Rate R-EV Rate Summary

		Propoposed Rates (7/1/22)
	CC	$ 16.50
Peak	Distribution	$0.08916
	Transmission	0.08979
	RRA	-0.00032
	SCRC	0.00360
	SBC	0.00863
	ES	0.18924
	Total Price	$0.38010
Off Peak	Distribution	$0.04315
	Transmission	0.01747
	RRA	-0.00032
	SCRC	0.00360
	SBC	0.00863
	ES	0.08919
	Total Price	$0.16172
Δ price (time varying)		$0.21838
Δ price (all)		$0.21838

Peak Design Usage	17.5%
Off-Peak Design Usage	82.5%
Peak Period Duration (hours)	5
Peak Period	2 pm - 7 pm
Peak Days	M-F x/holidays

Rate R-EV - Proposed Rate Design

I. Rate Design Revenue Requirements

Distribution			Average Rate
	Total	$ 248,281,391	
	Customer*	(169,679,589)	
	Volumetric	$ 78,601,802	$ 0.02499
Transmission		$ 94,695,072	$ 0.03011
Generation		$ 335,536,938	$ 0.10669
* includes local fixed costs of		$ 82,406,733	

II. Marginal Costs - Summer; 5 hours, 2 pm to 7 pm

	Peak	Off-Peak	MC Differential
	($/kWh)	($/kWh)	($/kWh)
Distribution (system level)	0.02102	0.00121	0.01981
Transmission	0.07727	0.00495	0.07232
Generation	0.13761	0.03756	0.10005
	0.15863	0.03877	0.11986

Rate Design Average Rate ($/kWh, for MC-based design)	
Distribution	0.02499
Transmission (design)	0.03011
Generation	0.10669

III. TOD Rate Design

Peak Period: Summer; 5 Hours (2 pm - 7 pm)

Rate Design Billing Determinants

	kWh Usage		
	Peak	Off-Peak	Total
	549,957,946	2,595,012,889	3,144,970,835
	17%	83%	

MC-based Rate Design - Step 1			Δ price
Distribution	$ 0.04134	$ 0.02153	$ 0.01981
Transmission	$ 0.08979	$ 0.01747	$ 0.07232
Generation	$ 0.18924	$ 0.08919	$ 0.10005
Sum	$ 0.32037	$ 0.12819	$ 0.19218
CC Adder 1 - peak (peak kWh fixed cost allocation)	$ 0.02620	$ -	
CC Adder 2 - all hours (residual)	$ 0.02162	$ 0.02162	

MC-based Rate Design - Step 2			Δ price
Distribution	$ 0.08916	$ 0.04315	$ 0.04601
Transmission	0.08979	0.01747	0.07232
Generation	0.18924	0.08919	0.10005
Sum	$ 0.17895	$ 0.06062	$ 0.11834

Revenue Proof			
	$ 49,036,100	$ 111,976,079	$ 161,012,179
	$ 49,380,724	$ 45,329,012	$ 94,709,736
	$ 104,074,042	$ 231,453,969	$ 335,528,010

Rate R-EV Bills
17% On-peak/83% Off-peak

(A)	(B)
USAGE	TOTAL MONTHLY BILL
TOTAL ENERGY (kWh)	PROPOSED
10	$ 18.49
20	$ 20.48
30	$ 22.47
40	$ 24.45
50	$ 26.44
60	$ 28.43
70	$ 30.42
80	$ 32.41
90	$ 34.40
100	$ 36.38
200	$ 56.27
300	$ 76.15
400	$ 96.04
500	$ 115.92
600	$ 135.81
700	$ 155.69
800	$ 175.58
900	$ 195.46
1,000	$ 215.34

	Proposed Rate R-EV
Customer Charge	$ 16.50
Energy Charge On Peak kWh	
Distribution (incl RRA)	$ 0.08884
Transmission	0.08979
Stranded Cost Recovery Charge	0.00360
System Benefits Charge	0.00863
Energy Service Charge	0.18924
Total per On Peak kWh	0.38010
Energy Charge Off Peak kWh	
Distribution (incl RRA)	$ 0.04283
Transmission	0.01747
Stranded Cost Recovery Charge	0.00360
System Benefits Charge	0.00863
Energy Service Charge	0.08919
Total per Off Peak kWh	0.16172
% Charging On Peak	17%
% Charging Off Peak	83%

