

CGE's Earth Week
for Everyone 2021

Renewable Energy
in Evanston

Rooftop Solar:
A Personal Story

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The Chapters

- 1: My Olde Roof
 - 2: The Solar Program
 - 3: Design
 - 4: Installation
 - 5: Energy Production
 - 6: The Money
-

Chapter 1:

My Olde Roof

Built 1920

Purchased 1991

1991 Tear off: Four (4)
shingle layers

“This is really heavy.”
Spiderman 2

My Olde Roof

- Replaced roof again in 2020
- Before panels installed
- Age Rule-of-Thumb: 10-12 years
- Panel removal/reinstall = \$\$\$\$
- Roof life about 20-25 years
- Panel lifespan approx. 25 years



Chapter 2: The Program

Solarize Chicagoland
2019

GRNE Solar



The Program

- Solarize Chicagoland 2019 (MREA)
- GRNE Solar Did It All
 - Sign up / Assessment
 - Design Layout/ Get Permit (Payment 1)
 - Install (Payment 2)
 - Approvals / Activation (Payment 3)
 - Process SRECs Incentives (I Get Paid)

The Program

- Assessment of solar potential
- “Google Project Sunroof”
- Not all roofs are equal



The Program

- Neighbors on-board early
- Evanston has 100+ Solar Photovoltaic (PV)



