

Creating a Sustainable Concord Middle School



Sustainability Subcommittee
October 31, 2019

Concord Has Committed To...

- **25% - Reduction in greenhouse gas by 2020**
- **100% - Carbon-free electricity by 2030**
- **80% - Reduction in greenhouse gas by 2050**

Concord Town Meeting

April 2017

ARTICLE 51

Concord's Energy Goals

CCTV

Energy Goals

1. Healthy Indoor Air Quality
2. Ignite a Passion for Learning
3. Super Energy Efficient
4. Lower Embodied Carbon
5. All Electric
6. Solar Ready

A 21st Century Education Facility is a Given



Sustainability - High Performance Building

- Healthier indoor air/environmental quality
- Improves student learning
- Comfortable spaces
- Better building durability / Resiliency
- Flexible re-design for the future
- Inspires connection to nature
- Lower operational costs





Commonwealth of Massachusetts

Division of Fisheries & Wildlife

Field Headquarters

Office of Fishing & Boating Access

Department of Fish & Game

1 Rabbit Hill Road
Westborough, MA



On Schedule

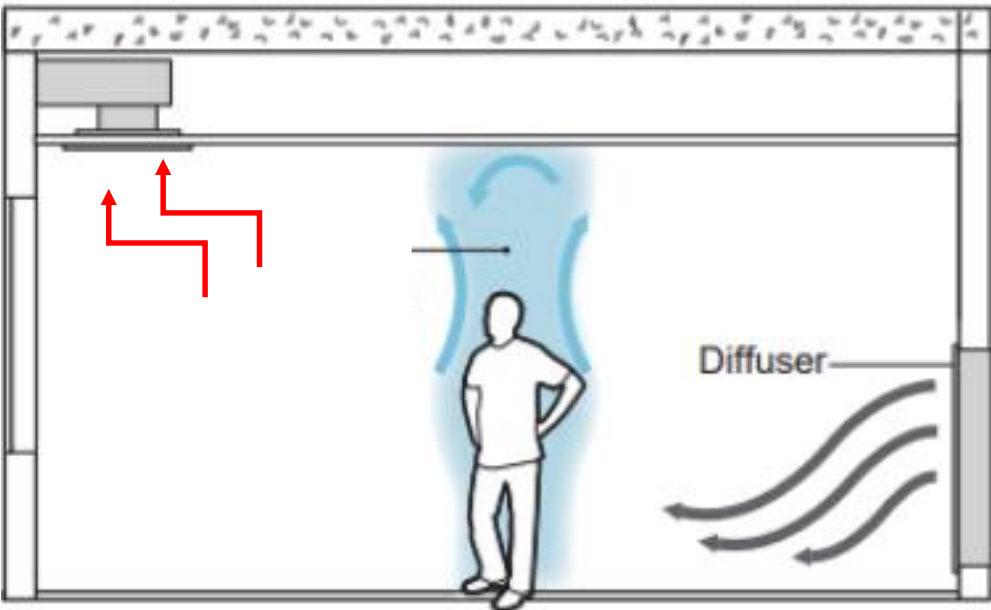
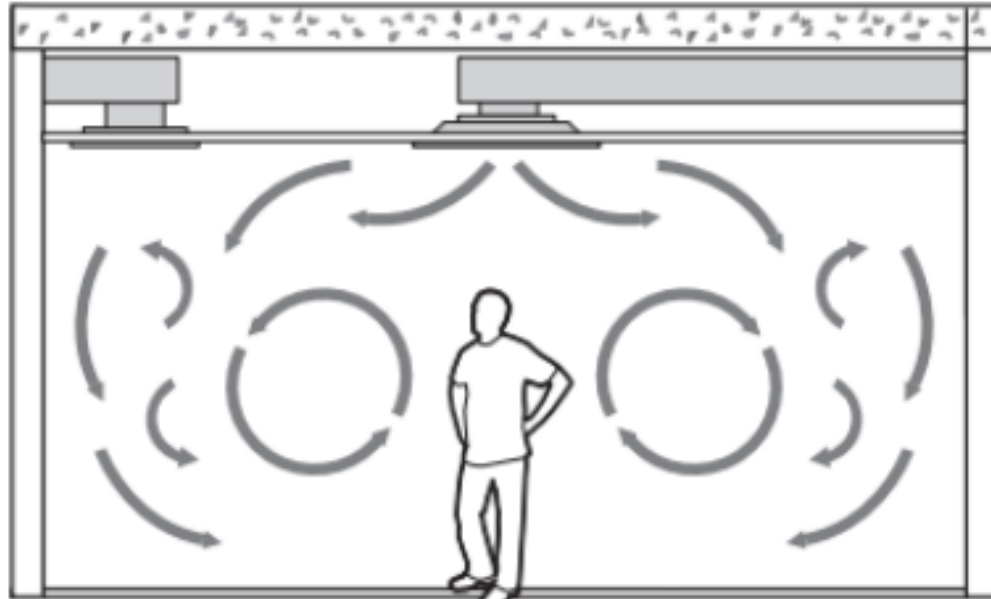


