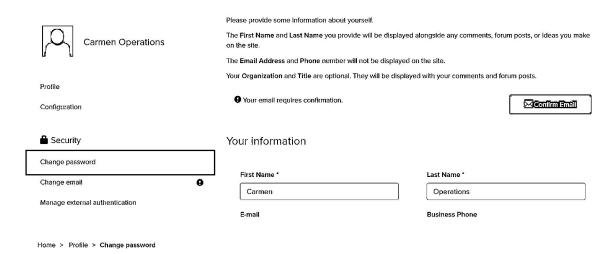
Home > Profile

Profile



 Select the Change password option and provide the old and new password you want to change.

Profile

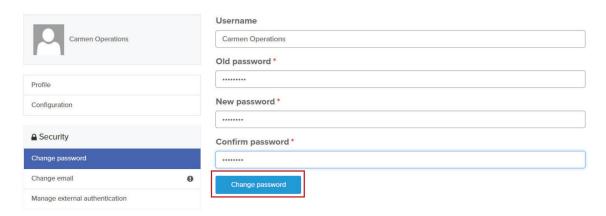


Change password



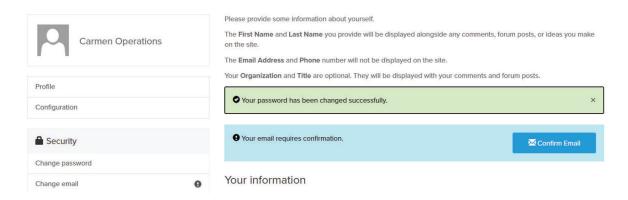
When all the information required is fulfilled, click on the Change password button.

Change password



A notification will be shown once your password has been changed successfully.

Profile



Change email

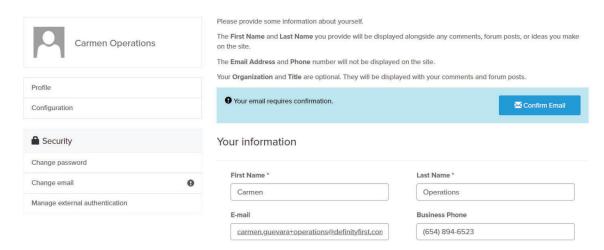
Log into the account for which you would like to change the email. You will be redirected
to the Dashboard screen. On the name of the account, select the dropdown arrow menu.
The options Profile, Configuration, and Sign out will be shown.



Select the Profile option. You will be redirected to the Profile editing screen.

Home > Profile

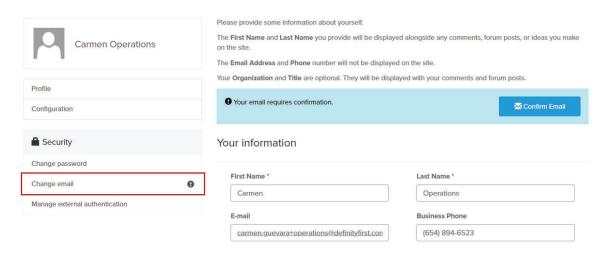
Profile



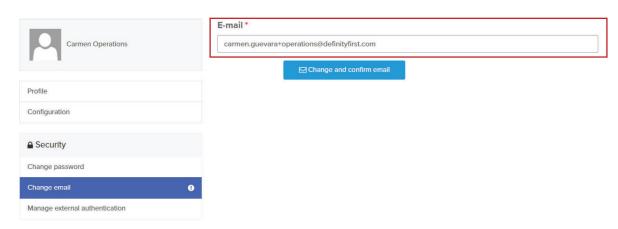
Select the Change email option and provide the new email address to change.

