



Southeast Alaska Energy Update and Profile

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Prepared for:
**Southeast Conference
Annual Meeting**

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McDowell Group

- Multidisciplinary research and consulting firm since 1972
- 17 professional staff in Anchorage and Juneau
- Current Southeast Alaska projects include:
 - Marine Highway System Governance Study with SEC and Elliot Bay Design Group
 - City and Borough of Juneau Parks and Recreation Survey
 - Local Food Systems Research for Haa Aani and Sustainable Southeast Partnership
 - Southeast Alaska Cluster Initiative Program Assessment for US Forest Service
 - Culturally-relevant Education Program Evaluations for Sealaska Heritage Institute
 - Alaska Visitor Statistics Program surveys in progress



Overview

- Alaska Energy Authority-funded, with SE Conference
- Complementary with the SE IRP
 - Updated information on biomass, energy efficiency, heat pumps, and other topics
 - Detailed data presented by community
- Many data sources:
 - Energy Information Administration, PCE reports, utilities, AEA, Alaska Housing Needs Assessment, SE IRP, DOL&WD, DCCED



Community Energy Profiles

- Angoon
- Coffman Cove
- Craig
- Edna Bay
- Elfin Cove
- Gustavus
- Haines
- Hollis
- Hoonah
- Hydaburg
- Juneau
- Kake
- Kasaan
- Ketchikan
- Klawock
- Klukwan
- Metlakatla
- Naukati
- Pelican
- Petersburg
- Sitka
- Skagway
- Tenakee Springs
- Thorne Bay
- Whale Pass
- Wrangell
- Yakutat



Community Energy Profiles

Community Profile: Gustavus



Incorporation	2 nd Class City (2004)		
Location	Gustavus lies on the north shore of Icy Passage at the mouth of the Salmon River, 48 air miles northwest of Juneau. It is surrounded by Glacier Bay National Park and Preserve on 3 sides.		
Longitude	-135.7104	Latitude	58.4189
ANCSA Region	Sealaska Corporation		
Borough/CA	Hoonah-Angoon Census Area		
School District	Chatham School District		
AEA Region	Southeast		

Alaska Native Name (definition)	Taxes Type (rate)	Per-Capita Revenue
	Sales (3%), Bed (4%), Fish Box (\$10/box)	\$741

Historical Setting / Cultural Resources	Economy		
Gustavus is the gateway to Glacier Bay National Park. Founded by homesteaders working the relatively flat land. There are a number of churches, a post office, school, gym, library, gas station, several art and gift galleries, a fish smoking business, a restaurant, and two grocery stores.	Many locals are employed in the summer tourism trade, including charter fishing, and at Glacier Bay National Park.		
Climate	Avg. Temp.	Climate Zone	Heating Deg. Days
	41.2	6	8,858

Energy Priorities and Projects	Community Plans	Year
Intertie to Glacier Bay National Park	Strategic Plan	2005
Energy efficiency and retrofits		

Local Contacts	Email	Phone
City of Gustavus	clerk@gustavus-ak.gov	907-697-2451
Alaska Power and Telephone	apt@aptalaska.com	800-982-0136

Demographics	2000	2010	2013
Population	429	442	Percent of Residents Employed
Median Age	41	50	Denali Commission Distressed Community
Avg. Household Size	3	3	Percent Alaska Native/American Indian (2010)
Median Household Income	\$53,462		Low and Moderate Income (LMI) Percent (2014)

Electric Utility	Generation Sources?	Interties?	PCE?
Alaska Power & Telephone	Hydroelectric, Diesel	No	Yes

Landfill	Class	Permitted?	Location	Gustavus
Water/Wastewater System	None		Homes Served	System Volume
Water	Household Wells		n/a	n/a
Sewer	Household Septic Tanks	Energy Audit?		

Access					
Road	No				
Air Access	Publicly-owned; Asphalt	Runway 1	3,146' x 60'	Runway 2	6,721' x 150'
Dock/Port	Yes	Barge Access?	Yes	Ferry Serv.?	Yes

Community Energy Profiles

Energy Profile: Gustavus

Diesel Power System

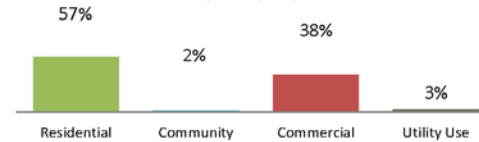
Utility	Make/Model	Condition/Hrs	Gen Capacity
Unit 1	John Deere	Good/957	100
Unit 2	John Deere	Good/8,384	371
Unit 3	John Deere	Good/7,321	371
Unit 4			
Line Loss	15.3%		
Heat Recovery?	No		
Upgrades	Priority	Projects	Status
Powerhouse		RPSU	Complete
Distribution			
Outage History/Known Issues			

Operators	No. of Operators	Training/Certifications
	2	Hydro

Maintenance Planning (RPSU)

