Ketchikan Public Utilities

Load Forecasting

Whitman Dam

KPU Electric

- Serves Ketchikan (City and Borough), approximately 13,000 people

- 7,600 Customer Accounts/Meters
  - 5,000 Residential
  - Large customers – Alaska Ship and Drydock, Coast Guard, fish processors, School District, Navy

- Generation:
  - 12 MW KPU Hydro, 26 MW KPU Diesel
  - 40% self-generated, 60% purchased from SEAPA
  - 170 million kWh annually, 31 mW peak

The 2009 – 2010 Situation

- KPU was beginning to hear discussion of significant commercial and industrial development to come on-line
- “Plug and Play”
- Anecdotal reports of heating conversions over recent years but no knowledge of “how many” or the impact
- KPU did not have a handle on measuring or forecasting load growth to plan for supply needs or address infrastructure upgrades

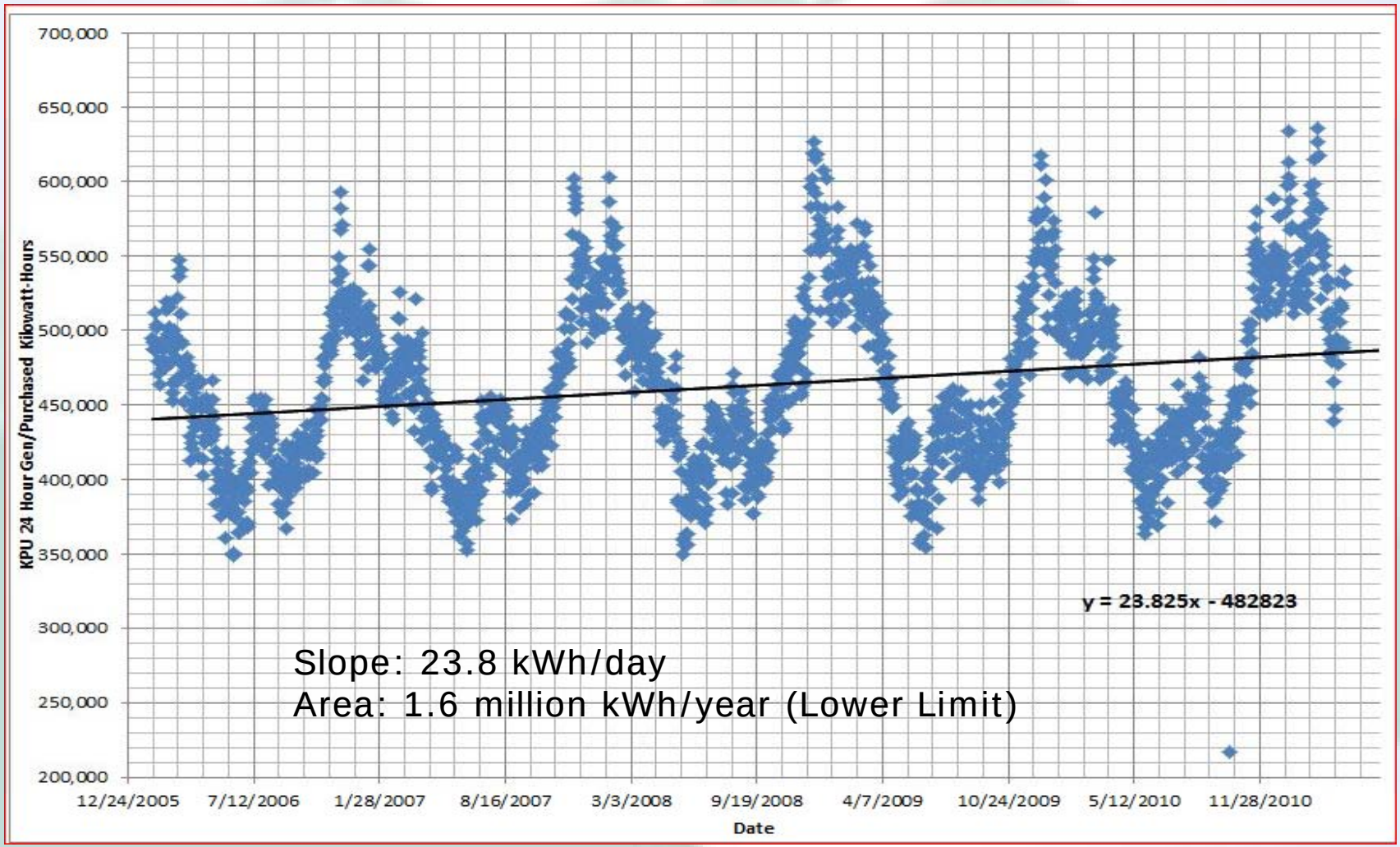
KPU's Load Forecasting

- Track and trend Ketchikan daily consumption in kilowatt-hours vs. heating degree day

- Inventory/track "identified" large, new commercial and industrial load

KPU's 5 Year Load Growth

(no temperature correction)



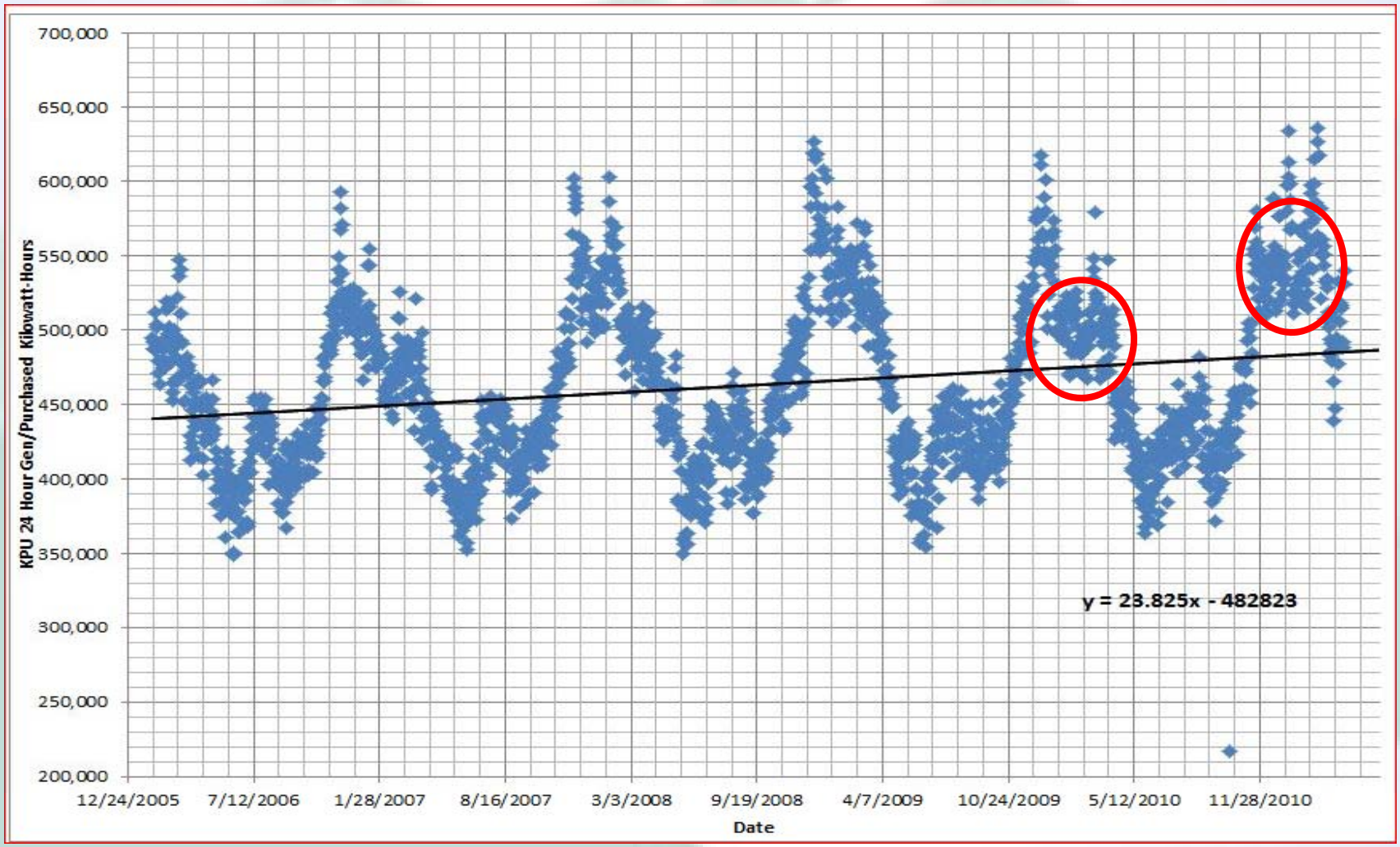
Average Daily Temperature @ Ketchikan Airport

