

# SPOTLIGHT ON SCHOOLS

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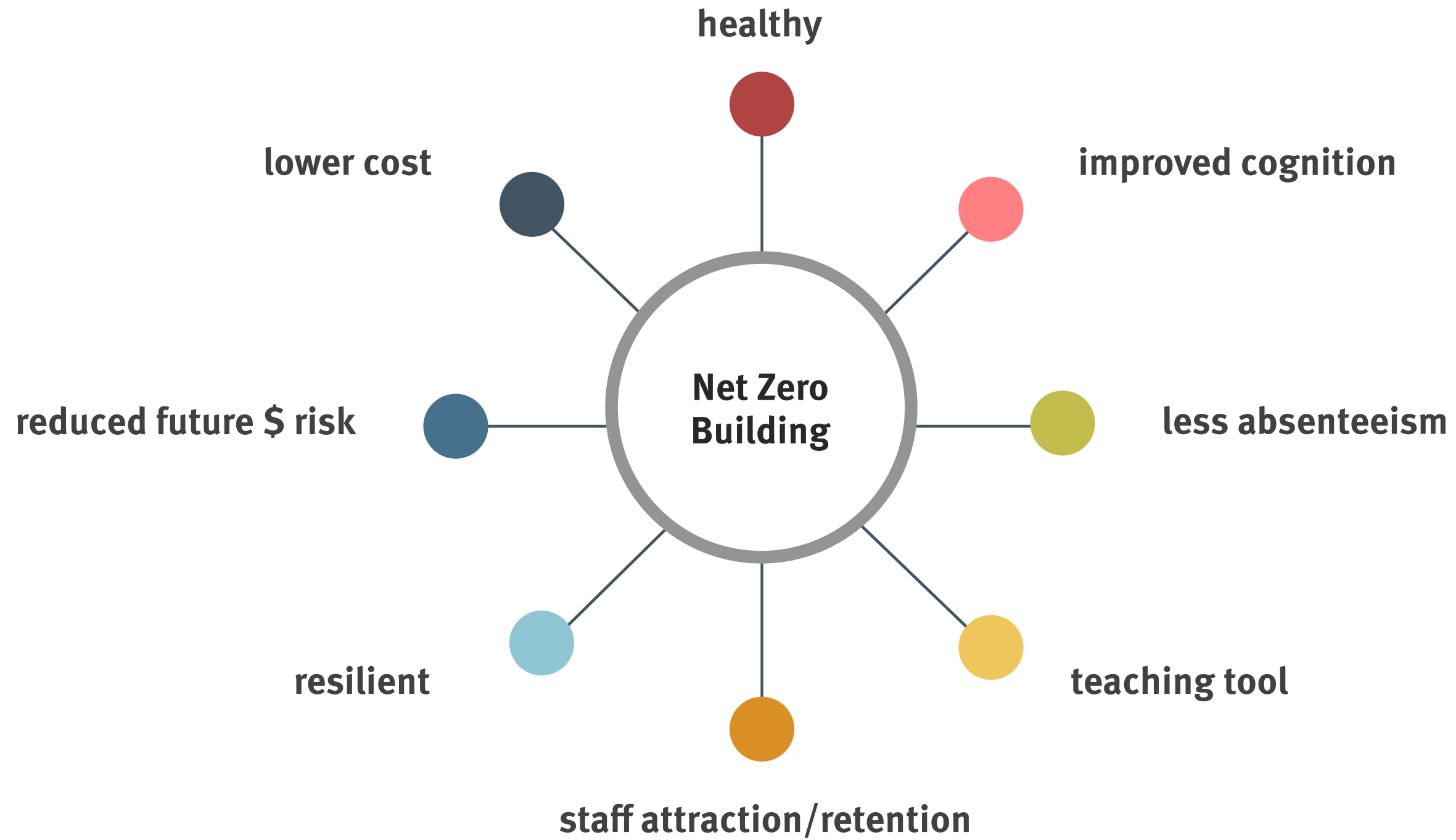
FEBRUARY 9, 2024