Home > Profile

Profile

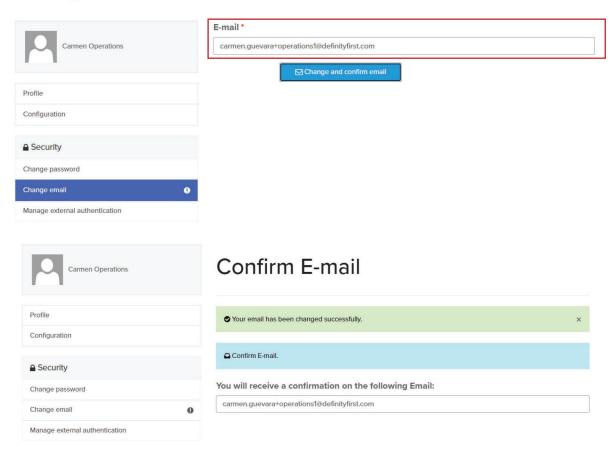


Change email



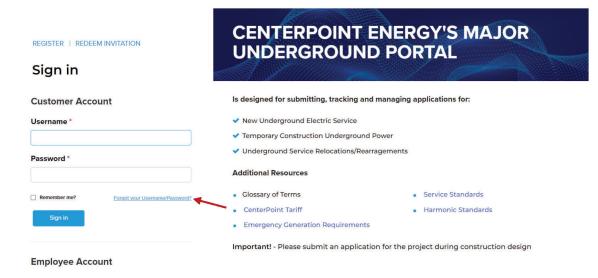
 Click on the Change and confirm email button. A message will be shown that your email has been changed successfully

Change email



Password Reset

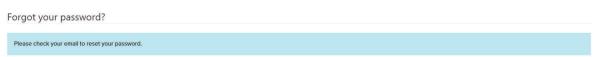
 On the login page, click on Forgot your Username/Password? The link below is the Password option.



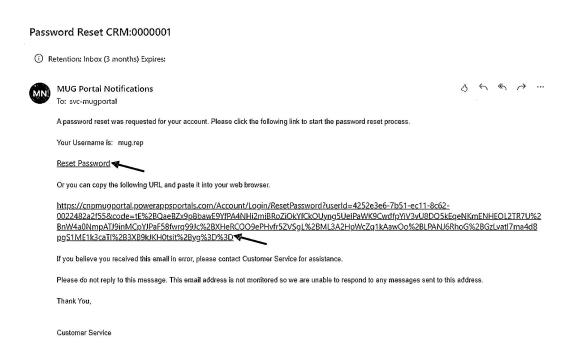
Provide the email address you used to create your account and click on the Send button.



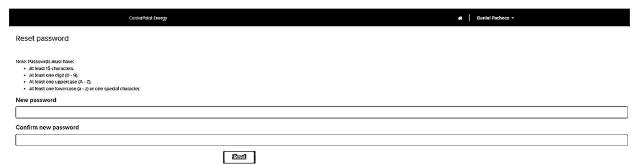
A notification to check your email to reset your password will be shown.



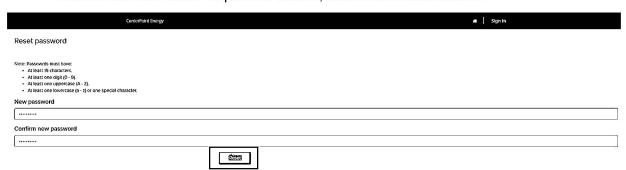
 An email notification will be sent to the email address provided; select the Reset password option.



You will be redirected to the Reset password screen. Provide and confirm your new password.



When all the information required is fulfilled, click on the Reset button.



A notification will be shown once your password has been changed successfully.

	CenterPoint Energy
Reset password	
Your password has been reset.	
- Carlotto	

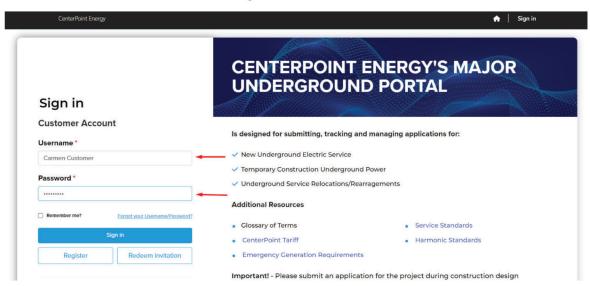
Dashboards views

Dashboard views as External Customer

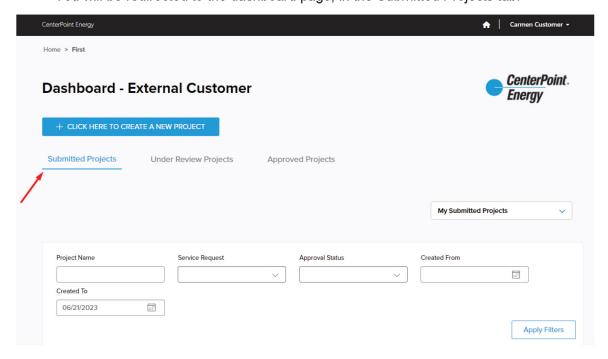
Getting to Unsubmitted Projects as External Customer

<u>Unsubmitted Projects</u>: Project applications that are in progress but not submitted.

