

**CITY OF GUSTAVUS, ALASKA
PROJECT SCOPING and DEVELOPMENT FORM**

This form is to be used to document project planning and approval to assure that: project options are well-considered; the best option is put forward; initial and continuing costs and funding are addressed; and that Council approval has been given for implementation. Use this project scoping form with the Project Planning and Approval Process Flow Chart.

Answer the questions that pertain to your proposed project. Attach additional narrative pages if necessary. Type in the electronic form using as much space as you feel is necessary.

Part 1. Project Identification

Name of Project: **Heat Pump Installations for City Buildings**

City Department: **Administration** Contact: **Mike Taylor**
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Part 2. Project Scope refers to a project’s size, goals, and requirements. It identifies what the project is supposed to accomplish and the estimated budget (of time and money) necessary to achieve these goals. Changes in scope will need Council approval.

- 1. What is the project?
 - What are its goals and objectives?

Goals:

The primary goal is to reduce the City’s carbon footprint by electrifying heating in city buildings using heat pump systems as the primary heating energy means. The secondary goal is to reduce reliance on expensive heating oil for existing heaters. Additional benefits are improved energy security, reduced energy cost volatility, and helping to keep system-wide costs affordable by spreading utility fixed costs over a greater sales volume. Heat pumps also offer air conditioning, which is useful during the peak of summer, and may be increasingly helpful depending on mid-term climate change trends, and weather pattern volatility.

By installing heat pumps in community facilities, the City of Gustavus will help to increase consumer awareness of and confidence in the technology. This will contribute to increased community conversion to heat pumps as a source of affordable heat from renewable energy sources.

City building heat will be supplied primarily from the local Falls Creek hydroelectric power facility. The existing oil-fired heating systems will be maintained as back up.

Objectives:

Likely buildings to have heat pump systems installed are:
Fire Hall. One heat pump with two discharge units.
DRC Office. One heat pump with one discharge unit
Old PO Bldg. One heat pump with one discharge unit.
Community Chest: One heat pump with one discharge unit.

Who/what will be aided by this project? Who are the targeted stakeholders/customers?
The global climate will benefit from the reduction of carbon emissions and the city budget will benefit because electric costs are less volatile than fossil fuel costs. Indoor and outdoor air quality in the vicinity of the facilities will improve due to elimination of exhaust. Through this project, the City will demonstrate its commitment to our vision as a distinctive community that prospers while and by protecting its natural resources. The project will increase utilization of electric power from the Falls Creek Hydroelectric facility, which will help to keep system-wide costs affordable by spreading utility fixed costs over a greater sales volume.

- Is a preliminary survey necessary to identify the number of potential customers/users? How will you design and conduct the survey?
No survey is needed. The project manager will identify buildings and scope systems for those facilities.
- What is NOT covered by this project? What are its boundaries?
The project addresses only heating systems. It does not address ventilation upgrades in City buildings. The Gustavus Public Library is not included in this project because the City is considering an addition to the library and could address a heat pump system as part of that project.

2. Why is the project needed?

- What community problem, need, or opportunity will it address?
The project addresses three needs: 1) to be a responsible organization that reduces its carbon emission impact on the planet; 2) to stabilize energy costs in a volatile geopolitical environment with wildly varying fossil fuel prices; 3) to increase utilization of the Falls Creek Hydroelectric Facility and the kilowatt-hours delivered to customers, which will help keep energy costs affordable by spreading utility fixed costs over a greater sales base.
- What health, safety, environmental, compliance, infrastructure, or economic problems or opportunities does it address?
The project will improve City infrastructure by converting buildings to modern alternative energy heating source—our community hydroelectric facility. By increasing use of electric power demand, the City will help keep energy costs affordable by spreading utility fixed costs over a greater sales base.

The project will also qualify for a \$500 incentive payment for each community facility from our utility, Alaska Power & Telephone for each system installed in a building. (Confirmed by Jason Custer of APC, 4/21/22)

Heat pumps come with modern controls and programmability that exceeds what is possible via legacy systems. This allows energy consumers to program and fine-tune the units to fit their specific heating requirements, using energy more efficiently, reducing consumption, and preventing waste.

