2018

MOT 18-356 - Staff's Report on Energy Initiatives

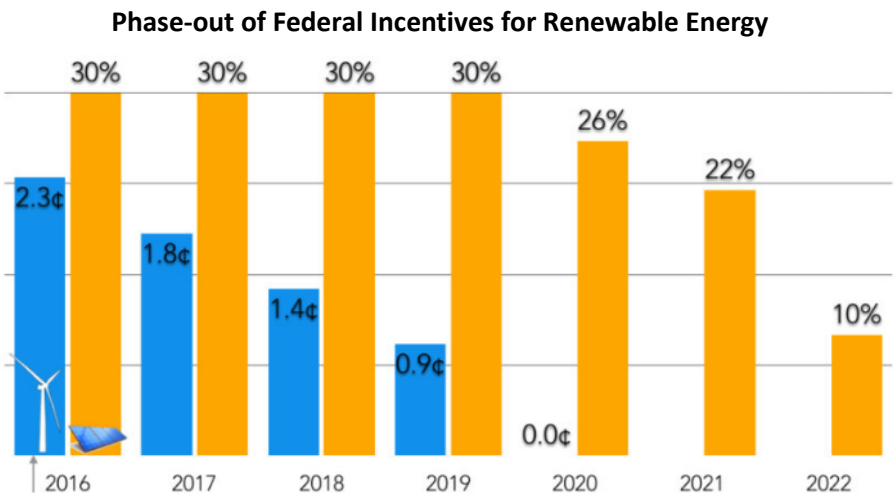
PRELIMINARY ANALYSIS OF OPTIONS FOR VILLAGE ENERGY INITIATIVES

VILLAGE OF OAK PARK

Executive Summary

The Future Energy Jobs Act (FEJA) of 2016 established new statewide goals for renewable energy and energy efficiency in Illinois and provides enhanced funding to support programs and projects in these sectors. Renewable energy incentives through FEJA are subject to a hard rate cap and are structured to provide higher incentives for projects that can be deployed in the near term and lower incentives for later projects.

Similarly, federal incentives for renewable energy projects are set to decline over the near term. As noted in the chart to the right, incentives for wind projects (the production tax credit) will decline from 2.3 cents per kWh to 0 cents per kWh in 2020. Additionally, incentives for solar projects (the investment tax credit) will decline from 30% of total project capital cost to 10% of total project capital costs in 2022.



In sum, the FEJA and federal incentives for renewable energy set strong financial incentives for projects that can be deployed in the near term. As a leader in sustainability planning and programming, the Village of Oak Park has an opportunity to leverage FEJA funding and federal tax credits with funds collected through the Village's Community Choice Aggregation program to benefit the entire community.

At the direction of the Board, Staff has undertaken an evaluation of eight (8) renewable energy and energy efficiency program that could be supported by a combination of FEJA and federal incentives and the Community Choice Electrical Aggregation Fund (CCA-Fund). In its evaluations, Staff sought to define appropriate goals and approaches and to score each option by key metrics as well as general economics. The key metrics applied by Staff included:

- Sustainability – What volume of energy efficiency or renewable energy generation can the option deliver?
- Economics – What is the balance between economic value delivered vs. program cost?
- Resource Requirements – What level of Village resources will be required to manage the program?
- Unknowns – How much experience exists in the market to support the program or related technologies?
- Longevity – What is the life cycle duration of the assets supported by the program?
- Complexity – What is the level of complexity related to managing the program?
- Scalability – What level of funding flexibility can the program accommodate?
- Calendar – What is the likelihood that the program can commence in calendar year 2018?

Staff then made recommendations for each program based on the results of the metrics evaluation. The table below consolidates the scoring values, composite scores, staff recommendations, and budget guidance for each of the options considered. Scores range from 1 to 5, with 1 indicating poor performance and 5 indicating superior performance.

A. Rooftop Solar Array for Village Hall (to Support Village Consumption)

Description. Rooftop solar arrays with installed generating capacity of less than 2,000 kW can receive substantial financial incentives under FEJA. By connecting a rooftop solar array to a building's electrical system, the solar energy generated can replace some or all the electricity purchased from the local utility. Financing the construction of rooftop solar arrays typically depends on revenues from multiple sources: federal tax incentives, the sale of Renewable Energy Credits (SRECs) to local utilities, direct capital investment by the property owner, and the avoided cost savings resulting from reduced electricity purchases from the local utility.

The Village could install a small solar array on the rooftop of the Village Hall, and utilize the electricity generated to offset electricity deliveries from Commonwealth Edison to that facility.