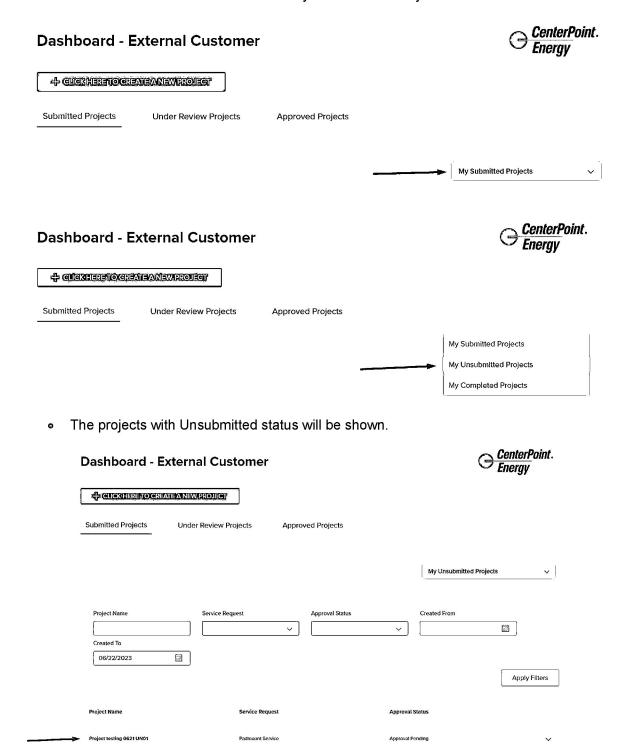
Enter the MUG Portal site and log in as an External Customer.



You will be redirected to the dashboard page, in the Submitted Projects tab.

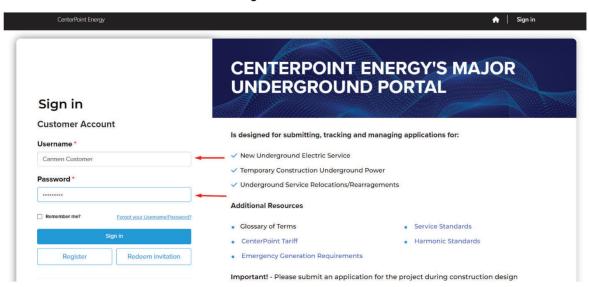


• Select the Views filter and click on My Unsubmitted Projects.

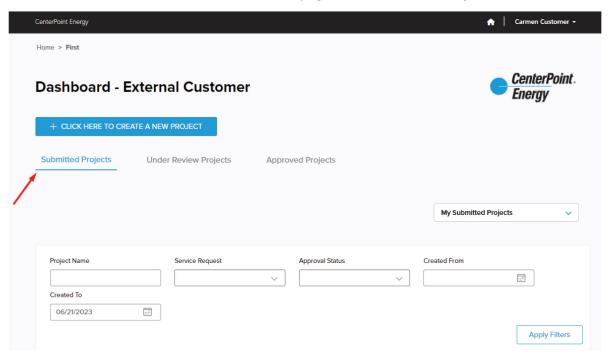


Getting to Submitted Projects as External Customer

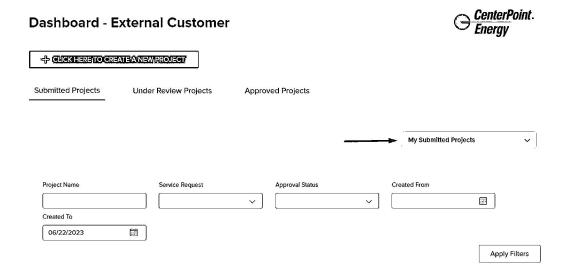
Enter the MUG Portal site and log in as an External Customer.



