

## Sharon Energy and Environment Commission

December 20, 2023

Project: The Proposed Solar Installation for Sharon Center School

The Sharon Energy and Environment Commission [SEEC] exists in order to advise the town and its Board of Selectmen [BoS] on matters within its purview. An example of the role SEEC can play is addressing whether issues being placed before voters are factually accurate. To the extent that inaccurate or misleading representations are identified and publicized, the electorate is assisted in making informed decisions in their voting.

A referendum regarding the solar project will be held on January 5, 2024. SEEC has analyzed the website of project opponents to examine whether public representations found on that website are factually accurate. We refer to [www.scs-solar.info](http://www.scs-solar.info), and its drop-down tab, “**The Proposed Savings**”, to which we direct your attention.

There are 13 discussion points and two graphs in this section. SEEC is able to demonstrate that 12 discussion points and both graphs are **false, misleading or irrelevant**. We will analyze them in sequence, starting with the upper left.

### Point by Point Analysis

**Discussion Point #1, “The town claims it will save \$30,000 a year for 20 years.” “...they [Casey Flanagan and Doug Cahill] have not provided any details.” FALSE:** This information was supplied by SEEC at the Wednesday, November 29<sup>th</sup> informational meeting at Sharon Center School. Both Casey Flanagan and Doug Cahill attended all of the 2-hour meeting and answered questions. A spreadsheet showing Eversource billing data for the 12 months ending mid-November was made available and was described from the podium. The leading project opponent was given a copy of the spreadsheet at the meeting.

That spreadsheet, **Exhibit 1**, updated to include final Eversource data for 2023, can be found by scrolling downward below the **Summary and Conclusion**: it shows that taxpayers were charged **\$31,637** during 2023 for Electric Delivery Services. Because the proposed solar array delivers its electricity directly to the school’s utility room, Eversource’s grid is not utilized. Therefore, the cost of this bill component, which totals **53%** of the total bill, will become **ZERO**.

“**Our calculations show closer to \$10,000 in savings.**” SEEC invites opponents to post their calculations for SEEC and the public to analyze.

As of December 18, this paragraph has been added to reflect a very recent change in the opponents’ website wording. The above sentence in red has been revised to say: “**Our research projects electricity prices could remain flat. It could be only \$330,000 in savings, or less.**” This assertion appears to be based on the bar graph “**Projected Electricity Prices 2021 – 2050**”. SEEC renews its request that opponents make public its “research” in order to determine if **2021 constant dollar data** are being utilized. This foundational issue is addressed at length in **Discussion Point #12** below.

**Discussion Point #2. “The SCS is currently paying \$0.813 per kWh.” MISLEADING:** Omitted from the text is the crucial fact that this rate expires in November 2024. **The background:** This rate was obtained in April 2020 at the height of pandemic-induced chaos in energy markets. While taxpayers currently benefit from this astute purchase dating back nearly four years, that’s not the issue. The relevant issue is what taxpayers **will pay for electricity over the next twenty years** following the expiration of this favorable contract in November 2024, not long after the commissioning of the solar project.

For perspective, Eversource’s **Standard Service** rate – what customers pay if they do not purchase their own electricity supply – is **13.82** cents/kWh. For the period January 1 – June 30, 2024, the Standard Service rate will rise to **14.71** cents/kWh. While it is impossible to forecast future rates, even for six months from now, these comparisons illustrate how favorable the expiring rate is *versus those available today*.

To illustrate the impact on taxpayers of 2024’s announced price, if one assumed that SCS had to pay **14.71** cents for all of 2024, that would represent an **extra \$22,400** for its electricity supply above 2023’s **\$28,100**, for a total of **\$52,000**; adding the **Delivery Charge** of **10.2** cents would boost 2024’s hypothetical cost to approximately **\$85,000**, a **44%** increase over 2023.

For further explanation of how electricity supply costs may change over time, please refer to **Discussion Point #12** below “**Projected Electricity Prices 2021 – 2050**”.

