

RETAIL SOLAR NET METERING REVIEW

July 23, 2019

BACKGROUND:

The City Council last made changes to the City's retail solar installation regulations on March 1, 2017. These regulations are found in Municipal Code, Section 28.109, and Section 2.7 of Appendix H. This report is intended to review the City's Retail Solar program and summarize impacts to the program after the changes went into effect.

Solar installations are becoming increasingly popular in Ames, and the City encourages this form of renewable energy in the form of rebates. For new installations of solar energy systems, the City provides a one-time rebate for the customer of \$300 per kW, calculated at the time the City's energy demand is highest. Solar installations may also be eligible for state and federal tax credits.

NET METERING'S IMPACT ON BILLS:

Customer electric bills are based on Ames' cost of providing electric service. This cost of service includes the cost to transport and deliver the electricity to the customer as well as the cost of the fuels used to generate electricity. Costs also include the maintenance of the grid (wires, poles, transformers, substations) as well as the programs for demand side management, energy efficiency, environmental improvements, and other public benefits.

As a basis for allocating costs to each of the different classes of customer, it is important to first define the three cost components – Demand, Energy, and the Customer Cost.

Demand Costs - Those costs which include operating & maintenance expenses, capital expenditures and other costs which are generally fixed and do not vary materially with the amount of electricity consumed.

Energy Costs - Those costs which vary substantially or directly with the amount of energy purchased or generated. Energy costs are those costs which could be expected to vary with electric consumption.

Customer Costs - Those costs which relate to the number and type of customer such as customer service, accounting, billing and collection, and metering equipment.

A typical electric customer has an electric meter that records the amount of power delivered by Ames. As electricity is consumed, the meter spins forward, similar to a car's odometer recording miles traveled. In the case of an electric meter, the meter records energy consumption in kilowatt-hours or kWh.

Customers with solar energy systems are producing energy locally, which reduces their energy consumption from the electric utility. When their solar output is less than their energy demand, the solar energy works like a credit to reduce the amount of electricity needed from the utility to serve the customer. When the opposite happens, and the solar output exceeds the amount of energy that can be used on their property, the excess solar energy is pushed back onto the utility like an odometer in reverse. At the end of the billing cycle, these pushes and pulls are tallied and the customer is only billed for their net consumption. This concept is called “net metering.”

NET METERING REQUIREMENTS AND INSTALLATIONS IN AMES:

Net Metering is available to any retail customer receiving electric service under a City of Ames Electric Services rate schedule. The customer must own and operate an approved on-site generating system powered by a renewable resource capable of producing not more than 500 kW of power and who interconnects with the City’s electric system. Prior to Fall 2015, the City restricted installations to be no larger than 10 kW.

Throughout 2016, the number of new installations grew from 20 to 130. Many of these new installations were greatly oversized, so that the total amount of energy produced by the solar system exceeded the total amount of energy consumed by the customer at certain times of the day. Under the Municipal Code language in place at the time, the customer would deliver the excess energy to the utility and later retrieve the energy when the customer’s load exceeded their solar production.

The City’s Net Metering language originally encouraged the practice of oversizing, which creates two issues:

- First, when a solar array is oversized, the utility becomes a “storage medium” to which the customer can overproduce and then draw on that overproduction at a later time. **This creates a situation where a solar customer is using the City’s electric grid without paying for the fixed costs associated with maintaining it (the “demand” costs described above).** These costs are then transferred to, or paid by, the customers who have not installed solar generation.
- Second, prior to March 1, 2017, the Municipal Code requires the City to pay any over-generating solar customer the full retail rate for excess energy produced, even though the utility is able to purchase considerably less expensive energy on the wholesale market. This creates cross subsidization with the customer base. **The City pays a premium for solar energy that could have been supplied with less costly energy.** The higher cost of the energy is passed along to other customers in the form of slightly higher rates.

The City’s Electric Utility Operations Review Advisory Board (EUORAB) held five public meetings in 2016 (September 12, October 6, two meetings on October 18, and November 1) to review the current process, to listen to customer and vendor input, and discuss alternative solutions. There were public notices of these meetings, a press release, website postings, and social media posts, as well as local media coverage. The goal was to make changes to the Net Metering language

so that all customers using the delivery system were making a contribution to the costs of maintaining the electric system. To accomplish this, staff separated the energy costs from the delivery system costs in the City’s rate structure.