RATE EV-1: Commercial EV 3-period TOU Rate Summary

Summary of Rates

	Summer TOU Rates ($/kWh)				Winter TOU Rates ($/kWh)			
	Peak	MidPeak	Off Peak	Reconciling Rate	Peak	MidPeak	Off Peak	Reconciling Rate
Generation *	0.17472	0.09217	0.06622	0.09275	0.22025	0.21626	0.21131	0.21425
Transmission	0.05185	0.01410	0.00053	0.01338	0.06709	0.00606	0.00067	0.01338
Distribution	0.03143	0.01394	0.01050	0.01514	0.01514	0.01514	0.01514	0.01514
Combined	0.25799	0.12021	0.07725	0.12127	0.30248	0.23746	0.22712	0.24277

Marginal Costs ($/kWh)

	May-Sep			Other months		
	Summer			Winter		
	Peak	MidPeak	Off Peak	Peak	MidPeak	Off Peak
Generation	0.13761	0.05506	0.02911	0.05201	0.04802	0.04308
Transmission	0.07727	0.01410	0.00053	0.08715	0.00606	0.00067
Distribution	0.02102	0.00354	0.00009	0.00000	0.00000	0.00000

TOU Periods:

Seasonality*

Summer	May through September
Winter	October through April

Time of Day:	Weekdays	Weekends
Peak	2pm-7pm	n/a
Mid-peak	11 am-2pm; 7pm-10pm	2pm - 10pm
Off-peak	10pm-11am	10pm - 2pm

* Commercial Default Energy rates vary monthly. July 2022 and February 2022 provided above.
Current (February 2022 through July 2022) time-differentiated DE Rates are as follows:

Monthly Default Energy Service Pricing for Rate EV-1

February 2022 - July 2022 (all amounts in $/kWh)

	Peak	MidPeak	Off Peak	Rate DE Pricing
February-2022	$ 0.22025	$ 0.21626	$ 0.21131	$ 0.21425
March-2022	$ 0.13209	$ 0.12810	$ 0.12315	$ 0.12600
April-2022	$ 0.09580	$ 0.09180	$ 0.08686	$ 0.08970
May-2022	$ 0.15759	$ 0.07504	$ 0.04909	$ 0.07605
June-2022	$ 0.16154	$ 0.07899	$ 0.05304	$ 0.07898
July-2022	$ 0.17472	$ 0.09217	$ 0.06622	$ 0.09275

Rate EV-1: Commercial EV 3-Period TOU Alternative

Marginal Costs* (all amounts in $/kWh)

May-Sep	Summer Peak	Summer MidPeak	Summer Off Peak	Other months	Winter Peak	Winter MidPeak	Winter Off Peak
Generation	$ 0.13761	$ 0.05506	$ 0.02911		$ 0.05201	$ 0.04802	$ 0.04308
Transmission	$ 0.07727	$ 0.01410	$ 0.00053		$ 0.08715	$ 0.00606	$ 0.00067
Distribution	$ 0.02102	$ 0.00354	$ 0.00009		$ 0.00000	$ 0.00000	$ 0.00000

*Source: Marginal cost studies updated for current costs

Class Annual Billed kWh

Summer Peak	Summer MidPeak	Summer Off Peak	Summer Total	Winter Peak	Winter MidPeak	Winter Off Peak	Winter Total	Annual Total
127,759,609	210,270,561	394,226,850	732,257,020	157,280,883	263,382,404	512,755,520	933,418,807	1,665,675,827

Monthly Class Default Energy Service Rates, Revenue and TOU Consumption

	A (from Tariff) Rate DE price ($/kWh) (input)	B (B = D + E + F) TOTAL kWh (calculation)	C (C = A x B) Rate Design Target Revenue (calculation)	D Peak kWh (input)	E Mid-Peak kWh (input)	F Off-Peak kWh (input)
February-2022	$ 0.21425	124,576,983	$ 26,690,619	21,309,373	35,533,016	67,734,595
March-2022	$ 0.12600	134,204,461	$ 16,909,762	21,936,331	37,718,054	74,550,076
April-2022	$ 0.08970	126,300,355	$ 11,329,142	20,528,063	35,509,506	70,262,786
May-2022	$ 0.07605	137,762,150	$ 10,476,811	24,858,872	39,188,852	73,714,425
June-2022	$ 0.07898	139,642,597	$ 11,028,972	23,728,668	40,380,328	75,533,601
July-2022	$ 0.09275	156,108,816	$ 14,479,093	27,386,582	45,103,968	83,618,265

Default Energy Service Time-differented Rate Design (all amounts in $/kWh)

