Frequently Asked Questions: School Building Project

How does Lincoln's "Energy Bylaw" apply to the new school building?

New municipal buildings built or substantially renovated in 2020-2025 must be designed to reduce their fossil fuel energy use by 80% of the fossil fuel energy used by a similar 2003 building

In 2008 at Town Meeting, Lincoln passed the Town Facilities Energy Performance Standard (commonly called the Energy Bylaw) to reduce our dependency on fossil fuels whenever we renovate or build new town facilities. For building projects like the proposed school renovation, which will be constructed/renovated in the 2020 time-frame, the Energy Bylaw requires that the reconstructed building will use 80% less fossil fuel energy than used by a comparable building in 2003.

Does the proposed school project meet the "Energy Bylaw"/Town Facilities Energy Performance Standard?

Yes

The design team, School Building Committee's sustainability consultant, and Green Energy Committee agree that Lincoln's school project will be able to meet the requirements of the Town Facilities Energy Performance Standard. The design includes a high-performance building envelope, energy-efficient mechanical equipment, and renewable energy sources, including onsite solar and possibly purchased renewably-generated electricity.

Does the school project need to meet Lincoln's Stretch Energy Code?

No. Only new buildings must comply with Lincoln's Stretch Energy Code.

In 2010 at Town Meeting, Lincoln adopted the Massachusetts stretch energy code (Building Code 780 CMR Chapter 115 AA) as part of the Town's Green Community designation process. The stretch energy code references standards for existing buildings and new buildings. The school building project is an existing building. Existing building alterations and additions do not need to comply with the stretch code. Additions and alterations in existing buildings must comply with International Energy Efficiency Code (IEEC-2015) and ANSI/ASHRAE/IESNA 90.1-2013 as amended by 780 CMR Chapter 13.

What is a Net Zero Building?

A Net Zero building is one in which the energy it uses is offset entirely by renewable energy.

According to a classification system developed through the National Renewable Energy Laboratory, there are four levels of Net Zero: (paraphrased from https://www.nrel.gov/docs/fy10osti/44586.pdf).
In Lincoln, the School Building Committee is pursuing level NZEB:B and may need to consider level NZEB:C.

NZEB:A	All energy used is renewable energy harvested within the building footprint
NZEB:B	**All energy used is renewable energy harvested within the building footprint and on the site**
NZEB:C	All energy used is renewable energy harvested within the building footprint, on site and/or by renewable energy imported to the site
NZEB:D	All energy used is renewable energy harvested within the building footprint and/or on site, supplemented by purchased renewable energy certificates

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What will it take to achieve a Net Zero school building?

Through design and operation, a very energy efficient building

- A highly detailed specification that includes both pre-construction modeling and post-construction monitoring of energy use
- A team that monitors on a daily basis the design, construction, and performance of the building from inception and that continues to ensure the building meets the specifications post construction
- High levels of insulation in walls, roofs, and foundation and highly energy efficient doors and windows
- A continuous sealing membrane around the building to make it air and moisture leak tight
- Use of heat exchange ventilation so that outgoing air transfers its warmth and humidity to incoming air in the winter and vice versa in the summer
- No generation or purchase of fossil fuel-based energy except for use by an on-site emergency generator
- Highly efficient heating, cooling, and domestic hot water (DHW) systems
- Highly efficient motors, lighting, appliances, and commercial kitchen equipment
- Intelligent, interactive controls that schedule, monitor, and operate the building's mechanical and lighting equipment efficiently
- Use of screening and canopies on windows facing East, West, and South to manage excessive solar heat gain
- Creative use and distribution of coffee makers, printers, computers, etc. to minimize "plug load"

A way to generate enough renewable energy to equal or exceed the energy use of the building

- In Lincoln, this generally means the use of solar photovoltaic (PV) panels
- Panels can be located on roofs, over parking lots and on the ground. If insufficient space is available for PV, off-site renewable energy generation may also be necessary

Where will solar PV be installed?

Only on roofs and parking canopies

The design team has proposed solar panels on school campus roofs and on canopies covering parking areas, but not on the surrounding land.

How do Net Zero buildings benefit the Town?

A Net Zero school building will benefit the town in multiple ways

- Reduced operating costs, including lower life cycle and maintenance costs
- Increased personal comfort, typically produced by energy efficient heating and cooling
- An opportunity for students to learn about sustainability from their own school
- An opportunity for students and the whole community to learn about sustainability through working together to achieve the net zero energy goal
- Reduction of the town's carbon footprint