ITEM #: 24
DEPT: P&H

Staff Report

CLIMATE ACTION PLAN INITIAL IMPLEMENTATION STEP TO INCENTIVIZE NET-ZERO-READY NEW CONSTRUCTION

November 26, 2024

BACKGROUND:

City Council accepted the Climate Action Plan (CAP) on June 13, 2023. The CAP's modeling assumed all new buildings constructed in 2026 and thereafter after would be net-zero ready and by 2030, net-zero. Net-zero homes have no net annual carbon emissions when offset by onsite renewable energy, while net-zero-ready homes are designed for future net-zero status once solar is installed to match their energy consumption. **The CAP also defines net-zero and net-zero ready new homes as all electric.**

As part of City Council's February 27, 2024, action on the city-wide tax abatement program, Council directed staff to return with an enhanced tax abatement program for new construction of single-family homes in line with the CAP's goals. Measures for multi-family and commercial buildings will be a future implementation step.

In designing the incentive, staff evaluated the cost of a net-zero-ready, all-electric home equipment costs for air source heat pumps and water heaters. After accounting for rebates from local utilities, staff estimated an additional cost of $2,500 per home. This cost does not assume any savings from not installing natural gas infrastructure. Staff estimates that due to the current cost of electricity and natural gas, a homeowner may not see these additional costs otherwise offset by savings on energy bills.

Staff also found that because most of the energy purchased off the Grid is not green, all-electric new construction may increase the City's carbon footprint in the short term. Once the energy supply greens to 50% renewable (assumed by 2035), all-electric homes would have lower emissions but would not offset the short-term increase until after 15 years. **These findings created a conundrum for staff when considering how to best use incentives to further the goals of the CAP in the near term.**

Further, future renewable energy portfolios will vary by utility provider within Ames. Although the non-Ames Electric providers currently have as good or better emission profiles for energy produced, in the future they may not share the same goals for greening their energy supply as desired by Ames Electric. Most new construction will occur outside of Ames Electric's service territory, which may limit the reduction in greenhouse gas emissions possible through an all-electric home. See the map in Attachment A that compares future growth areas from Ames' comprehensive plan, Plan 2040, and electric territories.

Staff found that these all-electric homes also needed to be higher performance in order to offset the homes' higher-carbon footprint in the short-term. Staff reviewed national energy efficiency programs, energy codes, and local utility provider rebates, and met with local builders to gain a broad understanding of best practices in operationalizing net-zero standards. A summary of other cities and utilities' incentive programs, as well as federal tax credits, are included in Attachments B - D. **These**

programs, however, focused on efficiency, rather than total energy usage of a home. Usage varies greatly based on the size of the home and behavioral choices of occupants, thus there is no guarantee of a carbon emission reduction.

As a result, staff believes an incentive for an all-electric home with solar installation at the time of construction would be the most beneficial option related to the CAP goals when compared to either an all-electric home or a high-performance, all-electric home. This option would provide the greatest carbon emissions reductions and is further detailed along with the net-zero-ready, all-electric option below.

OPTIONS:

Option 1: Net-Zero-Ready, All-Electric Home

The elements of this option include:

1. All electric heating and cooling, water heating, and appliances, no natural gas systems.
2. Roof area that can accommodate a future solar array installation that matches the projected energy use of the home.
3. Maximum HERS Rating Score of 55 (an energy performance measure further described in Attachment E).

Under the current 5-year, sliding scale tax abatement schedule (100% year 1, 80% year 2, 60% year 3, 40% year 4, 20% year 5) for all new owner-occupied homes, staff estimates (using 2023 tax rates) that the total estimated value of the incentive is $11,000 for a $500,000 home. **In keeping with the Council's directive, the current 5-year schedule could be enhanced to add $2,200 value for a $500,000, net-zero-ready, all-electric home as follows:**

- **100% abatement in years 1 - 3**
- **40% year 4**
- **20% year 5**

Based on the equipment pricing assumptions, a $2,200 abatement coupled with utility rebates would mostly offset the higher initial cost of the air source heat pump.