and On Budget

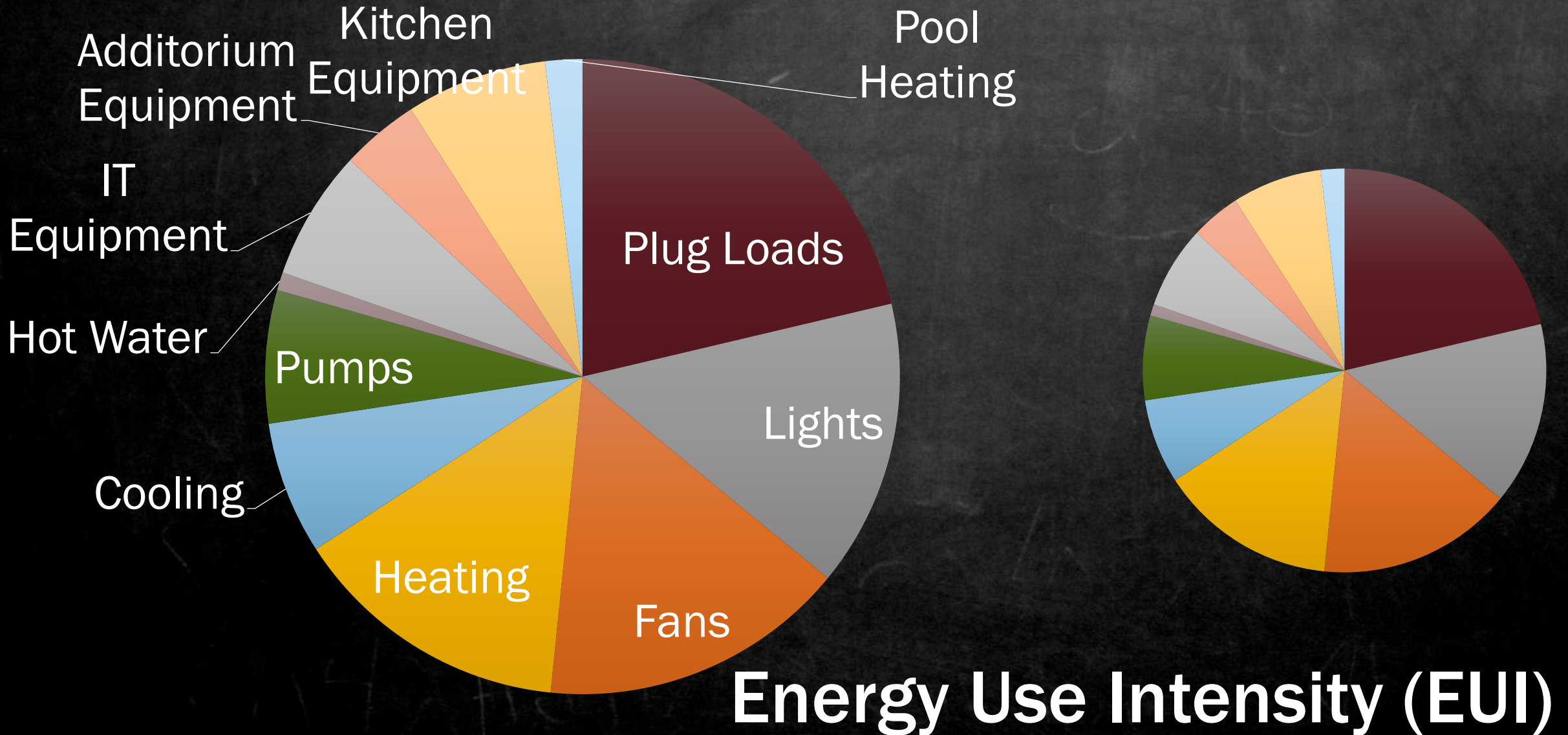
- Spend less on mechanicals and more on the enclosure
- RFS submission - Life Cycle Cost analysis showed all-electric Net Zero Energy option @ 0.3% premium



