Chaninik Wind Group Wind Heat Smart Grid

Our Presentation

- William Igkurak,
  President Chaninik Wind Group
- the harness renewables to lower energy costs,
- create economic opportunities
- build human capacity

- Dennis Meiners
- Principal Intelligent Energy Systems, Anchorage Ak.
- How it all works

Program Highlights

- Award Tribal Energy funding 2009, Village Smart Grid
- Received funds November 2010
- Project to be complete June 2011

- Theme: “communities working together we can become the heart beat of the region”

- Objective: Use wind to reduce energy costs for power and heat.

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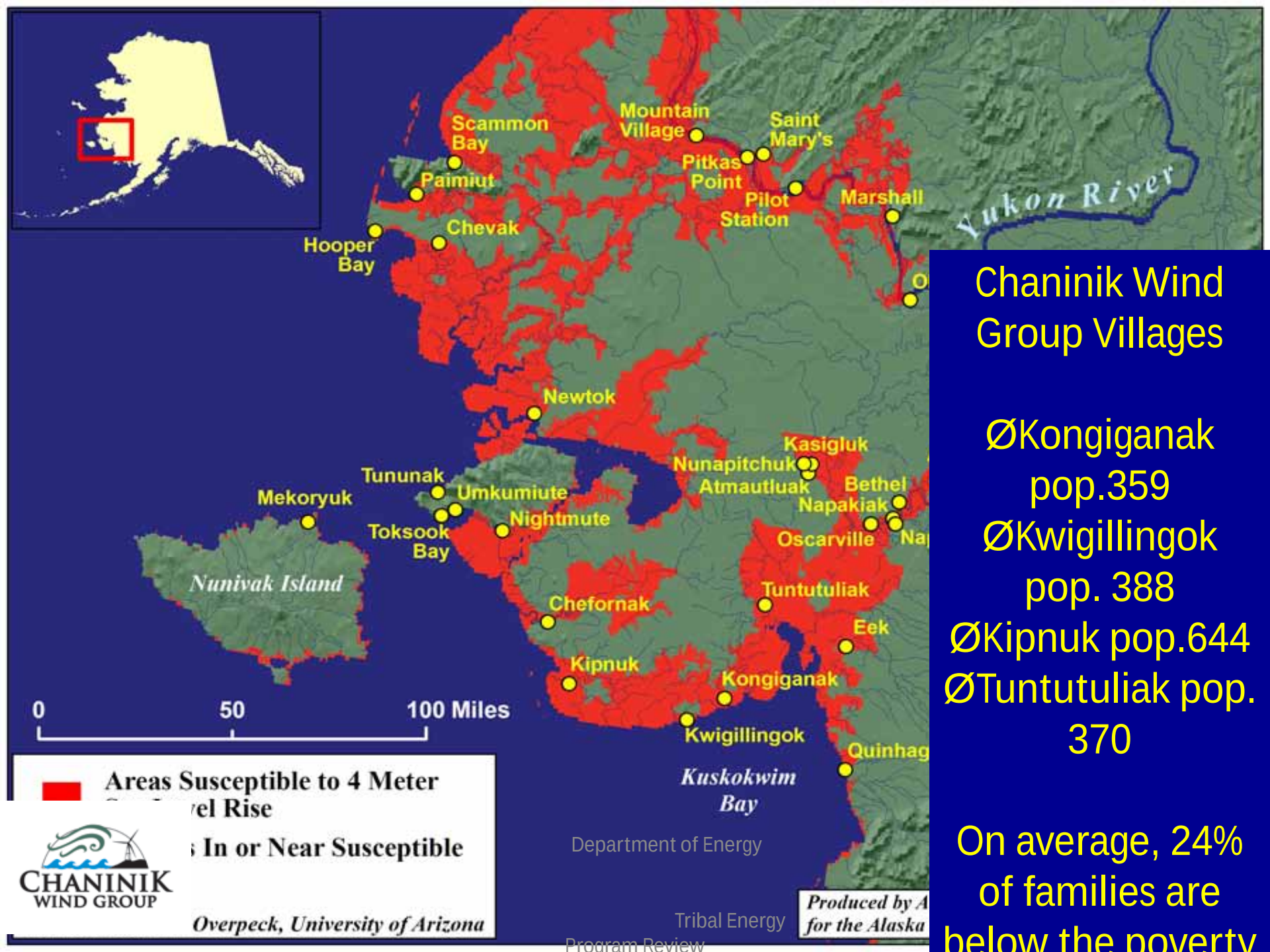

Chaninik Wind Group Villages

ØKongiganak pop.359
ØKwigillingok pop. 388
ØKipnuk pop.644
ØTuntutuliak pop. 370

On average, 24% of families are below the poverty

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"We try our best to keep up with costs of fuel and lights, in order to have transportation for survival."

-Sarah

"Installing wind turbines will be great because of high prices of stove oil is too high. Helping reduce electricity bills would help to buy oil to keep the houses warm."

-Paul

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We had to collect data and analyze the situation

Heat Loss Calculation Worksheet

(Whole House Concept)

CUSTOMER NAME AND ADDRESS: Bonnie Amik, PO Box 084, Kipnuk, 907-896-5148
OUTSIDE DESIGN TEMP -27
ROOM TEMP MAINTAINED 65
GARAGE TEMP MAINTAINED n/a