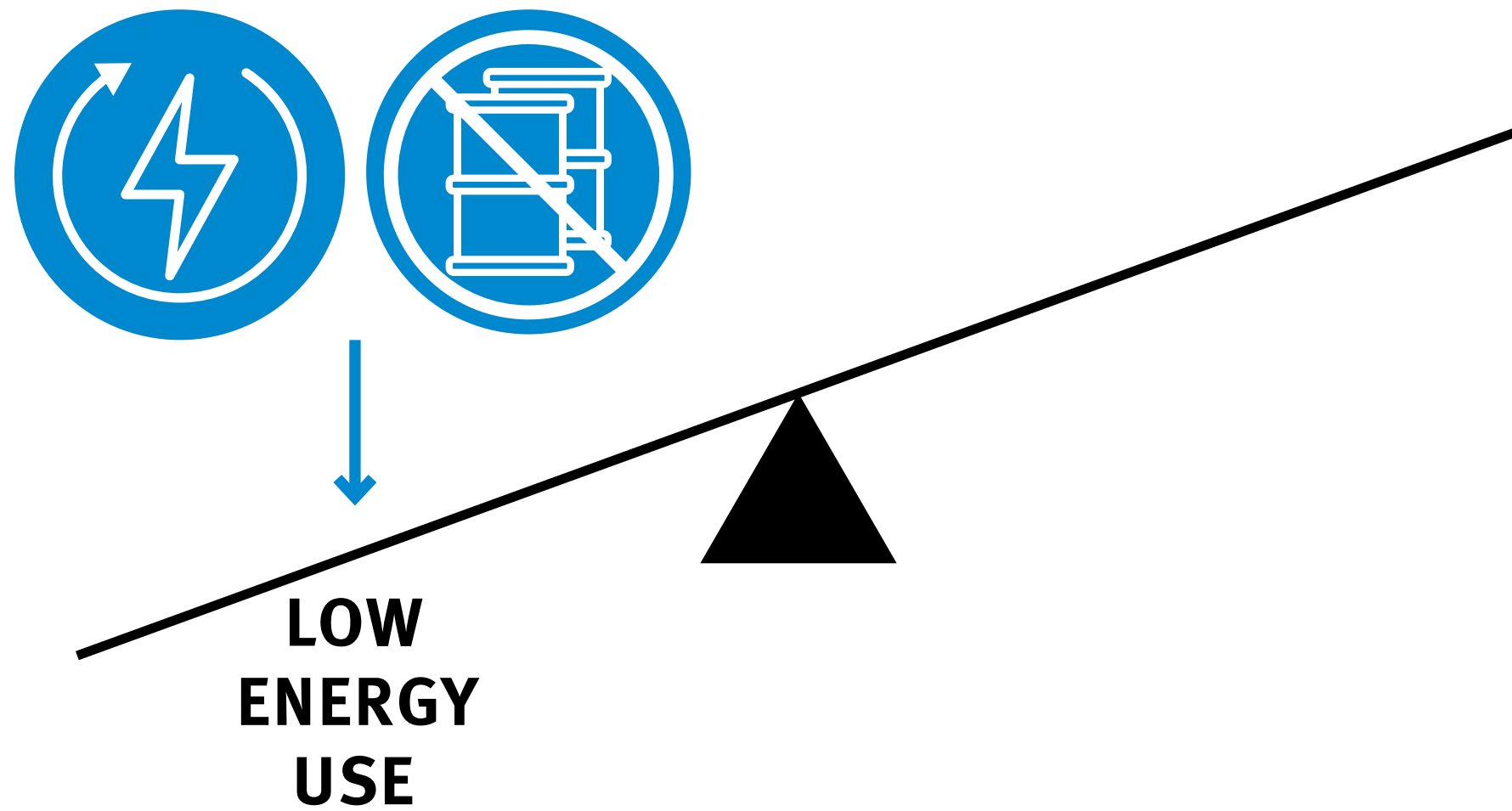
**NET ZERO ENERGY**



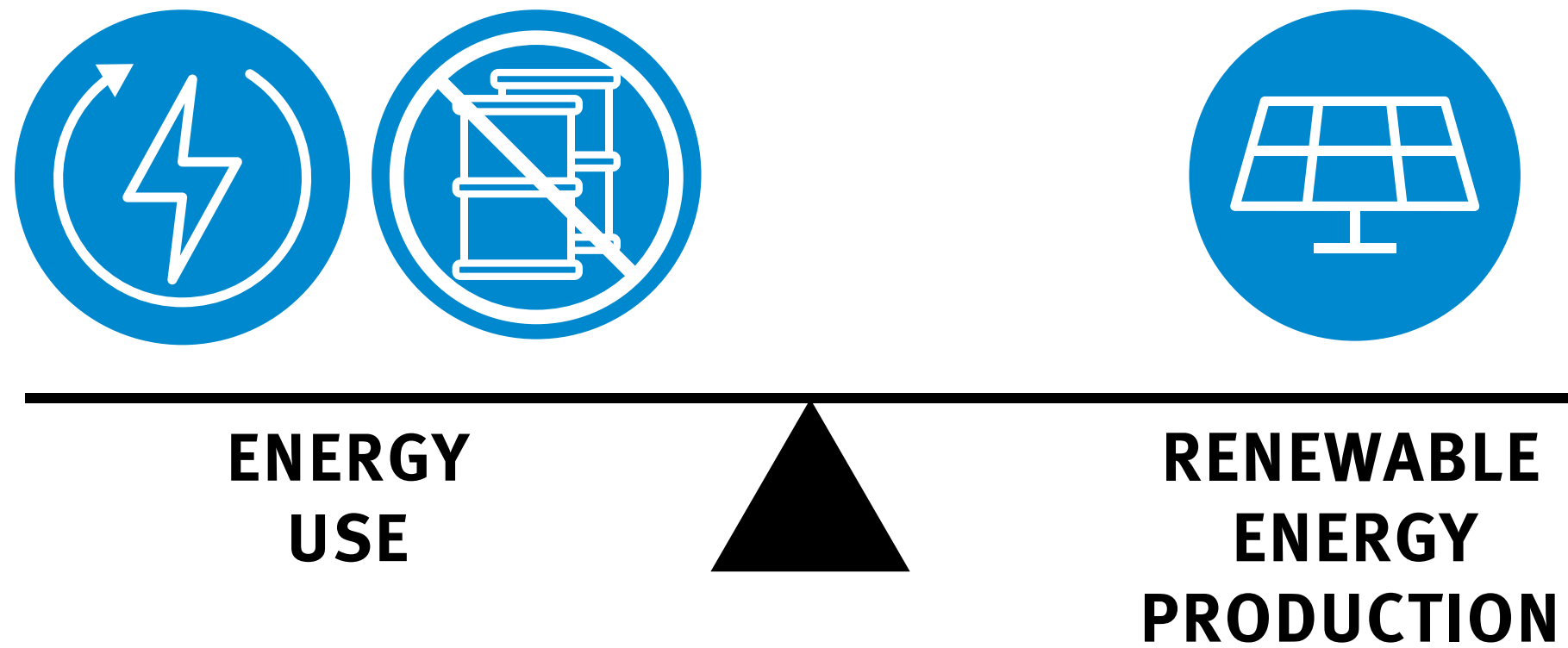
# BENEFITS OF NET ZERO SCHOOLS

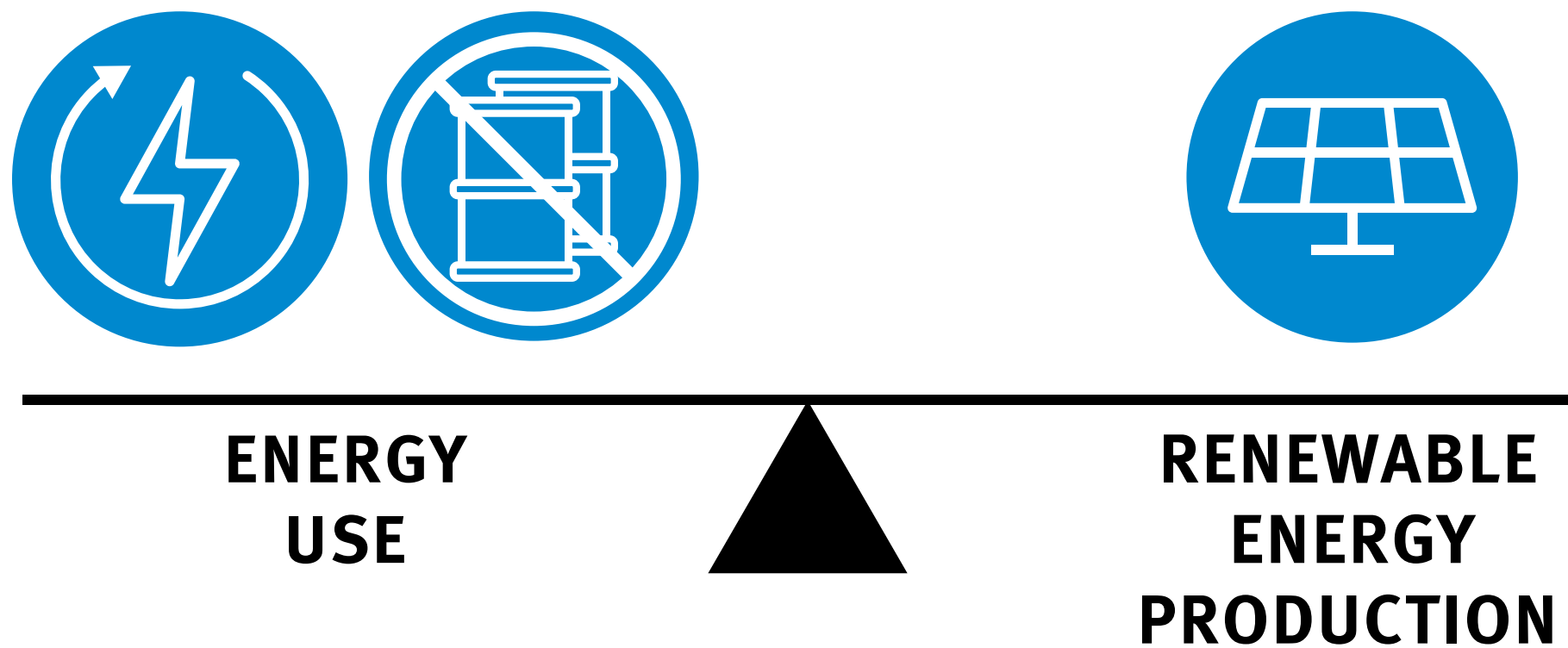


