



Amherst College Fuel Arbitrage Opportunities



Aaron Hayden, Amherst College
Keith Sampson, CES

IDEA 2015 – BOSTON
Summer 2015





Presentation Overview

2

- **Energy Plant at Amherst College**
- **Fuel Arbitrage Opportunities Made Available by Dual Fuel Capabilities**
- **Results of Fuel Arbitrage During the Past Two Winters**
- **Achieve Savings w/out Jeopardizing Budget Certainty and Stability**

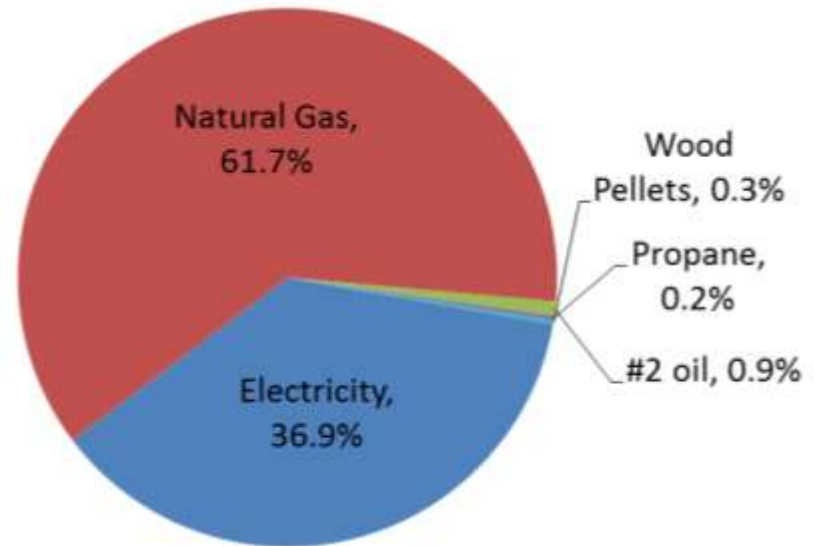


Amherst College

3

- Member of the Five Colleges consortium
- 1,800 students
- 415 faculty and staff
- 1,000-acre campus
- 52% of electricity generated on-site

