NON-CODE ORDINANCE

By: Public Works
Introduced: 04/12/10
Public Hearing: 04/26/10
Adopted: 04/26/10

CITY OF WASILLA
ORDINANCE SERIAL NO. 10-12

AN ORDINANCE OF THE WASILLA CITY COUNCIL AMENDING THE FISCAL YEAR 2010 BUDGET BY APPROPRIATING $50,000 IN DEPARTMENT OF ENERGY GRANT FUNDING FOR A GEOTHERMAL HEAT PUMP SYSTEM AT THE WASTEWATER TREATMENT PLANT.

Section 1. Classification. This is a non-code ordinance.

Section 2. Purpose. To amend the budget by appropriating $50,000 in US Department of Energy Grant funding for a Geothermal Heat Pump System at the Wastewater Treatment Plant.

Section 3. Appropriation. The funds are appropriated to the following:

Geothermal Heat Pump	310-4359-435.45-27	50,000

Section 4. Source of Funds.

DOE EECBG	310-4300-331.31-43	50,000

Section 5. Effective date. This ordinance shall take effect upon adoption by the Wasilla City Council.

ADOPTED by the Wasilla City Council on April 26, 2010.

VERNE E. RUPRIGHT, Mayor

ATTEST:

KRISTIE SMITHERS, MMC, City Clerk

[SEAL]

VOTE: Hall, Harris, Larson, and Woodruff in favor.

CITY OF WASILLA
LEGISLATION STAFF REPORT

ORDINANCE SERIAL No. 10-12: AN ORDINANCE OF THE WASILLA CITY COUNCIL AMENDING THE FISCAL YEAR 2010 BUDGET BY APPROPRIATING $50,000 IN DEPARTMENT OF ENERGY GRANT FUNDING FOR A GEOTHERMAL HEAT PUMP SYSTEM AT THE WASTEWATER TREATMENT PLANT.

Agenda of: April 12, 2010 **Date**: March 31, 2010
Originator: Public Works Director

Route to:	Department	Signature/Date
X	Finance Director	3/31/2010
X	Interim Deputy Administrator	
X	Public Works Director	3/31/10
X	City Clerk	

REVIEWED BY MAYOR VERNE E. RUPRIGHT:

FISCAL IMPACT: ☒ yes $50,000 *or* ☐ no Funds Available ☒ yes ☐ no

Account name/number: 320-4359-435.45-27/Geothermal Heat Pump DOE
Attachments: Engineering Study (4 pp)
Grant Information (7 pp)

SUMMARY STATEMENT: The American Recovery and Reinvestment Act of 2009 has made funding available for Alaskan Communities for projects that can reduce the use of fossil fuels. The City has proposed a geothermal heat pump system for the wastewater treatment plant as a project that is feasible with the $50,000 amount that is allocated for Wasilla. This project will extract heat from groundwater to supplement the treatment plant's natural gas heating system.

A separate Resolution will prepared for City Council approval to accept the grant, once the Department of Energy makes the grant offer available for the Mayor's signature.

STAFF RECOMMENDATION: Approve the adoption of Ordinance Serial Number 10-12 that appropriates $50,000 in Department of Energy Grant Funding for Geothermal Heat Pump System at the Wastewater Treatment Plant.