At the EUORAB meeting on November 1, 2016, the Board voted to support the purchase of excess energy produced by a solar panel at a defined cost. The formula is based on the City’s most current Cost of Service study. This study examined the “unbundling” of electric rates into three components – Demand, Energy, and Customer Cost for each customer class. Each component has a cost associated with it, and dividing the components by the "Total Cost" to provide service for that class of customers yields an approximation of how much each component makes up each rate (Table 1).

Table 1

	Residential	General Power	Large Power	Industrial
Energy Cost	\$6,074,919	\$1,984,596	\$8,759,027	\$5,437,43
Total Cost	\$15,563,782	\$4,848,958	\$17,822,47	\$8,662,84
Percentage of Energy to Total Cost	39%	41%	50%	63%
<u>Summer Rate</u>	<u>\$0.1166/kWh</u>	<u>\$0.1148/kWh</u>	\$0.0619/kwh	\$0.0619/kwh
Winter Rate	\$0.0966/kWh	\$0.0948/kWh		
Rate to Pay Customer for Excess Energy	<u>\$0.0455/kWh</u> \$0.0377/kWh	<u>\$0.0471/kWh</u> \$0.0389/kWh	\$0.0310/kWh	\$0.0390/kWh
<u>Summer Rate</u>				
Winter Rate				

The bottom row of Table 1 indicates how much the Cost of Service/Rate Study suggests to credit for energy pushed onto the grid by customers. For example, since 39% of the cost to provide service to a residential customer is made up of the energy cost, then only 39% of the residential rate should be credited for customer generation (\$0.0455/kWh in the summer). The remaining 61% of the summer rate should not be credited, since that portion of the rate covers the costs for poles, wires, transformers, billing, etc.

At the City Council meeting on November. 15, 2016, the City Council modified EUORAB’s recommendation and added additional incentives. City Council approved the purchase of excess energy from customer generation using the “Defined Cost” approach with the following additional incentives:

Residential: 2.5 cents/kilowatt hour incentive
 General Power: 2 cents/kilowatt hour incentive
 Large Power: 1.5 cents/kilowatt hour incentive
 Industrial: 1 cent/kilowatt hour incentive

These new rates went into effect on electric bills mailed on and after March 1, 2017. Later that year, on July 1, the Council approved a 4% across-the-board rate increase. Rates today are found in Table 2 below:

Table 2

	Residential	General Power	Large Power	Industrial
<u>Summer Rate</u> Winter Rate	<u>\$0.1213/kWh</u> \$0.1005/kWh	<u>\$0.1194/kWh</u> \$0.0986/kWh	\$0.0644/kWh	\$0.0644/kWh
Rate to Pay Customer Without Council-Authorized Incentives <u>Summer Rate</u> Winter Rate	<u>\$0.0485/kWh</u> \$0.0402/kWh	<u>\$0.0478/kWh</u> \$0.0394/kWh	\$0.0322/kWh	\$0.0406/kWh
Additional Council-Authorized Incentives	\$0.025/kWh	\$0.020/kWh	\$0.015/kWh	\$0.010/kWh
Rate to Pay Customer for Excess Energy <u>Summer Rate</u> Winter Rate	<u>\$0.0735/kWh</u> <u>\$0.0652/kWh</u>	<u>\$0.0678/kWh</u> <u>\$0.0594/kWh</u>	\$0.0472/kWh	\$0.0506/kWh

PUBLIC MEETING:

After the new Net Metering rules were in place for over a year, EUORAB held a public meeting to invite those who have solar installed and fall under the Net Metering rules. On August 1, 2018, 17 customers attended a meeting at the Ames Public Library. Director Kom reviewed the current information regarding systems installed and the Net Metering language currently in effect.

In general, those in attendance were appreciative of the support the City of Ames has made towards the installation of customer owned solar. The general consensus of the participants was that the Net Metering program did not go far enough. Most requested that either A) the Net Metering language be returned to the previous language, or B) that the rate paid for excess generation be increased to something more like the full retail rate.

EUORAB RECOMMENDATION:

The EUORAB held a follow-up meeting on August 13, 2018 to discuss the Net Metering language and the comments received from those in attendance at the August 1, 2018 public meeting. In the end, the **EUORAB passed a motion to direct staff to recommend to the City Council that no changes be made to the Net Metering program.**

