

# Prepayment Utility Meter Systems

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A Case Study from  
the Aleut Region



Bruce Wright, Aleutian Pribilof Islands Association

# Overview

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- Introduction to prepayment systems.
- Comparison of system features.
- Case Study
- Lessons Learned

# What are Prepayment Utility Meters Systems?

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- Customer purchases utility units (electrical, water, sewer, waste, cable etc.) in advance.
- Meter measures actual electrical use and removes units in real time.
- Other utility units are based on a fixed rate and removed daily.

# Electrical service is driver.

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If customer runs out of money ...

- Audible alarm sounds.
- System turn off electricity at predetermined times, or
- System adjusts peak load level and tracks overage dues.

# System Types

- “PowerStat”  
Precision Power, LLC
- “Ampy”  
Marsh Creek, LLC



# Prepayment Systems in Alaska

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- Systems in 21 villages statewide.
- Small villages (~100 units or less).
- Five of 12 villages in Aleut Region.

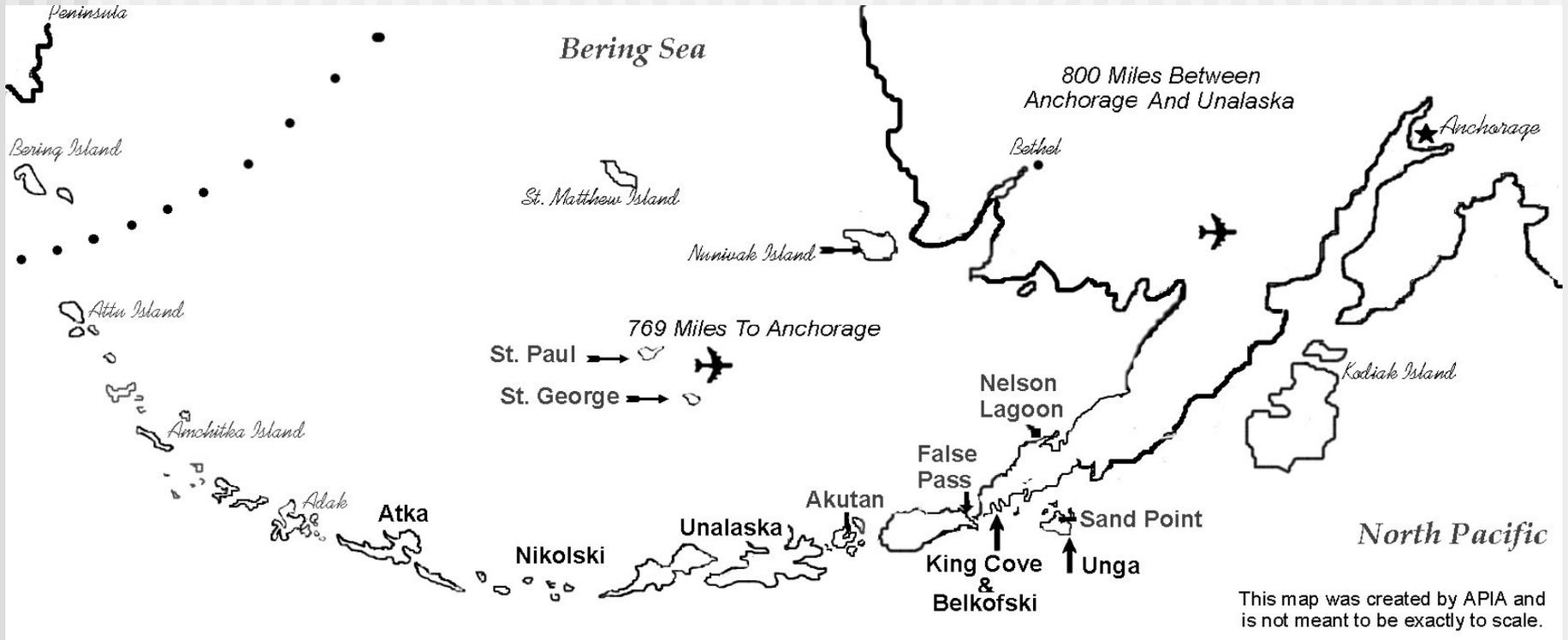
Andreanoff Electric Company (Atka)  
Tuluksak Traditional Power Utility  
City of Port Heiden  
City of Akutan  
City of Ekwok  
Pilot Point  
Chalkyitsik Energy Systems  
City of Adak  
Kwig Power Company (Kwigillingok)  
City of St. George  
Nelson Lagoon Electric Cooperative  
Atmautulak Joint Utilities  
City of Perryville  
Tatitlek IRA Village Council  
Pilot Point Electrical  
Chenega IRA Village Council  
Chignik Lake Electric Utility