CITY OF WASILLA WASTEWATER TREATMENT FACILITY

GEOTHERMAL HEATING SYSTEM STUDY

WASILLA, ALASKA

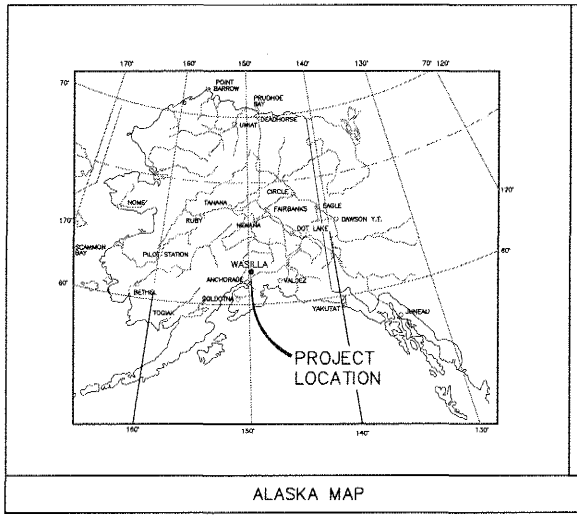
ISSUED FOR REVIEW

JUNE 2009

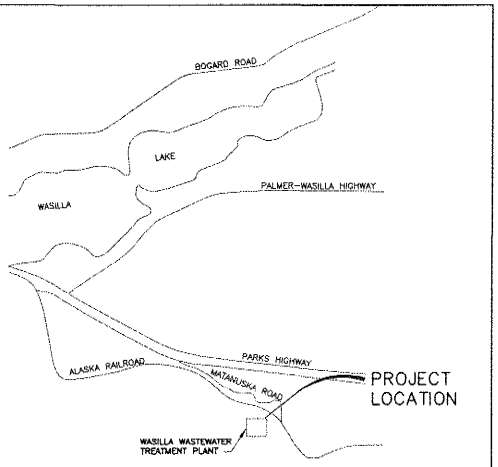
GREAT NORTHERN ENGINEERING

CONSULTING ENGINEERS
137 E. ARCTIC
PALMER, AK 99645
(907) 745-6988

GNE PROJECT #29025



ALASKA MAP



ALASKA STATE FAIR MAP

DRAWING INDEX

DWG.	REVISION	DATE	DESCRIPTION
GENERAL			
COVER			COVER
GA-1	A	6/15/09	VICINITY MAPS & DRAWING INDEX
SITE			
C-1	A	6/15/09	SITE PLAN
MECHANICAL			
M-01	A	6/15/09	SIMPLE GEOTHERMAL FLOW DIAGRAM