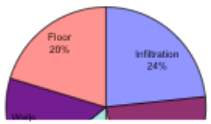
ROOM or AREA NAME				LIVING AREA Room/Area Room 1		Room/Area Room 2		Room/Area Room 3		Room/Area Room 4		Room/Area Room 5		Room/Area Room 6		TOTALS	GARAGE	
			LENGTH	14.00		10.00		10.00		10.00		10.00		20.00			0.00	
			WIDTH	10.00		12.00		10.00		10.00		10.00		10.00			0.00	
			HEIGHT	8.00		8.00		8.00		8.00		8.00		8.00			0.00	
INFILTRATION RATE (AIR CHANGES/HOUR)				0.75		0.75		0.75		0.75		0.75		0.75			0.75	
		*T		AREA	LOSS	AREA	LOSS	AREA	LOSS	AREA	LOSS	AREA	LOSS	AREA	LOSS	LOSS	AREA	LOSS
INFILTRATION LOSS		92		1,120	410	960	351	800	293	800	293	800	293	1,600	585	2223	0	0
	R-VALUE		SQ. FT.															
WINDOWS																		
Type 1	1.01	92	SF	0	0	18	480	12	320	6	160	12	320	12	320	1601	0	0
Type 2	0.00	92	SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glass Doors (Sliding or French)	0.00	92	SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DOORS																		
Type 1	2.13	92	SF	0	0	0	0	0	0	0	0	0	0	17.78	224.98	225	0	0
Type 2	0.00	92	SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leading into Unheated Area	0.00	46	SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXTERIOR WALLS																		
Main	20.00	92	SF	112	151	78	105	148	199	154	208	68	92	148	199	954	0	0
Main	0.00	92	SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Main (shared w/ unheated area)	20.00	46	SF	80	54	0	0	0	0	0	0	0	0	80	54	108	0	0
Basement - Above Grade	0.00	92	SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Basement - Below Grade	0.00	92	SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CEILING																		
Type 1	21.00	92	SF	140	180	120	154	100	128	100	128	100	128	200	257	976	0	0
Type 2	0.00	92	SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Under Unheated Area	0.00	46	SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FLOOR																		
Over Open Crawl Space	14.70	92	SF	140	257	120	220	100	183	100	183	100	183	200	367	1394	0	0
Over Unheated Area or Enclosed Crawl Space	0.00	46	SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Basement Floor	0.00	92	SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Edge Loss (slab on grade)	5.00	92	LF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL HEAT LOSS (WATTS)					1,051		1,311		1,124		972		1,016		2,007	7,481		0
TOTAL HEAT LOSS (BTU/hr)					3,586		4,472		3,835		3,316		3,467		6,849	25,525		0
Heat Loss (BTU/hr/Cubic Foot)					3.20		4.66		4.79		4.15		4.33		4.28	4.20		#DIV/0!

Heat Loss Calculation conducted by: Galen Brooks
Date: July 26, 2009
Revision Date (if revised):

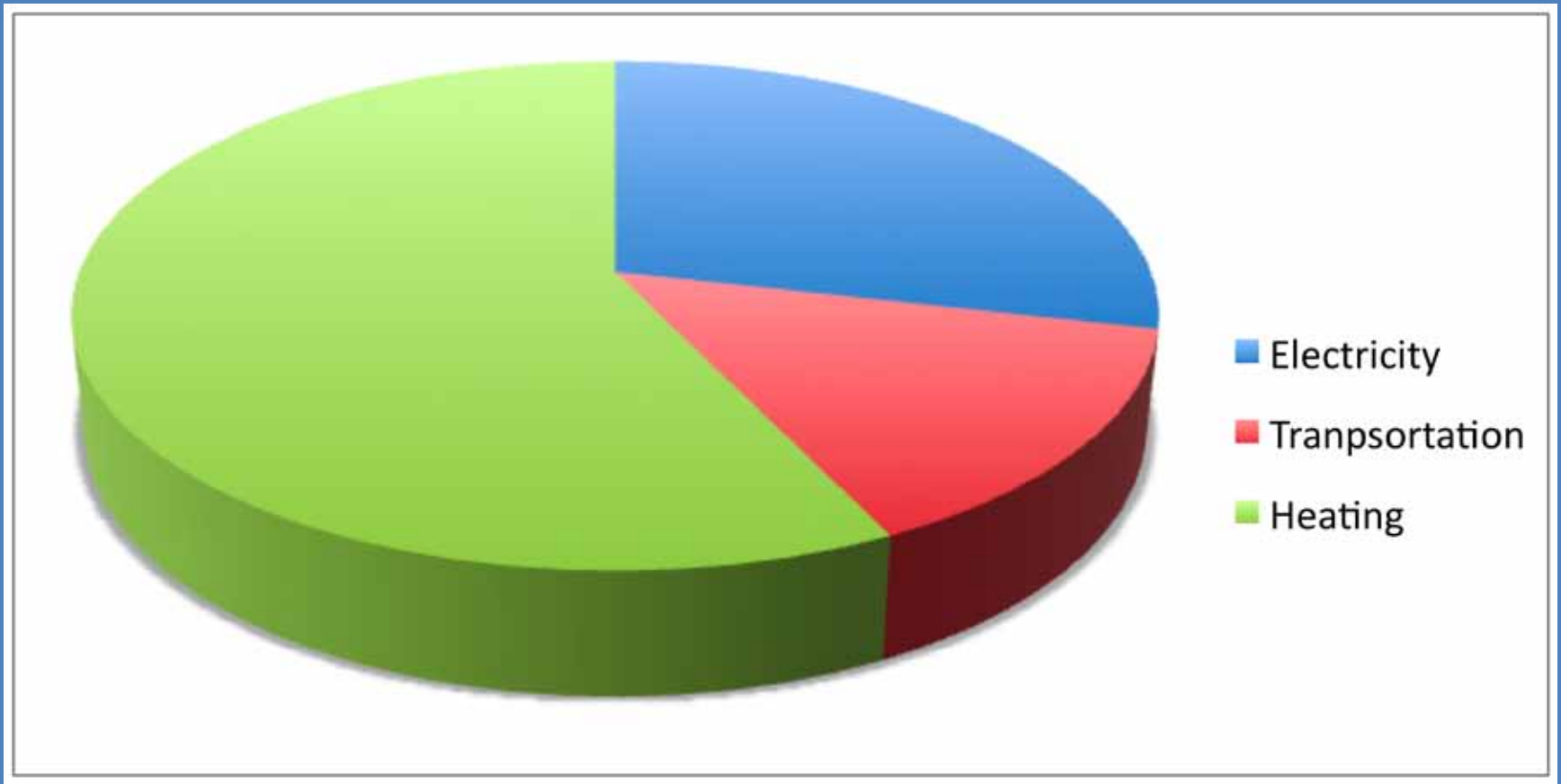
Disclaimer: Steffes performed this heat loss calculation to the best of their ability using information provided and making assumptions where information provided was unclear or not available. Please review this calculation for accuracy and completeness as Steffes nor any representative of Steffes assumes any liability in this regard.