51 Year Average Temp:	45.5	Deg. F

	Degrees F	
	Temp.	Diff from Avg
2006	43.7	-1.8
2007	44.2	-1.4
2008	43.9	-1.7
2009	44.2	-1.3
2010	46.5	1.0

KPU's 5 Year Load Growth

(no temperature correction)



Heating Degree Day (HDD)

✓ The number of degrees that a day's average temperature is below 65° Fahrenheit (18° Celsius), the temperature below which buildings need to be heated.

✓ HDD is a measurement designed to reflect the demand for energy needed to heat a home or business.

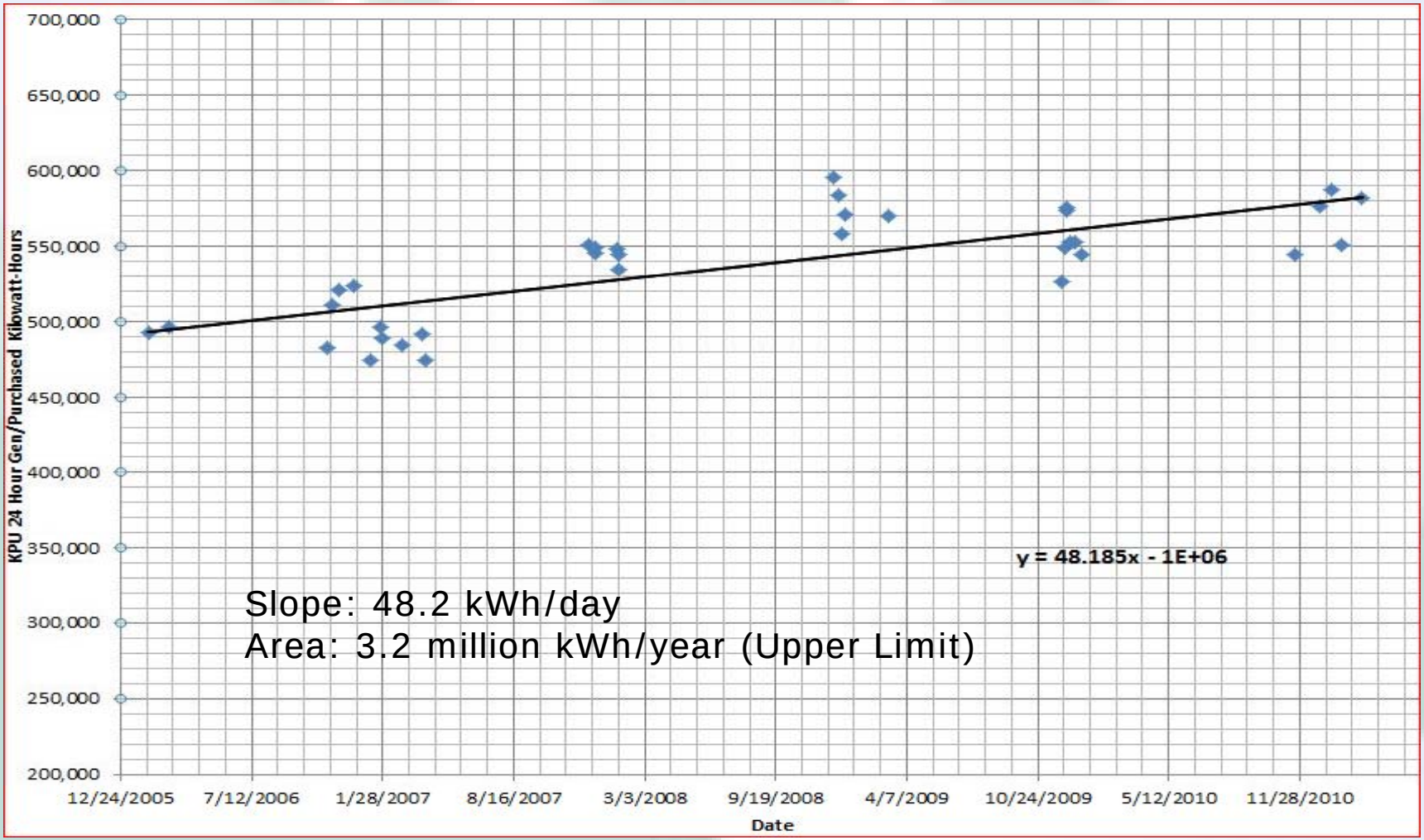
✓ If the temperature averaged 45 degrees F across the 24 hour period, the HDD would be 20.