REV.	DATE	REVISION DESCRIPTION	DWN	CHK
A	5/10/09	ISSUED FOR REVIEW	JM	RD

GREAT NORTHERN ENGINEERING
137 E. ARCTIC, SUITE 101
PALMER, AK 99645
(907) 745-6988

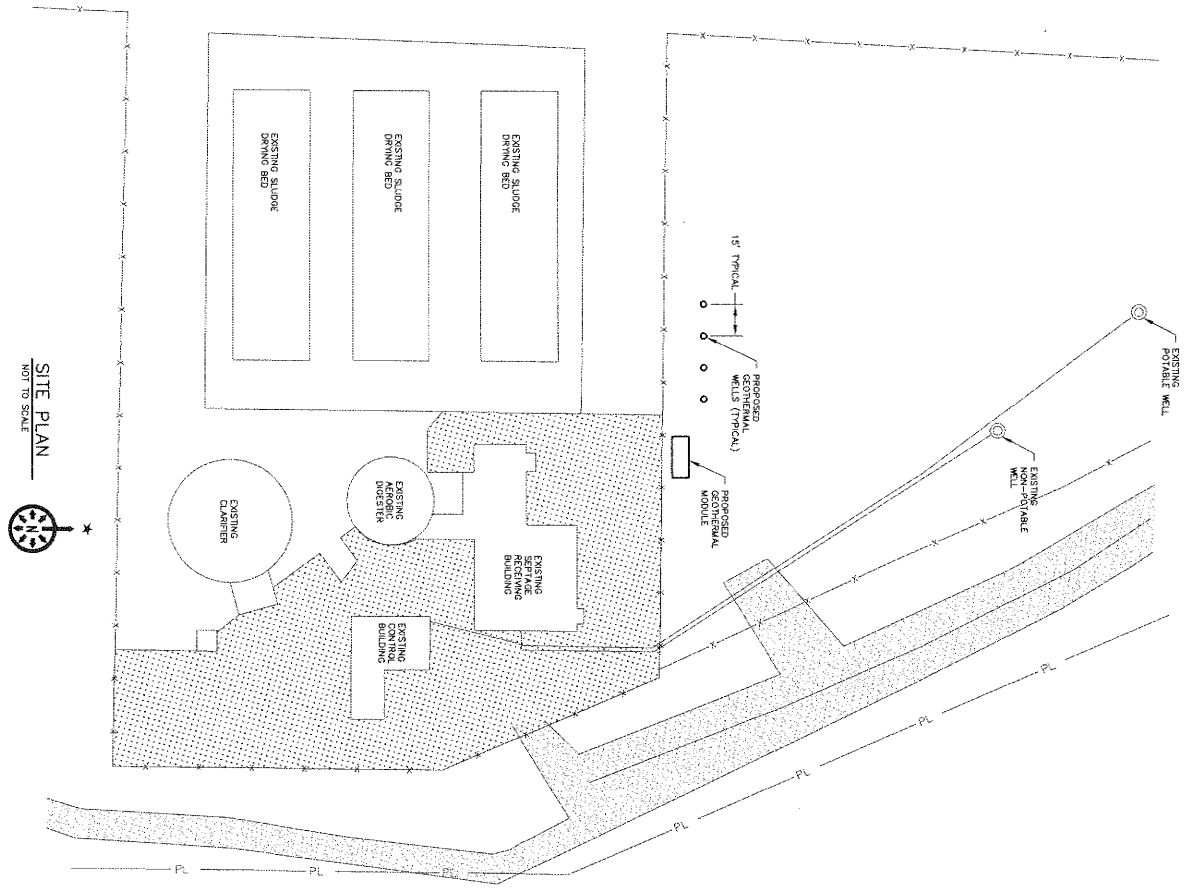
VICINITY MAPS AND DRAWING INDEX

GEOTHERMAL HEATING SYSTEM STUDY
WASILLA WASTEWATER TREATMENT FACILITY
CITY OF WASILLA

DATE:	6/15/09
DRAWN:	JM
CHECKED:	RD
DESIGNED:	
APPROVED:	

GA-01 DWG NO. | A REV.

29025 PROJECT NO.



SITE PLAN
NOT TO SCALE

PROJECT NO.	29025
DWG NO.	C-01
REV.	A
DATE:	6/10/09
DRAWN:	JM
CHECKED:	RD
DESIGNED:	
APPROVED:	