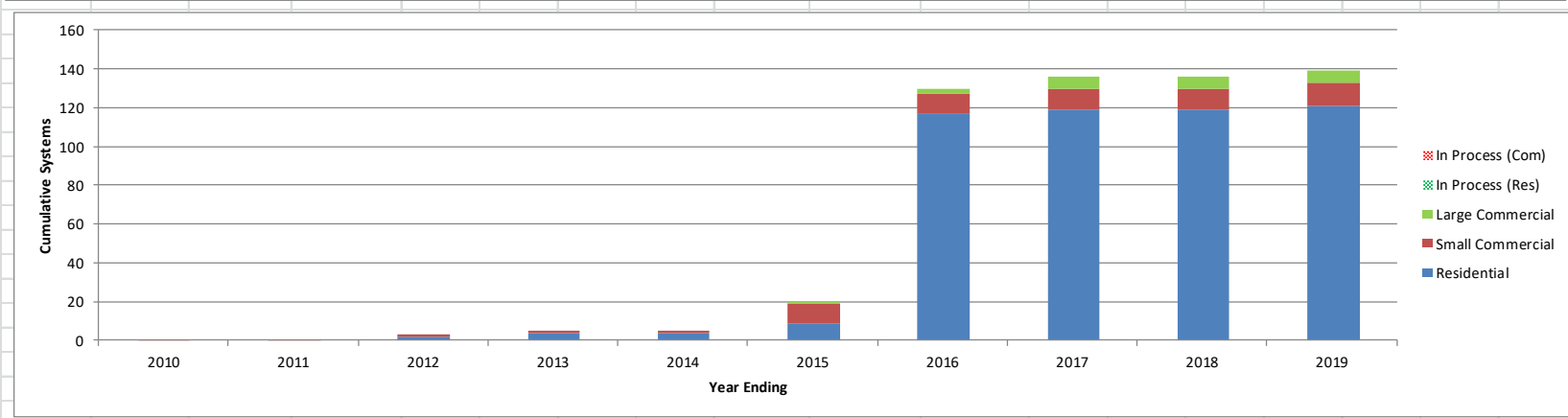
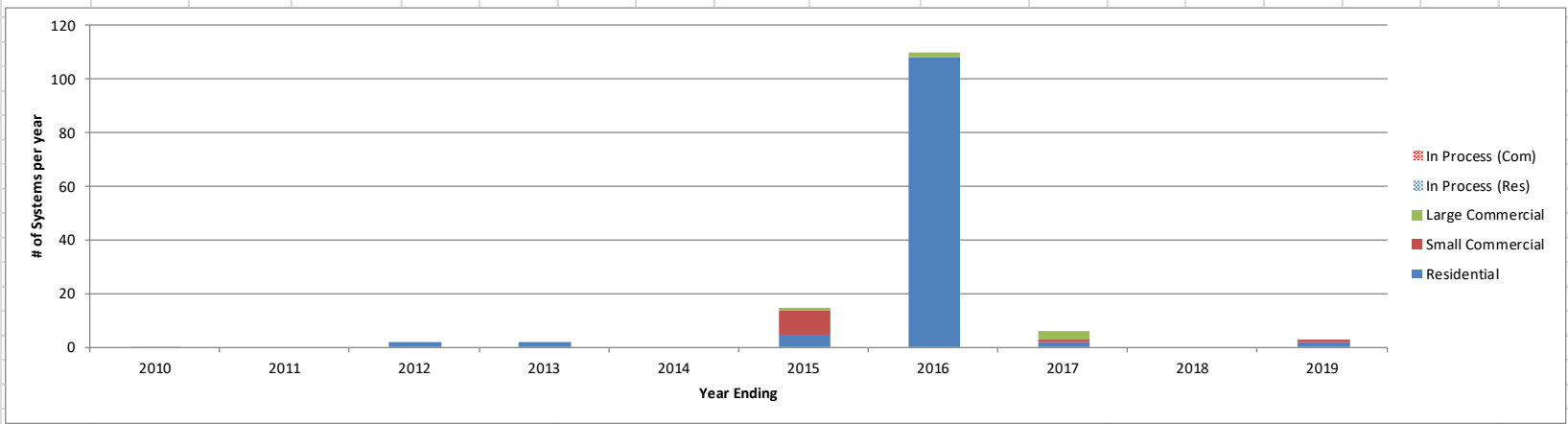
SUPPORTING MATERIALS:

For the retail solar program in Ames, staff tracks several data points broken out by year and by customer class. The information presented is current up to June 1, 2019. Each of these data points have been plotted on the attached graphs and include:

- Chart 1 – **Systems** - There are currently 138 systems installed or under development within Ames in the Ames Electric service territory. Of note on the attached graph, there was a spike in installations in 2016. This happened to be one apartment owner who installed over 100 systems, each unique to an individual apartment.
- Chart 2 - **Kilowatts** - At present, there are close to 1,000 kilowatts of installed solar within Ames. In comparison, Ames' SunSmart community solar farm is estimated to be 2,000 kilowatts.
- Chart 3 – **Solar Rebates** - Through the City's Smart Energy rebate program, a customer can receive a rebate of \$300 per kilowatt that a system can produce during the utility's summer peak. Thirty-two customers have applied for rebates since the program was added in 2015.
- Chart 4 - **Solar Rebate Dollars** – Over \$218,000 has been paid out in rebates since 2015.
- Chart 5 - **Solar Energy Purchased** - Following the changes to the City's Net Metering program approved by City Council in 2017, any energy over produced by a solar customer is purchased by the City. This chart summarizes the amount of energy over produced by customer class.
- Chart 6 - **Solar Energy Purchased Dollars** – This chart summarizes the payments made to the solar customers who over produced by customer class.

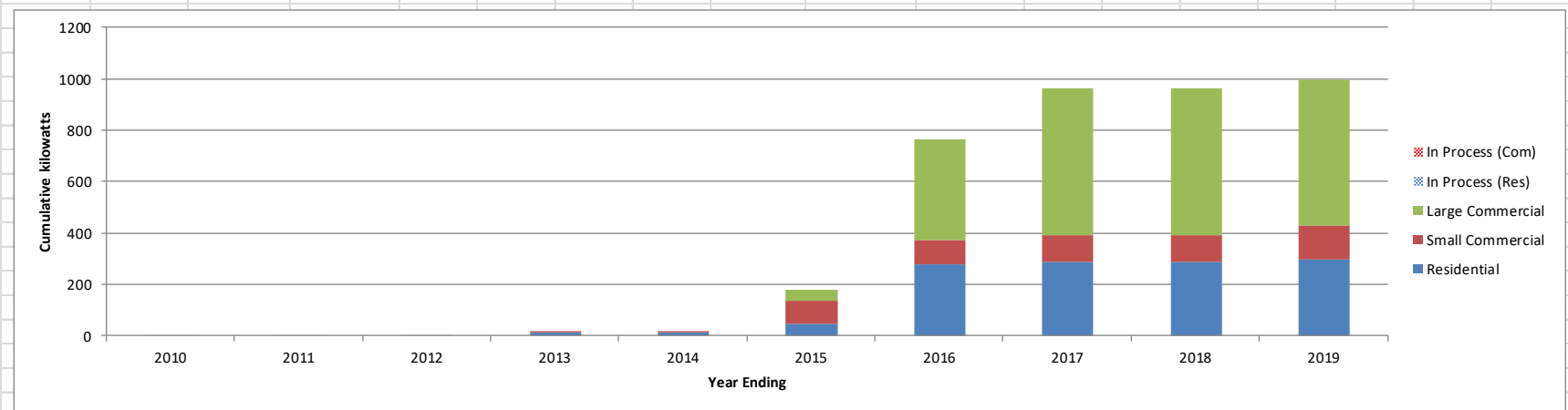
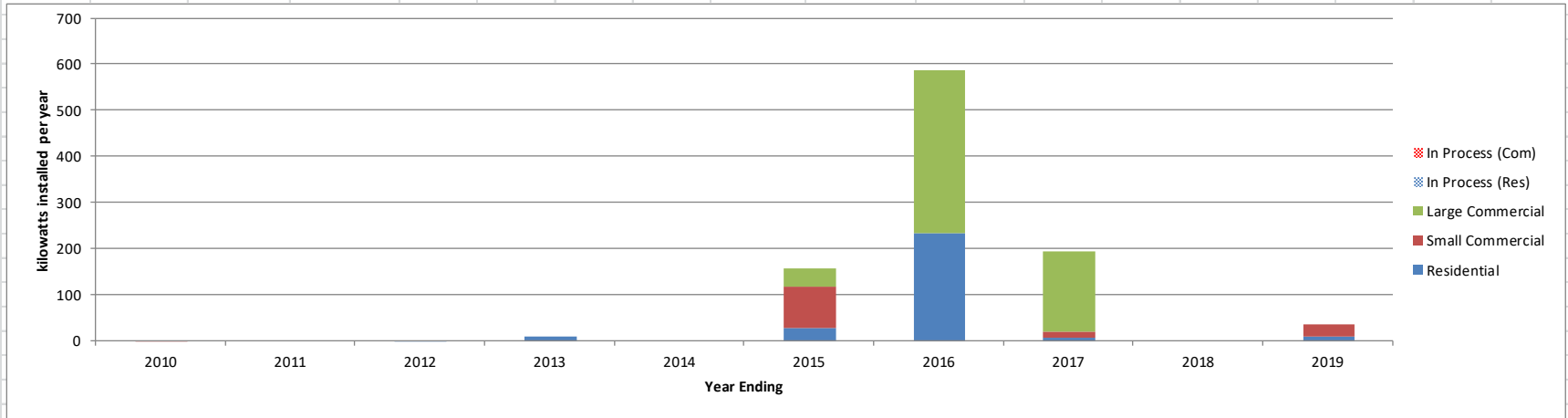
Systems