Electric Sales	No. of Customers	kWh/year	kWh/Customer
Residential	500	1,005,316	2,011
Community	5	32,178	6,436
Commerc./Non-PCE	113	677,684	5,997
Utility Use		48,427	

Electric Sales by Customer Type (kWh/year)

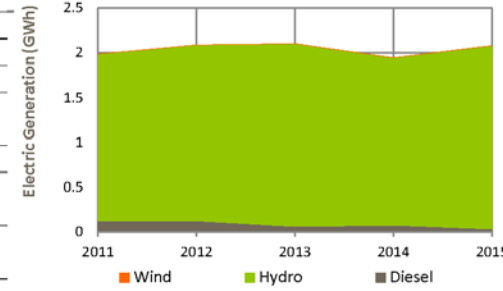


Alternative Energy Potential	Projects	Status
Hydroelectric	Falls Creek Hydro construction	Operating
Wind Diesel		
Biomass		
Solar		
Transmission	Transmission line to Glacier Bay National Park	
Oil and Gas		
Other		
Emerging Tech		
Heat Recovery	School nearby but backup power only	
Energy Efficiency		

Bulk Fuel	Purchasing	Deliveries/Year	Gallons/Delivery	Vendor(s)
Tank Owner	Fuel Type(s)	Capacity	Age/Condition	
	D1, D2, Gas	159,000 total	<5 yrs.	
Bulk Fuel Upgrade	Priority	Project	Status	
Yes		BFU	Complete	

Power Production

Diesel (kWh/yr)	30,719	Avg. Load (kW)	171
Wind (kWh/yr)	0	Peak Load (kW)	391
Hydro (kWh/yr)	2,051,378	Efficiency (kWh/gal)	15
Total (kWh/yr)	2,082,097	Diesel Used (gals/yr)	2,087



Electric Rates (\$/kWh)	Cost per kWh Sold (\$/kWh)
Rate with PCE \$0.28	Fuel Cost \$0.00
Residential Rate \$0.41	Non-fuel Cost \$0.17
Commercial Rate	Total Cost \$0.18

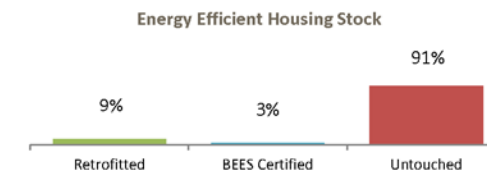
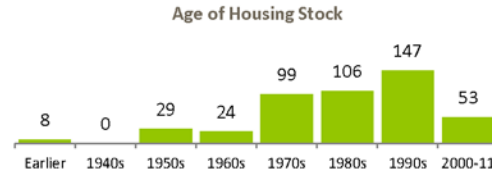
Fuel Prices (\$)	Utility/Wholesale	Retail	Month/Year
Diesel (1 gal)	\$4.10 (FY15)	\$3.58	1/16
Other Fuel? (1 gal)			
Gasoline (1 gal)		\$3.51	
Propane (100#)		\$116.19	7/15
Wood (1 cord)			

Pellets	Discounts?
	None

Community Energy Profiles

Energy Profile: Gustavus

Housing Units	Occupied	Vacant	% Owner-Occup.	Regional Housing Authority	Weatherization Service Provider	
	265	201	66%			
Housing Need	Overcrowded		1-star	Energy Use	Average Home Energy Rating	Average Square Feet
					2 star plus	1,427
Data Quality						Avg. EUI (kBtu/sf)
						114.3