(65-45 = 20)

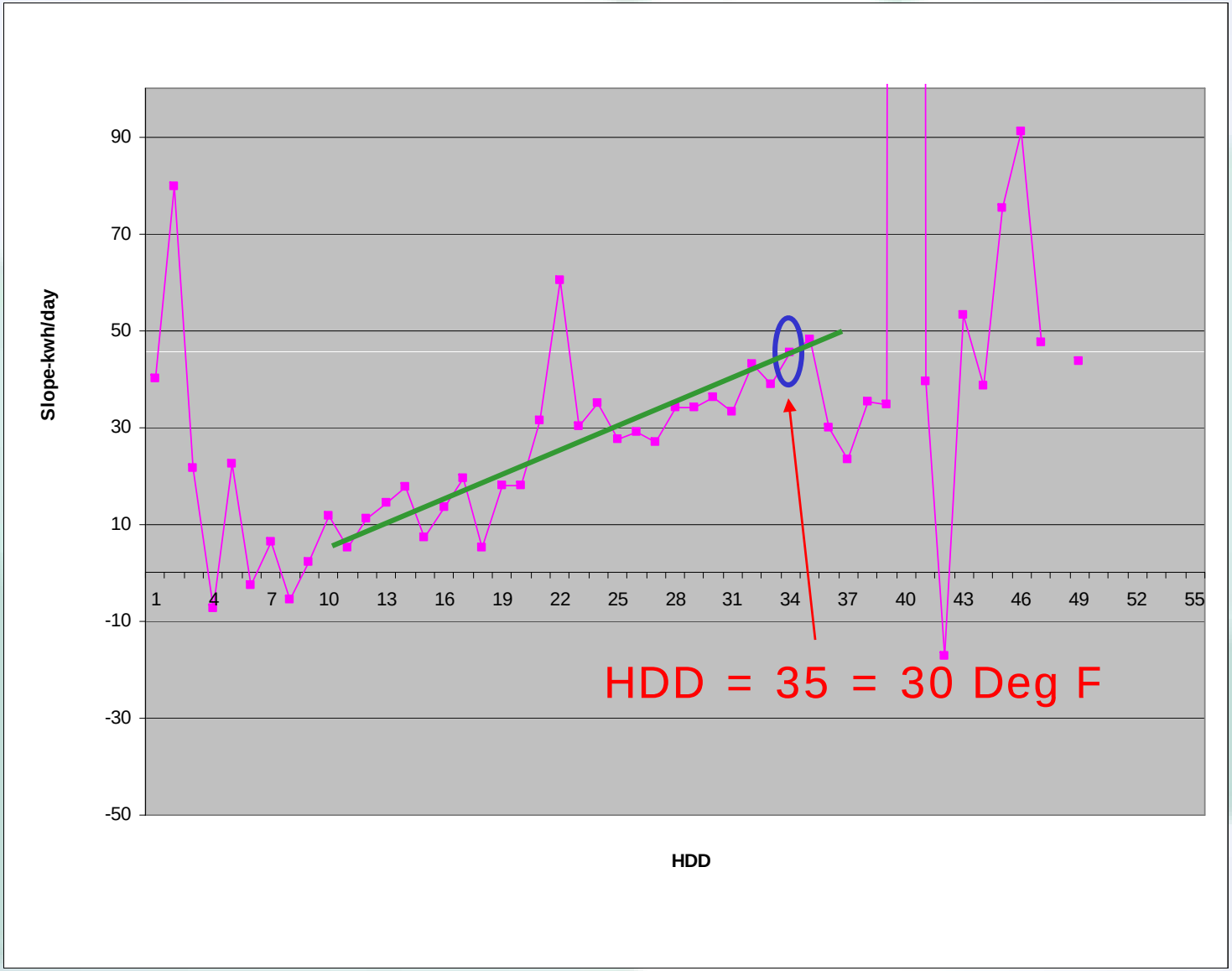
✓ www.degreedays.net

KPU's 5 Year Load Growth

(temperature correction, HDD=35)