**“The SCS is currently paying \$0.813 [8.13 cents] per kWh.” IRRELEVANT:** This statement refers to the Electricity **Supply Rate** and is therefore **totally unrelated** to the ~\$30,000 annual savings estimated by SEEC and the ~\$10,000 annual savings asserted by opponents. SEEC’s savings are determined solely by the fact that nearly **300,000 kWh** produced by the array would cost **ZERO** cents/kWh in **Delivery Charges** instead of **10.239 cents/kWh** with no solar project.

**MISLEADING:** This statement is misleading in that SCS currently pays **18.37** cents/kWh, of which **8.13** cents is the Electricity **Supply Rate** and **10.239** cents is the **Delivery Rate**. For clarification, please refer to the accompanying spreadsheet, Exhibit 1, displaying SCS’s 2023 billing data.

**“Delivery by Eversource will cost approximately \$0.106 [10.6 cents]/kWh.”** SEEC would welcome using the opponents’ figure of **10.6 cents/kWh** since SEEC’s savings figure assumes only the documented current rate of **10.239 cents/kWh**. Using the opponents’ **10.6 cents** increases projected annual savings by **~\$1,100** annually to **\$32,700**, which totals **\$655,000** over 20 years.

To restate SEEC’s calculations, the SCS **current annual consumption** is **346,000 kWh**. For reasons explained in **Discussion Point #9** below, SEEC bases its savings only on **300,000 kWh** per annum, multiplied by **10.239** cents of avoided **Delivery Costs** = **\$30,717** annually or **\$31,800** using the opponents’ **10.6** cents. Note that this calculation makes the **highly unrealistic assumption** that there will be **no increase in Delivery Costs over the next twenty years**. See **Discussion Point #12**, “Projected Electricity Prices”, for further commentary on this important topic.

**Discussion Point #3. “Original Power Purchase Agreement (PPA) price was \$0.84 per kWh.” FALSE:** the PPA signed on 8/30/2022 was for **10.9 cents /kWh**, not **\$.084 [8.4 cents]/ kWh**. The confusion lies in the fact that SEEC began discussions with Connecticut Green Bank in spring 2020 as pandemic-

induced chaos roiled energy markets. The Green Bank suggested that **if** a project had been approved **at that time**, the rate would have been around **8.4** cents. Note that the current SCS supply rate of **8.13** cents was procured in **April 2020**. More than two years elapsed, however, before the PPA went up for approval at a town meeting – and by then the rate had increased to **10.9 cents/kWh**.

**“The agreement was approved by a Special Town Meeting attended by 14 residents.” MISLEADING:** The Town Meeting was properly noticed and convened. The **number** of attendees is irrelevant and **does not delegitimize** the result.

**Discussion Point #4. “PPA was amended to \$.126 [12.6 cents] per kWh.” FALSE:** A PPA offering 8.4 cents **never existed** – the PPA price was **10.9** cents/kWh, as described above. **...“a 50% increase in the cost per kWh.” FALSE:** The increase is **16%**. **“We have been unable to get an answer why?” Answer:** Project opponents never contacted SEEC or the Connecticut Green Bank for the answer: the explanation is that (1) the array size was increased to take into account electricity consumed by SCS’s newly-installed air conditioning equipment, (2) increased costs in the supply chain, and (3) increased prices for electricity in the New England grid. The changes in costs and pricing are entirely determined by the CT Green Bank: the first organization of its kind, the Green Bank has overseen the financing of **\$2.4 billion** of projects in Connecticut. As of 2021, there were 21 Green Banks in 16 states plus the District of Columbia.

**“The Green Bank is asking for an additional price increase.” Answer:** This is true, to a current estimated figure of **13.1** cents/kWh, reflecting further cost increases incurred during **months of delays in obtaining town approvals**. To reiterate, the **13.1** cent/kWh figure available through the PPA for 20 years is the **total** cost of electricity, incorporating both **Supply** and **Delivery** charges.