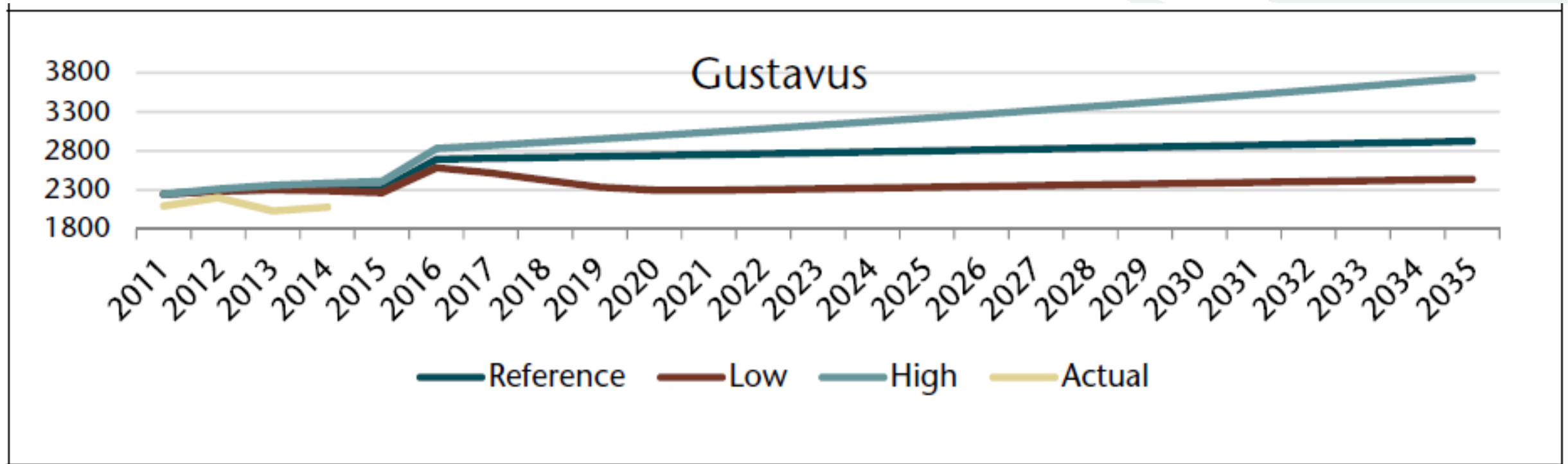


Lighting	Owner	Number/Type	Retrofitted?	Year	Notes

Non-residential Building Inventory

Building Name or Location	Year Built	Square Feet	Audited?	Retrofits Done?	In ARIS?
Fire Hall		1300*			
City Hall		420*			
Clinic		410*			
Library		1400*			
Gustavus School		5700*			
State Shops		3410*			
Historic Building		690*			
Church					
School Gym		4950*			
NPS Water Treatment		800*			
Preschool/ Post Office		380*			
AKDOT Equipment Shed		1900*			
Power Plant		2920*			
Main Lodge		4700*			
Guest Cabins					
Staff Dormitories					
Lodge Admin					
Water Plant					
Maintenance Building		13850*			
Park HQ Building		1900*			
Recycling Center					
Community Chest (Reuse center)					