Heat loss Summary

Infiltration	1,601 Watts
Windows	1,601 Watts
Doors	225 Watts
Ceiling	976 Watts
Walls	1,062 Watts
Floor	1,394 Watts



Annual Average Village Fuel Usage



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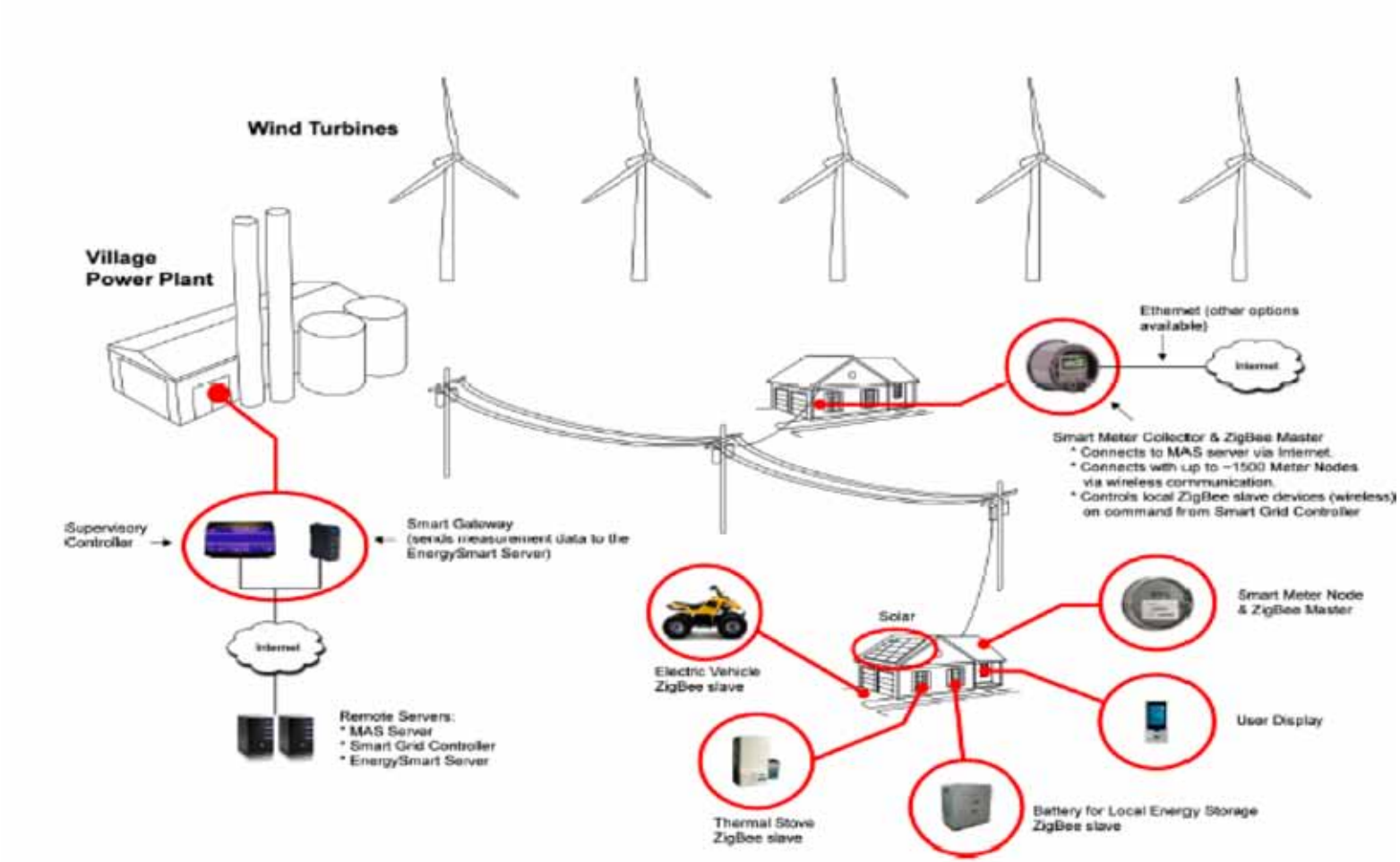
Village Wind Diesel Smart Grids



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Kongiganak from above

Had to figure out how to build wind turbines

We needed to understand for ourselves how wind turbines worked

We had to assemble a crew

We had to start training our crews

We had to learn how to climb wind turbines in Winter

We had to start to build intervillage cooperation

We needed to adapt the turbines for our needs

We had to figure out how to get our materials to the jobsite

CWG team installs wind turbines on their own!

Then we needed to get a handle on the new diesel technology

This meant in village training on new diesel controls

Installation of Thermal Storage in Homes

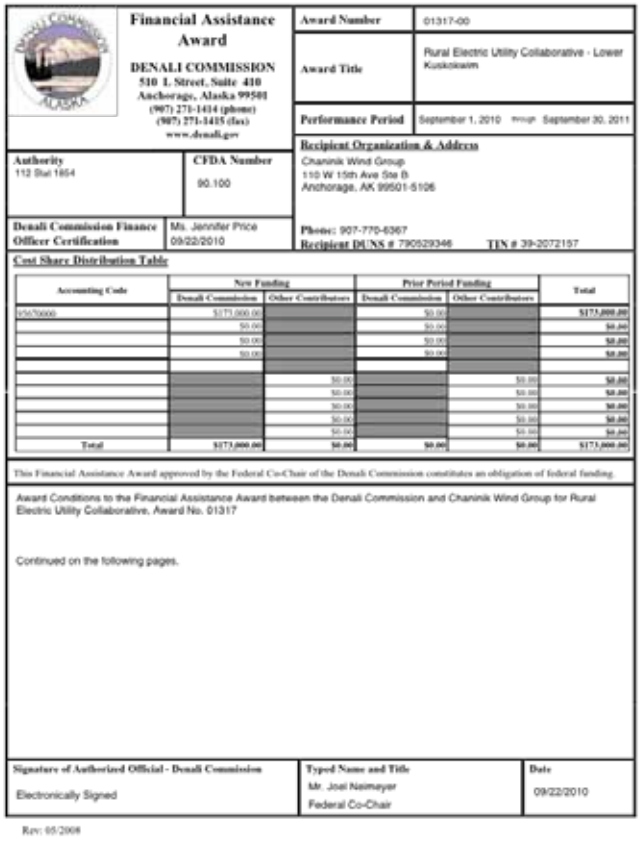
We needed to install thermal storage units

That required that we learn to upgrade electric services

Training is important, both in classroom and hands on, needs to be in village

What is really going on here?