**Discussion Point #5. “Size of the solar array.” “The revised PPA on 11/1/22 changed the system size from 209 kW to 250 kW. With power generation going from 278,833 kWhs to 295,916 kWhs.” Answer:** As described above, the upward revision to **298,528** kWh, a **7.1%** increase, incorporated higher electricity consumption of newly-installed heat pumps. The array size now meets the limit placed on solar projects, which is described fully in **Discussion Point #9** below.

**Discussion Point #6. “Solar at Housatonic High School.” “Is the SCS array too big? The HHS array is mounted on the roof. It has 372 panels that are spec’d at 115KW. The HHS array is less than ½ the size of the SCS array with four times the number of students.” MISLEADING:** Based on the performance of the initial 115 kW array, Housatonic Valley Regional High School has **already** applied to **add an additional 270 kW to 385 kW, an increase of 230%**.

**“We believe a smaller system should be put on the SCS flat roof.” Answer:** When SEEC first proposed the project in 2020, SCS informed us that its engineers had ruled out using both the gymnasium’s standing seam, pitched roof and the flat roof because of a history of leakage, the potential voiding of warranties, and shading of panels by existing ventilation structures. In addition, the flat roof was in such

poor condition that four months ago a \$540,000 emergency replacement was required. Jeopardizing the new roof's warranty for a solar array raises serious questions.

**Discussion Point #7. "How much of the annual solar power will be directly used?" ... "The excess power will go back to the grid at a cost of 12.6 cents/kWh or more, and be credited at the utility rate of \$.0813 per kWh? FALSE:** This SCS contract qualifies for the "net metering" protocol no longer available for new solar projects. Electricity not required at the moment of generation is sent to the grid, to be "banked" as **kW hours, not as cash**, to be drawn down when generation falls below consumption. As described more fully in **Discussion Point #9** below, the array is designed to generate less than the building's projected consumption.

**"...be credited at the utility rate of \$.0813 per kWh?" FALSE:** The favorable Electricity Supply Rate of \$.0813 cents will not be available after November 2024, as explained previously.

**Discussion Point #8. "How much power will SCS need from the grid to supplement daily needs?" ... "The school will be required to pull from the grid before and after those hours." IRRELEVANT:** On an intra-day basis, the timing and amounts of electricity consumed in the building is unrelated to any aspect of the solar project.

**Discussion Point #9. "Penalties for not using all the power?" "What is the estimated cost of penalties if SCS does not use 100% of the electricity generated by the array for the 20 years of the contract?"**

**MISLEADING:** The likelihood of an underusage penalty is negligible for two reasons, one inherent in the program's framework, the other site-specific. (1) Protocols established by the Green Bank are designed to minimize this eventuality, if not prevent altogether. Specifically, an array's generating capacity is limited to **85%** of a building's demonstrated kWh consumption. The resulting 15% cushion allows for energy efficiency measures to be implemented without exposing customers to a "make-whole" provision.

(2) The site-specific factor derives from two elements: first, the building's electricity consumption has been rising, from **310,000 kWh** in 2018 to **346,000 kWh** in 2023. The most likely cause is the installation of heat pumps in 2021 to provide air conditioning. Second, SEEC is working with SCS to activate the pumps' heating component in wintertime. Assuming success, electric usage will rise above current levels, allowing **reduced** use of **#2 fuel oil** and **improving air quality** in the school's immediate vicinity. Any incremental electric consumption will expand the cushion described above.

**Discussion Point #10. "Where are these solar panels being made?" Answer:** SEEC believes these concerns to be outside the scope of our purview.

**Discussion Point #11. "How will these panels be disposed of at the end of their lives?" IRRELEVANT:** Solar panels have useful economic lives of **25 – 35** years. SEEC believes that **innovation** during the next

three decades is likely to provide better solutions than landfill disposal. In the Interim, two decades of reduced greenhouse gases, air quality improvements in **central Sharon** and enhanced respiratory health in the community likely more than offset whatever disposal impact is created in post-2044.