Community Energy Profiles

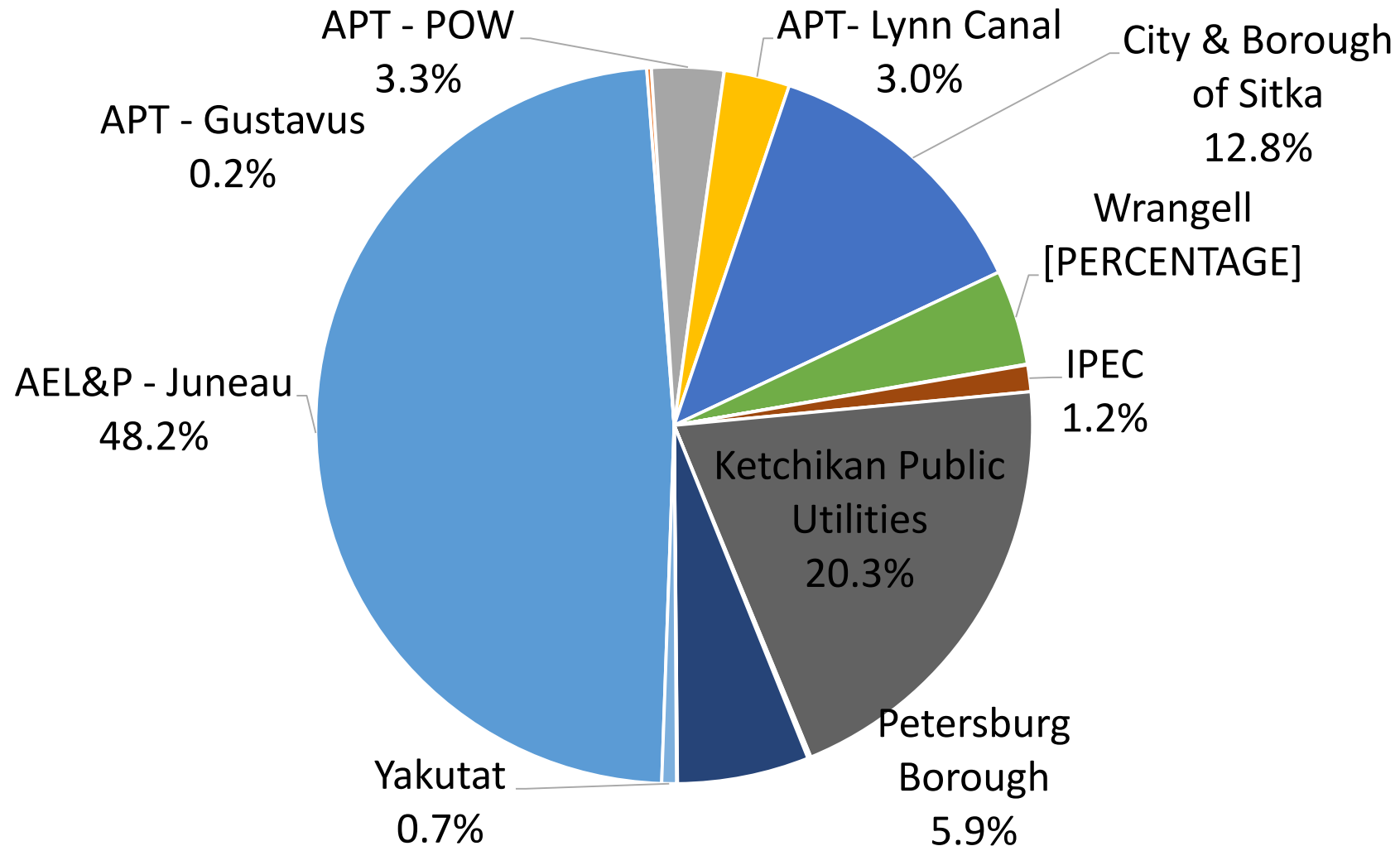




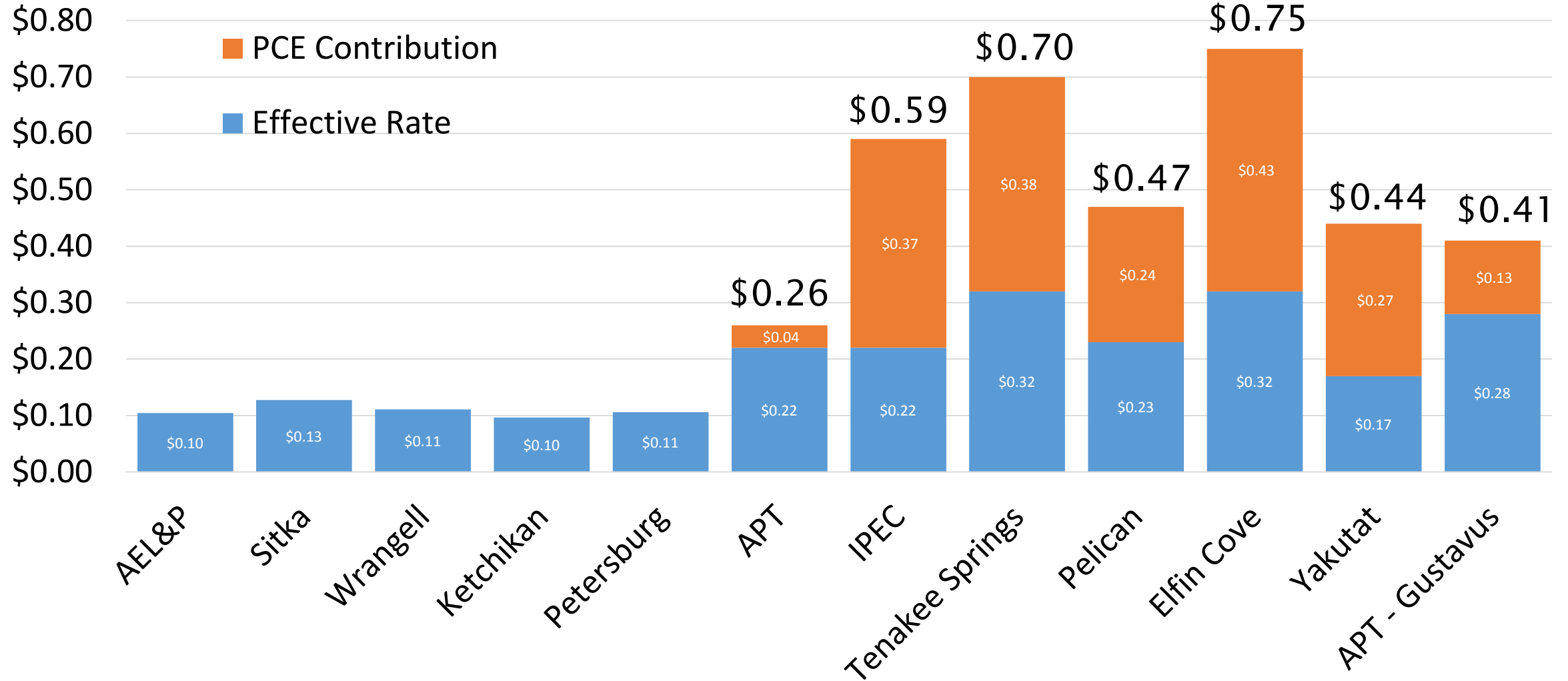
Regional Energy Profile

- Current energy system
 - Electricity
 - Variety of data available, utility input important
 - Heating
 - Some data gaps but basics covered
 - Transportation
 - Widespread data gaps
- Recent projects and progress
 - Biomass, heat pumps, energy efficiency

