Why burning No. 2 oil could end up costing about the same as burning No. 4 oil

Not every building will be able to switch to natural gas in the near future. When a building owner is deciding between switching to No. 4 oil or No. 2 oil, the price per gallon cost difference should not be the only factor. Important additional cost factors to be considered for *No. 4 oil* also include:

- Diminished boiler heat transfer leading to reduced efficiency;
- Anticipated smaller price difference as of 2012 between *low sulfur* No. 4 and No. 2 oil;
- Electricity cost for nozzle line pre-heating. Additional maintenance costs.

Burning No. 4 or No. 6 oil deposits layers of soot on the boiler tubes decreasing efficiency.

Clean boiler tubes provide optimal heat transfer leading to fewer gallons burned.

No. 4 oil is a blend of No. 6 oil (the most polluting type of heating oil) and No. 2 oil (the least polluting type). When burning No. 4 or No. 6 oil soot deposits form on the boiler tubes reducing heat transfer and efficiency. The result: more oil needs to be burned for the same amount of heat that a clean boiler would produce.

By new city law, as of October 2012, *low sulfur* No. 4 oil will be required to contain about 50% more No. 2 oil compared to the current No. 4 oil. Therefore, the price difference between *low sulfur* No. 4 oil and No. 2 heating oil will most likely become smaller than it has been in the past.[1] Additional costs that will be incurred with No. 4 oil include electricity for pre-heating[2], increased maintenance and an additional annual boiler cleaning.

CASE STUDY:
Manhattan Coop building that burned approx. 27,000 gallons of No. 6 oil during the winter of 2009/2010 burned almost ***10% fewer gallons*** during the following winter after switching to No. 2 oil even though 2010/2011 was a harsher winter.[3] The most likely reason for the drop in fuel usage is the improved heat transfer in the boiler due to No. 2 oil burning much cleaner than No. 4 oil.

EXAMPLE:

OPERATING COST COMPARISON ASSUMING A 5% FUEL USAGE REDUCTION WITH NO. 2 OIL COMPARED TO NO. 4 OIL[4]:

	No. 4 (50,000 gallons)	No. 2 Oil (47,500 gallons)	Approx. savings with No. 2 oil
Fuel Cost[5] (according to 2011 averages)	$145,250[6]	$145,378[7]	-$128
Electrical Cost	$1,000	$0	$1,000
Boiler Cleaning	$1,200	$600	$600
TOTAL	$147,450	$145,978	**$1472**

Capital costs for converting to No. 2 oil can be higher than for a No. 4 oil conversion.[8] However, eventually all buildings will need to convert to No. 2 heating oil or natural gas and incur those conversion costs. By converting straight to No. 2 oil, a building is in compliance with new city law and will not have to pay conversion costs twice.

To enjoy cleaner air at little or no extra cost, EDF recommends converting directly to No. 2 oil or natural gas when switching from No. 6 oil, and skipping the switch to No. 4 oil. Buildings currently burning No. 4 oil should switch to No. 2 oil. In addition, all buildings should implement energy efficiency measures to increase savings and help the bottom line.[9]

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[1] In 2010/2011 the average price difference between No. 4 and No. 2 oil was around $0.15/gallon. However, as of October 1, 2012 No. 4 oil's sulfur content can only be half of what it is now (3,000 ppm to 1,500 ppm). No. 4 oil is a mixture of No. 6 oil and No. 2 heating oil but with the reduced sulfur content, heating oil providers will need to mix in about 60% of No. 2 heating oil to make low sulfur No. 4 oil whereas now they are using only about 40% of No. 2 oil to make No. 4 oil. As a result, the price difference between No. 2 oil and No. 4 oil will most likely be smaller as of 2012 than it is now and could range between $0.05-$0.15. No. 2 and No. 4 oil prices should track each other closely because the new low sulfur No. 4 oil will need to contain about 60% of No. 2 oil to meet the newly mandated lower sulfur levels.

[2] No. 6 oil requires more preheating than No. 4 oil. No. 4 oil does not require a side-arm pre-heater but No. 4 oil oil requires a nozzle line electric pre-heater which should consume less electricity compared to electricity usage when burning No. 6. For a building burning 50,000 gallons of No. 6 oil annually, the electricity costs are estimated to be around $2,000 - $3,000.

[3] Almost 10% fuel savings despite winter '10/'11 having 7% *more* heating degree days compared to winter '09/'10. For details on this case study, go to www.edf.org/cleanheat.

[4] Based on a conservative estimate of a 5% fuel usage reduction due to improved heat transfer within the boiler and including the effect of the lower energy content of #2 oil (conservative estimate based on case study that showed a 10% reduction).

[5] Average prices for 2011 according to monthly averages provided by Castle Oil for the months of January to April 2011. The average price difference between No. 2 and No. 4 oil was $0.15/gallon.

[6] At. $2.91/gallon (price as of April 2011).

[7] At $3.06/gallon (price as of April 2011).

[8] The oil tank will need to be cleaned, oil lines steam cleaned and possibly the oil pump replaced. Check with the DOB rules for all requirements. Buildings with underground storage tanks might need to replace the tank and will need to be in compliance with all State DEC requirements.

[9] Given that most buildings are overheated, real savings come from implementing best maintenance practices and low-cost efficiency measures (e.g. heat management system, pipe insulation, steam trap replacement, thermostatic radiator valves or radiator shut off valves). Best maintenance practices and efficiency measures can lead to substantial fuel savings in the range of 5-25%.