# NET ZERO ENERGY DEFINITION



# NET ZERO ENERGY DEFINITION

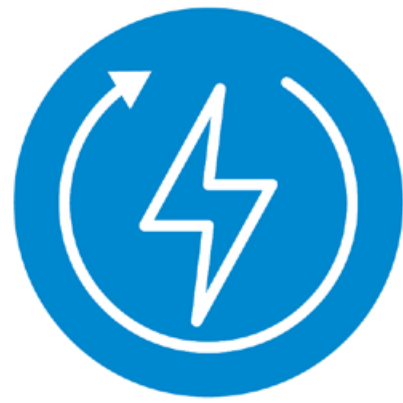




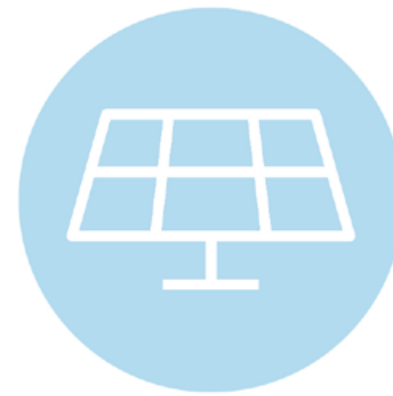
## **NET ZERO ENERGY DEFINITION**

An all-electric building, that has a very low EUI, whose annual energy use is equal to the amount of on-site or off-site renewable energy.