Chapter 3: Design

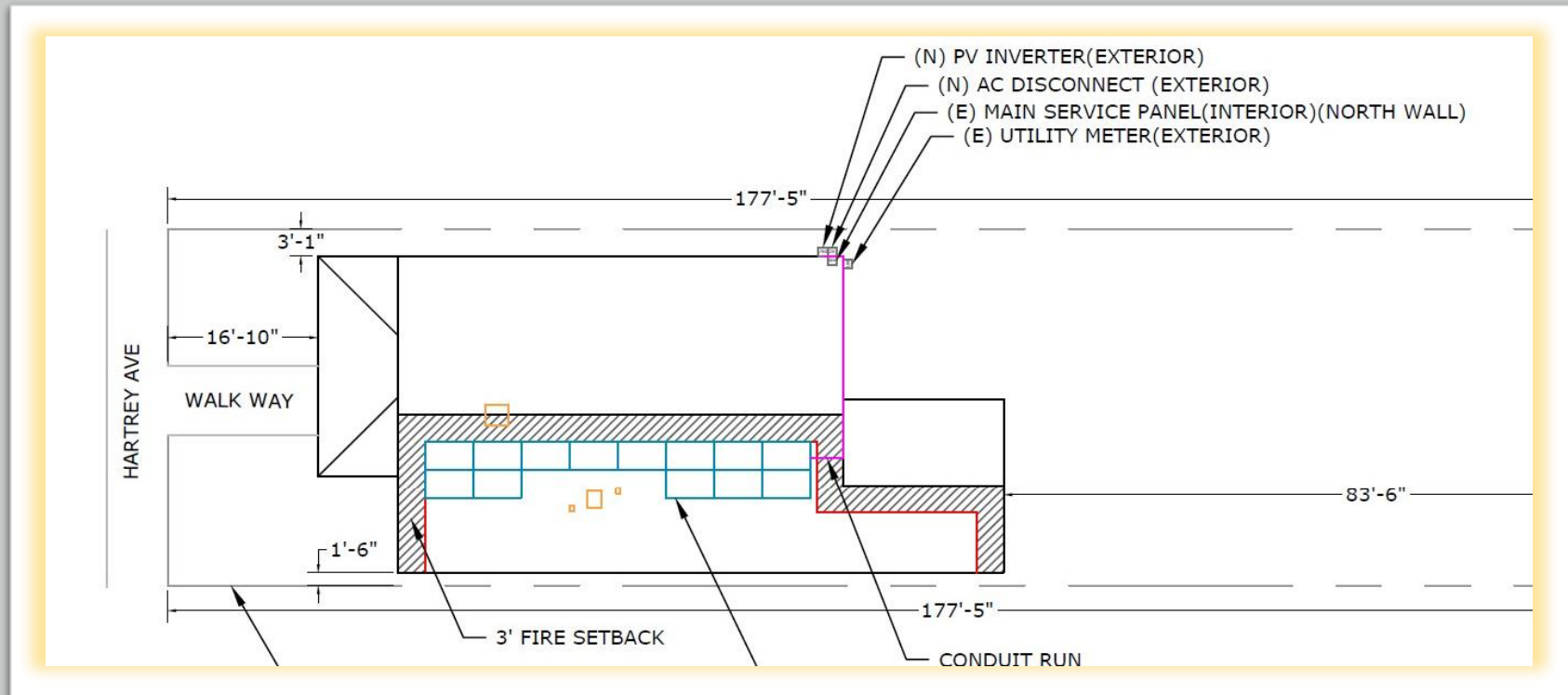
Size/Capacity

Layout



The Design – Capacity

- 13 Panels, 310 Watts each
- Total 4,030 Watts (4.03 kW DC Power)
- Inverter: Rated at 3,000 Watts (3.00 kW AC Power)



The Design- Layout

- Best direct sunlight
- Avoid shading
- Other roof elements (skylight, exhaust, plumbing stack)

Chapter 4: Installation

Panel crew

Electrical crew

Less than one day

Installation

- Panel crew installs the photovoltaic (PV) panels
- PV material converts light energy to electricity



Support “feet” mounted to wood rafters through the roof

Rails attached to the feet



Panels fastened to the rails

Installation

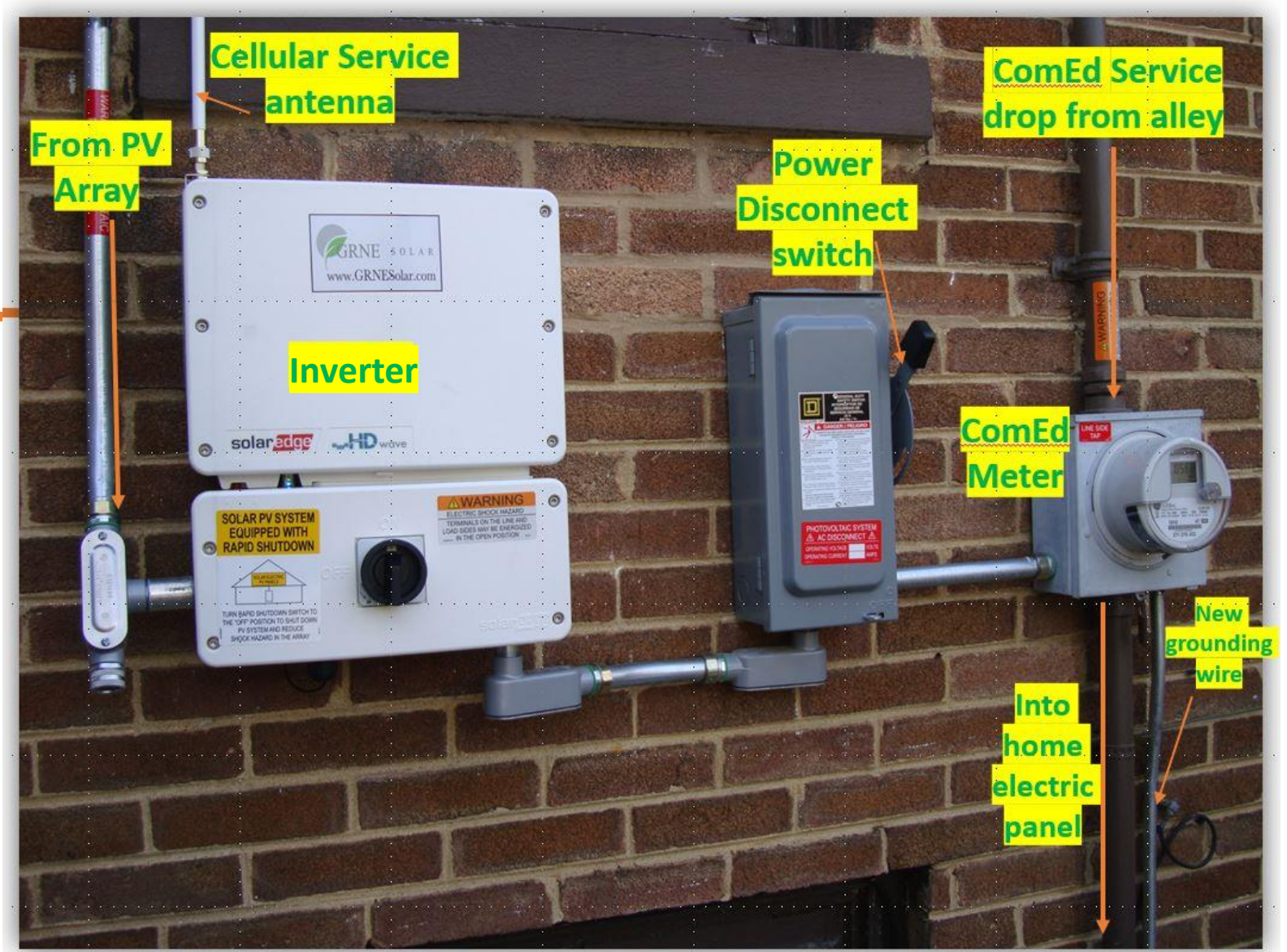
- PV panel wiring all connected
- Routed down from the roof



