Quillayute Valley School District Woody Biomass Project

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A Place Where All Students Can Learn QVSD

Department of Commerce
Innovation is in our nature.

PORT of PORT ANGELES
WASHINGTON STATE

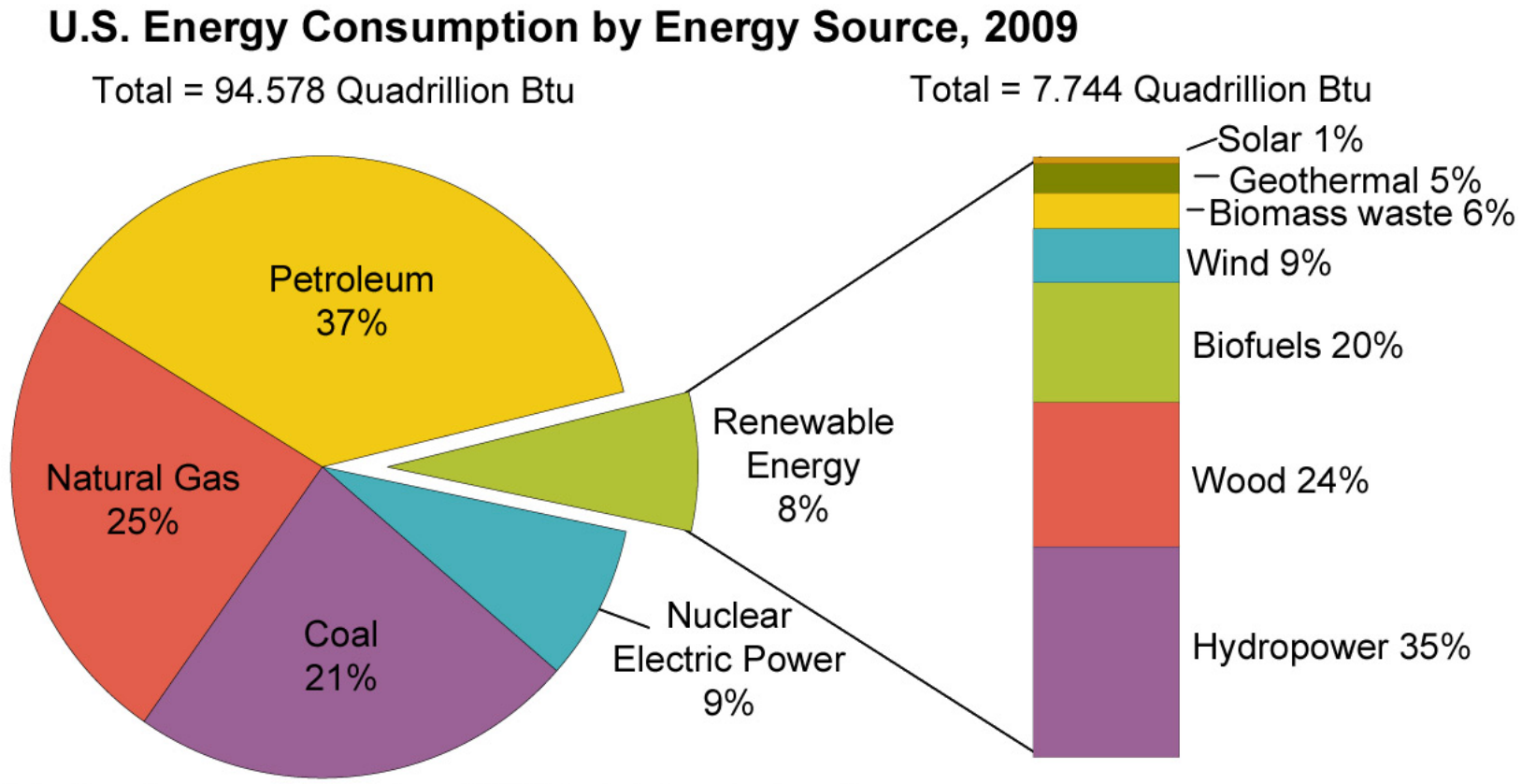
ClallamEDC
Clallam County Economic Development Council

CITY OF FORKS

A great partnership can result in a solid project.