	Summer Peak	Summer MidPeak	Summer Off Peak	Winter Peak	Winter MidPeak	Winter Off Peak
February-2022				0.22025	0.21626	0.21131
March-2022				0.13209	0.12810	0.12315
April-2022				0.09580	0.09180	0.08686
May-2022	0.15759	0.07504	0.04909			
June-2022	0.16154	0.07899	0.05304			
July-2022	**0.17472**	**0.09217**	**0.06622**			

Transmission Time-Differentiated Rate Design

Avg Rate (per kWh)	$ 0.01338
x Class kWh	1,665,675,827
= Revenue Target	$ 22,286,743

	Summer Peak	Summer MidPeak	Summer Off Peak	Summer Total	Winter Peak	Winter MidPeak	Winter Off Peak	Winter Total	Total
ırginal Costs ($/kWh)	$ 0.07727	$ 0.01410	$ 0.00053	$ 0.01782	$ 0.08715	$ 0.00606	$ 0.00067	$ 0.01676	
TOU kWh	127,759,609	210,270,561	394,226,850	732,257,020	157,280,883	263,382,404	512,755,520	933,418,807	1,665,675,827
Revenue				$ 9,797,599				$ 12,489,144	$ 22,286,743
Min price = MC		$ 0.01410	0.00053			$ 0.00606	0.00067		
	6,623,784.35	2,964,845.11	208,969.47	$ 9,797,599	10,552,042.27	1,596,043.14	341,058.22	$ 12,489,144	
TOU Rate:	**$ 0.05185**	**$ 0.01410**	**$ 0.00053**		**$ 0.06709**	**$ 0.00606**	**$ 0.00067**		
	$ 6,623,784	$ 2,964,845	$ 208,969	$ 9,797,599	$ 10,552,042	$ 1,596,043	$ 341,058	$ 12,489,144	$ 22,286,743
				$ 0.01338 ck				$ 0.01338	

Distribution Retail Price (from Rate GV) - Annual Price Time-Differentiated Seasonally

Avg Rate (per kWh)	$ 0.01514
x Class kWh	1,665,675,827
= Revenue Target	$ 25,218,332

	Summer Peak	Summer MidPeak	Summer Off Peak	Summer Total	Winter Peak	Winter MidPeak	Winter Off Peak	Winter Total	
	$ 0.02102	$ 0.00354	$ 0.00009	$ 0.00473	$ 0.00000	$ 0.00000	$ 0.00000	$ 0.00000	
	127,759,609	210,270,561	394,226,850	732,257,020	157,280,883	263,382,404	512,755,520	933,418,807	1,665,675,827
				$ 11,086,371				$ 14,131,961	$ 25,218,332
TOU Rate:	**$ 0.03143**	**$ 0.01394**	**$ 0.01050**		**$ 0.01514**	**$ 0.01514**	**$ 0.01514**		
	$ 4,015,550	$ 2,931,877	$ 4,138,944	$ 11,086,371	$ 2,381,233	$ 3,987,610	$ 7,763,119	$ 14,131,961	$ 25,218,332
				0.01514				0.01514	

Rate EV-1 Revenue and Rate Design Targets by Function

CUSTOMER RATE **$ 211.21** (from Rate GV)

DEMAND RATES

	A	B	C	D = A x .5 (50%)	E = D/B	F = A - D
	Rate GV Demand Revenue	Rate GV Billing Units	Average Rate	Rate GV Demand Revenue	50% Demand Rate	Residual Demand Revenue
Distribution	$ 28,705,086	4,236,122	$ 6.78	$ 14,352,543	**$ 3.39**	$ 14,352,543
Transmission	$ 44,564,004	4,236,122	$ 10.52	$ 22,282,002	**$ 5.26**	$ 22,282,002
SCRC	$ 1,906,255	4,236,122	$ 0.45	$ 953,128	**$ 0.23**	$ 953,128
	$ 75,175,345	4,236,122	**$ 17.75**	$ 37,587,673	**$ 8.87**	$ 37,587,673

VOLUMETRIC RATES (total)