SITE PLAN

GEOTHERMAL HEATING SYSTEM STUDY
WASILLA WASTEWATER TREATMENT FACILITY
CITY OF WASILLA

GREAT NORTHERN ENGINEERING
137 E. ARCTIC, SUITE 101
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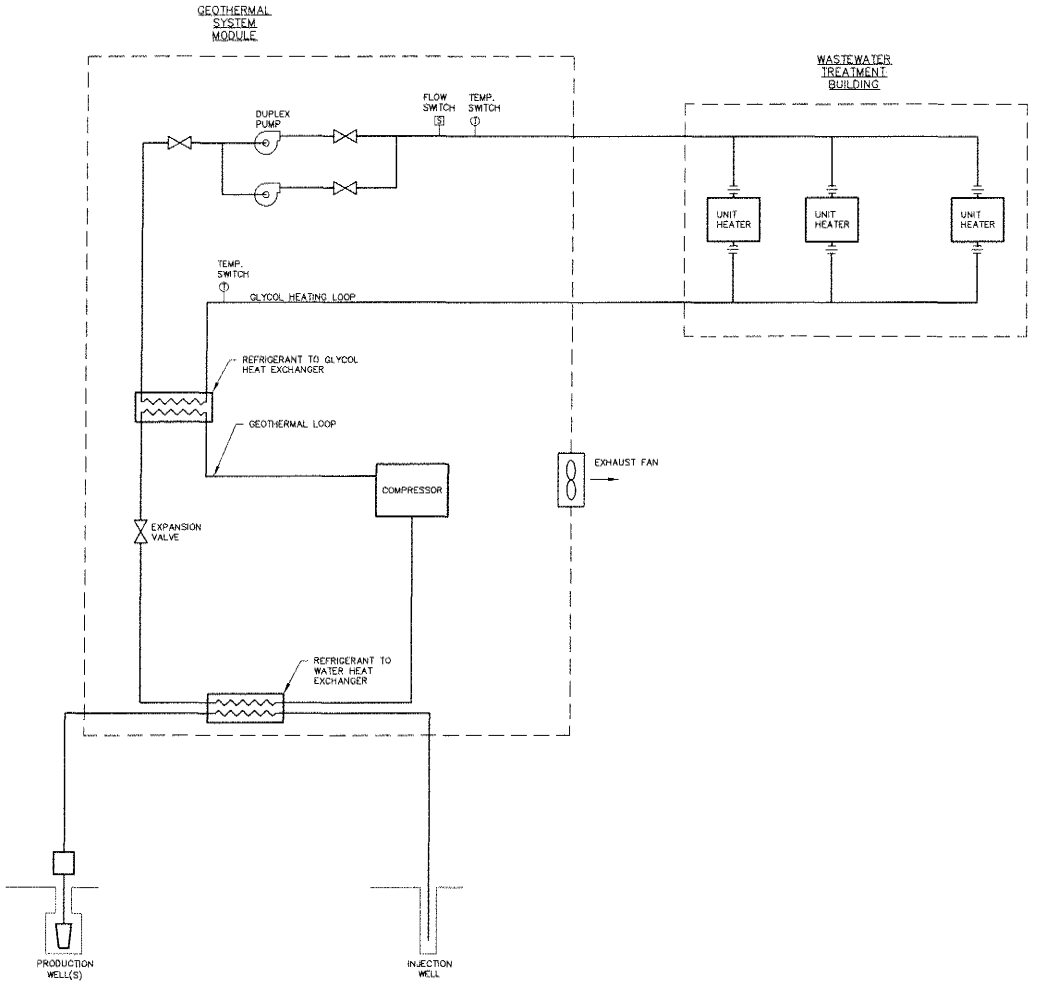
REV.	DATE	REVISION DESCRIPTION	DWN	CHK
A	6/15/09	ISSUED FOR REVIEW	JM	RD



1 SIMPLE GEOTHERMAL FLOW DIAGRAM
NOT TO SCALE

MECHANICAL NARRATIVE:

THE CITY OF WASILLA'S WASTE WATER TREATMENT PLANT (WWTP) HEATING SYSTEM DOES NOT PROVIDE ADEQUATE HEAT. A GROUND SOURCE GEOTHERMAL HEATING SYSTEM IS BEING CONSIDERED AS A VIABLE ALTERNATIVE TO SUPPLEMENT THE HEAT DEFICIT AND OFFSET HIGH ENERGY COSTS. CAPACITY AND DESIGN OF THE PRODUCTION WELLS HAVE NOT YET BEEN DETERMINED AT THE FACILITY.

A MODULE CONTAINING THE GEOTHERMAL LOOP AND CIRCULATION EQUIPMENT ARE TO BE INSTALLED ON A FOUNDATION NEAR THE FACILITY. GLYCOL PIPING IS TO BE TRENCHED AND INSTALLED TO UNIT HEATERS LOCATED WITHIN THE FACILITY. A GROUND SOURCE GEOTHERMAL LOOP IS APPLIED TO A VARIETY OF SYSTEMS THAT USE THE GROUND, GROUND WATER, OR SURFACE WATER AS A HEAT SOURCE AND SINK. THE EXCHANGE MUST TRANSFER SUFFICIENT HEAT (WHEN COMBINED WITH THE COMPRESSOR LOAD) FROM THE GROUNDWATER TO THE GEOTHERMAL LOOP TO MEET THE FACILITY SPACE HEATING REQUIREMENTS. REJECTED HEAT FROM THE GEOTHERMAL LOOP IS TRANSMITTED THROUGH A CLOSED GLYCOL LOOP HEAT EXCHANGER TO HEAT THE FACILITY. AS HEAT IS REJECTED TO THE FACILITY, HEAT IS ALSO EXCHANGED FROM THE GROUND WITH A WATER CIRCULATION LOOP. THE VAPOR-COMPRESSION CYCLE, GIVEN BY THE GEOTHERMAL LOOP, IS THE DRIVING FORCE THAT STARTS THIS HEAT EXCHANGE.