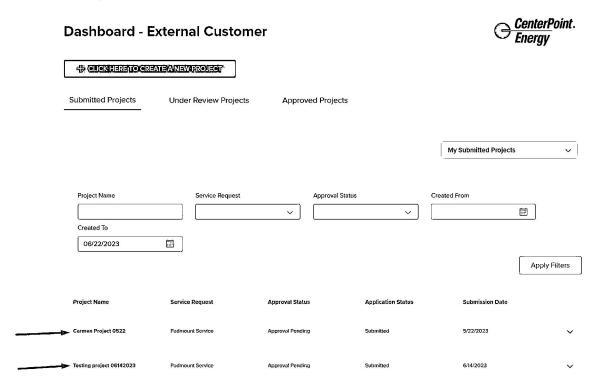
You will be redirected to the dashboard page, in the Submitted Projects tab.



• The default option selected in the Views filter is "My Submitted Projects."

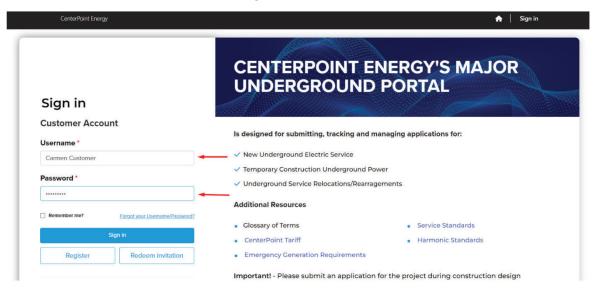


• The projects with Submitted status will be shown.

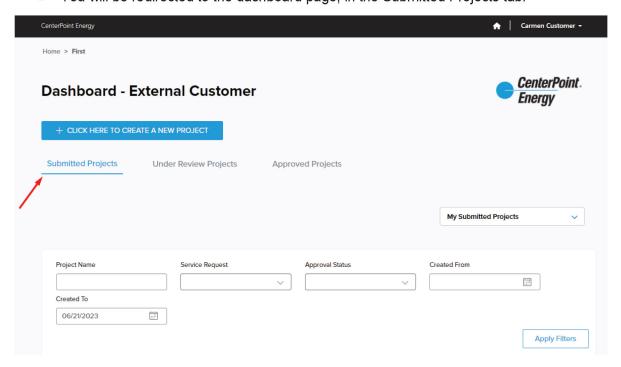


Getting to Rejected Projects as External Customer

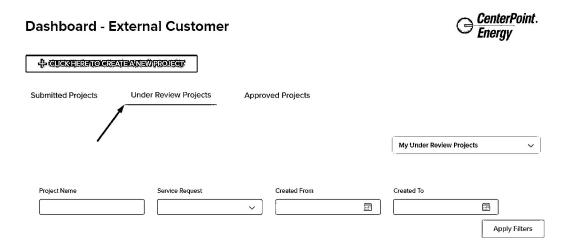
Enter the MUG Portal site and log in as an External Customer.



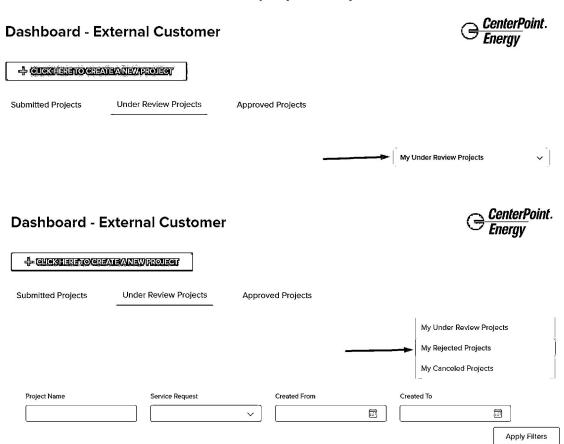
• You will be redirected to the dashboard page, in the Submitted Projects tab.