We got Denali Commission help!
Training and CWG business development



Financial Assistance Award

DENALI COMMISSION
510 L Street, Suite 410
Anchorage, Alaska 99501
(907) 271-1414 (phone)
(907) 271-1415 (fax)
www.denali.gov

Award Number	01317-00
Award Title	Rural Electric Utility Collaborative - Lower Kuskokwim
Performance Period	September 1, 2010 through September 30, 2011

Authority
112 Stat 1864

CFDA Number
90.100

Recipient Organization & Address
Chaninik Wind Group
110 W 15th Ave Ste B
Anchorage, AK 99501-5106

Denali Commission Finance Officer Certification: Ms. Jennifer Price, 09/22/2010

Phone: 907-770-6367
Recipient DUNS # 790529346 **TIN #** 39-2072157

Cost Share Distribution Table

Accounting Code	New Funding		Prior Period Funding		Total
	Denali Commission	Other Contributors	Denali Commission	Other Contributors	
05670000	$173,000.00		$0.00		$173,000.00
	$0.00		$0.00		$0.00
	$0.00		$0.00		$0.00
	$0.00		$0.00		$0.00
		$0.00		$0.00	$0.00
		$0.00		$0.00	$0.00
		$0.00		$0.00	$0.00
		$0.00		$0.00	$0.00
		$0.00		$0.00	$0.00
Total	$173,000.00	$0.00	$0.00	$0.00	$173,000.00

This Financial Assistance Award approved by the Federal Co-Chair of the Denali Commission constitutes an obligation of federal funding.

Award Conditions to the Financial Assistance Award between the Denali Commission and Chaninik Wind Group for Rural Electric Utility Collaborative, Award No. 01317

Continued on the following pages.

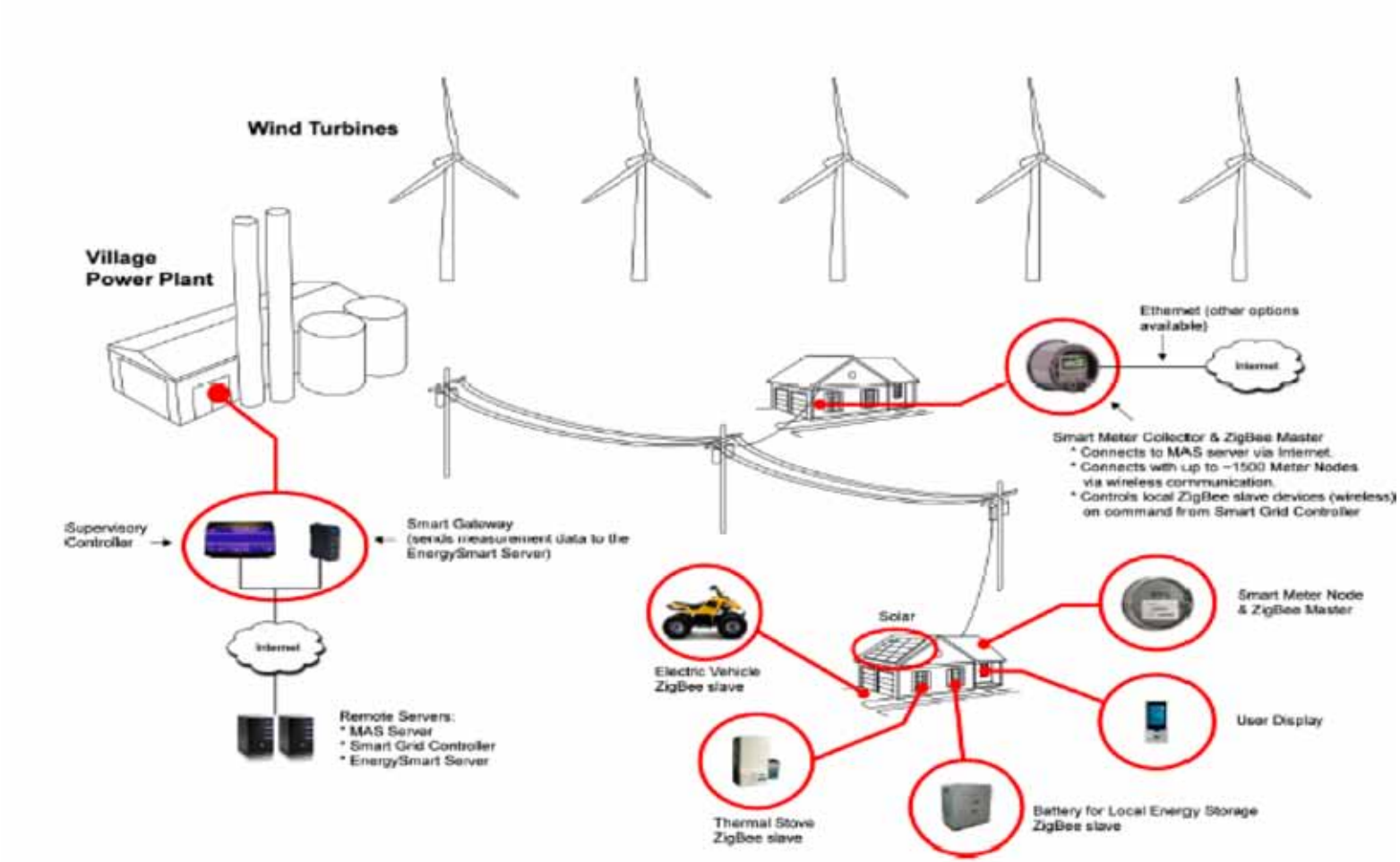
Signature of Authorized Official - Denali Commission	Typed Name and Title	Date
Electronically Signed	Mr. Joel Neimeyer Federal Co-Chair	09/22/2010