Reminder of what we are talking about

http://www.eia.doe.gov/renewable/

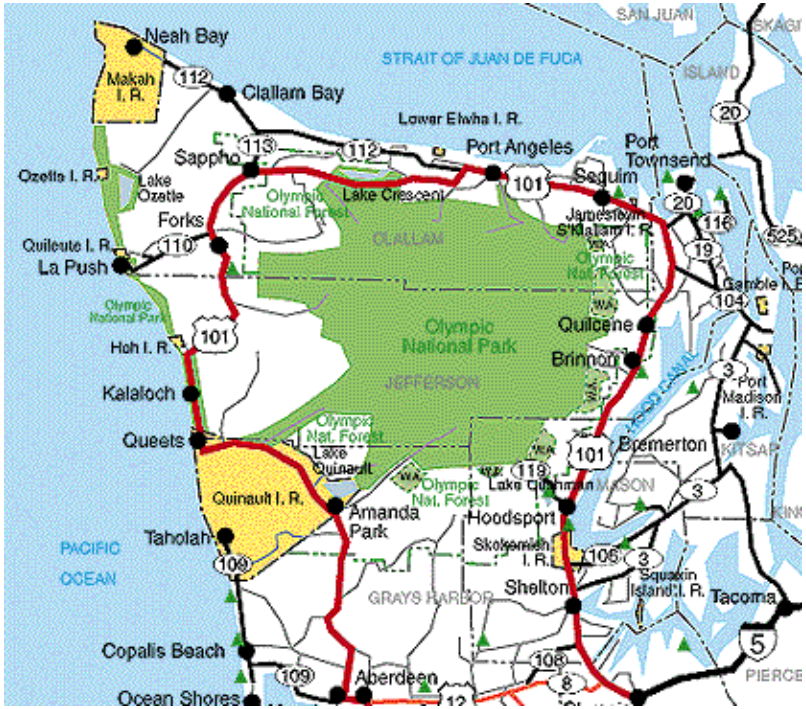


Note: Sum of components may not equal 100% due to independent rounding.
Source: U.S. Energy Information Administration, *Annual Energy Review 2009*, Table 1.3, Primary Energy Consumption by Energy Source, 1949-2009 (August 2010).

Where's Forks?

- Incorporated in 1945;
- Mayor Bryon Monohon
  - (Elected in November 2009)
- City Council:
  - Bruce Guckenberg
  - Mike Breidenbach
  - Gus Wallerstedt
  - John Hillcar
  - Kevin Hinchen
- Economic Base:
  - Government
    (Hospital, School, Prison, Local)
  - Natural Resources
    (Timber, Fishing)
  - Tourism
    (Twilight, Olympic National Park)
- 2010 Demographics

- 3,532 people in City, with "urban growth area" at about 5,000..
  - 26% Hispanic - predominately from Mexico and Latin America. 1999 Median Income was less than 75% of State's.
- 74+% of the students qualify for free/reduced lunch.



Why Forks?

"FORKS LOGGING CAPITAL OF THE WORLD"

Top Right and Bottom Left courtesy of Mike Gurling, Forks Chamber of Commerce

Why Wood?

- Project arose out of a series of studies that initiated from an air quality regulatory requirement that our local cedar mills had to comply with – end of burning of their waste in burners lacking emissions controls.
- Siemens conducted a detailed study about biomass power options and a school based project was the smallest of those options
- Funding obtained from the Washington State Legislature via the Energy Freedom Program administered by Washington State's Department of Commerce.

Why Forks?

Objective is to be able to utilize mill waste and residue in the facility.

Cedar Mill Waste (cedar wool), saw mill waste, etc.

Hundreds of thousands of acres of managed forest lands within the region.

Why Wood?

Déjà vu all over again….(Sorry Yogi)

Gas prices surge 17 cents in a week

- By Ben Rooney, staff reporter, February 26, 2011: 12:03 PM ET

NEW YORK (CNNMoney) -- Gas prices have increased nearly 17 cents a gallon in the past week. And analysts expect prices to continue higher, following a sharp rise in the price of crude oil.

The national average price for a gallon of regular gas rose 4.3 cents to $3.33, motorist group AAA said Saturday. That marks the fourth day in a row that prices have risen, and brings the national average to the highest level since October 2008.

- *[Petroleum based or electrical heat only two options in Forks. No natural gas lines, etc.]*

Why wood?

- 1 March 2011:
  - Heating Oil $3.03 (NYH);
  - #2 Diesel $3.15 (LA)
  - WTI Crude $99.63 per barrel;

http://www.eia.doe.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=RWTC&f=D

Why Wood?