**Discussion Point #12 - Bar Graph. "Projected electricity prices 2021-2050." MISLEADING and IRRELEVANT:** The bar graph asserts that US average electricity prices are projected to decline modestly over the 30-year period shown, from **11.1** cents in 2021 to **10.3** cents in 2045, just after the PPA expires. Although the purpose of displaying these data is not stated, SEEC infers that the intent is to call into question the prudence of locking in a **13.1** cent total cost of electricity through the PPA. The apparent gap between **11.1** cents, declining to **10.3** cents, may refer to **Discussion Point #9** and its suggestion that cost penalties could become a meaningful liability for taxpayers.

#### **Projected Prices versus Past Prices**

The reality is that, if one looks closely at the **footnotes** to the bar graph, the last line discloses that the projected prices are stated in **2021 dollars**: in other words, the data show what prices would be assuming **no cost increases** throughout the decades shown. SEEC believes that it is imprudent to assume that **electricity rates** will experience **zero increases until 2044**.

We refer instead to data from the **US Energy Information Administration [EIA] for Connecticut Commercial Customers**: these data, shown in **Exhibit #3** below, are specific to **our state** rather than the **US average**. Also, EIA data and forecasts assume that *costs will increase over time*, consistent with experience documented over decades.

An EIA projection for **2021-2040**, based on data from 2001-2020, forecasts that CT's commercial rate will increase at **2.7%** per annum (see bottom right of Exhibit #3): to put that in perspective, taking **SCS's actual rate** in 2020 – around **18 cents/kWh**, would become **30 cents/kWh** in 2040, an increase of **70%**. In stark contrast, however, opponents' bar graph suggests that SCS's rate would have **declined** by **5%** to **17** cents, a position unsupported by actual experience and by EIA projections.

#### **Taxpayer Benefit on Delivery Rate**

To recapitulate, SEEC's projects that taxpayers will save approximately **\$31,700** annually for 20 years, or **\$634,000**, as described in **Discussion Point #3** above. This figure assumes that today's **Delivery Rate** of **10.239** cents does **not increase** throughout the PPA's twenty years, an unrealistically conservative methodology.

To gauge the risk to Sharon's taxpayers of incurring **avoidable** cost increases if the solar project is canceled, let us turn to recent relevant data: Eversource's **Delivery Rate** in **January 2018** was **8.846** cents/kWh. Today's rate is **10.239** cents, an increase of **16%** over six years: this equates to a **2.5%** annual cost increase. **EIA** projects that costs will increase at **2.7%** annually until 2050, practically identical to what the school has experienced, a validation of EIA methodology. Utilizing EIA's **2.7%** figure, SEEC estimates that by 2044, the Delivery Rate will become approximately **19** cents/kWh, or an increase of **86%**.

#### **Taxpayer Risk on Energy Supply Rate**

SEEC makes no claim of “savings” unless they can be independently corroborated, as described above. On the other hand, Eversource’s Energy **Supply Rate** is largely driven by **volatile commodity costs** and by **geopolitical developments**. For these reasons, future Supply Rate levels are not documentable – and SEEC therefore does not make a specific savings claim. That said, taxpayers are at risk of paying higher costs, which can be projected using EIA’s forecast protocol: at a **2.7%** annual increase, the **Energy Rate** would trend upward from today’s Standard Service level of **14.7** cents to around **25** cents.

### **Avoidable Exposure to Increasing Electricity Costs – Summary**

As demonstrated by this graph and by the recent rewording of their **Discussion Point #1**, opponents suggest that the **PPA rate of 13.1** cents/kWh exposes taxpayers to a long-term, overpriced contract. SEEC argues that the **directly opposite outcome** is more likely. To restate the point, SEEC believes the probabilities strongly favor the thesis that electricity prices will increase, driven in part by expenditures to make the **state-wide electric grid more reliable** and more able to serve rising data center, EV and heat pump loads.