Good Indoor Air Quality Costs More.



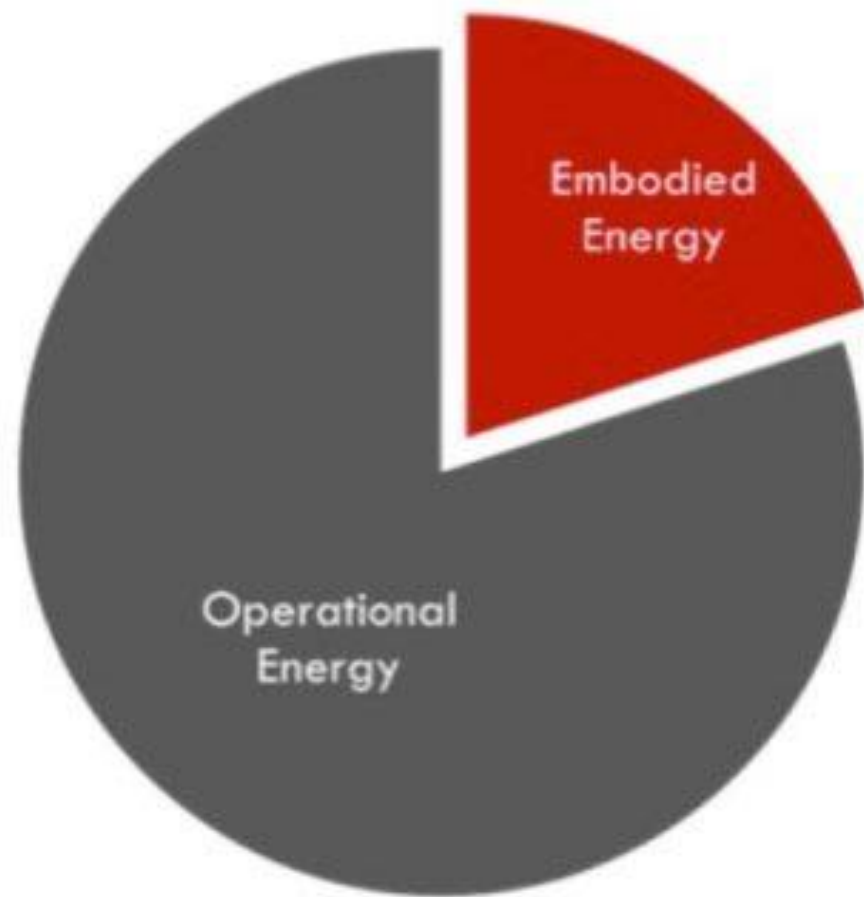
Step 1 - Super Energy Efficient



Step 2 - Lower Embodied Carbon



Operating vs Embodied Carbon



Typical Building