Sector. Renewable Energy (government)

Goal. To supply a portion the electricity consumption of the Oak Park Village Hall with electricity generated by a rooftop solar asset.

Approach. The Village can solicit bids from solar installation companies to design and build a solar array on the Village Hall roof. Typically, rooftop solar projects are financed through power purchase agreements, equipment leases or cash payments plus utility and tax incentives. The simplest method for the Village to finance a rooftop solar array for Village Hall would be to: i) sell the SRECs generated by the array over a 15-year period to Commonwealth Edison; and, ii) pay the remaining costs from the CCA-Fund.

Operational Assessment. Staff's evaluation of the Rooftop Solar Array option for Village Hall according to key operational characteristics is found in the following table. Scores range from 1 to 5 with 1 indicating poor performance and 5 indicating superior performance.

Category	Description	Score (1-5)
Sustainability	Volume of energy efficiency results or renewable energy generation	2
Economics	Level of economic value vs. cost	1
Resources	Level of Village resources required to create and manage program activities	3
Unknowns	Level of market experience with approach or technology	5
Longevity	Duration of project life cycle	5
Complexity	Level of management complexity	4
Scalability	Level of ability to increase or decrease funding levels as needed	2
Calendar	Ability to facilitate the approach in 2018	4

Staff Recommendation: Staff recommends that the Rooftop Solar Array for Village Hall be considered by the Board. The recommendation is supported by the relatively low cost of the project, and the visibility the project would have for residents and businesses that are considering their own rooftop solar projects. Additionally, Staff recommends further evaluation of: i) utilizing solar PV film for the Rooftop Solar Array (as opposed to solar PV panels); ii) examining options for utilizing more rooftop square footage for generation; and iii) evaluating the option of installing solar canopies in the Village Hall parking lot.

Economic Benchmarking. Development and management of a Rooftop Solar Array for Village Hall will not reduce electricity supply costs for the Village as the Village Hall receives unbilled electricity supply service from Commonwealth Edison through the Village's utility franchise agreement. As such, the economic benchmarking

assessment of a Rooftop Solar Array for Village Hall project presents a net negative value. However, initial cost estimates for the project indicate that the cost of installing a rooftop solar array (after incentives) can be supported by the CCA-Fund. The table below conveys the preliminary economic analysis of the Rooftop Solar for Village Consumption option. Staff can continue to refine the economic analysis at the direction of the Board.

Variables		Calcs	Village Hall
Rooftop Solar Project Capacity			
A	Available Roof Space (Square Feet)	A	9,000
B	Potential Solar Generating Capacity (kW)	B	120
C	Solar Capacity Factor	C	16%
D	Hours in a Year	D	8,760
E	Annual Solar Generation Potential (kWh)	E = B * C * D	168,192
F	Annual Consumption (kWh)	F	2,237,000
G	Solar Offest Value (%)	G = E / F	7.5%
Solar Project Installation Costs			
H	Potential Solar Generating Capacity (kW)	H = B	120
I	Estimated Unit Cost of Solar ($/kW)	I	$3,500
J	Estimated Total Cost of Solar Project	J = H * I	$420,000
K	Estimated SREC Incentives (15-year contract, payment in 1st 4 years)	K	($135,554)
L	Estimated Inverter Incentives ($250/kW, 1 time payment, year 1)	L	($30,000)
M	Net Solar Project Capital Cost	M = J + K + L	$254,446
Cost Offsets from Solar Project Installation			
N	Electricity Supply Cost ($/kWh)	N	$0.0000
O	Annual Solar Generation Potential (kWh)	O	168,192
P	Potential Annual Avoided Cost for Solar Project	P = N * O	$0
Net Results for Solar Project Installations			
Q	Net Solar Project Capital Cost	Q = M	$254,446
R	Potential Annual Avoided Cost for Solar Project	R = P	$0
S	Net Cost to Village for Solar Project Installation	S = R - S	($254,446)

*Capacity Factor is the ratio of energy generated over 1-year, divided by the installed capacity.

B. Rooftop Solar Array for Village Hall (to Support Community Solar)

Description. Community Solar projects with an installed generating capacity of less than 2,000 kW can also receive substantial financial incentives under FEJA. By connecting an array of solar panels to the Commonwealth Edison distribution system, the electricity generated by the array can be credited to the accounts of any Commonwealth Edison customer that subscribes to that Community Solar array – a process called Net Metering. Financing the construction of Community Solar arrays typically depends on revenues from multiple sources: federal tax incentives, the sale of Renewable Energy Credits (SRECs) to local utilities, direct capital investment by the property owner, and subscription fees from project subscribers.