Opponents’ sole focus is on the potential burden of future price **declines**; they do not address the risk of price **increases projected by EIA** in **Exhibit #3**. What is the magnitude of exposure to avoidable costs through rejecting the project? **Exhibit #2** displays that exposure through a sensitivity analysis under **differing cost increase scenarios**. It contrasts the opponents’ **2021 Zero increase** price projection (**blue** bars) with SEEC’s hypothetical **1% (yellow)**, **2% (orange)** and **3% (red)** annual price increases.

This approach allows SEEC to avoid imposing its own estimate on the community – rather, it allows anyone with spreadsheet skills to insert their own assumptions: the financial consequences are instantly displayed.

**Exhibit 4** explores the financial burden to which taxpayers are exposed if today’s electricity costs increase in line with EIA’s projection of **2.7%** annually. Obtained by subtracting the **cumulative** cost of the PPA’s **13.1** cent **all-in** electricity rate (**\$786,000**) from that of no solar (**\$2,057,759**), the **avoidable costs** are projected at **\$1,271,759**.

**Discussion Point #13 – Bar Graph. “Annual Solar Production by month.” IRRELEVANT:** This graph has no relevance to SCS itself or to any solar installation, whether “net-metered” or not. Electricity production from any array fluctuates throughout the 24-hour day and from season to season.

### **Summary and Conclusion**

SEEC believes that the Town of Sharon would be well-served by a public forum exploring these issues before casting a vote of such broad and lasting consequences. It respectfully submits this commentary to our neighbors in hopes of raising their understanding and stimulating informed discussion.

### Exhibit One - Sharon Center School Monthly Electric Bills 2023

Date	Monthly kWh	Supply Rate - Cts	Supply Cost - \$	Delivery Rate - Cts	Delivery Cost - \$	Meter Cost - \$	Monthly Bill - \$
12/14/2023	36,320	8.13	2,953	10.239	3,719	65	6,737
11/14/2023	34,720	8.13	2,823	10.239	3,555	65	6,443
10/16/2023	23,840	8.13	1,938	10.239	2,506	65	4,444
9/22/2023	21,760	8.13	1,769	10.239	2,287	80	4,057
8/23/2023	22,880	8.13	1,860	10.004	2,289	80	3,692
7/17/2023	20,320	8.13	1,652	8.541	1,801	65	3,571
6/15/2023	27,680	8.13	2,250	8.124	2,314	65	4,564
5/15/2023	29,120	8.13	2,367	8.124	2,431	65	4,798
4/14/2023	32,960	8.13	2,680	8.124	2,743	65	5,422
3/15/2023	31,520	8.13	2,563	8.107	2,620	65	5,183
2/14/2023	32,640	8.13	2,654	8.091	2,706	65	5,360
1/17/2023	32,160	8.13	2,615	8.091	2,667	65	5,502
<b>2023 YTD</b>	345,920		28,123		31,637		59,772
<b>2023 Final</b>	345,920		28,123		31,637		59,772

**Explanatory Notes:**

**Monthly kWh** - The number of kilowatt-hours consumed at SCS by month and for 2023.

**Supply Rate Cts** - This attractive price obtained in April 2020 is unlikely to be matched for sustained periods. This contract expires in November 2024. See Discussion Point #2 in accompanying materials.