# Why Small Villages?

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- Cost – there are economies of scale, many units result in a large sticker price.
- Capacity – Larger utilities may be more successful in achieving efficiency and higher percentage of collections.
- Administration – Small villages often have multiple services owned by city or tribe.

# Aleut Region



# Advantages for Household

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- User friendly.
- No bills at end of month.
- Reduced concern over administration.
- Ends further debt.
- Provides system to pay off past debt.
- Provides specific data on energy use.
- Assists households to conserve ~15%.

# Advantages for Utility

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- No more billing/collection hassles.
- Lower operational costs.
- No more disconnects and reconnects.
- Achieve 100% collections immediately.
- Ability to collect on past due.
- Encourages energy/fuel conservation.
- Software has multiple report formats.
- Remote access for technical assistance.

# Disadvantages

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- Customer must pay in advance.
- Systems will turn off / turn down electricity.
- Requires new equipment and education.
- Utility must provide reliable access.
- Customer must go to office (open hours) to purchase.

# Major Components

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- Staff & Tech Support
- System Management - Computer
- Meter
- Information Card
- Household Display

# PowerStat

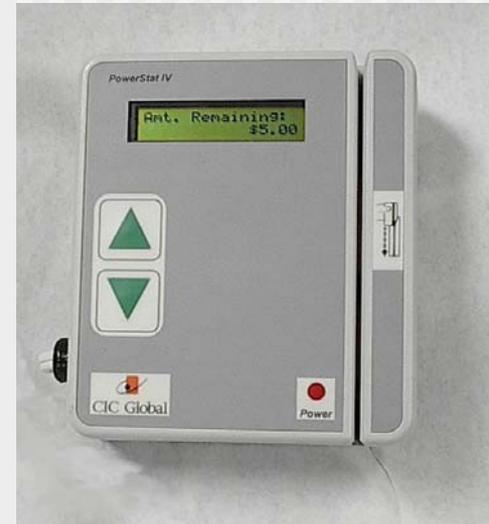
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- CIC Global developed first prepayment system for U.S market.
- 1990s introduced first prepayment system in Alaska.
- Since early 1990s has been installed in 20 villages in Alaska.

Contact: Ward Sattler Tel. 907-561-7797

# Components - PowerStat

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# Ampy



- Parent company has over 30 years experience in the prepayment meter business, mostly in UK and abroad.
- North America market developed in 2002.
- Manufacture 1.5 million systems annually.
- St. George was the first Ampy.

Contact: Clarissa Quinlan  
Tel. 907-248-5530

# Components - Ampy

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# Computer System

- Computer System installed to receive payments, program cards, review data, make system wide changes and generate reports.



# Meter



The old meter is removed and a new Power Stat meter and disconnect sleeve, or Ampy Meter is installed.

# PowerStat Meter Display

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- Kwh Usage
- Money Remaining



# Ampy Meter Display

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- Total Kwh Consumed
- Present Demand
- Tamper Date
- Tamper Time
- Credit Balance
- Last Credit Date
- Last Sale Value
- Tamper Count



# Information / Payment Cards

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- Payment amount is transferred onto the payment card. PowerStat uses a plastic card with a magnetic strip. Ampy uses a plastic “smartcard” with an implanted micro-chip. Both cards are customer specific.