				In Process (Res)	In Process (Com)				In Process (Res)	In Process (Com)			
	Residential	Small Commercial	Large Commercial			Residential	Small Commercial	Large Commercial					
2010	0	1	0					2010	0	1	0		
2011	0	0	0					2011	0	1	0		
2012	2	0	0					2012	2	1	0		cumulative
2013	2	0	0					2013	4	1	0		
2014	0	0	0					2014	4	1	0		
2015	5	9	1					2015	9	10	1		
2016	108	0	2					2016	117	10	3		
2017	2	1	3					2017	119	11	6		Note - ISRM added second
2018	0	0	0		1			2018	119	11	6		Note - VB Seals
2019	2	1						2019	121	12	6		
Total	121	12	6		138								



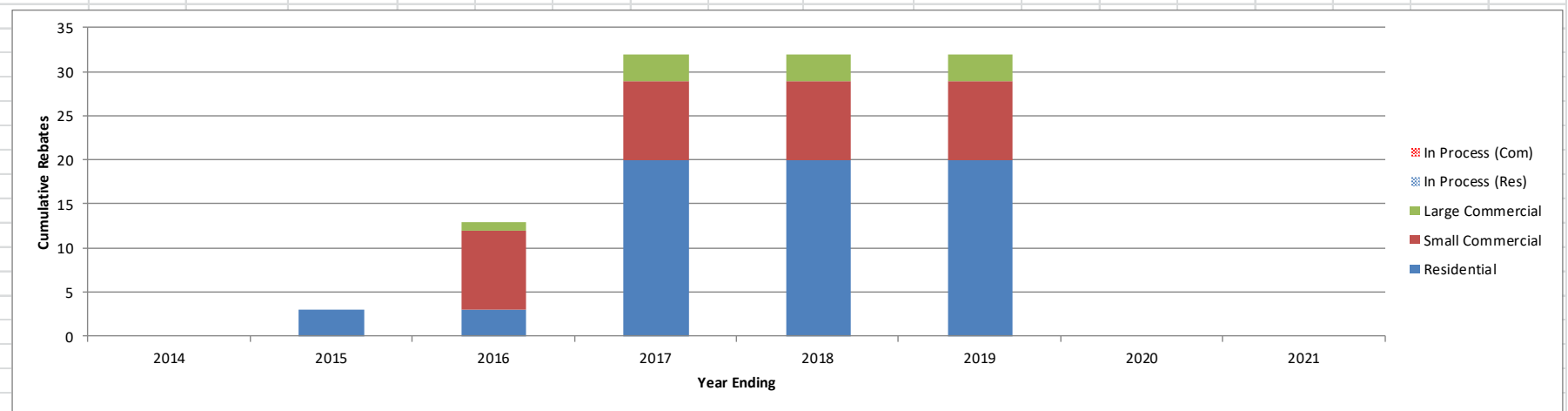
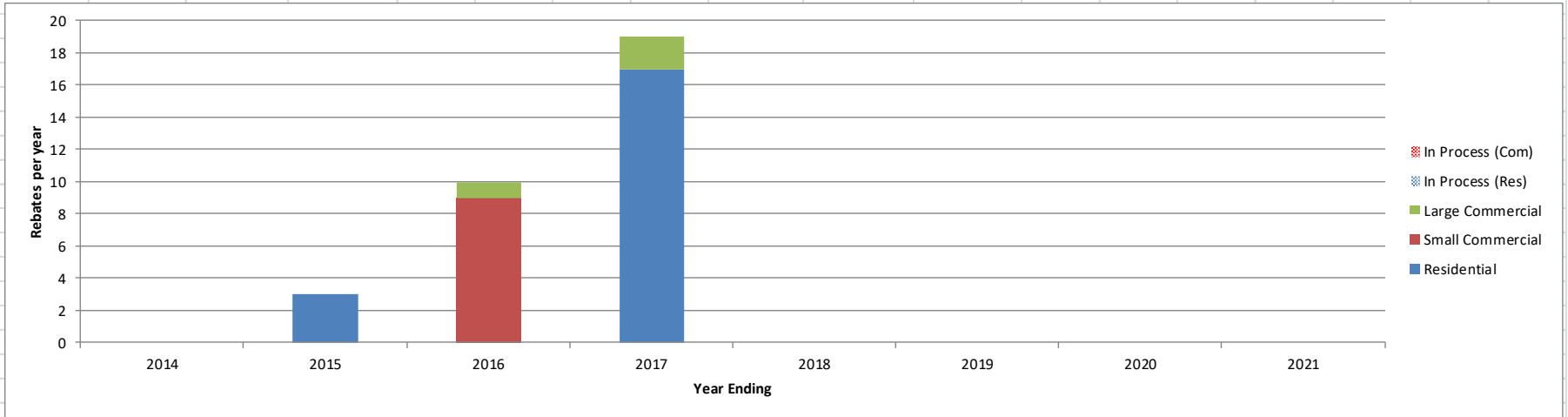
Kilowatts