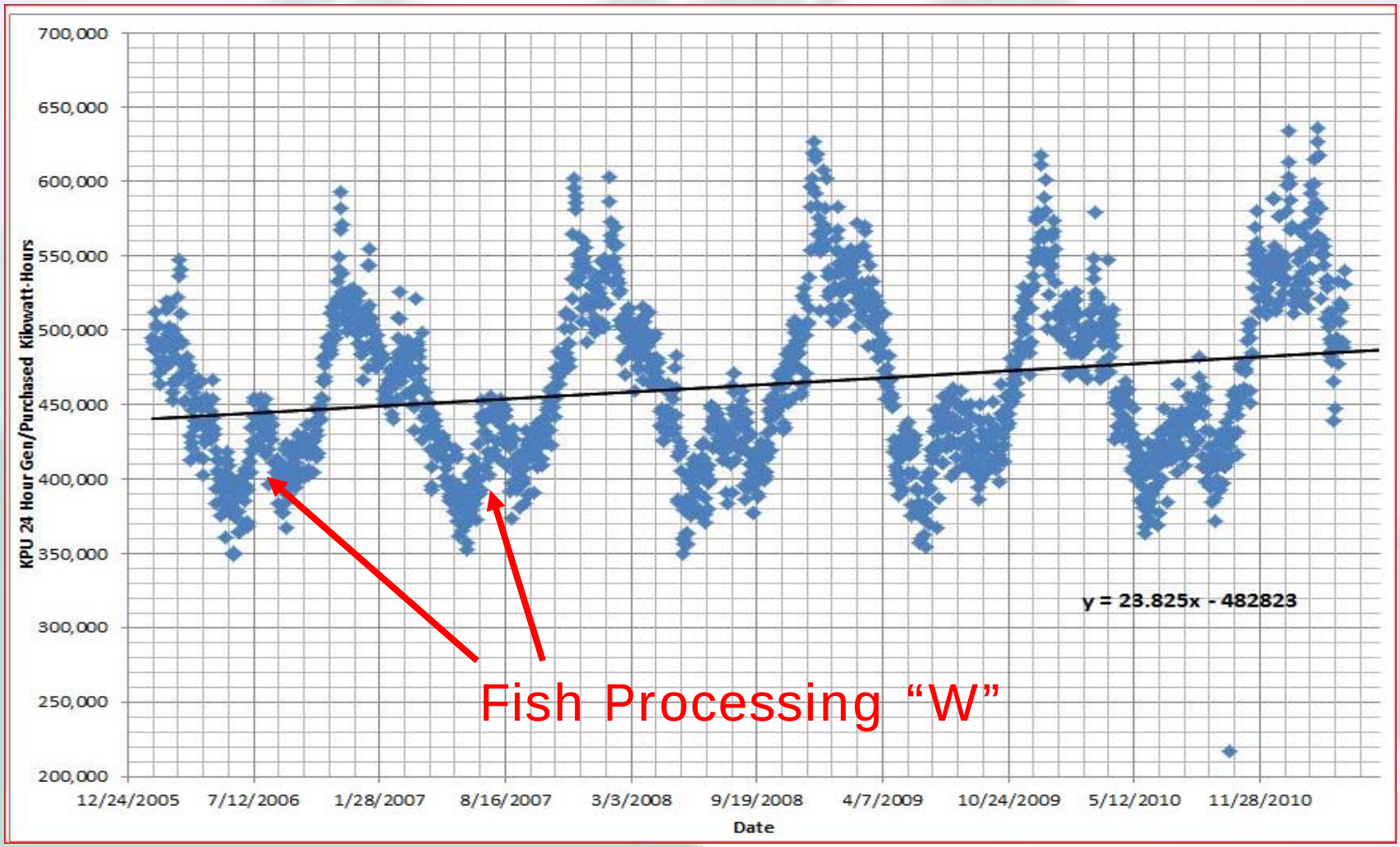


HDD Slopes


Slope-kwh/day
90
70
50
30
10
-10
-30
-50
1
4
7
10
13
16
19
22
25
28
31
34
37
40
43
46
49
52
55
HDD
HDD = 35 = 30 Deg F

KPU's 5 Year Load Growth

(no temperature correction)



Inventory

	PROJECT	SERVICE CAPACITY	FEEDER	STATUS
2011-2012 Winter Heating Season - 2,645 kVA*	KGB Pool (in addition to Rec Center)	1000	Ketchikan 3	Construction
	KGB Whitman Booster Station	100	Mtn Pt 2 South	Complete
	KIC A&T Facility	100	Ketchikan 2	Complete
	Northland - Tongass Ave	225	Bethe 2 Tongass	Construction
	Pioneer Heights	300	Ward Cove 1 South	Construction
	Saxman Elder Housing	300	Mtn Pt 1 North	Construction
	OceansAlaska (Phase I)	No Data Yet*	Mtn Pt 2 South	Construction
	AP&T Warehouse	No Data Yet*	Ward Cove 1 South	Construction
	Ketchikan Mechanical Warehouse	200	Ketchikan 3	Construction
	Marble Construction	300	Ward Cove 2 North	Design
	USCG Barracks	120	Ketchikan 4	Design
2012-2013 Winter Heating Season - 9,195 kVA*	Schools	5,000	System Wide	Preliminary
	AMHS Admin & Yard - Ward Cove	750	Ward Cove 2 North	Design
	ASD Facility	No Data Yet*	34.5kV	Preliminary