Rev: 05/2008

What we learned

- **Working together is essential,**
- **There will be obstacles,**
- **We have found its like riding a bike, up hill,,, if you stop pedaling and moving forward, you fall down, but as you get near the top of the hill you see new things.(regional energy plan, plug in vehicles, battery storage, transportation, interties, weatherization etc..)**

Village Wind Diesel Smart Grids



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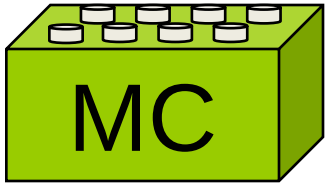
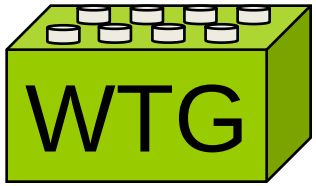
Wind-Diesel Smart Grid Control System Elements



System Master Controller

Automate, Integrate, Communicate



Wind Turbine Control

Reactive power, remote start stop, power control

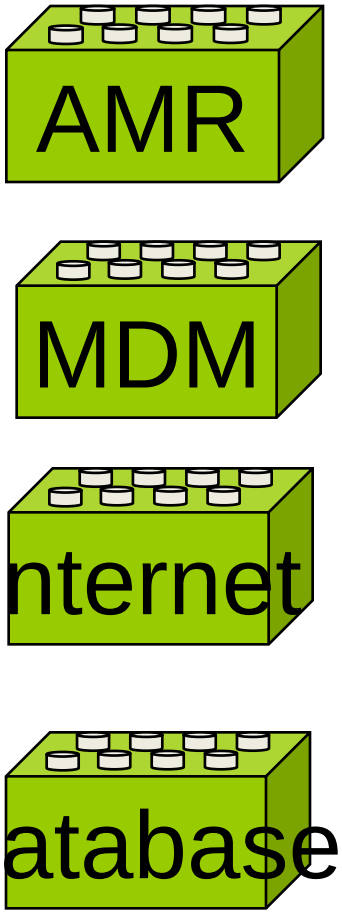
Spinning Reserve

Loads able to balance variable loads to power system

Smart Grid Controller,

captures excess wind into thermal stoves, (will be batteries, ice making, plug in vehicles)