If more energy is generated or purchased than energy is used the building is **Net Positive**



**ENERGY  
USE**

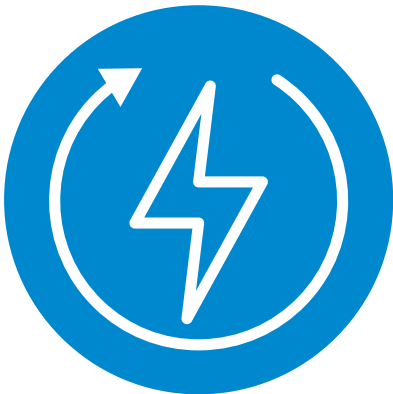


**ENERGY  
PRODUCTION**

## **NET ZERO READY**

EUI target achieved but  
renewables not yet provided

**MEASURING  
ENERGY USE**



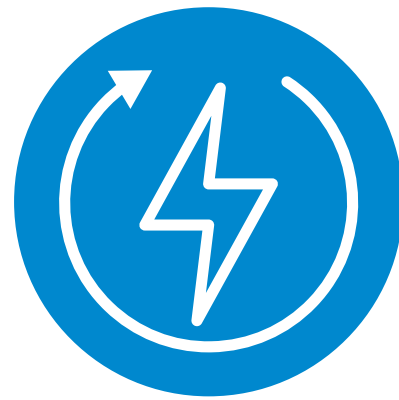
**ENERGY  
USE**