By reducing fuel oil use, the City will reduce the environmental risks of spilled fuel. Transferring, transporting, and storing oil in Alaska's pristine environment is an inherently risky activity, and operator error is not unknown.

Additionally, many rural communities experience theft of fuel, particularly during times of high fuel prices. Eliminating on-site fuel storage will protect the City from this risk.

- 3. Where did the idea for this project originate? (Public comments, Council direction, committee work?)

The council considered this project a year ago but decided then only to install a heat pump at City Hall first to gain experience. We installed a MRCOOL brand, donated by the manufacturer as a demonstration project. The installed unit is a 36,000 btu/hour system with discharge units in two sections of City Hall. The system has proven capable of keeping the building warm with outdoor temperatures below 20F. At temperatures closer to zero supplementary heat from the legacy Toyo oil heaters was sometimes needed, at least in the early morning after a cold night.

- 4. Is this project part of a larger plan? (For example, the Gustavus Community Strategic Plan, or committee Annual Work Plan?)

No

- 5. What is your timeline for project planning?

- By when do you hope to implement the project?

The project may be constructed iteratively and could extend over a couple years. The first heat pump could be installed in Summer 2024.

- Will the planning or final project occur in phases or stages?

This may occur in stages depending on funding. Buildings would be done in priority.

- 6. What is your budget for the planning process? Will you be using a consultant?

Planning will be done by the project managers at no cost to the city. However, grant application by the grant writer is estimated at \$7071.

- 7. What is your rough estimate of the total cost of the planning and final product? At the least, please list cost categories. See Part 4. (Ques. 4-8) and Part 5 (Budget) for guidance.

| | | |
|--------------------|---|-----------------|
| Fire Hall. | One large (36btu/hr?) heat pump with two discharge units: | \$13,000 |
| DRC Office. | One 12,000 btu/hour heat pump with one discharge unit: | \$ 6,500 |
| Old PO Bldg. | One 12,000 btu/hour heat pump with one discharge unit: | \$ 6,500 |
| Community Chest: | One 12,000 btu/hour heat pump with one discharge unit: | <u>\$ 6,500</u> |
| Subtotal: | | \$35,500 |
| Contingency: | Possible additional electrical requirements: | <u>\$ 4,500</u> |
| Total Cost: | | \$40,000 |

Note: After installations the City will qualify for the AP&T heat pump installation incentive of \$500/building. That incentive for four buildings totals \$2000.

Parts 3., 4., 5., 6. Project Investigation and Development

Parts 3.-6. refer to social, environmental, and financial impacts of various options. These questions will help you document your consideration of alternatives and your choice of the option providing the best value for the community. Your goal is to generate alternatives and make a recommendation from among them. Return to Part 3., "Summary" after applying Parts 4.-6.

Summary:

1. What alternative approaches or solutions were considered? Make a business case for your top two or three options by discussing how effectively each would fulfill the project goals, and by comparing the economic, social, and environmental costs vs. benefits of each one.

No alternative approaches other than heat pumps were identified. However, within the heat pump plan there would be the options of using a contractor to install them or to self-install using city staff or volunteers.

Also, various configurations may be considered for the Fire Hall, including a heat pump for the upstairs only, with a single discharge unit, and keeping oil heat for the apparatus floor downstairs.

The City of Gustavus is aware that many rural housing developers and housing authorities (ex: Tlingit Haida Regional Housing Authority) are prioritizing heat pumps due to reliability, air quality benefits, economic benefits within the context of microgrid utility systems, and excellent performance in southeast Alaska’s climate.

2. What solution was chosen as the best and why is it the best?

Heat pumps are the modern method of electrifying heating systems to reduce carbon emissions and air pollution that are characteristic of fossil-fueled heating systems.

3. Identify your funding source(s).

Potential funding sources include federal green-energy grants an Endowment Fund grant and capital funding from the City savings.