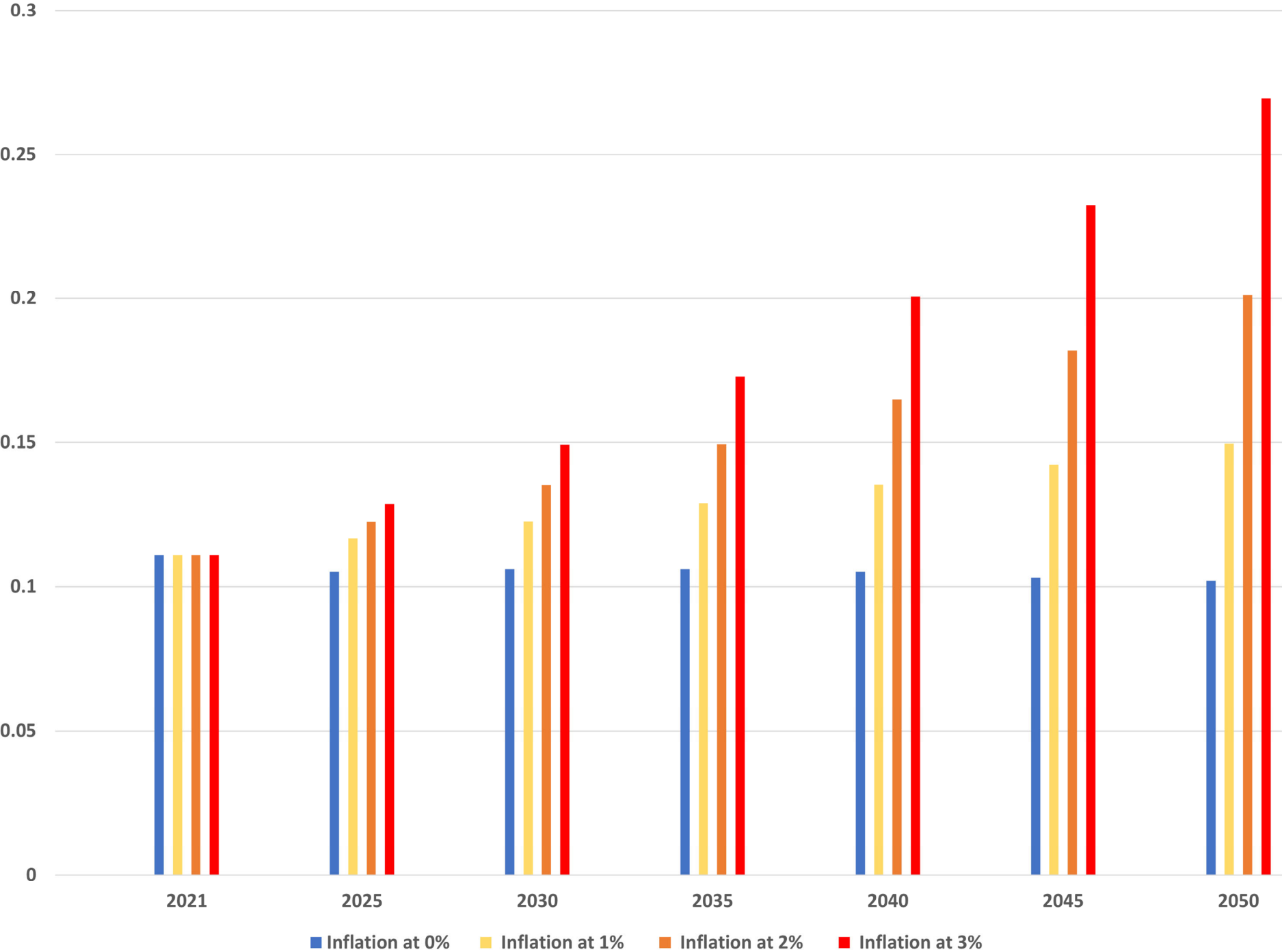
**Supply Cost \$** - The number of kilowatt-hours (kWh) multiplied by the price.