**ENERGY USE INTENSITY**

**EUI ~ MPG**

**LOWER EUI MEANS LESS  
ENERGY USED**





**ENERGY  
USE**

**ENERGY USE INTENSITY**

**EUI ~ MPG**

**LOWER EUI MEANS LESS  
ENERGY USED**

## **MEASURING ENERGY USE**

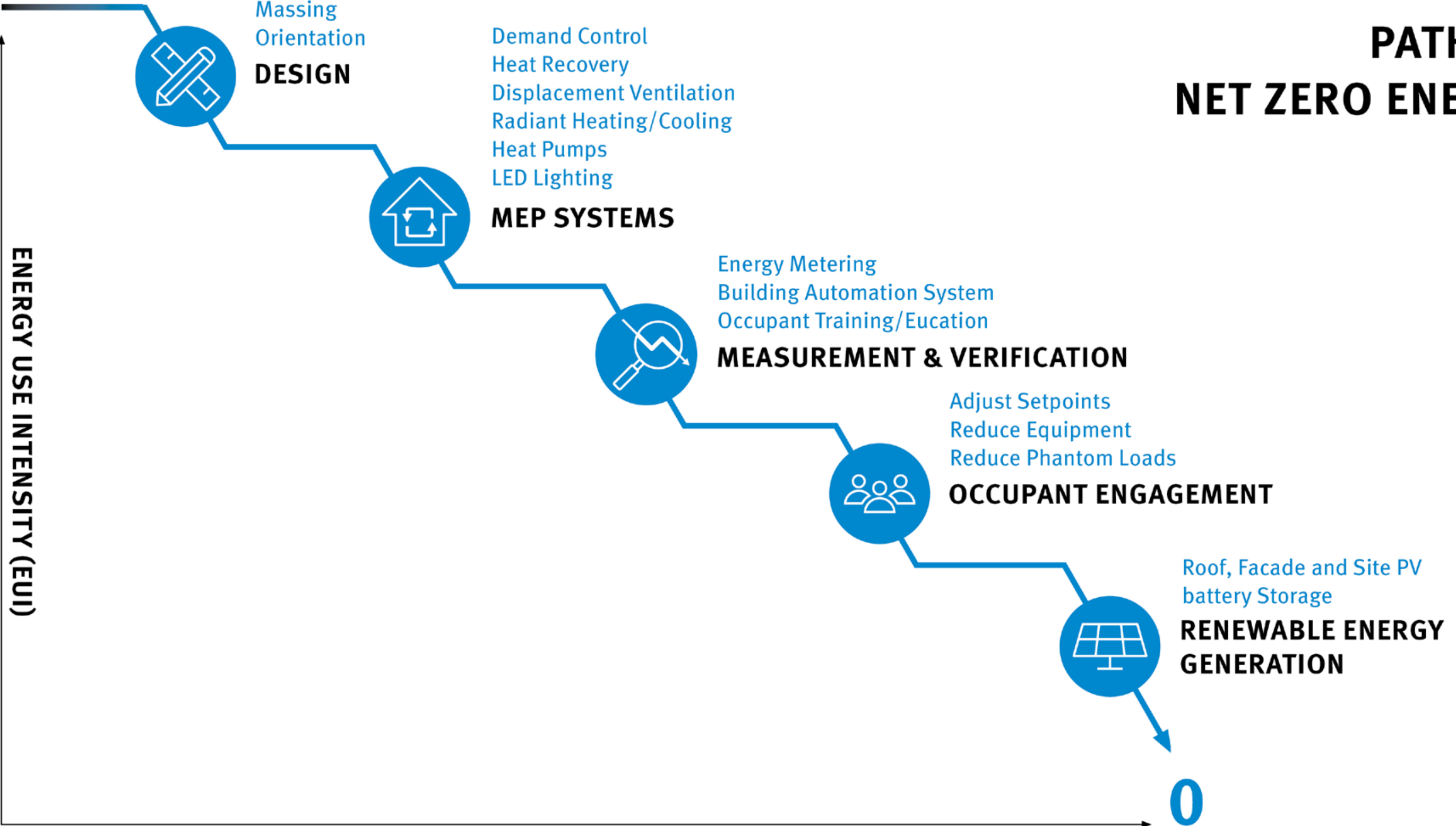
**Net Zero School  
EUI 25**

School designed to current  
Stretch Energy Code  
EUI 28-40

Average existing MA school  
EUI 85

BASELINE BUILDING

ENERGY USE INTENSITY (EUI)