GEOTHERMAL PRODUCTION WELL CAPACITY

GPM	BTU's per hour	TONS (12,000 BTH/TON)
35	140000	11.7
40	160000	13.3
45	180000	15.0
50	200000	16.7
55	220000	18.3

Notes:
Assumed 80% efficiency
Assumed Source Temperature drop of 10 degrees F.
Expected Load is 15 TONS for Geothermal Module.

REV	DATE	REVISION DESCRIPTION	DWN	CHK
A	6/15/09	ISSUED FOR REVIEW	JM	RD

GREAT NORTHERN ENGINEERING
137 E. ARCTIC, SUITE 101
PALMER, AK 99645
(907) 745-8886

SIMPLE GEOTHERMAL FLOW DIAGRAM

GEOTHERMAL HEATING SYSTEM STUDY
WASILLA WASTEWATER TREATMENT FACILITY
CITY OF WASILLA

DATE:	6/10/09
DRAWN:	JM
CHECKED:	RD
DESIGNED:	
APPROVED:	

M-01 DWG NO. | A REV.

29025 PROJECT NO.

GREAT NORTHERN ENGINEERING

137 E. Arctic Avenue
Palmer, Alaska 99645
(907) 745-6988
Fax (907) 745-0591
gne@mtaonline.net

TECHNICAL MEMO

TO:	**Archie Giddings**	**DATE:**	**June 24, 2009**
COMPANY:	**City of Wasilla, Waste Water Treatment Facility**	**TM:**	**#GNETM-01**
FROM:	**Randy Downing**	**PRJ:**	**#29025**
SUBJECT:	**Geothermal Heating System ROM Cost Study**		

Great Northern Engineering (GNE) was asked to prepare a Rough Order of Magnitude (ROM) construction cost study for a geothermal heating system for the City of Wasilla Wastewater Treatment Facility. The proposed geothermal system would be used in conjunction with the existing facility's primary heating system to alleviate process piping from freezing and reduce overall operating costs. GNE has determined that a 5 TON geothermal system may be possible in order to remain under the $50,000 price cap established by the customer; however, a 5 TON geothermal system may not be adequate to eliminate the current freeze-up problems witnessed at the facility.

Certain assumptions have been made by GNE upon calculating the ROM:

- The geothermal heating system is to be constructed onsite at the existing City of Wasilla Wastewater Treatment Facility.
- Existing on-site equipment storage will be utilized.
- Existing foundation design is adequate for installing of new heating system.
- A productive aquifer is available for the geothermal heat sink on location.
- A ground water well system was used since an existing productive well is present onsite. Well production and well injection is estimated to be around 12 gpm. Geothermal loops can be constructed in lieu of using ground water but the cost would be greater than a well.
- The geothermal heat pump loop is to be shipped as an assembled package and commissioned on-site.
- Circulation glycol pumps and thermostatic controls are to be installed within the facility in a code compliant zone. The pumps and expansion tank can be wall hung just inside of the designated installation point.
- A single 60 MBH unit heater, (radiation heaters or duct coils are also an option but not added to the cost estimate) can be added to the facility to aid in the heating deficit.