Well Educated Smart Grid brings operations and management together



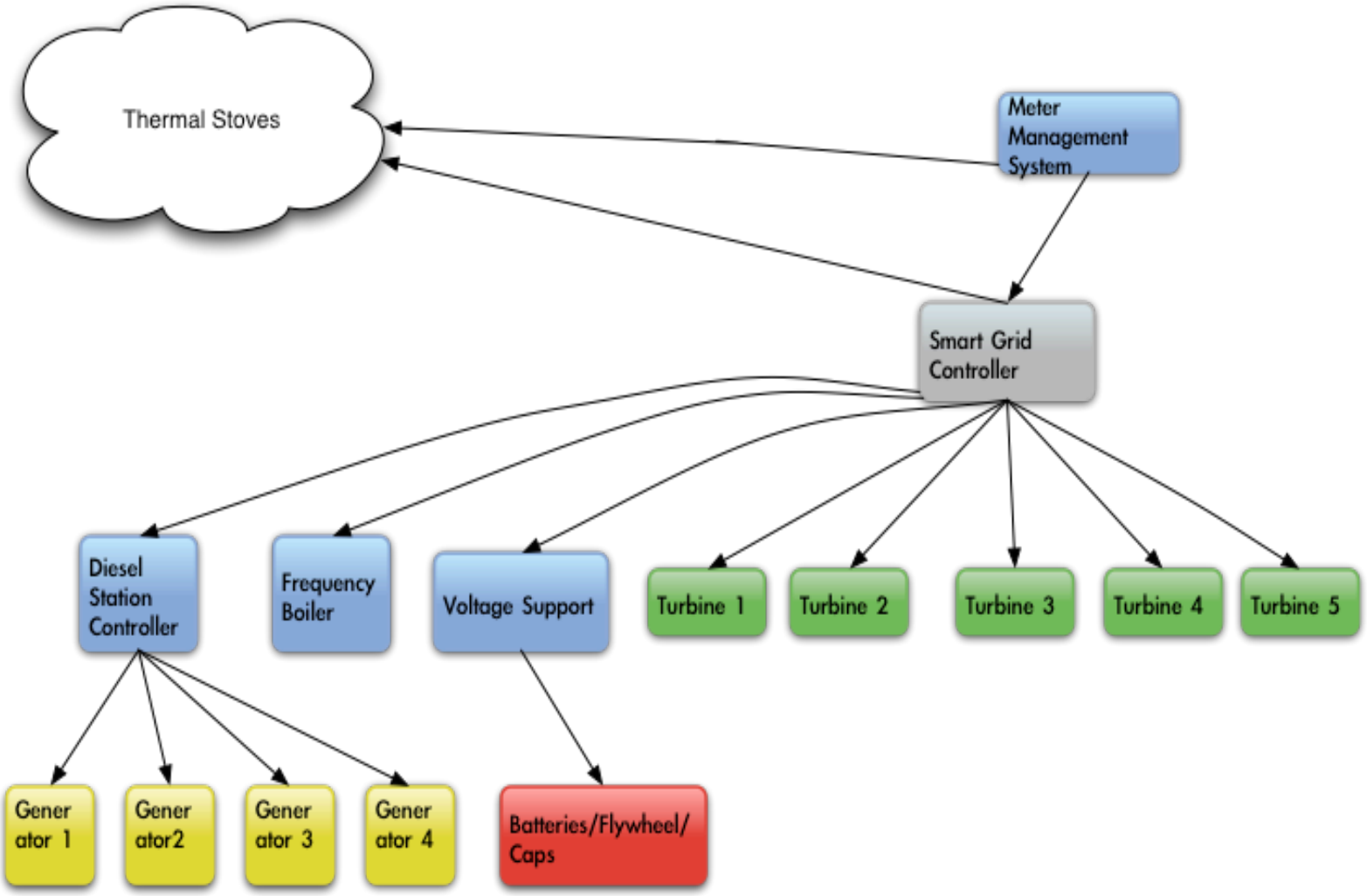
Automatic Metering System

Meter Data Management System,

Combines and communicates information

Analysis, functionality, convenience