Installation

Electrical crew routes conduit from roof for wiring to:

- Inverter
- Disconnect Switch
- ComEd Service Meter
- Grounding (included!)



Chapter 5: Energy Production

Online “App” through
inverter company

Learn patterns of
production

Installer (GRNE Solar)
tracks operation

Energy Production



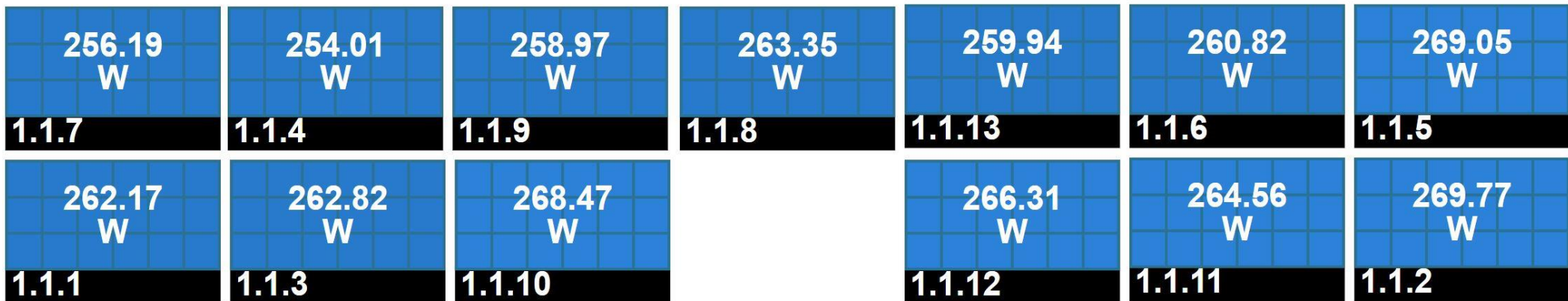
- Online “App”
- Physical layout

160.88 W 1.1.7	158.42 W 1.1.4	158.69 W 1.1.9	159.32 W 1.1.8	158.78 W 1.1.13	156.56 W 1.1.6	159.76 W 1.1.5
160.22 W 1.1.1	158.47 W 1.1.3	161.31 W 1.1.10		155.96 W 1.1.12	156.37 W 1.1.11	156.07 W 1.1.2