The Village could install a community solar array on the rooftop of the Village Hall and allow residents to subscribe to the array to offset all or a portion of their own electricity consumption through the Net Metering Process.

Sector. Renewable Energy (Residential)

Goal. To host a community solar array for Oak Park residents on the roof of the Oak Park Village Hall.

Approach. The Village can solicit bids from solar installation companies to design and build a Community Solar array on the Village Hall roof. The Community Solar array would export electricity to the Commonwealth Edison distribution system. The simplest method for the Village to finance a community solar array for the Village Hall roof would be to: i) sell the SRECs generated by the array over a 15-year period to Commonwealth Edison; and, ii) pay the remaining costs from the CCA-Fund. Residents may enter into 15 to 20-year agreements to subscribe to the Community Solar Array to purchase a portion of the array's output.

Operational Assessment. Staff's evaluation of the Community Solar Array for the Village Hall Roof option according to key operational characteristics is found in the following table. Scores range from 1 to 5 with 1 indicating poor performance and 5 indicating superior performance.

Category	Description	Score (1-5)
Sustainability	Volume of energy efficiency results or renewable energy generation	2
Economics	Level of economic value vs. cost	3
Resources	Level of Village resources required to create and manage program activities	3
Unknowns	Level of market experience with approach or technology	4
Longevity	Duration of project life cycle	5
Complexity	Level of management complexity	4
Scalability	Level of ability to increase or decrease funding levels as needed	3
Calendar	Ability to facilitate the approach in 2018	4

Staff Recommendation: Staff recommends that the Community Solar for the Village Hall Roof option be considered by the Board. The recommendation is supported by the relatively low cost of the project, and the visibility the project would have for residents and businesses, and the financial benefits that may be realized by subscribers. Additionally, Staff recommends further evaluation of i) utilizing solar PV film for the Rooftop Solar Array (as opposed to solar PV panels); ii) examining options for utilizing more rooftop square footage for generation; and iii) evaluating the option of installing solar canopies in the Village Hall parking lot.

Economic Benchmarking. Development and management of a Community Solar Array on the Village Hall Roof project will not reduce electricity supply costs for the Village as the electricity generated by the array will be

delivered into the Commonwealth Edison distribution and credited to subscribers' accounts. As such, the economic benchmarking assessment of the Community Solar on the Village Hall Roof project presents a positive economic value for subscribers. The table below conveys the preliminary economic analysis of the Utility-Scale Solar option. Staff can continue to refine the economic analysis at the direction of the Board.

Variables		Calcs	Village Hall
Rooftop Solar Project Capacity			
A	Available Roof Space (Square Feet)	A	9,000
B	Potential Solar Generating Capacity (kW)	B	120
C	Solar Capacity Factor	C	16%
D	Hours in a Year	D	8,760
E	Annual Solar Generation Potential (kWh)	E = B * C * D	168,192
F	Annual Consumption (kWh)	F	2,237,000
G	Solar Offest Value (%)	G = E / F	7.5%
Solar Project Installation Costs			
H	Potential Solar Generating Capacity (kW)	H = B	120
I	Estimated Unit Cost of Solar ($/kW)	I	$3,500
J	Estimated Total Cost of Solar Project	J = H * I	$420,000
K	Estimated SREC Incentives (15-year contract, payment in 1st 4 years)	K	($223,956)
L	Estimated Inverter Incentives ($250/kW, 1 time payment, year 1)	L	($30,000)
M	Net Solar Project Capital Cost	M = J + K + L	$166,044
Simple Cost for Community Solar Subscriptions			
N	Annual Solar Generation Potential (kWh)	N = E	168,192
O	Community Solar Contract Term (Years)	O	15
P	Solar Generation Potential for Community Solar Contract Term (kWh)	P	243,710,208
Q	Net Solar Project Capital Cost	Q = M	$166,044
R	Average Subscription Unit Cost ($/kWh)	R = P / Q	$0.00068
Consumer Benefit from Community Solar Subscription			
S	Estimated annual consumption per household (kWh)	S	7,500
T	Number of Households Served by Community Solar Installation	T	22
U	Projected Unit Price for Elecrticity Supply (Grid)	U	$0.03000
V	Average Subscription Unit Cost ($/kWh)	V = R	$0.00068
W	Annual Cost savings per Subscription Houehold	W = (U - V) * S	$219.89

*Capacity Factor is the ratio of energy generated over 1-year, divided by the installed capacity.