As noted above, local utility AP&T is prepared to commit \$500 in matching funds per facility via its utility heat pump incentive program.

Part 4. Environmental, Social, Financial Impacts

1. Project Impacts Checklist

| Will this project affect: | No | Yes (+/-) | Maybe |
|---|-----------|------------------|--------------|
| Environmental quality? (+ = impact is beneficial; - = harmful) | | | |
| • Climate change | | + | |
| • Streams/groundwater quality | | + | |
| • Air quality | | + | |
| • Soils/land quality | | + | |
| • Fish/wildlife habitat, populations | | + | |
| • Plant Resources (timber, firewood, berries, etc) | X | | |

| | | | |
|--|---|-----|---|
| • Invasive or pest species | X | | |
| • Natural beauty of landscape or neighborhoods | X | | |
| • Neighborhood character | | + | |
| • Noise or other environmental impacts | X | | |
| • Environmental sustainability | | + | |
| • Hazardous substances use | | + | |
| • Community waste stream | | + | |
| • Light pollution at night | X | | |
| Recreational opportunities? | | | |
| • Public land use and access | X | | |
| • Trails/waterways | X | | |
| • Parks | X | | |
| • Public assembly/activities | X | | |
| Education/training/knowledge & skill development? | | | + |
| Public safety? | X | | |
| Public health? | | + | |
| Medical services? | X | | |
| Emergency response? | X | | |
| Economic performance & sustainability? | | | |
| • Employment of residents | | | |
| ◦ Short-term (i.e. construction) | | + | |
| ◦ Long-term (operating and maintenance) | X | | |
| • Cost of living reduction | X | | |
| • Return on investment | | + | |
| • Visitor opportunities/impressions/stays/purchases | | + | |
| • Competitive business environment | | + | |
| • Support for existing businesses | | +/- | |
| • New business opportunities | | | + |
| • Economic sustainability | | + | |
| • Attractiveness of City to new residents/businesses | | + | |
| City government performance? | | | |
| • Infrastructure quality/effectiveness/reach (more people) | | + | |
| • Existing services | X | | |
| • New services | X | | |
| • Cost of City services | | + | |
| • Tax income to City | X | | |
| Transportation? | | | |
| • Air | X | | |
| • Water | X | | |
| • Roads | X | | |
| Communications? | | | |
| • Internet | X | | |

| | | | |
|-------------------------|---|--|--|
| • Phone | X | | |
| • TV/radio | X | | |
| Other? (type in) | | | |

2. How does this project provide benefits or add value in multiple areas? (E.g., benefits both to the environment and to business performance.)
 The project will reduce the City’s impact on global climate. It will benefit the reputation of the City of Gustavus as an environmentally distinctive community and government. It will reduce City dependence on fossil fuel, which is increasingly expensive and volatile in price. Increasing City purchase of electric energy will increase kilowatt-hour sales by the utility, which ultimately supports a lower base rate for the power from the fixed cost Falls Creek Hydroelectric Facility.
3. Are other projects related to or dependent on this project?
- Is this project dependent on other activities or actions?
 Maybe
 - If yes, describe projects, action or activities specifying phases where appropriate.
 For the Fire Hall, installation of a heat pump may be integrated with other renovations or replacement of the existing boiler with a backup heating system.
4. Will the project require additional infrastructure, activity, or staffing outside the immediate department or activity? (e.g., will the construction of a new facility require additional roads or road maintenance or more internal City staffing?)
 No
5. What regulatory permits will be required and how will they be obtained?
 None
6. What are the estimated initial (e.g., construction or purchase) and continuing operational costs of the project?
- Initial Cost:
 Operating Cost: Heat pumps are nearly maintenance free; a significant contrast to oil-based heating systems. The city will purchase more electricity, the cost of which is offset by not buying heating oil.
7. Is an engineering design or construction estimate necessary?
 No engineering design work is required. These systems are standard, manufactured units that can be installed by skilled trade workers.
8. Will operation of the project generate any revenue for the City such as sales, user fees, or new taxes? If so, how will the new revenue be collected?
 No