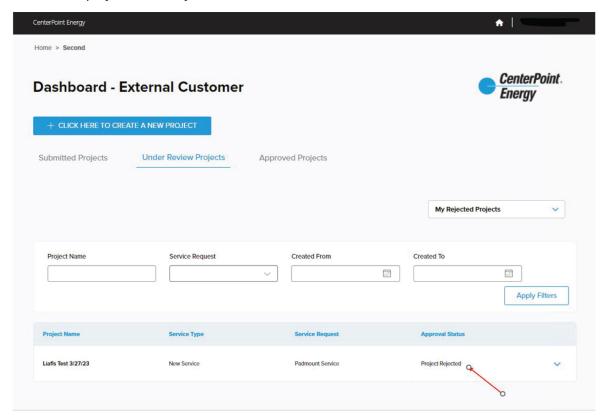
Select the Under Review Projects tab.



• Select the Views filter and click on My Rejected Projects.

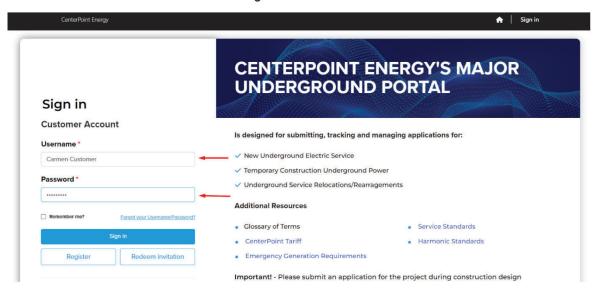


The projects with Rejected status will be shown.

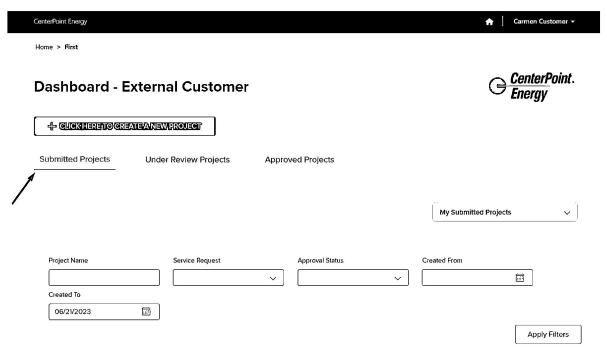


Getting to Approved and Accepted Projects as External Customer

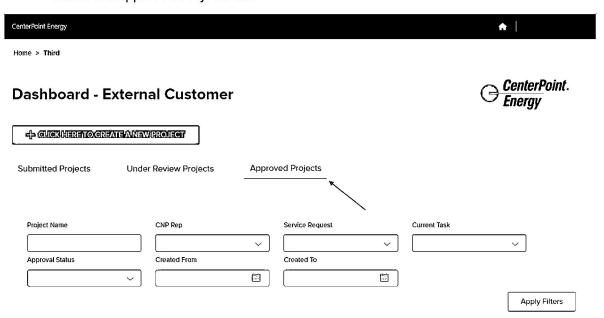
Enter the MUG Portal site and log in as an External Customer.



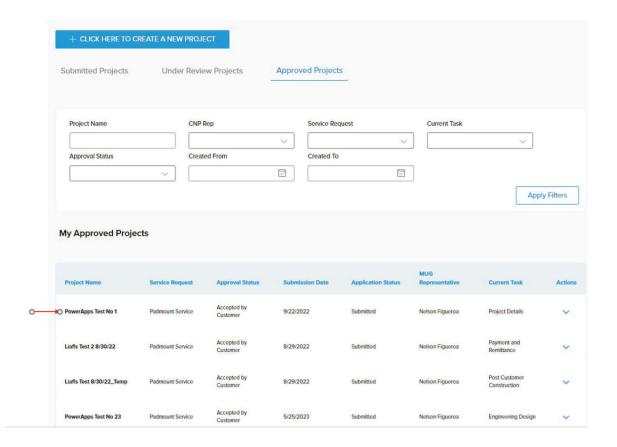
You will be redirected to the dashboard page, in the Submitted Projects tab.



Select the Approved Projects tab.