	Residential	Small Commercial	Large Commercial	In Process (Res)	In Process (Com)		Residential	Small Commercial	Large Commercial	In Process (Res)	In Process (Com)				
2010	0	4.3	0				2010	0	4.3	0					
2011	0	0	0				2011	0	4.3	0					
2012	5.24	0	0				2012	5.24	4.3	0					cumulative
2013	10.1	0	0				2013	15.34	4.3	0					
2014	0	0	0				2014	15.34	4.3	0					
2015	29.76	89.1	39.6				2015	45.1	93.4	39.6					
2016	234.025	0	354.465				2016	279.125	93.4	394.065					
2017	8.02	12.18	176.18				2017	287.145	105.58	570.245					note ISRM added 2nd
2018	0		0		0		2018	287.145	105.58	570.245					
2019	11	24.85	0				2019	298.145	130.43	570.245					
Total	298.145	130.43	570.245		998.82										

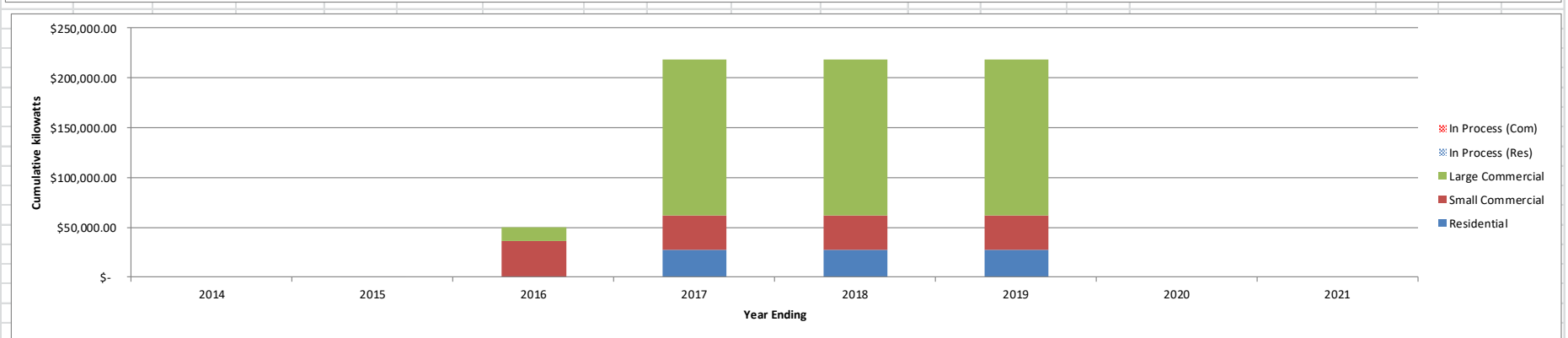
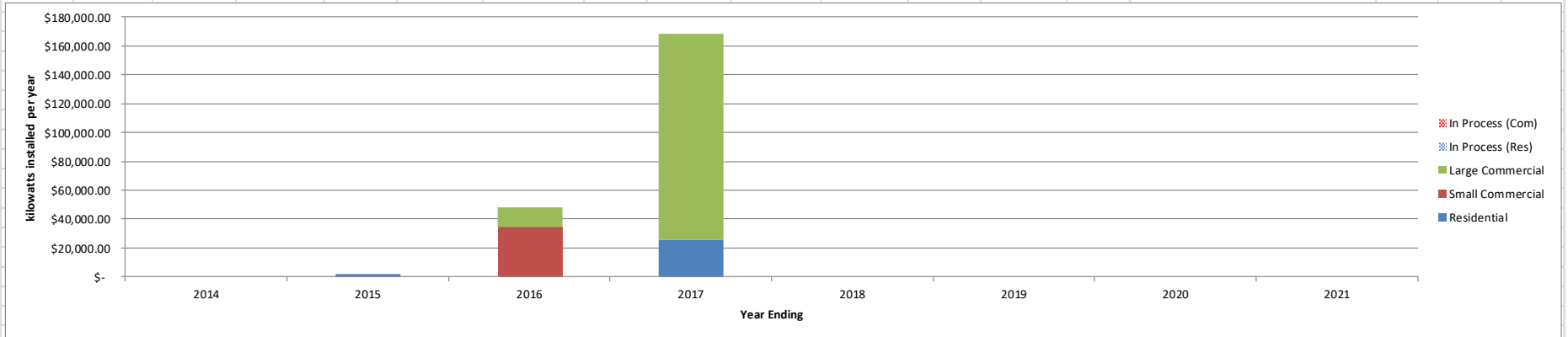