# Information Display



The information display is installed in a readily accessible location in the home or business. It provides information about utility rates, electrical use, and amount of money being used.

# PowerStat Display

- Amount Remaining
- Usage/hr
- Used Yesterday
- Used Last Month
- Last Purchase
- Current Rate



# Ampy Meter Display

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- Credit Balance
- Days Remaining
- Present Demand
- KWh Rate
- Fixed Fee (weekly)
- Cost Per Hour
- Peak Demand



# St. George Case Study



# St. George Project

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- First “Ampy” in Alaska
- Funded by EPA
- Partners: City, Tribe, Rural Cap
- Region’s 1st combined billing system.
- 44 units installed.

# Cascading Problems

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Loss of revenue

Cash flow problems.

Downsizing of city staff.

Inconsistent billing for services.

Infrequent rate adjustments.

50-60% collections on all services.

Large percentage of customers in debt.

High level of customer discontent.

Inadequate operations and maintenance.

Major system failures.

Loss of competitiveness for infrastructure grants.

# Utility Needs

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- Increased efficiency
- More revenue
- Lower administrative costs
- Improved management system
- Increased public confidence
- Improved grant scoring



03/02/2006



ST. GEORGE  
SAND  
Village Center  
Dalnoi  
Zapadni Bay  
A L A

03/04/2006

# GENERATOR 4 150 KW



-  LOW COOLANT LEVEL SHUTDOWN
-  LOW OIL PRESSURE
-  HIGH OIL TEMPERATURE
-  HIGH WATER TEMPERATURE
-  OVER SPEED
-  LOW COOLANT LEVEL ALARM



VOLTAGE ADJUST  
RAISE  
→



03/05/2006



03/05/2006

# System Cost

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Economies of scale.

Starting cost for equipment is ~\$12,000.

- St. George – 50 units @ \$1,109/ea.  
Total Cost \$51,000.
- Nikolski – 23 units @ \$1,565/ea.  
Total Cost \$36,000.

# Survey Results - Sept 2006

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- 30% of households surveyed.
- 31% Very Satisfied
- 69% Satisfied
- 0% Not Satisfied
- 100% Conserving More Energy