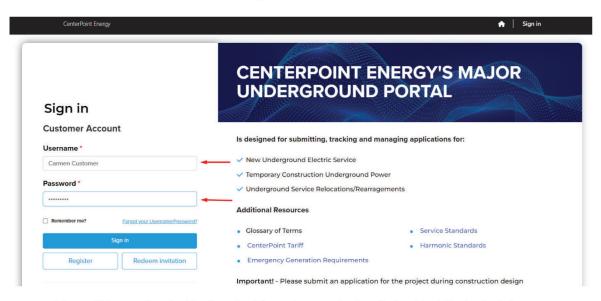


The projects with Approved and Accepted status will be shown.

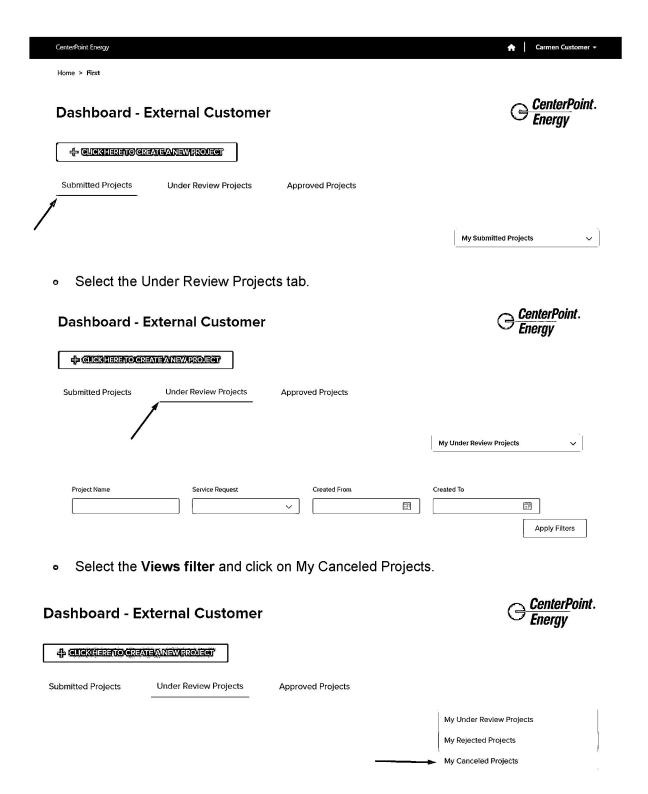


Getting to Canceled Projects as External Customer

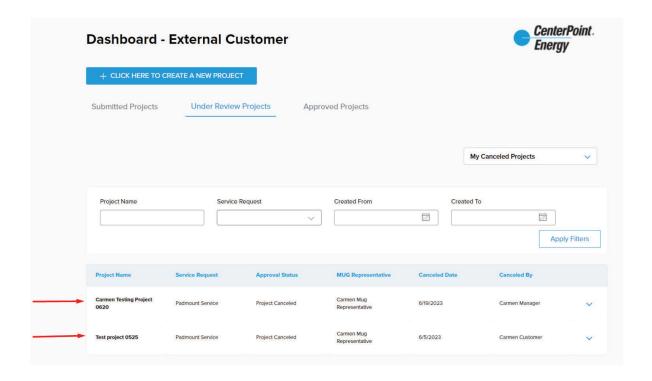
Enter the MUG Portal site and log in as an External Customer.



• You will be redirected to the dashboard page, in the Submitted Projects tab.

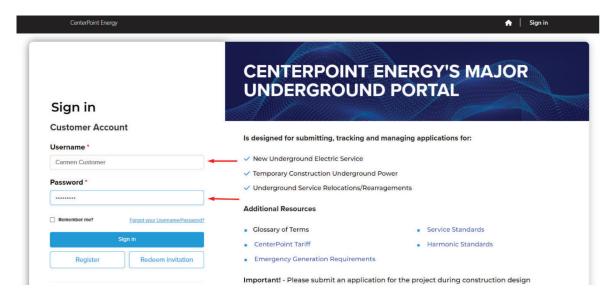


The projects with Canceled status will be shown.