Educated Smart Grid



New Turbine controls

Thermal Stove Controller

Front View

Interior View

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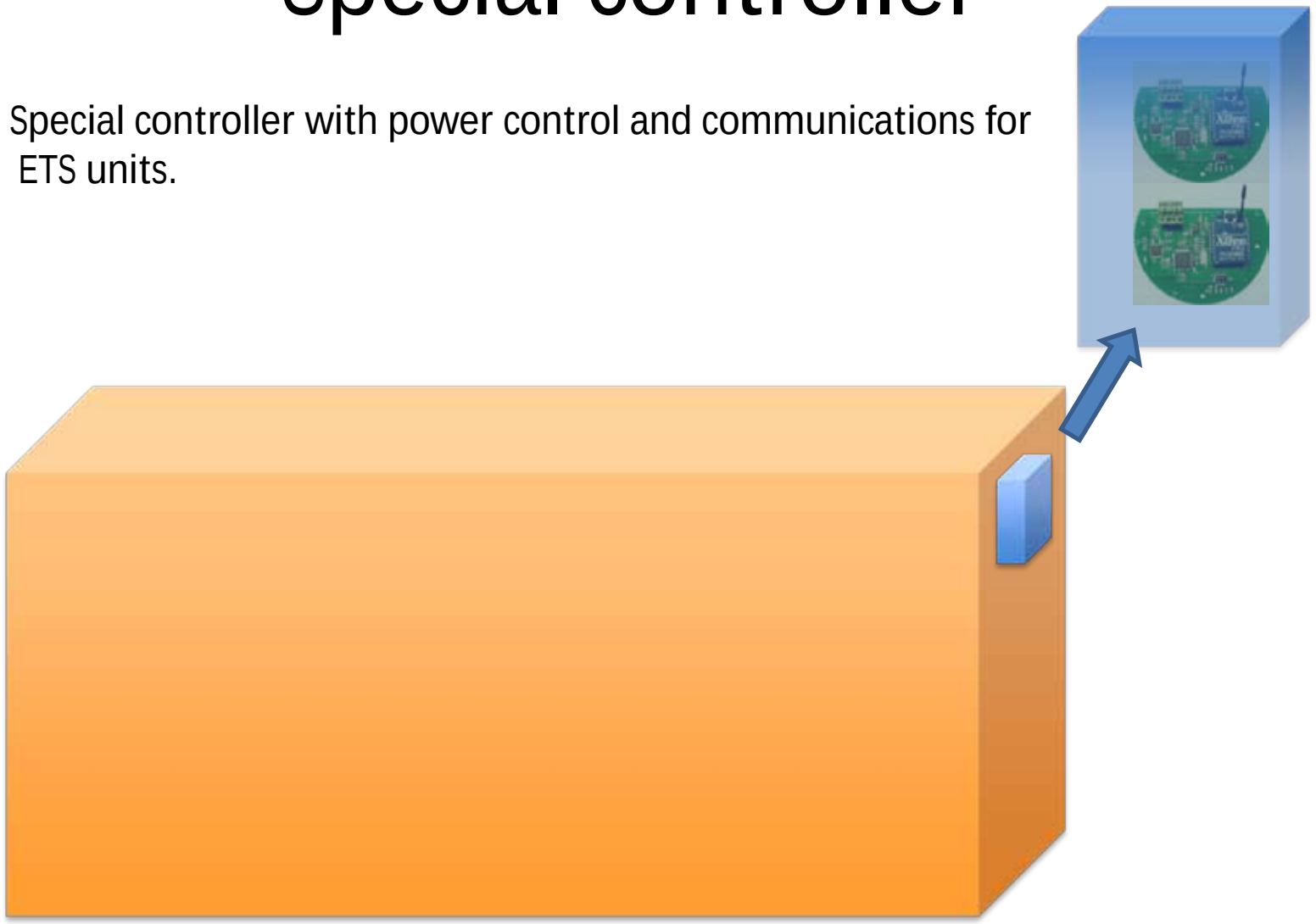
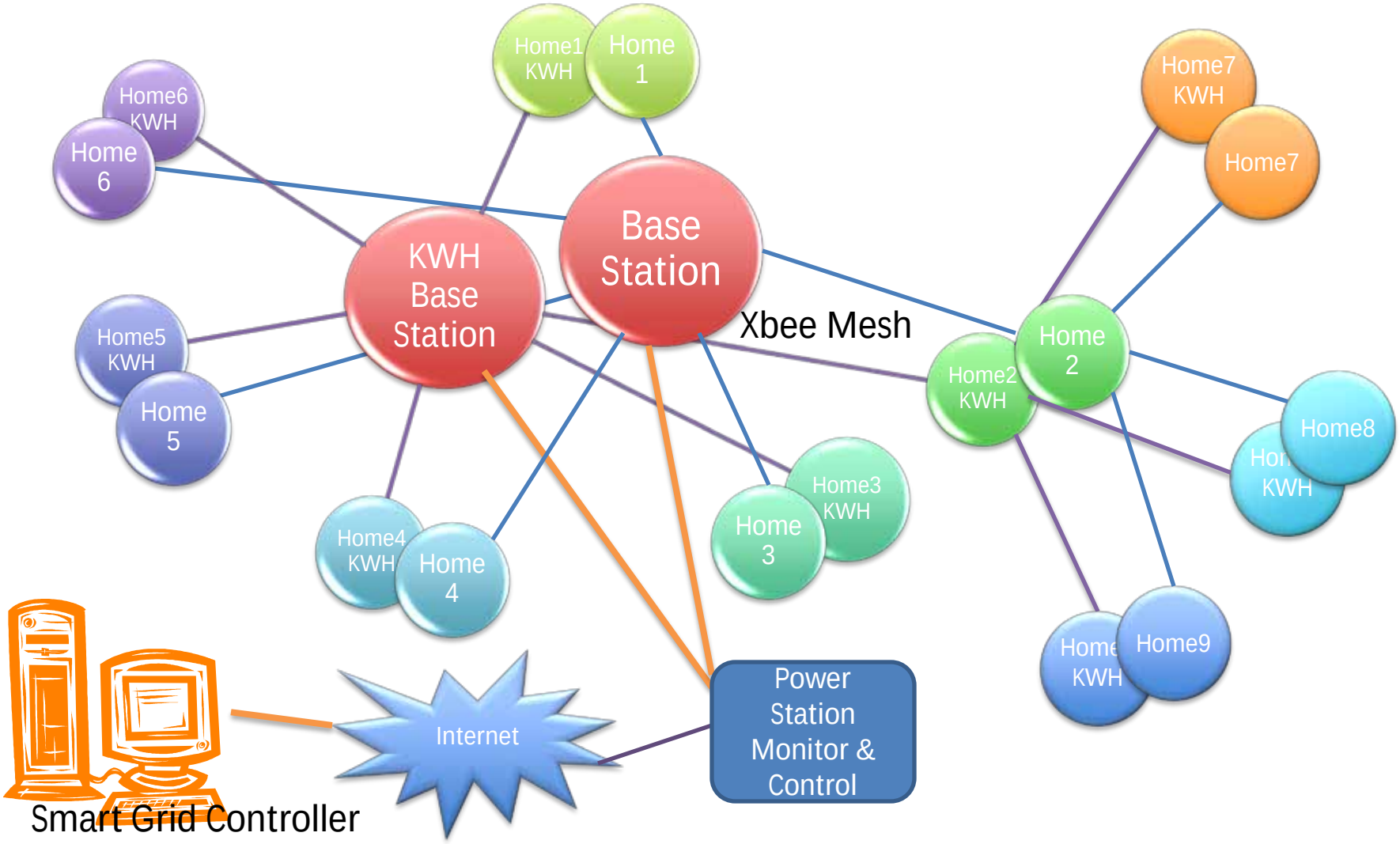
Special controller