High Performance

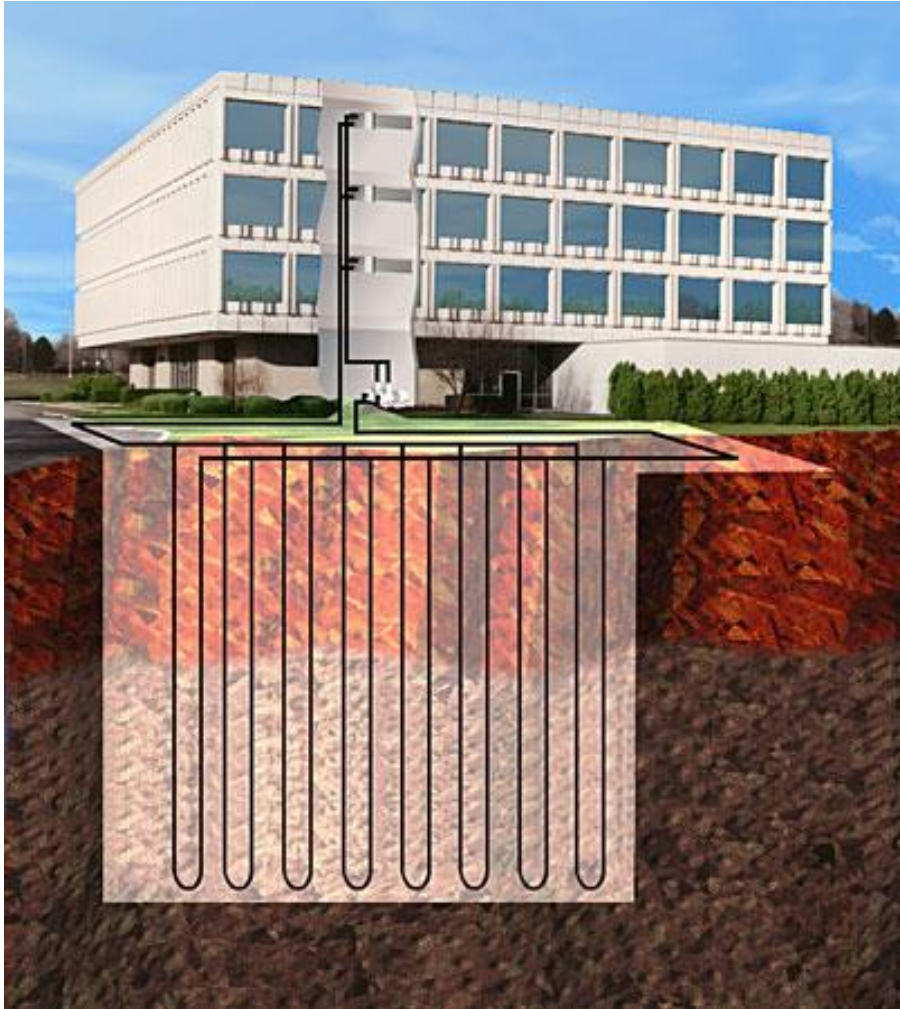
Step 3 - All Electric



Air Source Heat Pump



Ground Source Heat Pump



Step 4 - Solar Ready



How Do We Get To High Performance?