	G	H	I = F	J = G + I	K = J/H	
	Rate GV Volumetric Rate Revenue	Rate GV Billing Units	Residual Demand Revenue	Total Volumetric RD Revenue Target	Average Volumetric Rate ($/kWh)	
Distribution	$ 10,869,512	1,665,675,827	$ 14,352,543	**$ 25,222,055**	**$ 0.01514**	*
Transmission	-	1,665,675,827	$ 22,282,002	**22,282,002**	**$ 0.01338**	*
SCRC	3,364,665	1,665,675,827	$ 953,128	**4,317,793**	**$ 0.00259**	**
SBC	14,374,782	1,665,675,827	-	**14,374,782**	**$ 0.00863**	**
Energy Service	154,491,433	1,665,675,827	-	**154,491,433**	**$ 0.09275**	*
	$ 183,100,392	1,665,675,827	$ 37,587,673	**$ 220,688,065**	**$ 0.13249**	

* Provides Overall Average Rate for Time Differention (see Attachment 7, page 1)
** All Hours Rate (SBC plus SCRC): $ 0.01122

Rate EV-1 Bills at Various Demand and Usage Levels

At July 2022 Rates

Monthly Maximum Demand (kW)	Monthly Utilization (load factor)	Total Usage (all hours)	Proportion of Usage			Charging Consumption (kWh)			Monthly Bill
			Peak	Mid-Peak	Off-Peak	Peak	Mid-Peak	Off-Peak	
60	3%	1,314	50%	30%	20%	657	394.2	262.8	$ 995.34
60	4%	1,752	50%	30%	20%	876	525.6	350.4	$ 1,079.32
60	5%	2,190	50%	30%	20%	1095	657	438	$ 1,163.30
60	6%	2,628	50%	30%	20%	1314	788.4	525.6	$ 1,247.27
60	7%	3,066	50%	30%	20%	1533	919.8	613.2	$ 1,331.25
60	8%	3,504	50%	30%	20%	1752	1051.2	700.8	$ 1,415.23
60	9%	3,942	50%	30%	20%	1971	1182.6	788.4	$ 1,499.20
120	3%	2,628	50%	30%	20%	1314	788.4	525.6	$ 1,779.47
120	4%	3,504	50%	30%	20%	1752	1051.2	700.8	$ 1,947.43
120	5%	4,380	50%	30%	20%	2190	1314	876	$ 2,115.38
120	6%	5,256	50%	30%	20%	2628	1576.8	1051.2	$ 2,283.34
120	7%	6,132	50%	30%	20%	3066	1839.6	1226.4	$ 2,451.29
120	8%	7,008	50%	30%	20%	3504	2102.4	1401.6	$ 2,619.24
120	9%	7,884	50%	30%	20%	3942	2365.2	1576.8	$ 2,787.20

RATES (effective July 1, 2022)

Summary Rates

Customer Charge	$ 211.21	Attachment 7 p.2
Demand Charge (effective)	$ 8.87	Attachment 7 p.2
Volumetric Charge		
Peak	$ 0.25799	Attachment 7 p.1, line 43
Mid-Peak	$ 0.12021	Attachment 7 p.1, line 60
Off-Peak	$ 0.07725	Attachment 7 p.1, line 76
Other (All Hours)	$ 0.01122	Attachment 7 p.2

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE D/B/A EVERSOURCE ENERGY EV TOU RATE COST AND IT IMPLEMENTATION ESTIMATES

Pursuant to Commission Order No. 26,604 in Docket No. DE 20-170, Public Service Company of New Hampshire d/b/a Eversource Energy ("Eversource" or the "Company") has developed a residential two-period Electric Vehicle ("EV") Time of Use ("TOU") rate and a commercial three-period EV TOU rate. This attachment provides the associated cost and timeline estimates for implementation of each rate, as directed by the Order.

I. Two Period Residential EV TOU Rate (Rate R-EV)

A. Rate Design

Order No. 26,604 at page 26 directs the Company "to adopt a two-period time-varying rate for residential customers. The time varying generation component will only be available to Eversource default service customers. To the extent similar billing or other system changes are required in Eversource's other utility jurisdictions, we would expect Eversource to appropriately allocate those costs resulting in lower costs to New Hampshire ratepayers." Eversource proposes this to be Rate R-EV, and has included the rate summary as Attachment 3 of this filing; the rate design as Attachment 4; proposed rate bills as Attachment 5, and; proposed new clean and redlined tariff pages included in Attachments 1 and 2.

B. Cost Estimate and Timeline

In response to a record request identified as Exhibit 33, Eversource prepared a high-level estimate of the work required and cost to develop service plan options within its C2 billing system to implement a new, two-period residential time-of-use rate option (based on monthly peak and off-peak period kWh consumption), for three components of service: distribution, transmission, and company-supplied energy service (customers on competitive energy supply are not included in this rate design). The Company estimates that work would involve design, build, test and deployment under its C2 system and take approximately ten months after receiving Commission direction to implement the rate or six months from the time of a resourced project kick-off meeting. Eversource's estimated cost is approximately $600,000. For this estimate, Eversource assumed that competitive supply service billed by the Company would not be time-differentiated.

