



# MEMO

**To:** Mayor and City Council  
**From:** Donald Kom, Electric Services Director  
**Date:** September 24, 2021  
**Subject:** **RETAIL SOLAR NET METERING REVIEW**

The City's Electric utility provides for customers to install small solar energy systems and sell excess energy back to the utility through a net metering process. On July 23, 2019, the City Council requested a report to better understand the costs and impacts of the City's current Distributed Generation Buyback Policy. In addition, the Council requested suggestions of new models to increase the incentive for and accessibility of customer-owned solar energy. In response to the City Council's referral, this memo:

- 1) Reviews the current status of Net Metering for Ames utility customers
- 2) Compares Ames' current incentives for solar installations to those of neighboring electric utilities
- 3) Provides staff comments and potential future steps related to solar incentives

## **NET METERING OVERVIEW:**

Net Metering applies to a customer-owned solar generating system that primarily offsets part or all of the customer's electric service energy requirements provided by the City's Electric Services. 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 of Ames electric system. This does not apply to those Ames residents and business that are served by one of the other three electric utilities.

There have been three modifications to the Municipal Code since Net Metering was first adopted. The first update was in fall 2015 when the maximum allowable size of a facility was increased from 10 kW to 500 kW.

The second modification to Net Metering is more complex. Since 2016, the number of new installations grew significantly from 20 to 152. **In 2021 alone, seven installations entered into service with three more applications pending as of this writing.** In 2016, as staff reviewed the projects being installed at that time, a pattern emerged where customers were greatly oversizing installations 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 prior to 2016, 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 design of the City’s Net Metering language prior to 2016 actually encouraged this process of oversizing which creates two issues of concern:

- **First, by oversizing an installation, the customer would use the electric system without paying for the installation and maintenance of the wires, staff, programs, etc. These costs would then be shifted to the other non-solar producing customers.**
- Second, prior to March 1, 2017, the Municipal Code required 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 via the Energy Cost Adjustment.

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 net metering process, 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. The study examined the “unbundling” of electric rates into three components – Demand, Energy, and Customer Cost for each customer class. Dividing the "Energy" components by the "Total Cost" provides an approximation of the energy component of each rate. EUORAB’s recommended buyback rate is reflected in Table 1.**

[Table 1: Calculation of Energy Buyback Rates](#)

	<b>Residential</b>	<b>General Power</b>	<b>Large Power</b>	<b>Industrial</b>
Energy Cost	\$6,074,919	\$1,984,596	\$8,759,027	\$5,437,433
Total Cost	\$15,563,782	\$4,848,958	\$17,822,475	\$8,662,840
Percentage of Energy to Total Cost	39%	41%	50%	63%
Summer/Winter Rate	11.66/9.66 cents per kWh	11.48/9.48 cents per kWh	6.19 cents per kWh	6.19 cents per kWh
<b>Rate to Pay Customer for Excess Energy</b>	<b>4.55 / 3.77 cents per kWh</b>	<b>4.71 / 3.89 cents per kWh</b>	<b>3.10 cents per kWh</b>	<b>3.90 cents per kWh</b>

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

The City Council held three hearings to make these changes official in the Municipal Code. These were held on December 12, 2016; December 20, 2016; and January 10, 2017. The new rates went into effect on electric bills mailed on and after March 1, 2017.

The third and most recent modification to the Municipal Code related to Net Metering occurred on July 1, 2017, when the Council approved a 4% across-the-board rate increase, both to rates the utility charges for electricity and the rate at which the utility purchases excess solar energy. This results in the current rates, which are found in Table 2 below:

**Table 2: Current Energy Buyback Rates**

	<b>Residential</b>	<b>General Power</b>	<b>Large Power</b>	<b>Industrial</b>
Full Summer/ Winter Delivered Rate	12.13/10.05 cents per kWh	11.94/9.86 cents per kWh	6.44 cents per kWh	6.44 cents per kWh
<b>Rate to Pay Customer for Excess Energy</b>	<b>7.35 / 6.52 cents per kWh</b>	<b>6.78 / 5.94 cents per kWh</b>	<b>4.72 cents per kWh</b>	<b>5.06 cents per kWh</b>

**AMES INCENTIVES COMPARED TO OTHER UTILITIES**

Ames Municipal Electric System (AMES) currently incentivizes residential solar in two ways:

1. A one-time, up-front rebate in the amount of \$300 per kW of energy the installation is capable of producing on the most favorable day of the year, during the Utility’s peak hour, 5-6pm.
2. Electricity that customers overproduce and push to the grid is purchased by the utility at a rate higher than it would pay for electricity from any non-customer generator or energy market (see the current buyback rates in Table 2).

The solar rebate (the first incentive described above) accounts for about 10% of the incentives paid to solar customers by AMES, with the remaining 90% showing up in subsidized buyback rates for solar customers.

Alliant Energy

Alliant’s residential solar programs include several provisions that differ from Ames. Notably, these differences include:

1. **System Sizing** – IPL limits the size of the solar system through a formula that considers the energy load of the homeowner and a load factor of 17%. *COA presently has no limit on the size of a solar system.*

2. **Carryover** – IPL allows some excess energy, capped at the system size, to be carried over to the next month. Any extra energy is purchased at the Buyback rate. COA purchases all excess energy each month at the Buyback rate.
3. **Buyback rate** – IPL’s excess energy buyback rate is set at \$0.0286/kWh. COA’s excess energy buyback rate is set at \$0.0735/kWh summer and \$0.0652/kWh winter.