# PATH TO NET ZERO ENERGY

# ALL-ELECTRIC HVAC OPTIONS FOR SCHOOLS

## NET ZERO

Ground Source Heat  
Pump

Displacement  
Ventilation

## MAYBE NET ZERO

Air Source Heat  
Pump or VRF

Overhead  
Ventilation

Air - Water Heat  
Pump Chiller/  
Heating Plant

Displacement  
Ventilation

## APPLICABLE INCENTIVES

### FEDERAL

- SECTION 48 INVESTMENT TAX CREDIT - SOLAR, ENERGY STORAGE, AND GROUND SOURCE HEAT PUMPS

### STATE

- MASS SAVE - PATH 1 OR PATH 2
  - EVSE CHARGING

### MSBA

- 3% ADD'L IF MEET SPECIALIZED ENERGY CODE
  1. ON-SITE NET ZERO
  2. ALL-ELECTRIC
  3. ELECTRIC READY

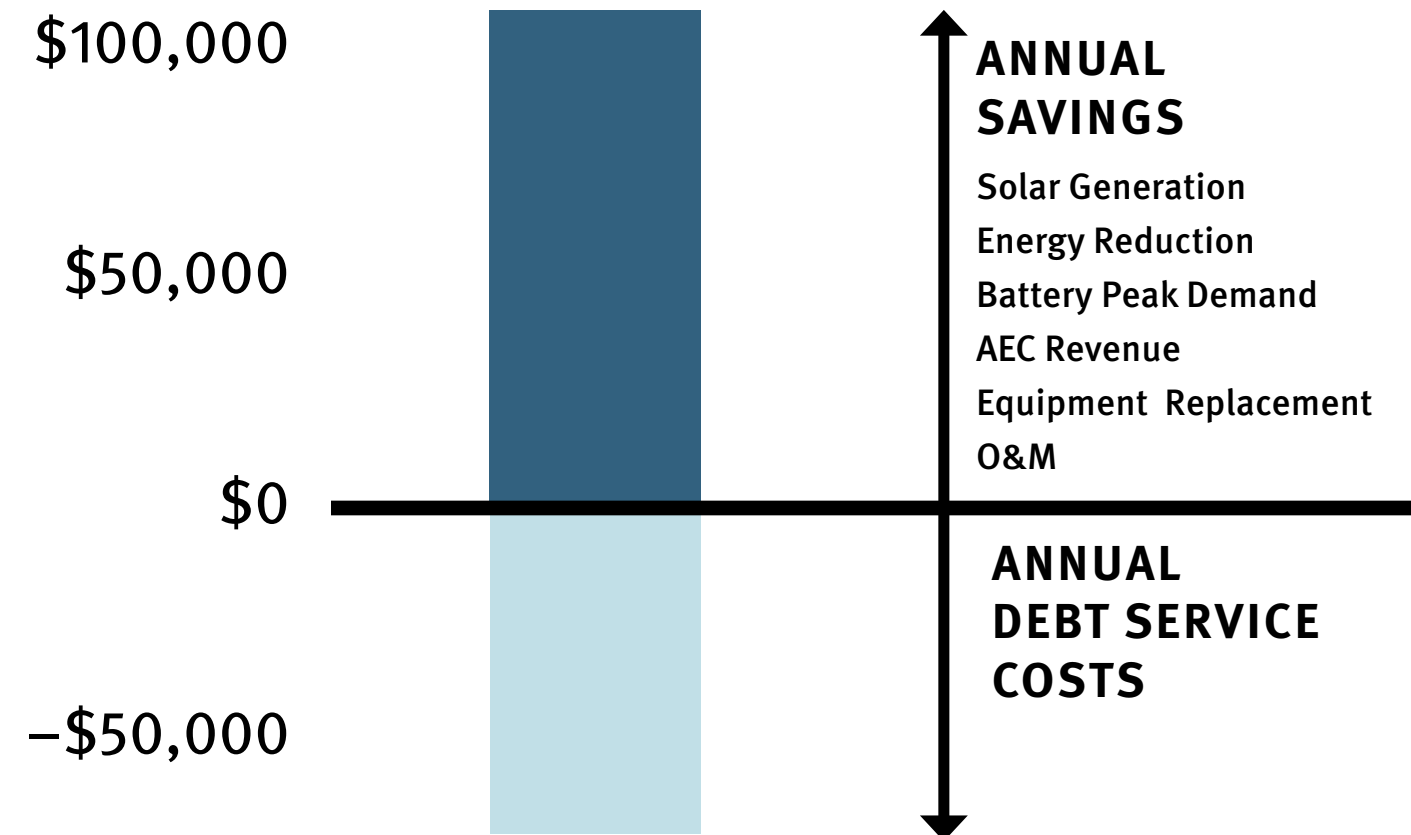
# NET ZERO BUILDINGS = SAVINGS

Comparison of ground source heat pump  
to gas boiler system:

Without incentives

**\$ 3,118,651**    **FIRST 30 YEARS**

**\$ 109,471**    **ANNUAL AFTER**



# POTENTIAL INCENTIVES

	Technology	Cost	Rate <sup>1</sup>	Estimated Value
Sec 48 Alternative Energy Investment Tax Credit	Solar, Wind	\$1,400,000	25.5%	\$357,000
	Ground Source Heat Pump	\$8,000,000	34%	\$2,720,000
	Thermal Energy Storage	NA	34%	
	Electrochromic Glass	NA	34%	
Mass Save	Path 1			\$1,169,000
MA EVIP Public Access <sup>2</sup>	EV charging	\$42,000	100%	\$42,000

