HT 9: PHASE OUT DIRTY BOILER FUELS

New York City Fuel Gas Code
Proposal developed by the Materials & VOCs Committee

Summary

Issue:
Boilers that use #4 and #6 fuel oils emit a substantial portion of the city’s air pollution.

Recommendation:
Do not issue new permits for boilers using #4 and #6 fuel oils, and require all new burners to utilize only #2 fuel oil and/or gas fuel. The issue addressed by this proposal is already under consideration by the City.

Proposed Legislation, Rule or Study

Amendments to the New York City Fuel Gas Code

1. Add a new Section 631.4 as follows:

631.4 Phase Out of Boilers Using #4 and #6 Fuel Oil.

631.4.1. New boilers. No new boiler shall utilize #4 or #6 fuel oil.

631.4.2. New burners. Any new burner for an existing boiler shall only utilize #2 fuel oil and/or gas fuel.

631.4.2. Permit modification. No burner or boiler that uses #2 fuel oil and/or gas fuel shall convert to use #4 or #6 fuel oil.

Exceptions:

1. If the commissioner determines the building does not have access to gas fuel.

Supporting Information

Issue – Expanded
According to New York City’s analysis of National Emissions Inventory data from the U.S. Environmental Protection Agency, heating oil is responsible for approximately 14% of local emissions of fine particulate matter (PM 2.5) and is a significant source of NOx, a precursor to smog. The burning of heating oil emits large quantities of particulate matter because of its high sulfur content – heating oil contains 2000-3000 parts per million of sulfur compared with 15 parts per million for on-road diesel. Because of heating oil and other sources, New York City does not comply with federal Clean Air Act standards for PM 2.5.

Particulate matter is made up of many compounds, most of which are highly toxic, but some sources of particulate matter are worse than others. PM 2.5 from residual heating oil tends to have high levels of nickel, vanadium and elemental carbon. PM 2.5 and ozone are linked to respiratory problems, such as: irritation of the airways, coughing, or difficulty breathing; decreased lung function; aggravated asthma; development of chronic bronchitis; irregular heartbeat; heart attacks; and premature death in people with heart or lung disease. New York City asthma rates are consistently higher than elsewhere; 300,000 children in the City have been diagnosed with asthma and hospitalizations cost over $10,000 per visit and over $240 million a year. In addition, cardiovascular disease is the number one cause of death, killing over 22,000 New Yorkers a year.

The effect of heating oil on local air quality is exacerbated by the fact that the oil is burned in the midst of densely populated areas, creating high levels of exposure. It will be difficult, if not impossible, to improve air quality in the City without reducing the use of No. 4 and No. 6 fuel.

The New York City Department of Environmental Protection issues permits for space heating equipment and approximately 9,900 permit holders use No. 4 or No. 6 oil as their primary or secondary fuel. This proposal addresses both new boilers and new burners, which is the portion of the boiler that injects and ignites a fuel air mixture into the
combustion chamber. There are some known instances of boilers using #2 fuel oil or gas fuel converting to #4 or #6 fuel oil – the proposal would prohibit this practice.

**Environmental & Health Benefits**
Conversion from dirtier residual oils (#4 and #6) to cleaner fuels (natural gas or #2) has the potential to reduce the emissions of particulate matter and other pollutants, as well as reduce CO$_2$ emissions.

Improvements in air quality - particularly reductions in PM 2.5 and ozone precursors – will improve the health of New Yorkers. A recent study in the New England Journal of Medicine showed that decreases in PM 2.5 were associated with increases in life expectancy. An analysis by the City of New York, using emission factors from EPA AP-42, shows that conversion of No. 6 boilers to No. 2 oil will decrease PM emissions by approximately 52% and NOx emissions by approximately 61%. Conversion of existing permitted No. 6 boilers to natural gas would reduce PM pollution by 86% and NOx pollution by approximately 73%.

This proposal was found to have a high, positive environmental impact per building and to impact a large number of buildings. It was thus given an environmental score of 3.

This proposal was found to have a high positive health impact per building and to impact a large number of buildings. It was thus given a health score of 3.

**Cost & Savings**
As described in the Executive Summary, Bovis Lend Lease prepared cost estimates for each Task Force proposal in the context of well-defined construction projects in specific buildings. Where possible, members of the Technical Committees prepared savings estimates for some of these projects and buildings. These cost and savings estimates are presented in the February 1st draft version of Appendix A. The innate uncertainty in how construction and operation will vary from one building to another, the complexity of the Task Force proposals, and the wide range of applications in which the proposals may be realized mean these figures are truly estimates.

This proposal was estimated to increase capital cost by between $0.01 and $0.10/square foot depending on the building type. It was thus categorized as incurring no to a low capital cost increment.

**Market Availability**
National Grid and Con Ed are confident in their ability to absorb additional demand for natural gas. The amount of natural gas already used in NYC is many times more than would be required to replace residual oil. NYSERDA figures show that natural gas use in New York City is approximately 262 trillion BTUs a year. The energy content of residual heating oil in New York City is approximately 46 trillion BTUs, or 17% of the energy content of current natural gas use. Therefore, conversion phased in over 20 years means an average 1-1.5% increase per year.

In addition, regional gas supply is increasing. Millennium Pipeline began service in December 2008, with the potential of bringing an additional 525,000 mmBTU per day and 1/3 of capacity is free. Other new projects include the Iroquois, Algonquin, Empire and Islander East pipelines. Williams is in the preliminary stages of developing an expansion of its existing Transco pipeline to the Northeast to accommodate new Rocky Mountain sources, and the plans include new lateral connections to Manhattan and the Rockaways.

**Precedents**
There are no known precedents for this proposal.

**LEED**
There are no LEED credits associated with this proposal.

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**ENDNOTES:**