	New City Fire Station	750	Ketchikan 2	Construction
	New City Library	No Data Yet*	Ketchikan 3	Design
	Northland - Stedman St	No Data Yet*	Ketchikan 4	Preliminary
	Trident Seafoods (Phase II)	2400	34.5kV	Design
	AMHS Admin Ops	35	Ward Cove 2 North	Design
	Seley 10-Mile Site	No Data Yet*	Ward Cove 2 North	Design
	USCG Galley & Clinic	260	Ketchikan 4	Design
	South Tongass Alliance Church	No Data Yet*	Mtn Pt 1 North	Construction
	Airport Hanger	No Data Yet*	Ward Cove 1 South	Preliminary
2013-2014 Winter & Beyond Heating Season - *No Data Yet	OceansAlaska (Phase II)	No Data Yet*	Mtn Pt 2 South	Preliminary
	Emerald Forest Subdivision (Phase II)	No Data Yet*	Mtn Pt 1 North	Preliminary
	Hospital (Various Projects)	No Data Yet*	Bethe 2 Tongass	Preliminary
	Pulp Mill Site	No Data Yet*	34.5kV	Preliminary

Yellow reflects completed service connections.

2011-2012

2,645 kVA * 24 hours/day * 365 days * 25% = 5.8 million kWh

2012-2013

9,195 kVA * 24 hours/day* 365 days * 25% = 20.1 million kWh

Alaska Ship & Drydock 3.0 million kWh

28.9 million kWh

Assumptions:
- kVA approximates kW
- Load Factor = 25%

Questions?