Solar Rebates

	Residential	Small Commercial	Large Commercial	In Process (Res)	In Process (Com)			Residential	Small Commercial	Large Commercial	In Process (Res)	In Process (Com)				
2014	0	0	0					2014	0	0	0					
2015	3	0	0					2015	3	0	0					
2016	0	9	1					2016	3	9	1					cumulative
2017	17	0	2					2017	20	9	3	0	0			
2018	0	0	0					2018	20	9	3					
2019	0	0	0					2019	20	9	3	0	0			
2020								2020								
2021								2021								
Total	20	9	3				32									32

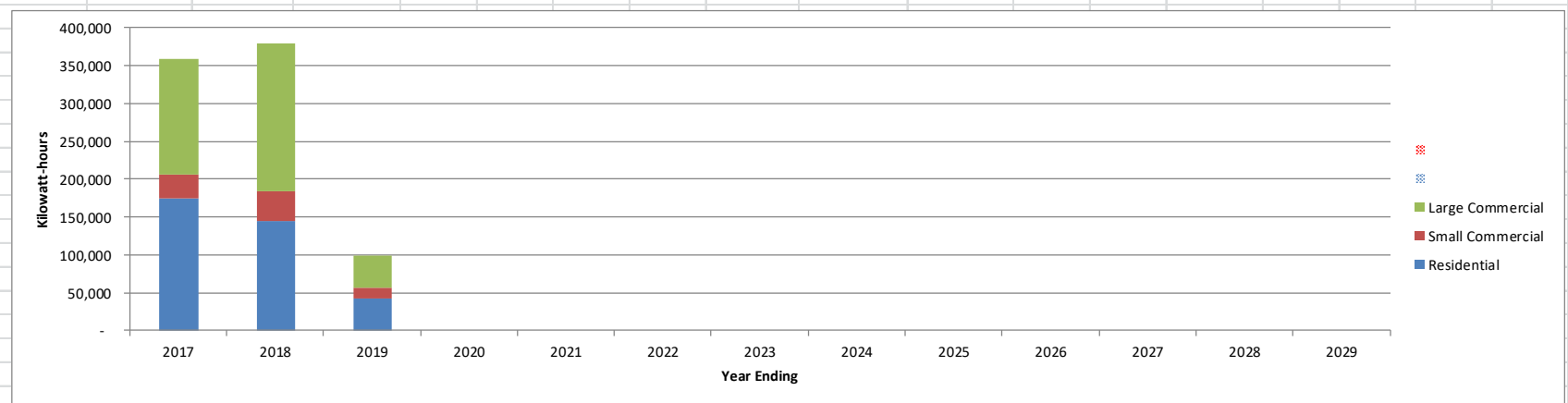
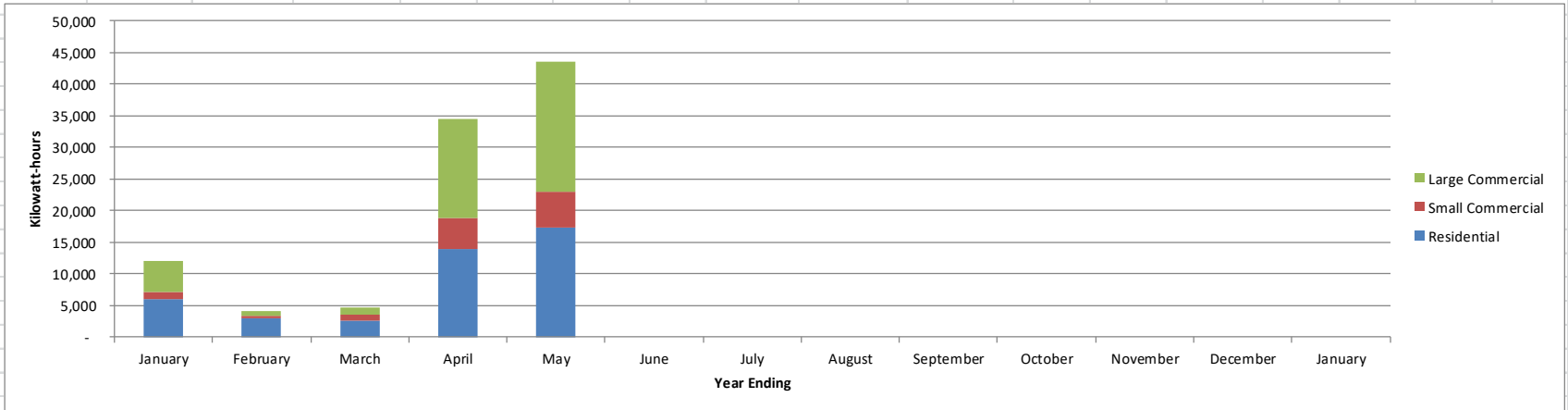