U.S. Energy Information Administration

Price Summary

(8 Feb 2011)

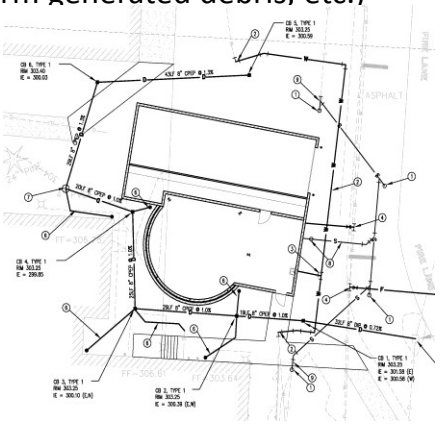
	Year				Percent Change		
	2009	**2010**	**2011**	**2012**	**09-10**	**10-11**	**11-12**
WTI Crude[a] ($/barrel)	**61.65**	**79.40**	*93.26*	*97.50*	**28.8**	*17.5*	*4.5*
Gasoline[b] ($/gal)	**2.35**	**2.78**	*3.15*	*3.30*	**18.4**	*13.4*	*4.8*
Diesel[c] ($/gal)	**2.46**	**2.99**	*3.43*	*3.51*	**21.5**	*14.7*	*2.4*
Heating Oil[d] ($/gal)	**2.52**	**2.97**	*3.41*	*3.55*	**17.5**	*14.8*	*4.3*
Natural Gas[d] ($/mcf)	**12.12**	**11.17**	*11.29*	*12.01*	**-7.8**	*1.1*	*6.3*
Electricity[d] (cents/kwh)	**11.51**	**11.58**	*11.65*	*11.74*	**0.7**	*0.6*	*0.7*

[a] West Texas Intermediate. [b] Average regular pump price.
[c] On-highway retail. [d] U.S. Residential average.

http://www.eia.doe.gov/steo/

The Project

- Lots of preliminary work
  - Cedar Mill Study – UW ONRC
  - Siemens Report – Commerce & Local Governments (Forks, PA, Port, PUD, QVSD)
  - Modification of Siemens Report Recommendations boiled down to a “School-based solution”
- Objectives:
  - Utilize mill waste and evaluate use of other wood waste streams (logging, storm generated debris, etc.)
  - Must be efficient and effective means of heating school facilities
  - Must meet and exceed emissions standards in place with ORCAA
  - Must not create significant demand on the time of QVSD Staff – reduce boiler related staff time
- Must heat new ***High School Addition*** and portions of ***Middle School***
- Engagement of numerous entities
  - State Legislators
  - Local officials
  - Olympic Regional Clean Air Agency (ORCAA)
  - Department of Commerce – Energy Division
  - WSU Extension Energy Program
  - Boiler experts
  - Public
  - Media
- Constant team effort by partners



The Project

- Building
  - 2,184 sq. ft.
  - Building height – 26’
  - Stack height – 51’
- Furnace/Boiler
  - Fire-tube Boiler – Wood Chip
  - Messersmith Combustion System
    - Hurst Boiler, Model #FB-400
    - 2,000,000 BTU per hour net output
  - Water-Tube Backup Boiler - #2 Fuel Oil
    - Bryon Boiler, Model CLM-300-W
    - 2,400,000 BTU per hour net output
- Emissions to meet ORCAA Requirements’s.
  - Advanced Metals Cyclone
  - Filter Technology Baghouse
- Fuel Storage
  - Chip Bin Capacity 28 tons
  - Diesel Fuel Tank 2,000 gals.
- Hot Water Heating System
  - Water loop system
  - Utilizing fan coil air handling units
  - Low pressure

- At present, heating 15,000 sq. ft. in the Forks Middle School (11 Classrooms + 1 MP Room)
- In about a year, will also heat the Forks High School Addition consisting of 38,000 sq. ft. (15 Classrooms, library, admin offices).

The Project

- "Maiden Shake Down Cruise"
  - Started in September – limited run due to fact that there needed to be equipment modifications made
  - Much more efficient than estimated with regard to wood fuel usage
  - Still making modifications to the system to address issues within the dryer and boiler room to maintain temperatures; and
  - Also fine-tuning of system programming.
- To date, it has operated for about three weeks and has used about 10 green tons of wood chips in that period
  - Chips 2" x 2" x ¼"
  - 15-45% moisture content
- Estimated annual use 900-1000 green tons
- On the horizon:
  - Working with ORCAA, review usage of other mill waste material if possible;
  - Education opportunities with students on woody biomass utilization

- http://search.sequimgazette.com/static/Biomass/
  Great slide show courtesy of Chris Cook, Editor, Forks Forum.

Key factor at present is lack of load as the new High School Addition is now under construction and represents 2/3rds of the load for the system.

Must Contact People

- Peter Moulton, Bioenergy Coordinator,
  Washington Department of Commerce
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- David Sjoding, Team Leader
  WSU Extension EnergyProgram
  SjodingD@energy.wsu.edu
- Mark Goodin, P.E.,
  Olympic Regional Clean Air Agency
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Local Contact Information

- Bryon Monohon, Mayor of the City of Forks - bmon.forks@forkswashington.org
- Rod Fleck, City of Forks – rodf.forks@centurytel.net
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