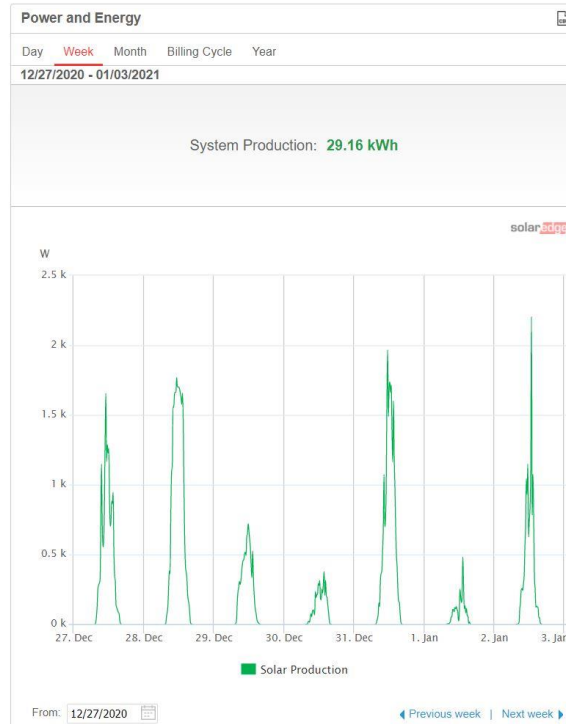
Energy Production

- Peak Power
- Patterns of production



Energy Production

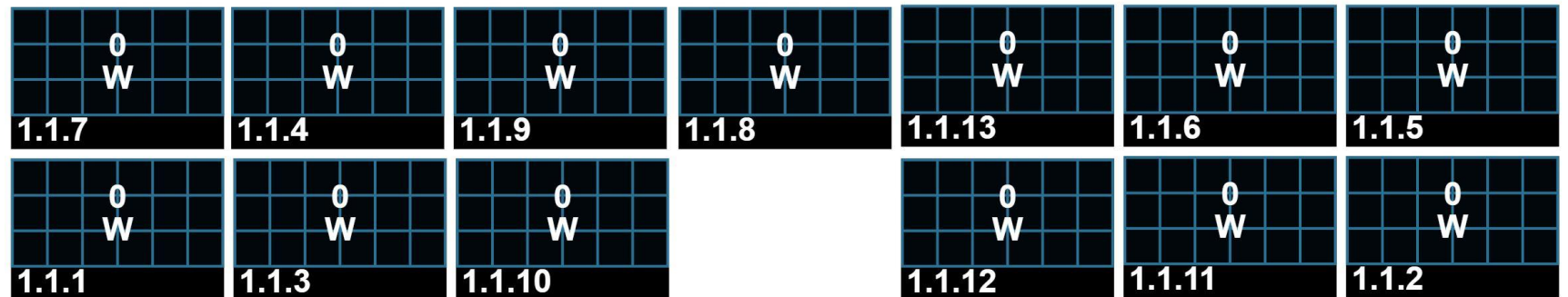
- Hourly power for weekly totals
- Note the hourly weather