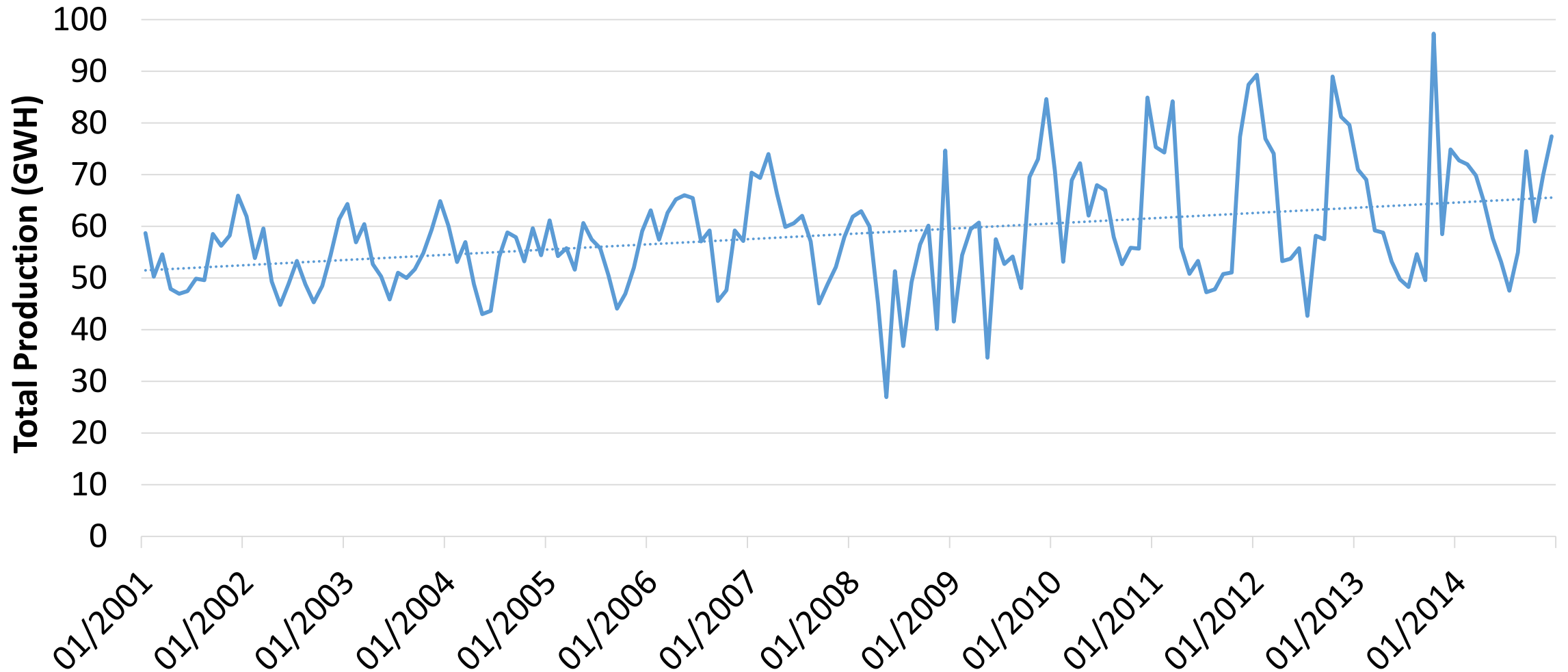
Electricity Sales



Electricity Rates

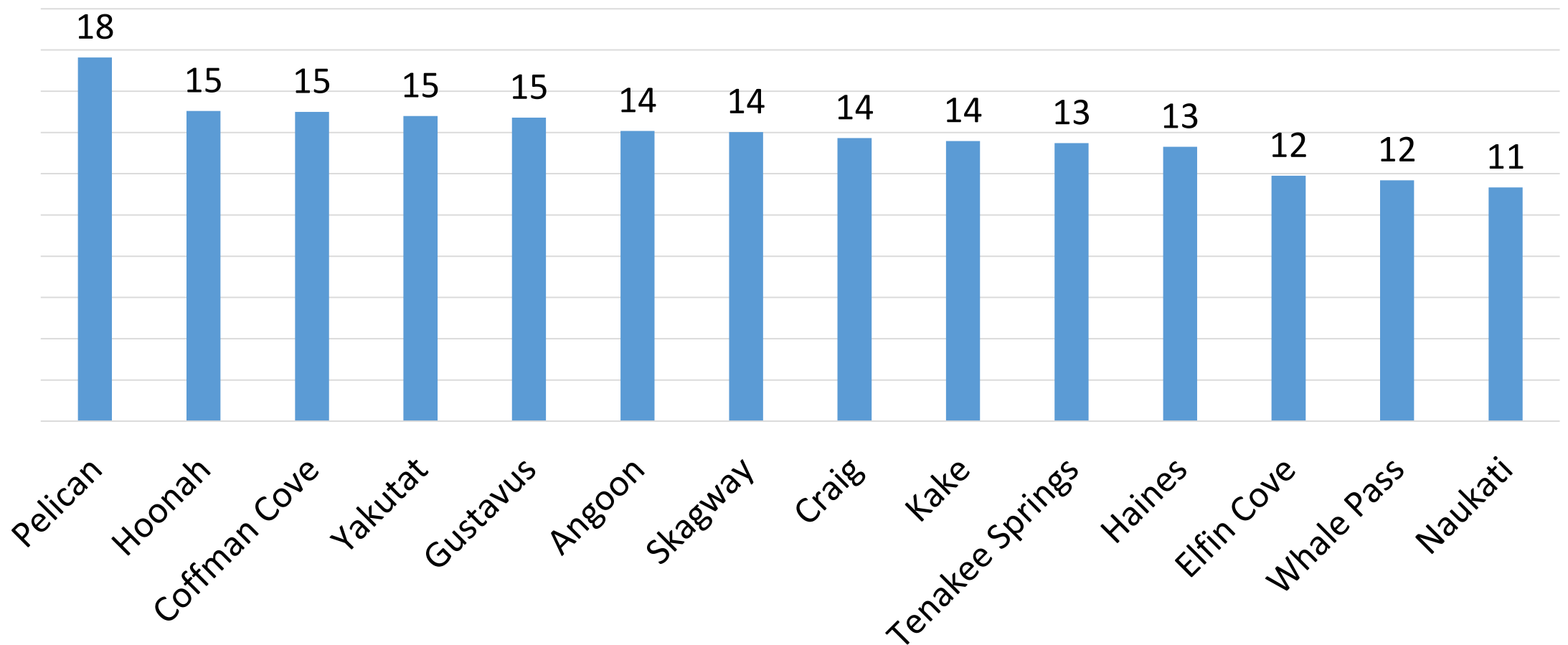