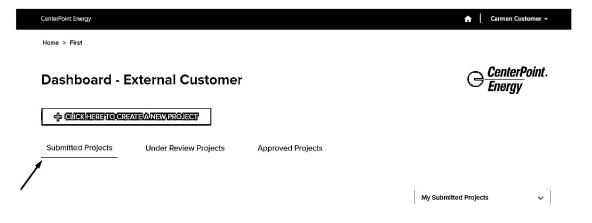


Getting to Completed Projects as External Customer

Enter the MUG Portal site and log in as an External Customer.



• You will be redirected to the dashboard page, in the Submitted Projects tab.



Select the Views filter and click on My Completed Projects.

Dashboard - External Customer

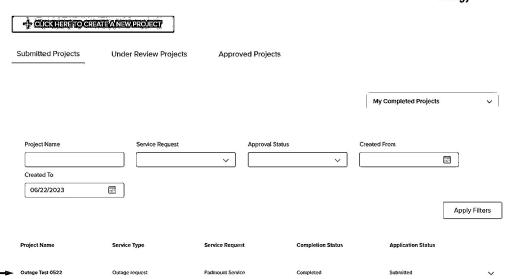




• The projects with Completed status will be shown.





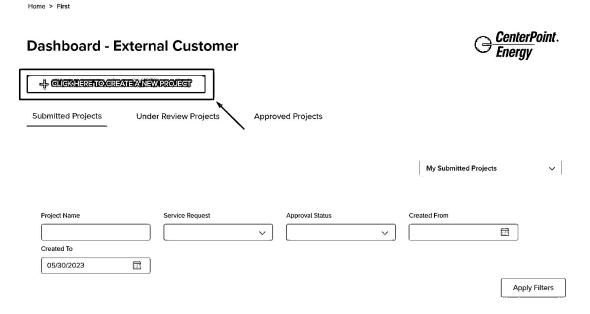


Project initiation and acceptance

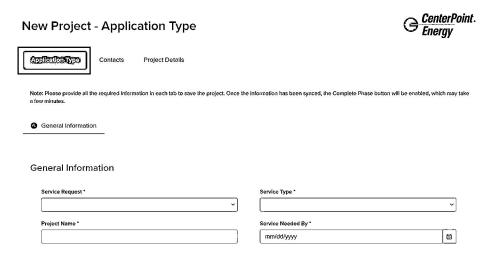
The process for creating a project and beginning its review and approval process is described below.

Start new service project

 On the Dashboard screen, click the "+CLICK HERE TO CREATE A NEW PROJECT" button



- You will be redirected to the "New Project Application Type" screen.
- Provide the required information in the "Application Type" / "General information."



Service Request Options

New Service: Providing service to a new building.

Existing Service: Providing a second point of service to an existing building.

Outage Service: When requesting a shut-down to an existing service for customer maintenance, adding a meter to an existing gutter, adding secondary cable to an existing service at the service transformer.

Service Type Options

Padmount Service: When requesting a service from a padmounted equipment (Transformer or Primary Meter).

Vault Service: When requesting service from a padmounted equipment inside a dedicated room in a building.

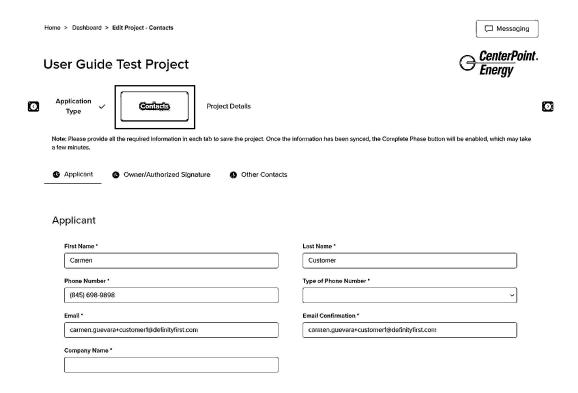
Feeder Service: When requesting overhead lines to be converted to underground lines. This option does not include any service equipment like transformer or switches.

• When all required information is populated, click on the "Complete Phase" button.

General Information



• You will be redirected to "Edit Project – Contacts". The Applicant information will be populated by the information of the user creating the project.



• In the Contacts phase, provide all the information required in each tab: Applicant, Owner/Authorized Signature, Other Contacts. When all required information is provided, the tab will be marked as completed.