Solar Rebate Dollars														
	Residential	Small Commercial	Large Commercial	In Process (Res)	In Process (Com)			Residential	Small Commercial	Large Commercial	In Process (Res)	In Process (Com)		cumulative
2014	\$ -	\$ -	\$ -					2014	\$ -	\$ -	\$ -			
2015	\$ 1,985.14	\$ -	\$ -					2015	\$ 1,985.14	\$ -	\$ -			Penny, A Vansettner, R. Vansteenber
2016	\$ -	\$ 34,598.50	\$ 13,448.00					2016	\$ 1,985.14	\$ 34,598.50	\$ 13,448.00			Theisens, Haverkamp Properties
2017	\$ 25,619.50		\$ 142,689.00					2017	\$ 27,604.64	\$ 34,598.50	\$ 156,137.00	\$ -	\$ -	Gleason, Steffen, Koszewski, Stone, Schnable, Brotherson, ISU Readi Mix, Mc Farland Stadium View, Shaffer's Auto Body
2018	\$ 0.00	\$ 0.00	\$ 0.00					2018	\$ 27,604.64	\$ 34,598.50	\$ 156,137.00			
2019								2019	\$ 27,604.64	\$ 34,598.50	\$ 156,137.00	\$ 0.00	\$ 0.00	
2020								2020						
2021								2021						
Total	\$ 27,604.64	\$ 34,598.50	\$ 156,137.00			\$ 218,340.14								



Solar Energy Purchased

	Small			Large				Small			Large		
	Residential	Commercial	Commercial	# Res	# S Com	# Com		Residential	Commercial	Commercial	Residential	Commercial	Commercial
January	6,082	1,101	4,925	20	9	4	2017	174,587	31,827	152,006			
February	2,977	317	832	20	10	3	2018	144,440	40,160	194,197			
March	2,577	978	1,090	18	10	2	2019	42,831	13,105	43,160			
April	13,895	4,999	15,684	21	12	4	2020						cumulative
May	17,300	5,710	20,629	21	12	4	2021						
June							2022						
July							2023						
August							2024						
September							2025						
October							2026						
November							2027						
December							2028						
January							2029						
Total	42831	13105	43160										99,096



Solar Energy Purchased

	Small			Large				Small					
	Residential	Commercial	Commercial	Residential	Commercial	Commercial		Residential	Commercial	Commercial			
January	\$ 396.56	\$ 65.42	\$ 232.46	2017	\$ 11,777.88	\$ 2,006.53	\$ 7,098.72				\$20,883.13		
February	\$ 194.16	\$ 18.83	\$ 39.26	2018	\$ 9,866.22	\$ 2,530.36	\$ 9,660.46				\$22,057.04		
March	\$ 168.09	\$ 58.10	\$ 51.45	2019	\$ 2,792.67	\$ 778.46	\$ 2,037.14				\$ 5,608.27		
April	\$ 905.96	\$ 296.94	\$ 740.29	2020									
May	\$ 1,127.90	\$ 339.17	\$ 973.68	2021									
June				2022									
July				2023									
August				2024									
September				2025									
October				2026									
November				2027									
December				2028									
January				2029									
Total	\$ 2,792.67	\$ 778.46	\$ 2,037.14		\$ 5,608.27						\$ 5,608.27		