**Delivery Rate Cts** - The rate is state-regulated costs for strengthening the state-wide & local grids.

**Delivery Cost \$** - These charges would go to zero for 20 years if the project is completed.

**Monthly Bill** - Total costs of delivered electricity by month and cumulative for 2023.

EXHIBIT TWO - PROJECTED ELECTRICITY PRICES 2021-2050  
ACCOUNTING FOR INFLATION





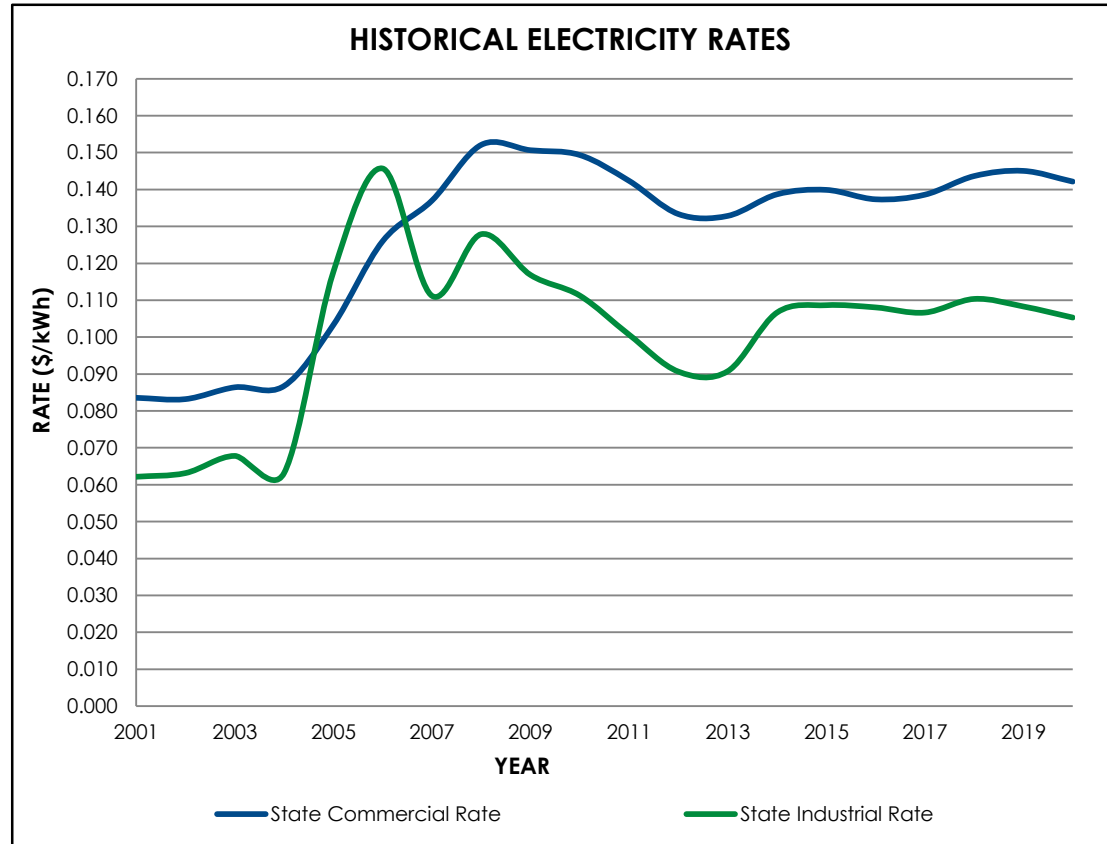
# 20 YEAR HISTORICAL ELECTRICITY RATE ANALYSIS: INDUSTRIAL AND COMMERCIAL BY STATE