A 5 TON Heat Pump (60 MBH output) accompanied with the current gas fired unit heaters (25 MBH output) will produce 85 MBH, a heating gain of 5 MBH. This will cover the heat losses through transmission in one 20' x 40' bay. It will not cover the additional infiltration load as the overhead doors are opened and closed. Mounting a larger gas fired unit heater in place of the current gas fired unit heaters, in the drive through bay and the storage area would be

a recommendable solution for preventing pipe freeze-up and improve the performance of the current heating system.

$50K Geothermal System ROM Construction Cost..... $47,000

* Total cost of construction was considered for management, engineering and contingency. No additional costs are included for site inspection and associated permitting.

Attachments:

1. **$50K Geothermal Heat System ROM Construction Cost Estimate**

WASILLA, ALASKA - WASTE WATER TREATMENT FACILITY, 5 TON GEOTHERMAL HEAT SYSTEM ROM CONSTRUCTION COST ESTIMATE

GREAT NORTHERN ENGINEERING

17-Jun-09

SECTION	SUB SECTION	ITEM & DESCRIPTION	QTY	UNITS	MAT'L	INST'L'N	TOTAL
100		MODULE TO FACILITY TRENCH & PIPING					
	100.100	TRENCHING AND BACKFILL	20	B.C.Y	$0	$218	$218
	100.200	8" HDPE CASING	50	LF	$15	$1,364	$1,379
	100.300	1" STEEL PIPE	150	LF	$5	$3,092	$3,098
	100.400	DEMOLISH & REPAVE ROAD	35	S.Y.	$5	$368	$372
			100 SUBTOTAL		$25	$5,043	$5,067
200		GEOTHERMAL PACKAGED HEATING SYSTEM					
	100.100	5 TON PACKAGED HEAT PUMP SYSTEM	1	EA	$3,290	$1,925	$5,215
	100.200	4'W X4'L X6' H EQUIPMENT SHELTER	1	EA	$700	$700	$1,400
			200 SUBTOTAL		$3,990	$2,625	$6,615
300		GLYCOL HEATING SYSTEM COMPONENTS					
	300.100	VERTICAL MOUNTED UH (60MBH)	1	EA	$826	$280	$1,106
	300.200	CIRCULATION PUMP (1/12 HP)	2	EA	$1,176	$314	$1,490
	300.300	AUTOMATIC AIR VENT	2	EA	$26	$53	$78
	300.400	1" STRAINER Y-TYPE	1	EA	$32	$50	$82
	300.500	EXPANSION TANK (2 GAL)	1	EA	$140	$7	$147
	300.600	SYSTEM FILL (GLYCOL)	25	GAL	$389	$39	$427
	300.700	3 - WAY CONTROL VALVE	1	EA	$360	$81	$441
	300.800	3/4" BALANCING VALVE	1	EA	$46	$45	$90
	300.900	FLOW CHECK CONTROL	2	EA	$158	$99	$258
	301.000	PRESSURE TEST	1	EA	$0	$595	$595
			300 SUBTOTAL		$3,152	$1,562	$4,714
400		GEOTHERMAL WELL CONSTRUCTION					
	400.100	WELL @ 200 FEET ($40 PER FOOT)	2	EA	$0	$16,000	$16,000
	400.200	1 HP WELL PUMP	1	EA	$658	$686	$1,344
	400.300	1" STEEL PIPING	40	LF	$692	$1,072	$1,764
	400.400	1" STEEL 90 DEGREE FITTING	10	EA	$174	$799	$973
			400 SUBTOTAL		$1,523	$18,558	$20,081