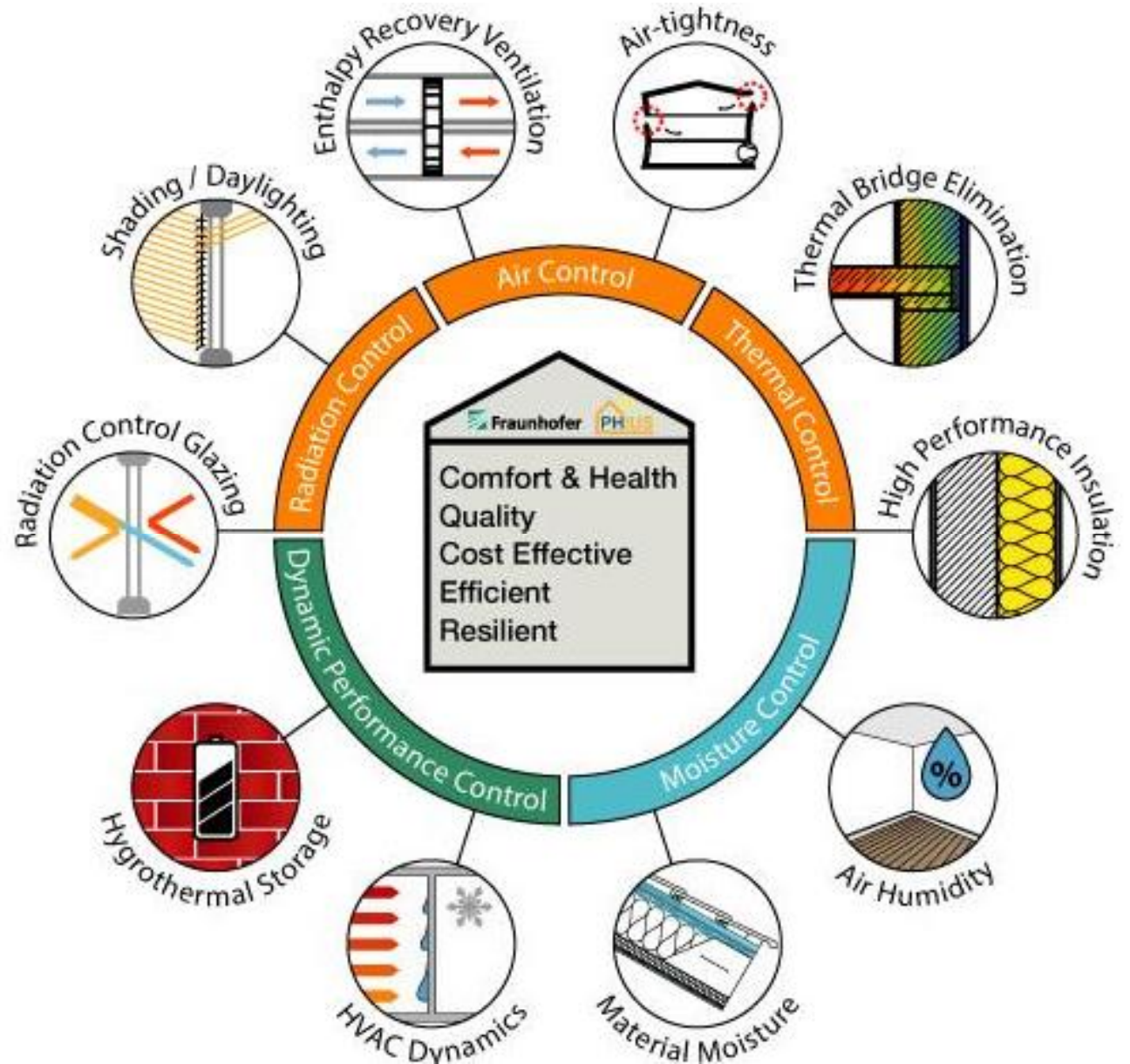


What about LEED?