# Types of Conservation

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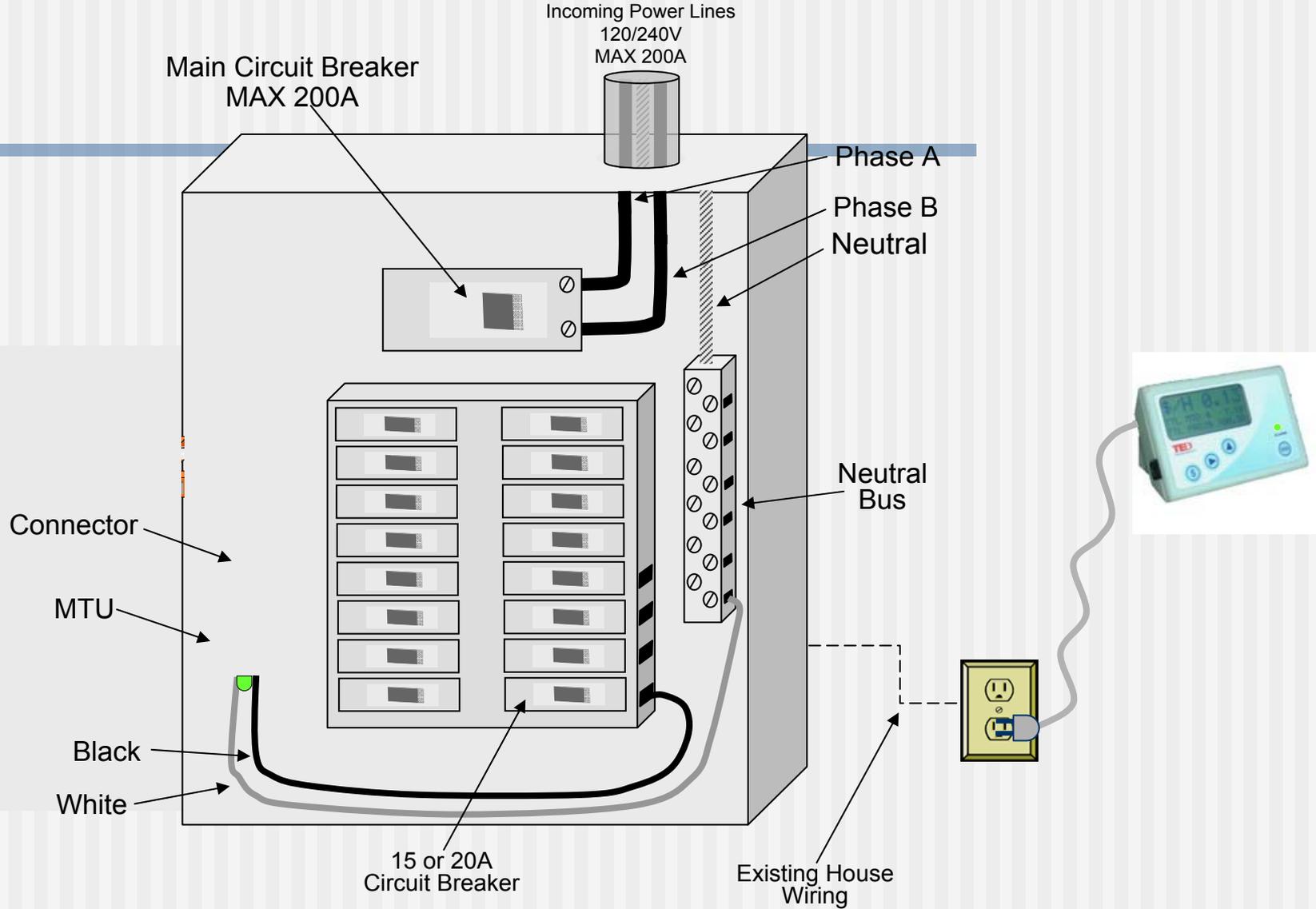
- Turning off un-needed appliances
- Unplugging appliances
- Turning down water heater / heat
- Purchasing Green Star Appliances
- Installing energy efficient bulbs

# Outcomes

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- Installation fast and easy.
- Households report increased conservation.
- Lower energy demand at power plant.
- Reliable and complete collection for all services.
- Remote technical assistance effective.
- Less conflict between city and customers.
- Customer satisfied with system.

# How Does TED WORK?



# 's INSTALLATION

- ❖ **Typical Installation cost \$30 - \$70**
- ❖ **New Construction: *No install cost***
- ❖ **Retrofit: *No install cost* if installed by utility during meter swap-out**
- ❖ **Average Time to Install: 15 minutes**
- ❖ **Permanent Install / maintenance-free**
- ❖ **Meter-neutral - No matter what technology, brand, or model**

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# BENEFITS AND OPPORTUNITIES

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- **Ideal tool for Demand Response**
- **Instant Rate Update for CPP**
- **Conservation awareness**
- **High-Bill complaints**
- **Low-income programs**
- **Resolve utility meter complaints**
- **Fixed-income assistance**
- **Public awareness and education**
- **Increased level of service**
- **Improved customer satisfaction**
- **Confirm energy efficiency**
- **New Home Construction**
- **New Tariff Programs**



# Coming Soon to a near you ...

- ❖ Download Rates or Rate Changes direct from the Utility website
- ❖ *Load-shedding* at user-parameters
- ❖ Graphing / diagnostic use
- ❖ Interact with Home Automation systems



# St. George Rates

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- Current gas \$4.08 gallon.
- Current diesel \$4.47 gallon.
- Electrical cost per KWH resident .35
- Electrical cost per KWH business .45
- Average Electrical Bill ~ \$65.00 month
- Fixed fee seniors \$71.50/month
- Fixed fee general public \$121.50.
- Total average utility bill = \$186.50/month