## 2001-2020



### Connecticut (CT)

Year	ELECTRICITY RATES (\$/kWh)			
	INDUSTRIAL		COMMERCIAL	
	Rate	% Change	Rate	% Change
2001	\$ 0.062	--	\$ 0.084	--
2002	\$ 0.063	+1.6%	\$ 0.083	-0.4%
2003	\$ 0.068	+7.4%	\$ 0.086	+3.8%
2004	\$ 0.063	-6.9%	\$ 0.087	+0.4%
2005	\$ 0.118	+86.3%	\$ 0.103	+19.1%
2006	\$ 0.146	+23.8%	\$ 0.126	+22.0%
2007	\$ 0.111	-23.7%	\$ 0.137	+8.7%
2008	\$ 0.128	+15.0%	\$ 0.152	+11.0%
2009	\$ 0.117	-8.6%	\$ 0.151	-1.0%
2010	\$ 0.111	-4.8%	\$ 0.149	-0.9%
2011	\$ 0.101	-9.5%	\$ 0.142	-4.7%
2012	\$ 0.091	-9.9%	\$ 0.133	-6.3%
2013	\$ 0.091	+0.1%	\$ 0.133	-0.4%
2014	\$ 0.107	+17.5%	\$ 0.139	+4.4%
2015	\$ 0.109	+1.9%	\$ 0.140	+0.9%
2016	\$ 0.108	-0.6%	\$ 0.137	-1.8%
2017	\$ 0.107	-1.3%	\$ 0.139	+0.9%
2018	\$ 0.110	+3.5%	\$ 0.144	+3.6%
2019	\$ 0.108	-1.9%	\$ 0.145	+1.0%
2020	\$ 0.105	-2.8%	\$ 0.142	-2.0%



ELECTRICITY RATE SUMMARY (\$/kWh)					
	2001 RATE	2020 RATE	AVERAGE ANNUAL INCREASE	TOTAL INCREASE	PREDICTED 2040 RATE
<b>INDUSTRIAL</b>	<b>\$0.062</b>	<b>\$0.105</b>	<b>2.7%</b>	<b>69.4%</b>	<b>\$0.178</b>
<b>COMMERCIAL</b>	<b>\$0.084</b>	<b>\$0.142</b>	<b>2.7%</b>	<b>70.1%</b>	<b>\$0.242</b>

SOURCE: US EIA Report: 2001-2020 (See methodology page for details)

### Exhibit Four - Sharon Center School - Avoided Costs

	Inflation at 2.7%	Initial Total Price Supply + Delivery	Nominal Total Price Supply + Delivery	Annual kWh Use	Annual Nominal Cost (\$)	Annual Solar Cost @13.1 cts (\$)	
2024	1.027	24.95	25.62	300,000	-	-	
2025	1.027	25.62	26.32	300,000	78,946	39,300	
2026	1.027	26.32	27.03	300,000	81,078	39,300	
2027	1.027	27.03	27.76	300,000	83,267	39,300	
2028	1.027	27.76	28.51	300,000	85,515	39,300	
2029	1.027	28.51	29.27	300,000	87,824	39,300	
2030	1.027	29.27	30.07	300,000	90,196	39,300	
2031	1.027	30.07	30.88	300,000	92,631	39,300	
2032	1.027	30.88	31.71	300,000	95,132	39,300	
2033	1.027	31.71	32.57	300,000	97,700	39,300	
2034	1.027	32.57	33.45	300,000	100,338	39,300	
2035	1.027	33.45	34.35	300,000	103,047	39,300	
2036	1.027	34.35	35.28	300,000	105,830	39,300	
2037	1.027	35.28	36.23	300,000	108,687	39,300	
2038	1.027	36.23	37.21	300,000	111,622	39,300	
2039	1.027	37.21	38.21	300,000	114,635	39,300	
2040	1.027	38.21	39.24	300,000	117,731	39,300	
2041	1.027	39.24	40.30	300,000	120,909	39,300	
2042	1.027	40.30	41.39	300,000	124,174	39,300	
2043	1.027	41.39	42.51	300,000	127,527	39,300	
2044	1.027	42.51	43.66	300,000	130,970	39,300	
<b>Cumulative Totals</b>						<b>2,057,759</b>	<b>786,000</b>
<b>Avoided Costs</b>						<b>1,271,759</b>	

**Notes:**

**2.7% Inflation from Energy Information Administration - See Exhibit Three**

**Initial Total Price = Supply Cost 14.71 cents, Delivery Cost 10.239 cents.**