Hydropower Production, 2001-2014

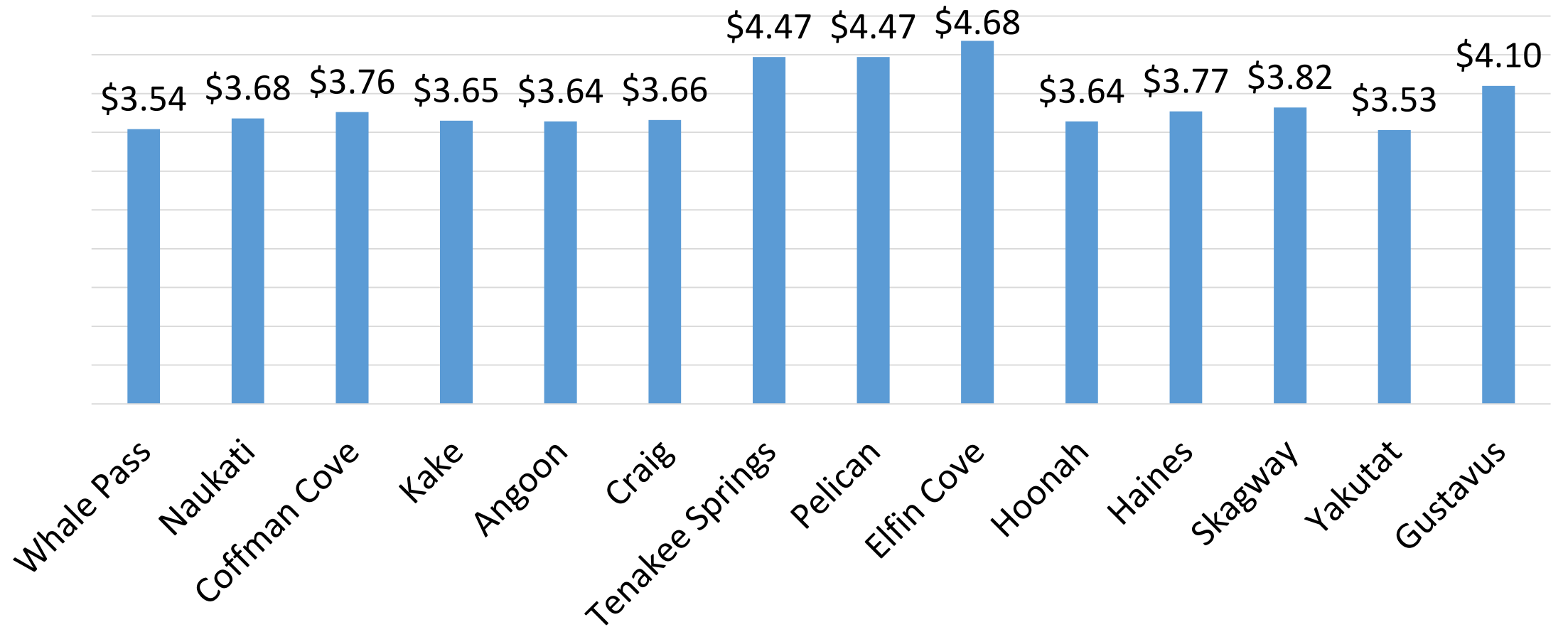