II. Three Period Commercial EV TOU Rate (Rate EV-1)

A. Rate Design

Also on page 26 of Order No. 26,604 the Commission directs Eversource "to adopt a manually billed three-period TOU rate consistent with the Settlement methodology for commercial customers." Eversource proposes this rate as Rate EV-1, and has included the rate summary as Attachment 6; the rate design as Attachment 7; proposed rate bills as Attachment 8, and; proposed new clean and redlined tariff pages included in Attachments 1 and 2.

B. Manual Billing Process, Costs and Timeline

Eversource proposes the attached three-period EV TOU Rate (Rate EV-1) for commercial customers, consistent with the direction of Order No. 26,604. Also consistent with the Order, this rate will be manually billed, and includes the following steps:

Initial Setup:

- Work with the rate department to develop the excel template for billing
- Work with MV90 to develop report to manually provide billing determinants.
- Set up controls for data input and calculation validations.
- Test spreadsheet for billing accuracy
- Test controls
- Test usage and revenue reporting
- Test usage flow to downstream areas
- Develop annual billing schedule

Billing/MV90 process:

One time:

- Develop MV90 billing determinant report
- Train billing reps and control owners
- Fill in applicable customer data in billing spreadsheet

Monthly:

- Receive billing determinant report from MV90.
- Enter billing determinants in appropriate fields in spreadsheet.
- Bill review by control owners
- Enter usage and revenue data into C2 screen
- Manually print and mail bill

Costs:
Onetime cost include:

- Build Initial Billing Template
- Develop MV90 reporting
- Billing Training
- Billing Testing

Total onetime costs: approximately $10,000

Monthly costs include:

- MV 90 manually providing monthly reports with required billing determinants
- Per bill cost includes calculating bill, executing controls, entering usage/revenue, printing and mailing

Total monthly costs: $250 per bill

The new customer costs include:

- Rate template update for each new customer

Total new customer cost: $100 per customer

Timeline*

- Rate Dept template initial development
- Testing
- Training

*The total timeline is approximately eleven weeks and is dependent on completion of revenue and usage reporting IT work.

C. IT Cost Estimate and Timeline to Support Revenue and Usage Reporting

The automation of the revenue and usage reporting will allow for direct system interface into the Company's C2 billing system to ensure consistency, comparability, and accuracy of the data reporting requirements.

Project cost & timeline to support manual billing for Rate EV-1. This rate design and cost & timeline estimate does not include TOU generation for competitive suppliers.

Project Scope Description	**Project Cost**	**Project Duration**
Modifications to Eversource C2 billing system to support the manual data entry of monthly t Rate EV-1 billing determinants and pricing to revenue reporting: 1) Develop in C2 billing system manual data entry screen usage revenue adjustment screen a new Rate EV-1 for On-Peak, Critical-Peak, and Off-Peak Usage and pricing 2) Update revenue & regulatory accounting reports to track and report on Rate EV-1 3) Regression test Rate EV-1 usage in load settlement and load research processes	$500,000	4 months

Project Authorization plus Project Cost Timeline

Project Authorization Funding & Project Resourcing	Requirements & Design	Build	Test	Deploy and Post Implementation	Total
Up to 4 months	**1 month**	**1 month**	**1 month**	**1 month**	**4+4 = 8 months**
Capital $ Approved	$125,000	$125,000	$125,000	$125,000	$500,000

Key Cost and Schedule Assumptions:

1. Even though a manual process will be used to translate Rate EV-1 billing determinants from a monthly report into Excel to calculate and present the bill, a core billing system change is needed for the manual data entry of usage and pricing to downstream revenue reporting. See "C. IT Cost Estimate and Timeline to Support Revenue and Usage Reporting" above.

2. If the Company were to include competitive supplier TOU generation billed by the Company it will significantly increase this estimate as the current structure with competitive suppliers only supports a one-price structure in Eversource core billing and NH EDI supplier interfaces.

3. Up to four months is needed to request funding, obtain approvals, mobilization, secure resources, kickoff (capital project authorization) before the capital project work begins. Then an additional four months is needed to complete the capital project work, for a total of eight months from the time of Commission approval and direction to implement to the time Rate EV-1 would be ready to offer to customers.