**Potential Total**

**\$4,288,000**

46% OF COST

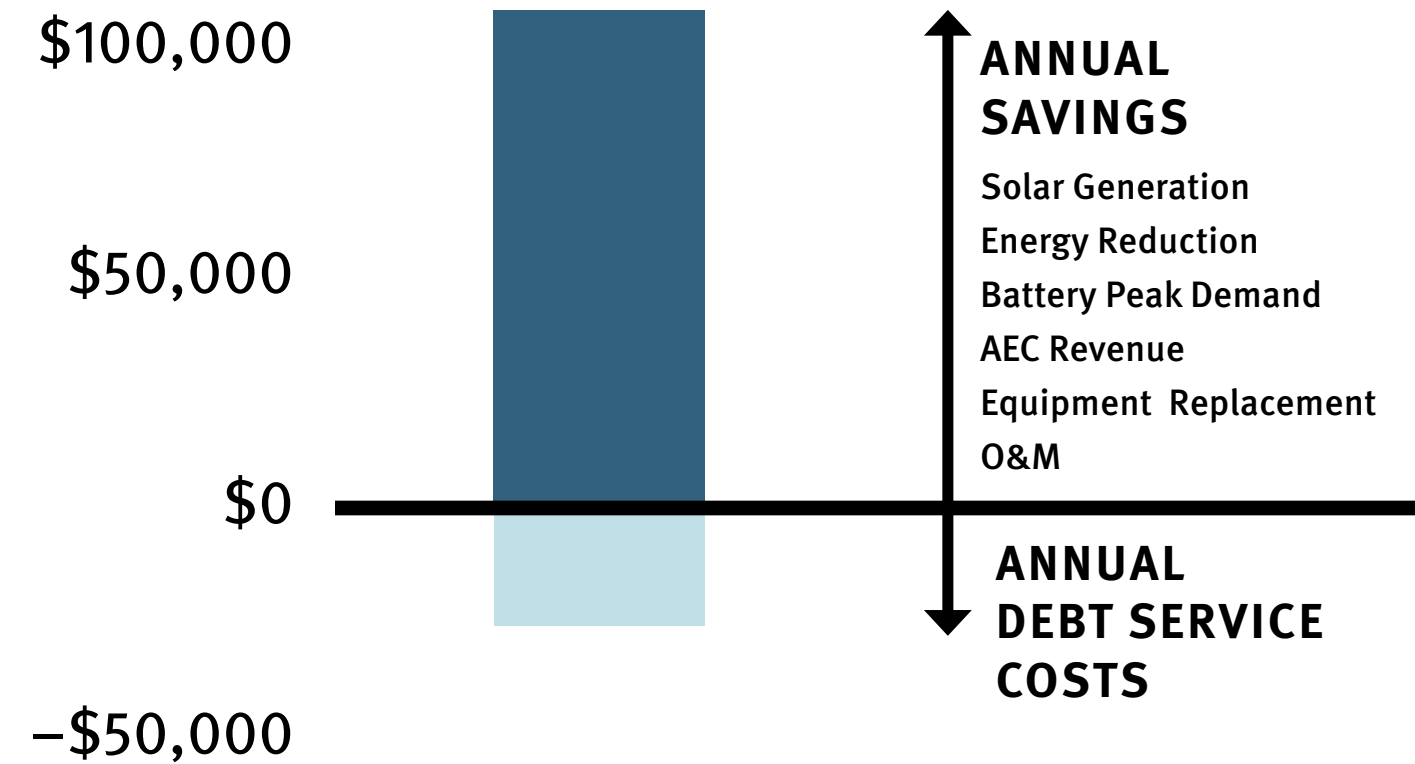
1. Assumed using tax-exempt bonds

Comparison of ground source heat pump  
to gas boiler system:

With Mass Save incentives

**\$ 3,118,651**    **FIRST 30 YEARS**

**\$ 109,471**    **ANNUAL AFTER**



Comparison of ground source heat pump  
to gas boiler system:

With Mass Save & Investment Tax Credit

**\$ 8,462,474**    **FIRST 30 YEARS**

**\$ 109,471**    **ANNUAL AFTER**