SECTION	SUB SECTION	ITEM & DESCRIPTION	QTY	UNITS	MAT'L	INST'LN	TOTAL
500		PIPING INSTALLATION					
	500.100	3/4" COPPER PIPING (SOLDER JOINTS)	40	LF	$197	$433	$630
	500.200	1" COPPER PIPING (SOLDER JOINTS)	10	LF	$71	$123	$194
	500.300	3/4" COPPER 90 DEGREE FITTING	4	EA	$11	$165	$176
	500.400	1" COPPER 90 DEGREE FITTING	4	EA	$28	$199	$227
	500.500	3/4" COPPER TEE	2	EA	$11	$132	$143
	500.600	1" COPPER TEE	4	EA	$65	$321	$386
	500.700	3/4" COPPER UNION	2	EA	$37	$91	$127
	500.800	1 1/2" COPPER FLANGE, SWEAT	6	EA	$35	$184	$218
			500 SUBTOTAL		$454	$1,648	$2,102
			CONSTRUCTION SUBTOTAL				$38,579
		Contingency	10%				$42,437
600		INDIRECT COSTS					
	600.100	Engineering Cost	8.00%				$3,395
	600.200	Construction Management	5.00%				$2,292
	600.300	Miscellaneous Indirects	5.00%				$2,406
			600 SUBTOTAL				$8,093
					SUBTOTALS		$46,672
		CITY COST INDEX	1.4				
			TOTAL CAPITAL COST				$46,672

U.S. Department of Energy - Energy Efficiency and Renewable Energy
Energy Efficiency and Conservation Block Grants Program

About The Program

"The Block Grants are a major investment in energy solutions that will strengthen America's economy and create jobs at the local level," said Secretary Chu. "The funding will be used for the cheapest, cleanest and most reliable energy technologies we have - energy efficiency and conservation - which can be deployed immediately. The grants also empower local communities to make strategic investments to meet the nation's long term clean energy and climate goals."

Program Pupose

The Energy Efficiency and Conservation Block Grants (EECBG) Program, funded for the first time by the American Recovery and Reinvestment Act (Recovery Act) of 2009, represents a Presidential priority to deploy the cheapest, cleanest, and most reliable energy technologies we have - energy efficiency and conservation - across the country. The Program, authorized in Title V, Subtitle E of the Energy Independence and Security Act (EISA) and signed into law on December 19, 2007, is modeled after the Community Development Block Grant program administered by the Department of Housing and Urban Development (HUD). It is intended to assist U.S. cities, counties, states, territories, and Indian tribes to develop, promote, implement, and manage energy efficiency and conservation projects and programs designed to:

- Reduce fossil fuel emissions;
- Reduce the total energy use of the eligible entities;
- Improve energy efficiency in the transportation, building, and other appropriate sectors; and
- Create and retain jobs.

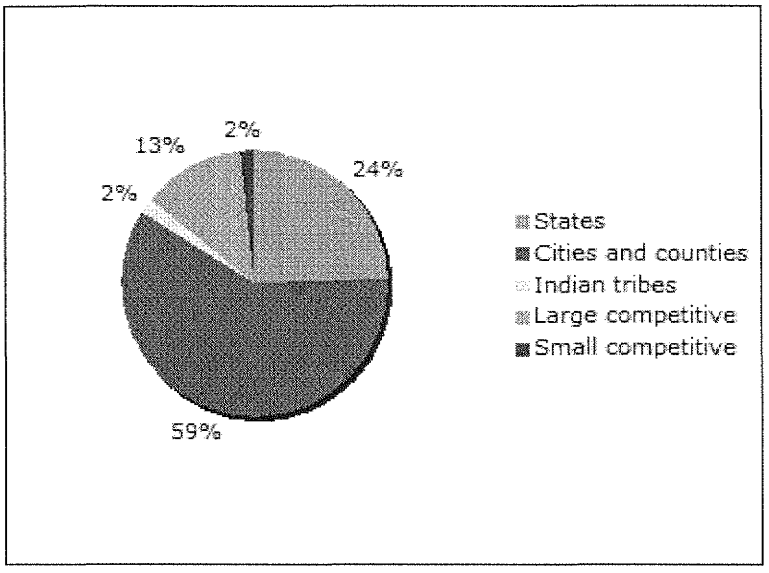
Through formula and competitive grants, the Program empowers local communities to make strategic investments to meet the nation's long-term goals for energy independence and leadership on climate change.