Energy Production

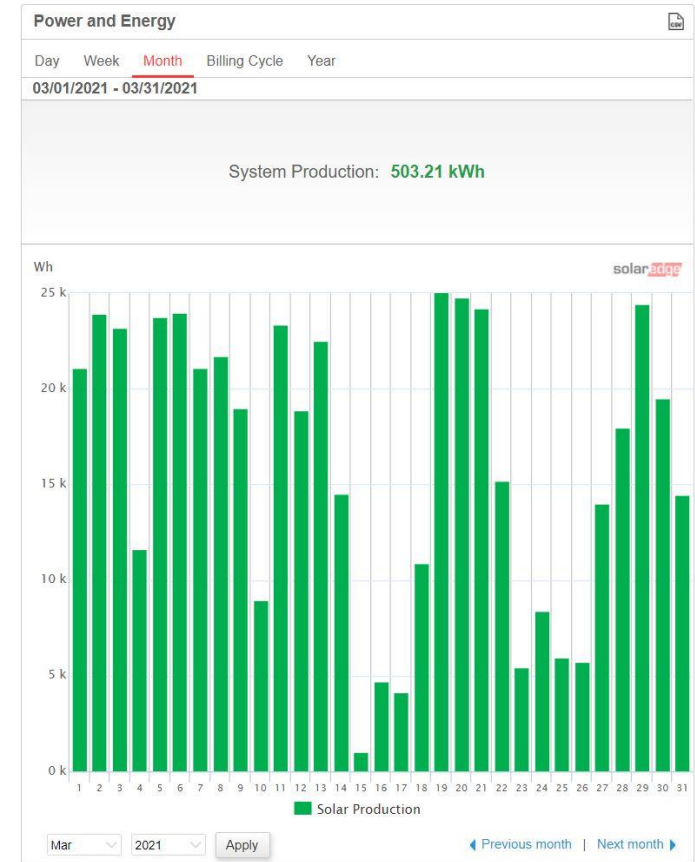
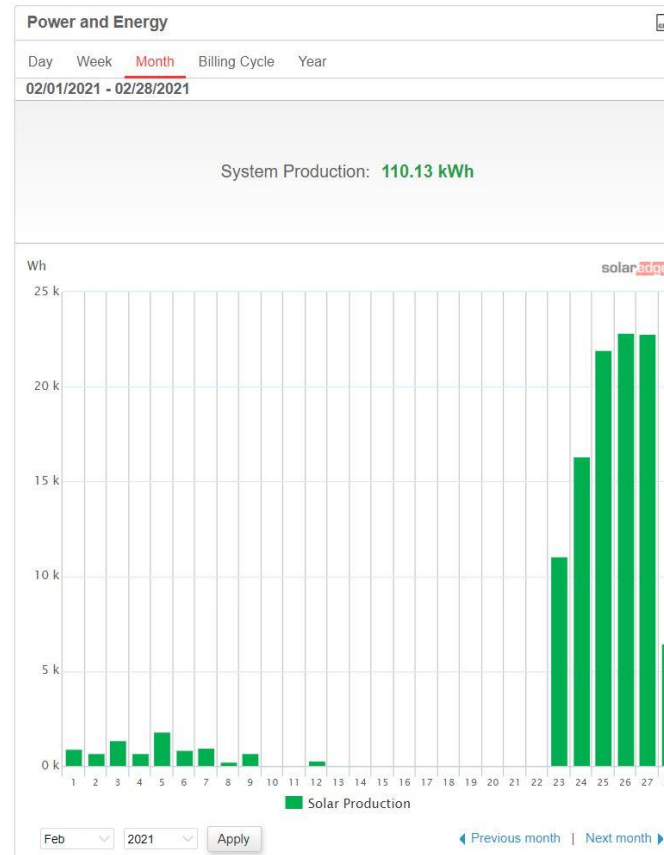
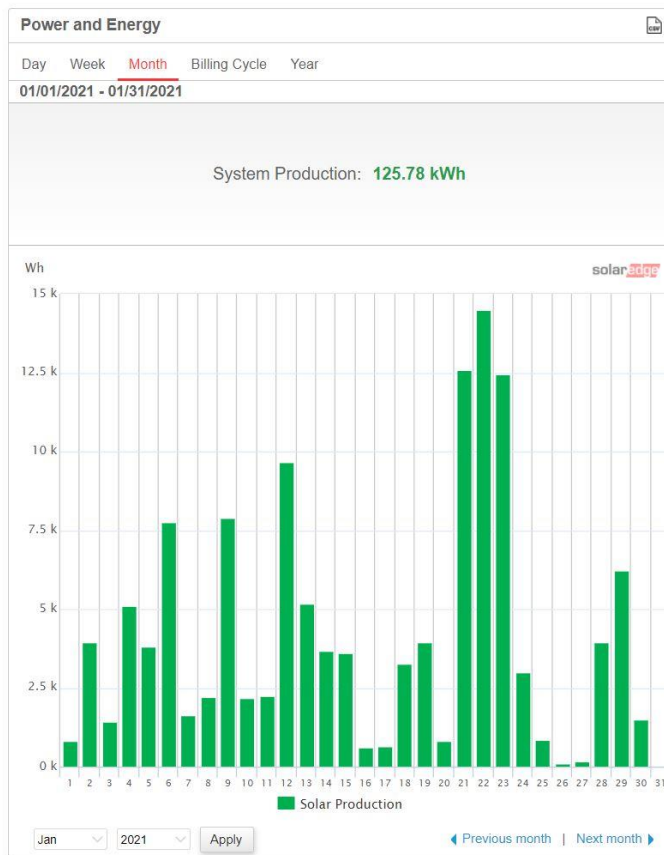