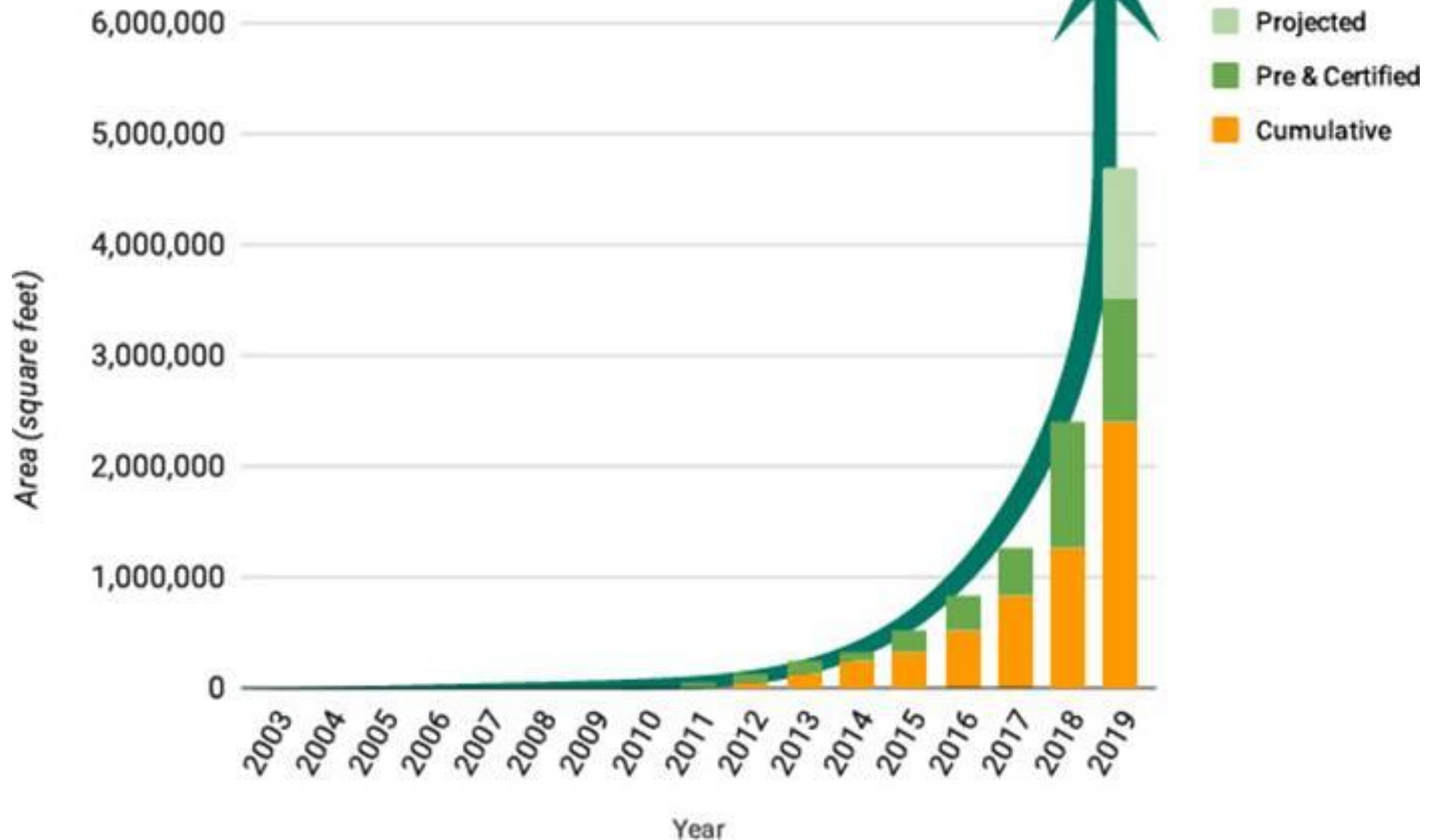
- Location and Transportation – 15 credits
- Sustainable Site – 12 credits
- Water Efficiency – 12 credits
- Energy and Atmosphere – 31 credits
- Materials and Resources – 13 credits
- Indoor Environmental Quality – 16 credits
- Innovation – 6 credits
- Regional Priority – 4 credits



PASSIVE BUILDING PRINCIPLES



PHIUS+ Certified and Pre-Certified Square Footage





WAYNFLETE LOWER SCHOOL
Portland, ME



ST. JOSEPH'S SCHOOL ADDITION
Chicago, IL (PHIUS+ Source Zero)



PARKVIEW RETROFIT SCHOOL
Chicago, IL (PHIUS+ Source Zero)
Photo Credit: **FGM** ARCHITECTS



MAINE COAST WALDORF SCHOOL
Freeport, ME

Path to Success

- Leadership - We set clear goals now
- Rely on third-party certification
- Choose Designers that can meet our goals
- Prioritize lowest life-cycle cost



A photograph of a classroom. A teacher is standing at the front, and several students are raising their hands. The text "Questions?" is overlaid in the center. The text "Thank you!" is overlaid in the lower center.

Questions?

Thank you!