Click here to see Conservation Block Grant Monitoring Plan (PDF 635 KB). Download Adobe Reader.

Program Funding

Funding for the EECBG Program under the Recovery Act totals $3.2 billion. Of this amount, approximately $2.7 billion will be awarded through formula grants. In addition, approximately $454 million will be allocated through competitive grants, which will be awarded through a separate, future Funding Opportunity Announcement (FOA). A request for information (RFI) has been released (September 14, 2009) for feedback from EECBG stakeholders on this planned FOA. The RFI closes on September 28, 2009. The remaining funds will be used to provide a suite of technical assistance tools to state, local, and tribal grantees.

Cities and Counties
$1,880,310,000
States



$767,480,000
Indian Tribes
$54,836,200
Competitive Grants
$63,680,000
$390,040,000
DOE Technical Assistance
$45,000,000

Governments ineligible for direct formula grants from DOE are still eligible for competitive funds from DOE or program funds from their State Energy Office. To find contact information for your State Energy Office, visit the National Association of State Energy Officials at http://www.naseo.org.

Use of Funds

Grants can be used for energy efficiency and conservation programs and projects community wide, as well as renewable energy installations on government buildings. Activities eligible for use of funds include:

- Development of an energy efficiency and conservation strategy;
- Building energy audits and retrofits, including weatherization;
- Financial incentive programs for energy efficiency such as energy savings performance contracting, on-bill financing, and revolving loan funds;
- Transportation programs to conserve energy;
- Building code development, implementation, and inspections;
- Installation of distributed energy technologies including combined heat and power and district heating and cooling systems;
- Material conservation programs including source reduction, recycling, and recycled content procurement programs;
- Reduction and capture of greenhouse gas emissions generated by landfills or similar waste-related sources;
- Installation of energy efficient traffic signals and street lighting;
- Installation of renewable energy technologies on government buildings;
- Any other appropriate activity that meets the purposes of the program and is approved by DOE.

Allocations For Alaska

State	Name	Government Level	Allocation
AK	Anchorage	City	$ 2,688,900
AK	Fairbanks	City	$ 164,100
AK	Juneau, City and Borough	City	$ 131,400
AK	Bethel	City	$ 50,000
AK	Kenai	City	$ 50,000
AK	Ketchikan	City	$ 50,000
AK	Kodiak	City	$ 50,000
AK	Palmer	City	$ 50,000
AK	Sitka	City	$ 50,000
AK	Wasilla	City	$ 50,000
AK	Fairbanks North Star	County	$ 250,300
AK	Matanuska-Susitna	County	$ 249,300
AK	Kenai Peninsula	County	$ 192,200
AK	Aleutians East	County	$ 50,000
AK	Denali	County	$ 50,000
AK	Haines	County	$ 50,000
AK	Ketchikan Gateway	County	$ 50,000
AK	Kodiak Island	County	$ 50,000
AK	North Slope	County	$ 50,000
AK	Northwest Arctic	County	$ 50,000
AK	Alaska	State	$ 9,593,500
AK	Cook Inlet Region, Incorporated	Tribe	$ 939,000
AK	Doyon, Limited	Tribe	$ 310,900
AK	Central Council of the Tlingit & Haida Indian Tribes	Tribe	$ 191,900
AK	Sitka Tribe of Alaska	Tribe	$ 159,200
AK	Orutsararmuit Native Village (aka Bethel)	Tribe	$ 138,200
AK	Native Village of Barrow Inupiat Traditional Government	Tribe	$ 129,300
AK	Native Village of Kotzebue	Tribe	$ 115,000
AK	Ketchikan Indian Corporation	Tribe	$ 105,700
AK	Nome Eskimo Community	Tribe	$ 101,800
AK	Kenaitze Indian Tribe	Tribe	$ 99,800