- February 2021
Production.....
.....not so much



Energy Production

- Daily energy for monthly totals
- Note the daily weather



Chapter 6: The Money

Purchase Outlays

Federal Incentive for
Installation

State Incentive for
Production

Lower Monthly Electric
Bills



The Money

Initial Purchase Outlays

Payment 1 = \$2,301.00

Payment 2 = \$6,328.00

Payment 3 = \$2,415.80

Out-of-Pocket = **\$11,044.80**

The Money

Federal Incentive for Installation

- Income Tax *Credit*:
 - 26% for 2020 = **(\$2871.65)**
- Current Phase-out Schedule:
 - 26% continues until 2022
 - 22% in 2023
 - 0% in 2024 for residential
 - 10% in 2024 for commercial

The Money

State Incentive for Production

- SRECs = Solar Renewable Energy Credits
- You get paid for your SRECs
 - Based on generating kWh for 15 yrs
 - Got initial check for \$4,807.91
 - Year 15, get remainder of \$284.58

Total = \$5,092



The Money

Year 1 Net Cost:

Out-of-Pocket.....\$11,044

Less Income Tax Credit...(\$2,872)

Less SRECs Check.....(\$4,808)

Net Out-of-Pocket**\$3,364**

The Money

My ComEd Bill:

- Reduced kWh “draw” from the grid
- “Net Metering” allows excess kWh into the grid

METER INFORMATION

Read Dates	Meter Number	Load Type	Reading Type	Previous	Present	Difference	Multiplier	Usage
3/3-4/1	271270422	I/O w/ Flow Thru	kWh From Grid	Actual	Actual			153
3/3-4/1	271270422	I/O w/ Flow Thru	kWh To Grid	Actual	Actual			357

CHARGE DETAILS

Residential - Hourly Single 3/3/21 - 4/1/21 (29 Days)

Service Period Total

Thank you for your payment of \$43.47 on March 26, 2021

Total Amount Due

\$6.28

\$6.28

The Money

Lower Monthly Electric Bills:

- Buy less from the grid
- Get **credits** for “export” to the grid
- Next month even better!

CHARGE DETAILS

Residential - Hourly Single 3/3/21 - 4/1/21 (29 Days)



SUPPLY

\$3.01

Electricity Supply Charge	153 kWh	\$3.60
Capacity Charge	1.60 kW X 5.81723	\$9.31
Transmission Services Charge	153 kWh X 0.00836	\$1.28
Misc Procurement Component Chg	153 kWh X 0.00099	\$0.15
Purchased Electricity Adjustment		\$0.25
Net Metering Credit - Hourly Pricing	357 kWh	-\$7.65
Net Metering Credit - Supply	357 kWh X -0.01100	-\$3.93



DELIVERY - ComEd

\$6.55

Customer Charge		\$10.55
Standard Metering Charge		\$3.73
Distribution Facilities Charge	153 kWh X 0.03663	\$5.60
IL Electricity Distribution Charge	153 kWh X 0.00124	\$0.19
Net Metering Credit - Delivery	357 kWh X -0.03787	-\$13.52

TAXES & FEES

-\$3.28

Environmental Cost Recovery Adj	153 kWh X 0.00028	\$0.04
Renewable Portfolio Standard	153 kWh X 0.00189	\$0.29
Zero Emission Standard	153 kWh X 0.00195	\$0.30
Energy Efficiency Programs	153 kWh X 0.00188	\$0.29
Franchise Cost	\$5.95 X 2.23700%	\$0.13
Franchise Cost		-\$0.27
State Tax		-\$0.67
Municipal Tax		-\$1.25
Net Metering Credit - Other	357 kWh X -0.00600	-\$2.14

A photograph of a two-story house with a brown brick chimney and a dark brown shingled roof. A row of blue solar panels is installed on the roof, extending from the chimney towards the right. The house has a gabled roof and a dormer window. Bare trees are visible in the background against a clear blue sky. The text 'You Can Get Energy From the Sun, Too' is overlaid on the image in white, with a horizontal orange line underlining the word 'Energy'.

You Can Get Energy From the Sun, Too

- ✓ Check roof: orientation, shading, age
- ✓ Check annual kWh: ComEd acct
- ✓ Invite installers to quote work
 - Assess / Design / Layout?
 - Financing?
 - Application for SRECs?



You Can Get Energy From the Sun, Too

- *Solar is one of the quickest and easiest ways to impact building GHG emissions*
- If rooftop solar is your Plan A, Community Solar is your Plan B
- It's good to “walk the walk”



Thank you!