Diesel Efficiency, FY2015

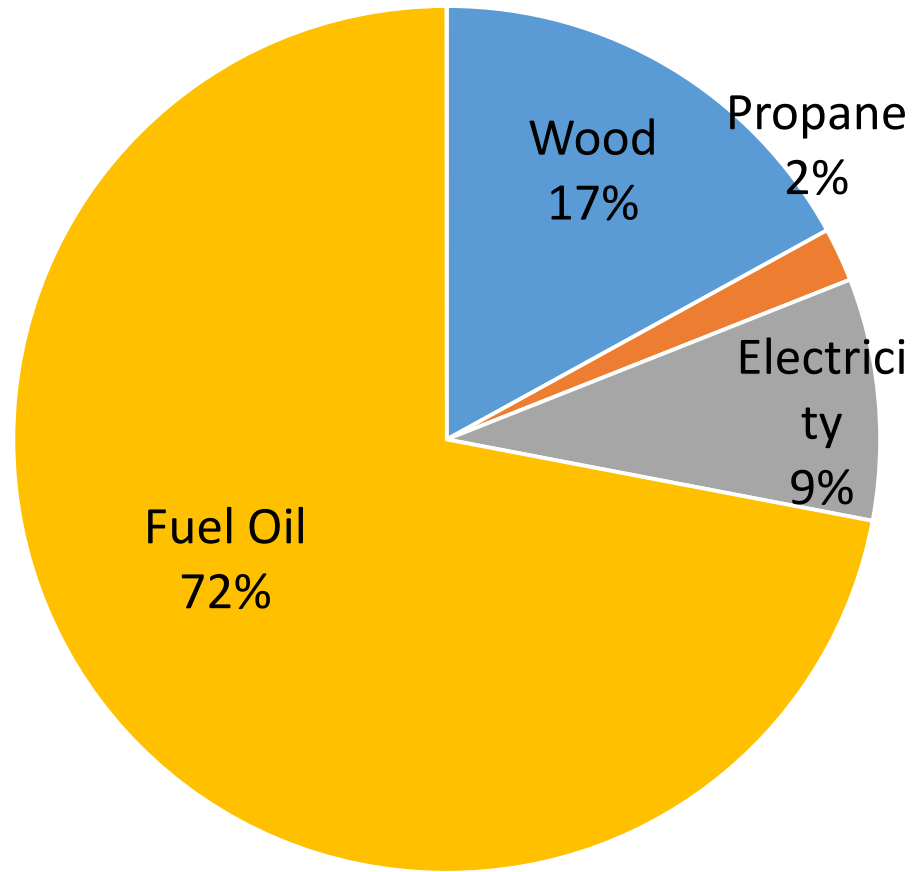
kWh produced per gallon of diesel consumed