Special controller with power control and communications for ETS units.



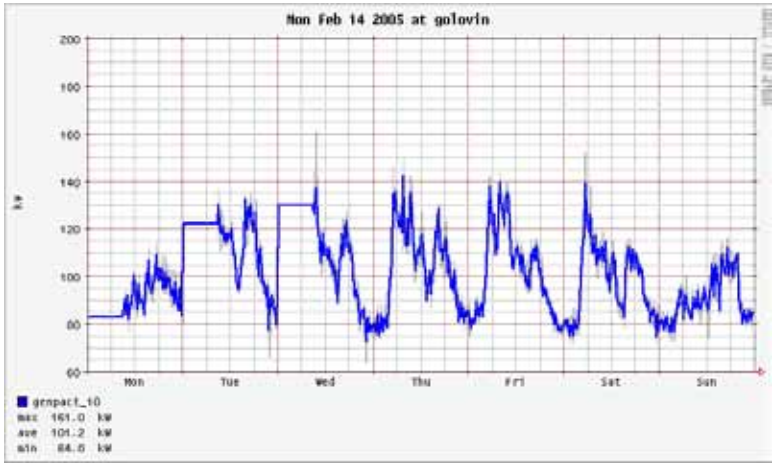
Phase1 Network



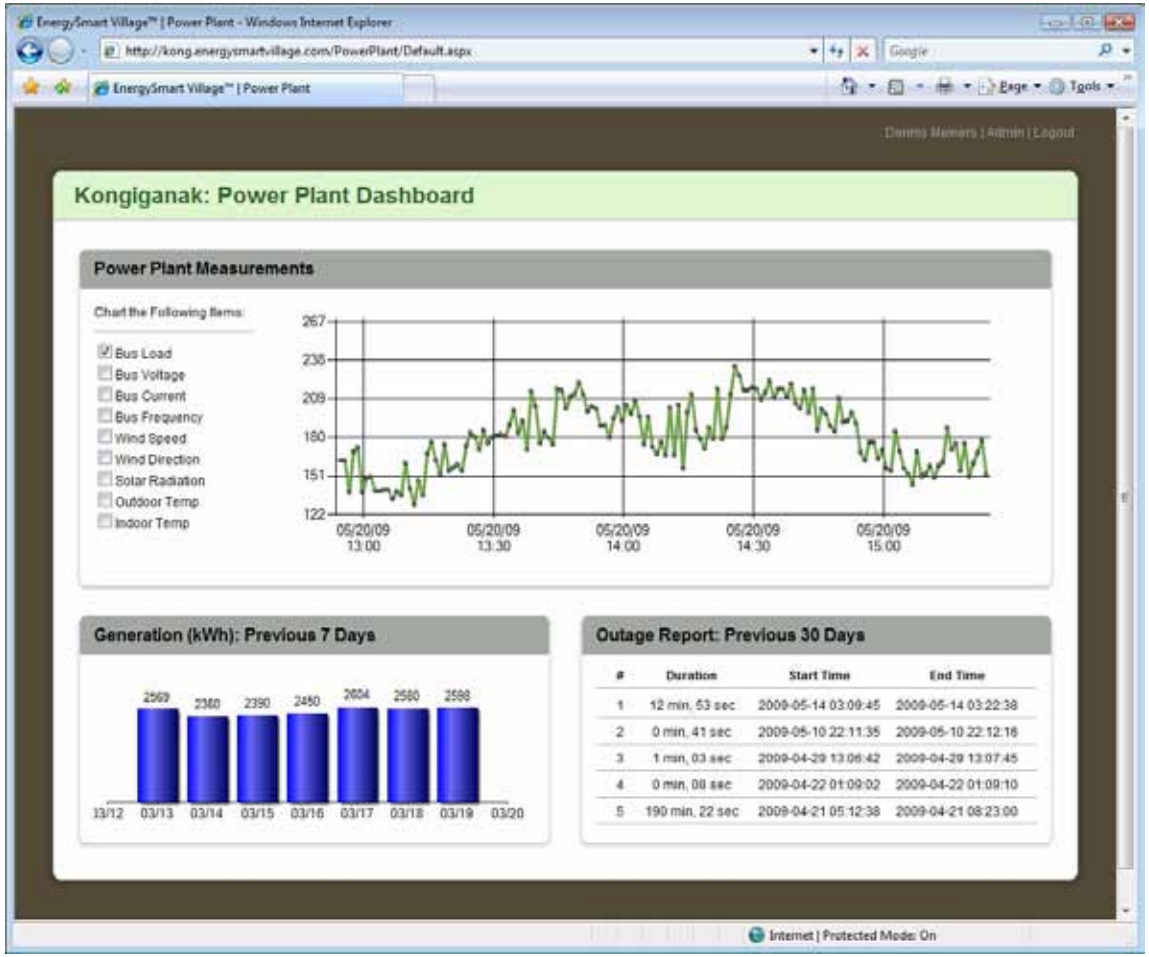
Powerplant Scada

Metering Systems, opportunity or obstacle

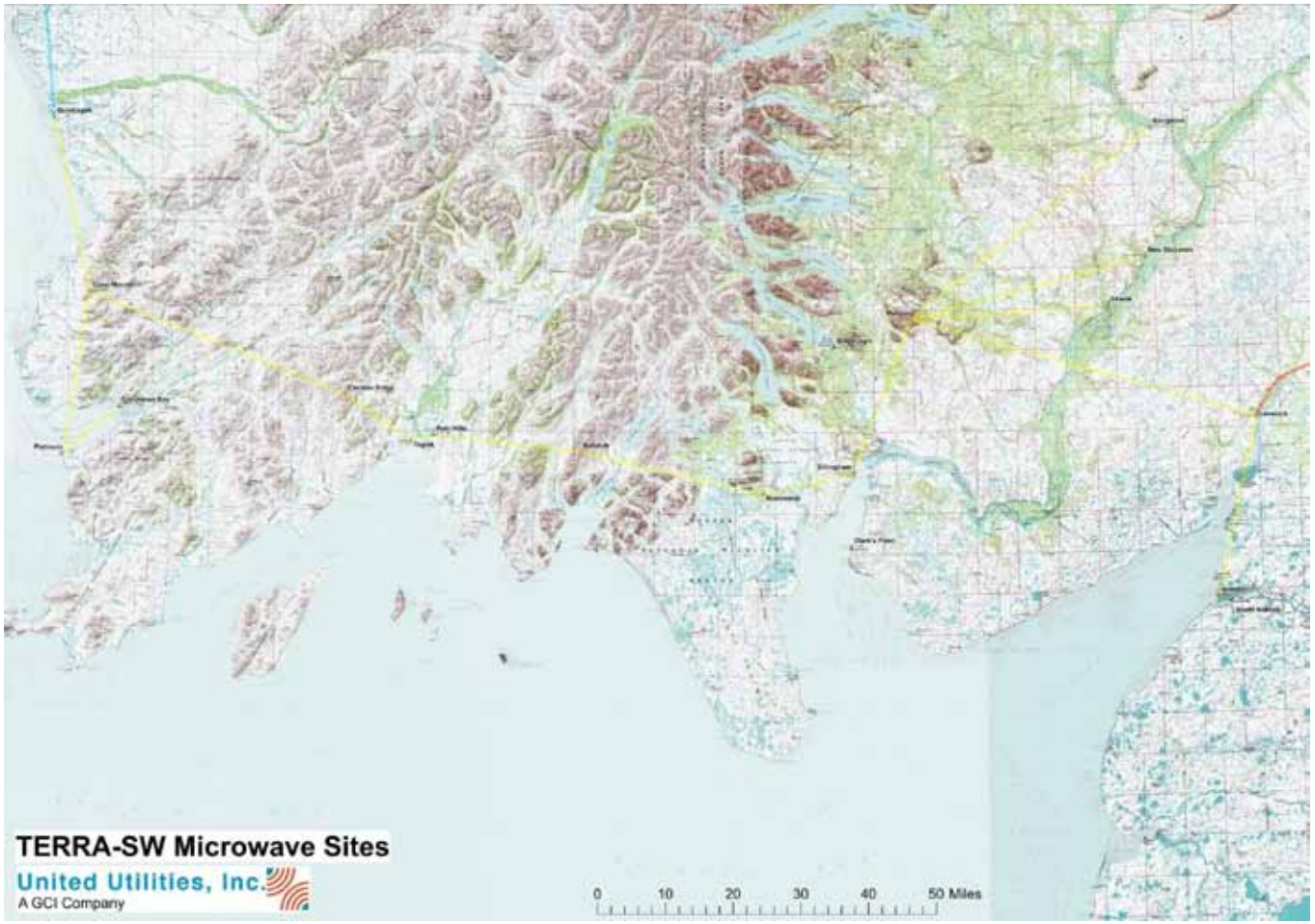
- Accounting
- Conservation/convenie nce
- Work together



Management Information



Future, broadband



Current Status

Kongiganak, Tuntutuliak, and Kwigillingok:

- Wind turbines completed 2011
- Metering December 2011
- SCADA thermal stoves smart grid Jan-May 2012

Kipnuk,

- New Power System 2012/13

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Many many people and organizations are helping us, and we believe many will benefit!

Thanks!
Tribal Energy Program,
State of Alaska
Denali Commission
Alaska Federation of Natives

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Questions???