To put these differences in perspective, city staff selected at random six AMES customers who have solar generation capacity installed at their homes. The electric bills that these customers would have received over the course of one calendar year—after considering their solar production—are compared between Alliant’s rate structure and AMES’ rate structure in Table 3.

Table 3: Actual billing comparison between actual Ames bills and calculated Alliant bills

Address	Ames (Actual)	Alliant (Calculated)	Difference	
2316 Apsen Drive	\$ 537.42	\$ 953.69	\$ 416.28	56%
711 Carroll Ave	\$ 1,771.85	\$ 3,091.51	\$ 1,319.67	57%
1020 Mesa Verde	\$ 1,311.79	\$ 2,264.46	\$ 952.67	58%
2936 Cypress Cir	\$ 1,101.56	\$ 1,399.05	\$ 297.49	79%
2621 Clayton	\$ 909.42	\$ 1,262.58	\$ 353.16	72%
1340 California	\$ 537.42	\$ 728.24	\$ 190.82	74%

**Ames Municipal Electric System’s rate/solar program was found to be more advantageous for all the customers whose bills were evaluated.** Over the course of one calendar year, AMES solar customers paid 21%-44% less than what they would have paid on Alliant’s solar program. In dollar terms, these customers paid an average of \$588 less per year for their electricity consumption with AMES, after compensation for the electricity they delivered to the grid, than they would have paid in electric bills under Alliant’s rates.

Cedar Falls Utilities

Cedar Falls Utilities (CFU), a comparable municipal utility, explains its policy on net metering in a news release titled, *CFU and Solar Customers*, posted on Wednesday, April 24, 2019:

“The credit we pay the customer for excess solar energy is based on CFU’s cost to buy electricity from the energy market. The credit rate for excess customer solar energy is set annually by evaluating the cost of transmission, capacity and the market rate for electricity delivered to Cedar Falls over the full prior year.

The rate structure is intended to fairly compensate the owners of solar panels for the value of excess energy that they choose to sell to CFU. We believe this serves our solar customers and non-solar customers equally well. We pay our solar customers for energy at the cost we normally pay for electricity, which keeps our energy supply costs low for all customers.”

Retrieved from <https://www.cfu.net/news/company-news/cfu-and-solar-customers> on October 21, 2019.

Table 4 outlines the specific rates CFU uses for electricity buyback.

Table 4: CFU rates for consumer-generated solar electricity.

Periods	Summer	Winter
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Buyback Rates	4.324¢ per kWh	4.324¢ per kWh
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**In summary, compared to Alliant Energy, a neighboring investor-owned utility, and Cedar Falls Utilities, a municipal utility in Northeastern Iowa that closely resembles Ames Municipal Electric System, AMES’ policies dedicate more funds to solar customers.**

**STAFF COMMENTS AND POTENTIAL FUTURE STEPS**

Even though AMES dedicates more funds to solar customers than some utilities in the area, customers and city staff alike have concerns with the *outcomes* of the existing policies, including rate shift, investment vulnerability/unpredictability, long payback periods for solar installations, and equitable access to incentives across many economic classes. These concerns may be addressed by changing the structure of incentives, without increasing dollars dedicated to the current incentives.

Rate Shift:

Currently, AMES purchases electricity from solar customers at a greater cost than it pays for any other source of electricity, bought on the market or generated in Ames. This cost difference is ultimately subsidized by the general ratepayers, creating a rate shift that tends to benefit customers with the financial means and available property to purchase and install a system and cost more for who rent or cannot afford to install a solar system.

Increasing buyback rates would reduce the payback time for solar installations, but exacerbate the rate shift, because the return on investment would increase over the lifetime of the project, using subsidies from the general ratepayers to ultimately produce a profit for customers who can afford solar installations. Increasing buyback rates would likely not increase accessibility of the incentive because the initial investment will remain a barrier, especially for lower economic classes, even with a slightly faster payback.

Concentrating funds on rebates would also accomplish the goal of shortening the payback time and would result in more equitable access to the incentive. Greater rebate amounts reduce the capital needed up-front for solar installations, making the incentive more accessible to lower income levels.

Investment Planning:

In comparing the two methods AMES uses to incentivize solar installations (one-time, up-front rebates and subsidized buyback of excess electricity), subsidized buyback of electricity over the lifetime of their solar equipment leaves customers more vulnerable to changing policies and the City less flexible to adjust its policies in dynamic market conditions. Residents have expressed frustration regarding the changes made to the previous net metering policy in 2016.

By shifting incentives to a rebate format, customers would be able to request pre-approval for rebates and make their investment decisions with less risk. Rebate applications that cannot be covered in a given fiscal year could be asked to reapply in the following year. This structure would also allow the City to adjust rebates to changing markets, to ensure effective and fair rebate programs.

**EUORAB is currently studying the idea of discontinuing the energy buy-back/net metering model in favor of a higher rebate-only model. Several things to consider are:**

- 1. Determine new rebate level**

2. **Grandfathering in the existing customers?**
3. **Developing a “right size” formula**
4. **Budget implications**

EUORAB will plan to deliver a report to the City Council containing recommendations regarding these issues by the end of the year.