Part 5. Project Budget

Proposed Budget Line Items

| Construction project Budget estimate | Cost | Operational budget estimate (annual) | Cost |
|---|----------|---|------|
| Administrative | \$0 | Personnel | \$0 |
| Project management | \$0 | Benefits | \$0 |
| Land, structures, ROW, easements | \$0 | Training | \$0 |
| Engineering work | \$0 | Travel | \$0 |
| Permitting, inspection | | Equipment | \$0 |
| Site work | \$0 | Contractual | \$0 |
| Construction | \$35,500 | Supplies | \$0 |
| Waste disposal | \$0 | Utilities | \$0 |
| Equipment | \$ | Insurance | \$0 |
| Freight | \$0 | Repair & maintenance | \$ |
| Contingencies | \$4,500 | Other (list) | \$0 |
| Other (list) | \$ | Other (list) | \$0 |
| Other (list) | | Total direct costs | \$ |
| | | Indirect costs | \$ |
| | | Income (fees, taxes) | \$ |
| | | Balance: costs-income | |
| | | | |

Updated Latest Estimate Budget Line Items if Changed Date: _____

| Construction project Budget estimate | Cost | Operational budget estimate (annual) | Cost |
|---|------|---|------|
| Administrative | \$ | Personnel | \$ |
| Project management | \$ | Benefits | \$ |
| Land, structures, ROW, easements | \$ | Training | \$ |
| Engineering work | \$ | Travel | \$ |
| Permitting; inspection | | Equipment | \$ |
| Site work | \$ | Contractual | \$ |
| Demolition and construction | \$ | Supplies | \$ |
| Waste disposal | \$ | Utilities | \$ |
| Equipment | \$ | Insurance | \$ |
| Freight | \$ | Repair & maintenance | \$ |
| Contingencies | \$ | Other (list) | \$ |
| Other (list) | \$ | Total direct costs | |
| | | Indirect costs | |
| | | Income (fees, taxes) | \$ |
| | | Balance: costs-income | \$ |
| | | | |

Part 6. Jobs and Training (required by some granting agencies)

1. What service jobs will be needed for operation and maintenance?
Operation and maintenance are relatively cost-free.
2. How many full-time, permanent jobs will this project create or retain?
 0 Create/retain in 1-3 years
 0 Create/retain in 3-5 years
3. What training is necessary to prepare local residents for jobs on this project?
 None
4. How many local businesses will be affected by this project and how?
Two local businesses likely: Mechanical and Electrical contractors

Part 7. Business Plan (Upon Council request)

Upon Council request, please prepare a business plan for the operating phase of your leading option(s). Plans will differ according to the nature of the project.

There are a number of good Internet sites that will assist you in developing a business plan. One example (12/2010): is http://www.va-interactive.com/inbusiness/editorial/bizdev/ibt/business_plan.html

Basic components of a business plan:

- The Product/Service
- The Market
- The Marketing Plan
- The Competition
- Operations
- The Management Team
- Personnel

Part 8. Record of Project Planning and Development Meetings

1. Please document the manner in which public input was received.
 - Public comment on agenda item at committee or Council meeting
 - Special public hearing
 - Dates and attendance for the above.
 - Written comment from the public (please attach)

2. Please use the following chart to document committee meetings, Council reports, and so on. Did the committee make recommendations or requests? Did the Council make requests of the committee?

Meeting Record

| Event (Meeting of committee, Council report, public hearing, etc. | Date | Agenda Posted (date) | Minutes or record attached? (yes/no) | Outcome Rec to Council, requested action of Council, etc. | No. of attendees |
|--|---------|----------------------------|---|--|---------------------|
| M. Taylor and D. Weikle | 4/19/22 | N/A | N/A | Initial discussion | 2 |
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Part 9. Feedback to the Council

With the understanding that this form must be adapted to a variety of projects, please provide feedback on how the form worked for your committee. Thank you for your suggestions.