Diesel Prices Paid by Utilities, FY2015

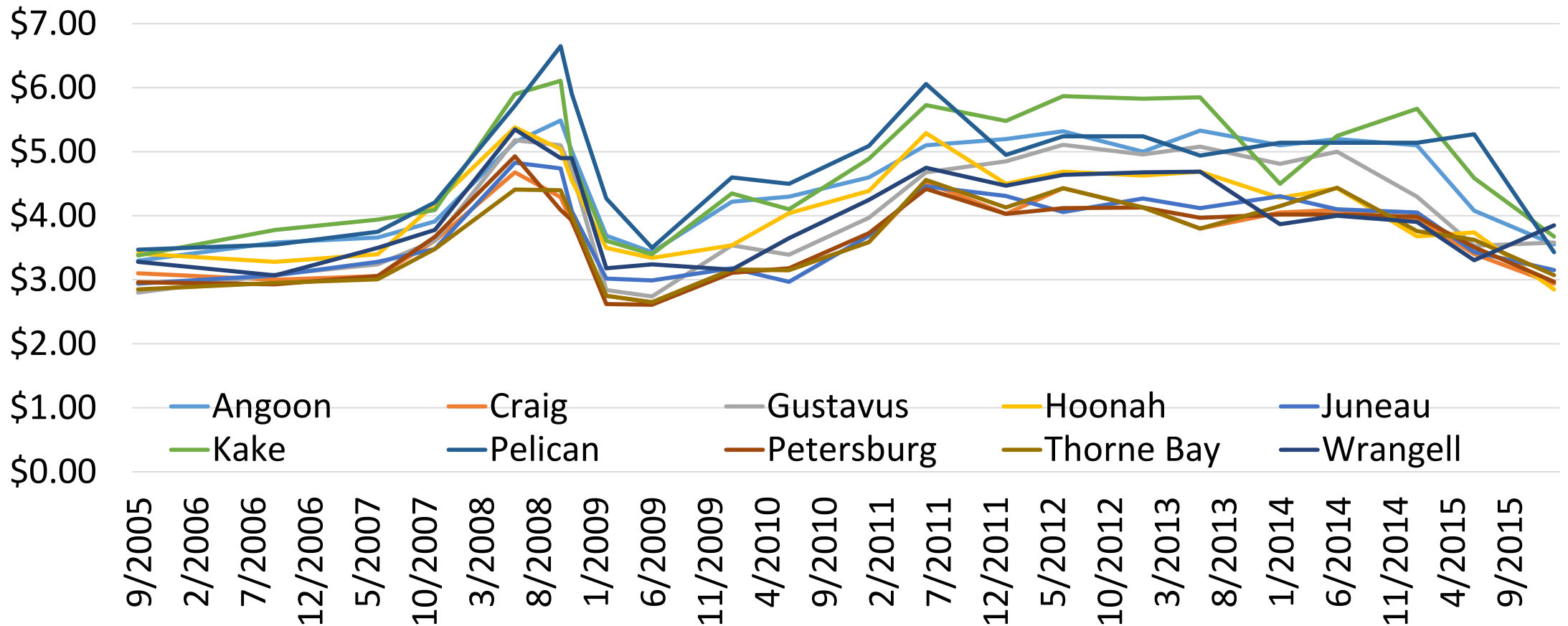


Space Heating



Community	Gallons of Fuel Oil	Cost
Juneau	7,700,523	\$31,452,518
Ketchikan	2,903,831	\$10,683,780
Sitka	1,844,742	\$8,144,044
Prince of Wales	1,110,191	\$4,926,292
Wrangell	784,572	\$3,175,260
Haines	675,533	\$2,982,297
Skagway	433,960	\$1,880,302
Metlakatla	328,117	\$1,327,930
Yakutat	295,094	\$1,393,902
Kake	286,552	\$1,271,506
Gustavus	254,931	\$1,297,638
Hoonah	238,235	\$1,093,805
Petersburg	225,961	\$914,492
Chilkat Valley	129,671	\$582,540
Angoon	125,356	\$556,333
Klukwan	34,238	\$151,922
Tenakee Springs	32,423	\$168,654
Pelican	23,247	\$124,597
Whale Pass	17,687	\$80,503
Elfin Cove	2,754	\$14,761
SE Alaska Total	17,447,619	\$72,223,076

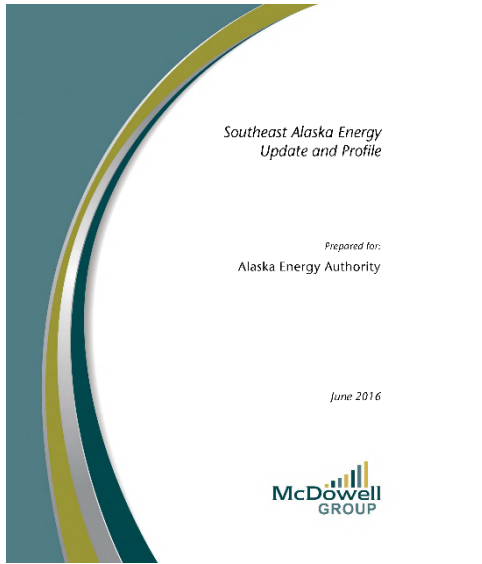
Fuel Oil Prices, 2005-2016



Other topics covered

- Electrical energy source, by utility
- Trends in average electrical customer use, by utility and customer type (residential, commercial, industrial)
- Hydropower projects in Southeast Alaska
 - Capacity
 - Trends in production in recent years
 - List of projects in development
- Commercial biomass space heating projects
- Description of DSM/EE efforts in recent years
- Description of heat pump installations
- Natural gas discussion

Community Energy Planning



SOUTHEAST ALASKA INTEGRATED RESOURCE PLAN

B&V PROJECT NO. 172144

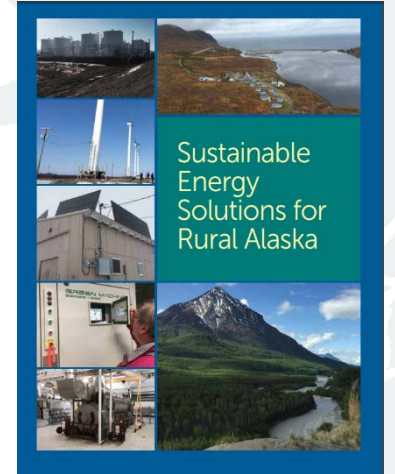


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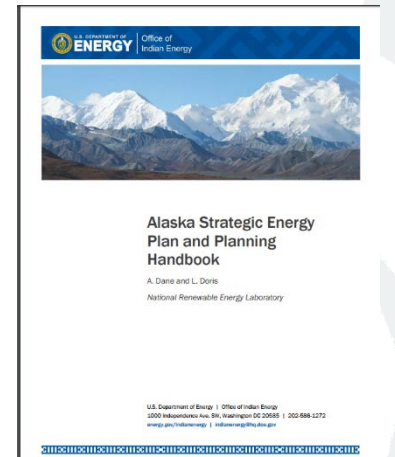


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Community Energy Profiles
(excel files available through
Robert Venables)



Questions?

- Report available at <http://www.mcdowellgroup.net/publications/>