Option 2: Net-Zero-Ready, All-Electric Home with Solar Installation

If Council wishes to mitigate short-term increases in emissions by going all electric and advancing more quickly towards an actual net-zero home, elements of an incentive program could include:

1. All electric heating and cooling, water heating, and appliances, no natural gas systems.
2. Installation of a minimum solar array sized at least 50% of projected energy usage of a home estimated for IECC (energy code) compliance, excluding electric vehicle charging.

As solar would introduce higher costs than anticipated with Option 1, the current 5-year schedule could be enhanced to add $5,180 value for a $500,000 home as follows:

- **100% abatement in years 1 - 3**
- **80% year 4**
- **60% year 5**

Note that a builder could build a speculative home and if the buyer adds solar to the home during the year the home is completed, they will still benefit from the enhanced abatement program option.

I**n addition to the abatement, the City would provide a builder incentive of $2,000 from the sustainability fund to encourage builder marketing for the first 5 solar homes constructed in each of the 2025, 2026, and 2027 calendar years.**

Based on the energy consumption of HERS-rated new homes in Ames, a $5,180 abatement coupled with federal tax credits and utility rebates may create a payback on solar for most consumers in 13-15 years versus 20 years without a city incentive. This assumes use of the federal 30% tax credit plus any utility rebates (see Attachments B and D). However, the payback will vary greatly depending on utility providers and rates.

HIGH PERFOMANCE HOME PARTNERSHIP:

Regardless of which option Council selects, staff believes it also would be valuable to seek out a partner builder to advance understanding and use of green building practices. The partnership would use a grant stipend for a builder to partner with the City to design and build a home as a way to model green building and energy efficiency practices. The intent is to remove some financial risk to the builder to work on new home options. This would ideally be targeted at a speculative home concept that could be repeatable in the market. This idea will need more input from homebuilders to determine interest and viability during 2025.

PUBLIC OUTREACH:

Staff was able to meet with a handful of local homebuilders to discuss potential incentive options and program criteria. Staff described the intent of the CAP and net zero-ready homes. **Some builders commented that gas appliances and fireplaces are desirable selling points for a home and all electric may not be as desirable. They noted that people commonly use dual-fuel air source heat pumps, meaning a furnace is the backup heat source. In an all-electric home, backup heat sources for days that are below the heat pump's lowest design temperature (standard heat pumps are 35 degrees, cold weather heat pumps are as low as 5 degrees) would also have to be electric, likely resistance heating.**

Two builders that staff consulted indicated that in the past ten years, none or potentially one new home that was built included the installation of solar at the time of construction. Additionally, builders are not likely to install solar on speculative homes, which would increase the cost of the home and limit the buyer pool. It seems solar with new construction would most likely occur with semi-custom and custom homes where the builder knows their buyers' budget.

STAFF COMMENTS:

Staff has thoroughly reviewed options for higher performing home criteria related to the City's CAP goal for net-zero-ready homes and determined that for a City benefit of reducing emissions and advancing the CAP, leveraging enhanced tax abatement to add solar to the home has the greatest benefit from a carbon reduction perspective, which is Option 2. Staff identified that there is a unique benefit of property tax abatement with new construction that could directly support actual solar installation, whereas tax abatement does not apply to solar added to existing houses since they are already an exempt improvement. Leveraging the overall new home value is the advantage of promoting solar.

An all-electric home with a solar system that offsets 50% of its energy usage would reduce carbon emissions from the average HERs-rated Ames new home by 43%. As Ames' energy portfolio

approaches 50% renewables, emissions reductions could reach 70% compared to a standard home. The benefit is substantially higher for a solar option compared to an efficiency option, which justifies offering the tax abatement incentive and builder stipend.

Although Option 1 is in line with the basic intent of the CAP, staff did not believe the cost-benefit of a City incentive for this option significantly advanced the CAP. Despite projected lower participation within Option 2 compared to Option 1, staff believes Option 2 with solar installation option is still best for advancing the CAP's goals.

ATTACHMENT(S):
Attachments A - E.pdf