FY16 Energy Budget





Amherst Central Plant - Equipment

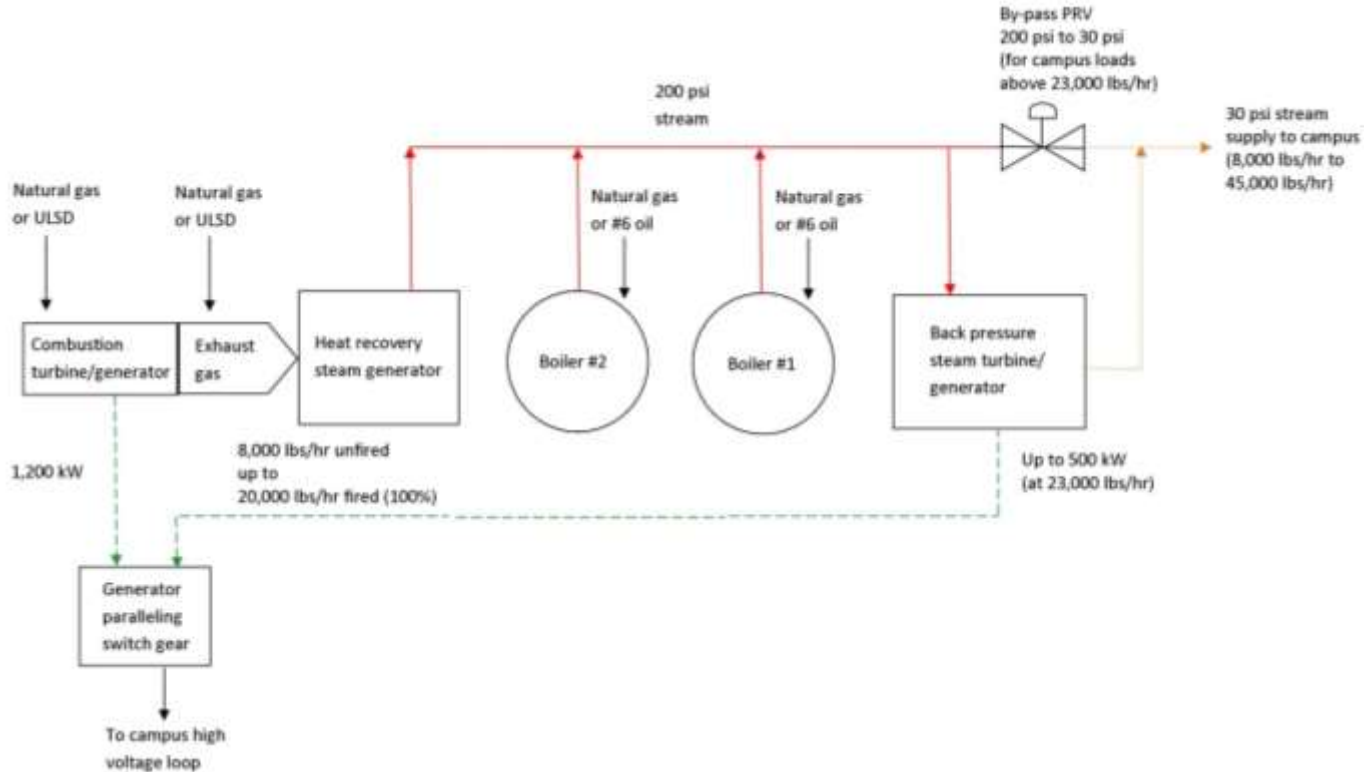
4

- 2 boilers – Dual Fuel (Natural Gas or #6 oil)
- 1.2 MW Combustion Turbine/Generator (CTG) - Dual Fuel – Natural Gas or ULSD
- 500 kW Backpressure steam turbine/generator (Operates on in the Winter)
- Heat Recovery Steam Generator (Exhaust Gas from the CTG)

Amherst Central Plant - Schematic



5





Amherst Central Plant - History

6

- Prior to 1975 - Coal
- 1975 – Switched from Coal to Oil
- 1978 – Added Natural Gas as Fuel Option
- 2007 – Fuel Price Spread led to consideration of Dual-Fuel Operations
- 2012 – Developing an Institutional Acceptance of Operational Flexibility



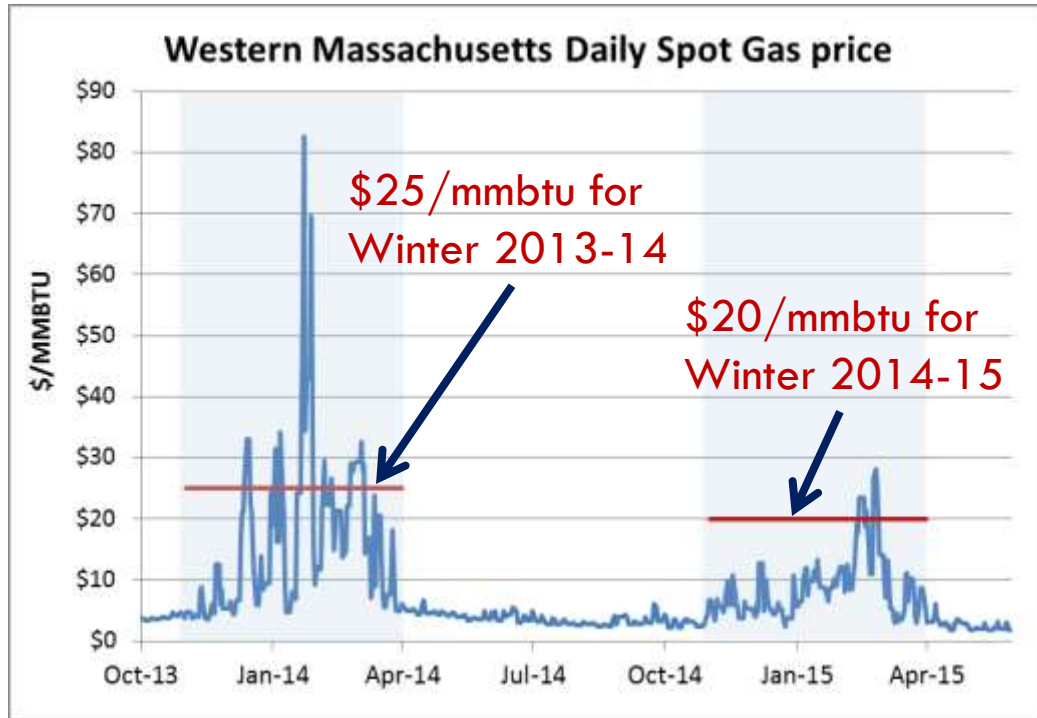
Fuel Switching

7

Dual Fuel Capability Enables Customers with Contract Commitments to Purchase Specific Volumes of Natural Gas to:

- ❑ Sell back contracted gas to the supplier at the spot price
- ❑ Purchase a lower cost fuel at the market price

Fuel Switching



Established
Trigger Prices
Based on Cost of
Alternative Fuel
(#6 oil or ULSD)



How To – The Process

Procedure

- 8:30 am: CES provides NG spot price estimate for next day. If price exceeds trigger, CES notifies Supplier that Amherst can Switch Fuels
- 10:00 am: Supplier makes price offer to buy back gas. CES calculates costs for each scenario using applicable fuel and buyback prices

	boilers	HRSG	Costs	Liquidation	Total	daily savings
no action	NG	NG	\$12,511	\$0	\$12,511	
liquidate boilers gas, HRSG on NG	#6	NG	\$16,851	-\$6,438	\$10,413	\$2,099
liquidate all gas, HRSG off	#6	OFF	\$22,604	-\$14,655	\$7,949	\$4,562
liquidate all gas, HRSG on ULSD	#6	ULSD	\$26,496	-\$14,655	\$11,841	\$670

- 10:30 am: Parties coordinate liquidation of volumes for next day

Results of Fuel Switching



□ Winter 2013-14

	# days action taken	Supplier Invoice	sellback proceeds	#6 oil gal	#6 oil costs	ULSD gal	ULSD costs	purchased electricity	lost APS credits	Fuel Switch TOTAL	Gas-only TOTAL	SAVINGS
Dec-13	3	\$ 156,487	\$ (46,286)	17,507	\$ 44,464	5,515	\$ 18,200	\$ 2,517	\$ (1,650)	\$ 18,893	\$ 57,168	\$ 38,275
Jan-14	12	\$(147,472)	\$ (266,655)	80,718	\$ 209,809	3,789	\$ 12,504	\$ 19,494	\$ (6,600)	\$ (24,848)	\$ 201,907	\$ 226,755
Feb-14	9	\$ 2,340	\$ (136,639)	44,706	\$ 116,204	14,247	\$ 47,015	\$ 8,785	\$ (4,950)	\$ 35,365	\$ 66,422	\$ 31,057
Mar-14	8	\$ 32,281	\$ (113,552)	35,298	\$ 91,750	28,105	\$ 92,747	\$ -	\$ (4,400)	\$ 57,536	\$ 88,710	\$ 31,173
Total	32	\$ 43,636	\$ (563,132)	178,229	\$ 462,226	51,656	\$ 170,465	\$ 30,796	\$(17,600)	\$ 86,947	\$ 414,208	\$ 327,260

□ Winter 2014-2015

	# days action taken	Supplier Invoice	sellback proceeds	#6 oil gal	#6 oil costs	ULSD gal	ULSD costs	purchased electricity	lost APS credits	Fuel Switch TOTAL	Gas-only TOTAL	SAVINGS
Feb-15	10	\$ 46,317	\$ (84,482)	12,018	\$ 129,011	40,775	\$ 91,522		\$ (2,280)	\$ 129,467	\$ 212,477	\$ 83,010



Additional Considerations

11

- **There are secondary impacts that may need to be considered:**
 - Boiler O&M; Unit Performance Warranties
 - Renewable Energy Credits (APS Credits)
 - GHG Emissions

- **Contribution of Institution to Maintaining Electrical System Reliability and freeing natural gas use for residential and other customers**



Budget Concerns

12

Fuel Switching allows the Institution to Have Its Cake and Eat It Too. By Fuel Switching, Amherst College is able:

- To lock in fuel prices in advance of a budget year to achieve budget certainty and stability
- To achieve some of the savings that are available through spot market purchasing without exposing the College to commensurate risks



13

Competitive Energy Services



www.competitive-energy.com | Portland, ME & Topsfield, MA

Phone 866.408.4591 | Fax 866.743.4968