

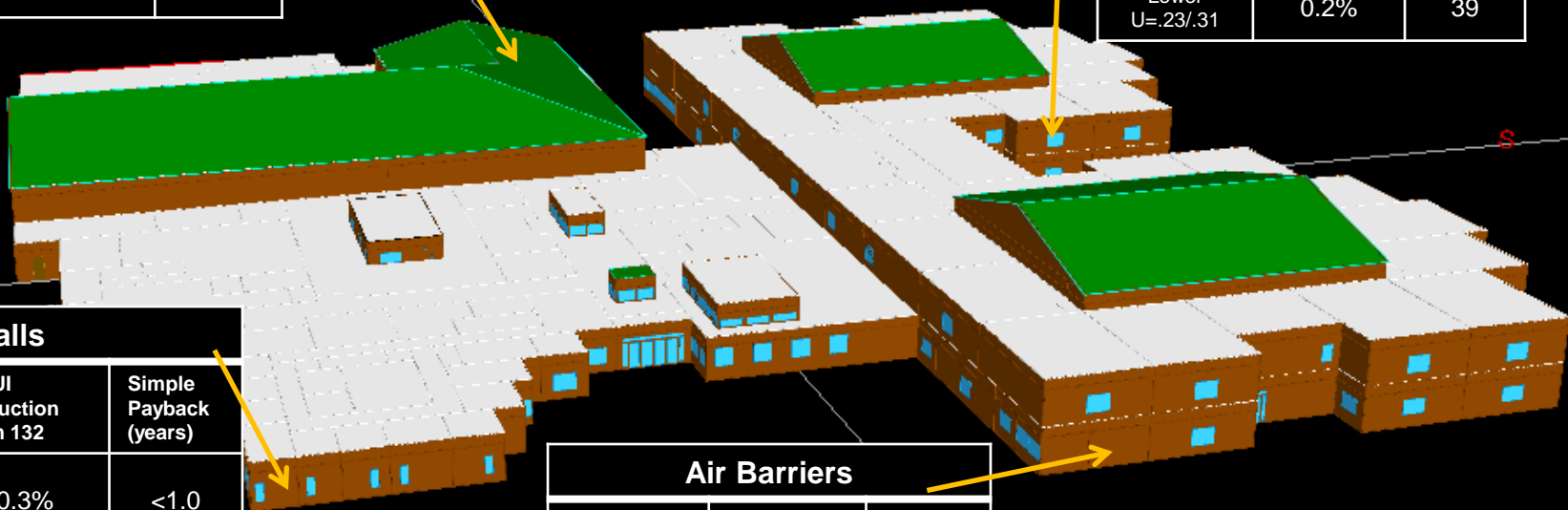
# Energy Savings and Payback in Typical Middle School\*



\*Louisville, KY – other climates similar  
 EUI – Energy Use Index (kBtu/SF)

Roof		
<u>Base R = 22</u> <i>pitched,</i> <u>R 26.3 flat</u>	%EUI Reduction from 132	Simple Payback (years)
R = 29.4 pitched, R 33.3 flat BUR	0.3%	160
R = 37.0 pitched, R 40 flat BUR	0.6%	189

Windows		
<u>Base U = .54/.64</u> <i>glass/frame</i>	%EUI reduction from 132	Simple Payback (years)
Higher U = .67/.69	0.0%	<u>Lower initial cost</u>
Lower U = .23/.31	0.2%	39



Walls		
<u>Base R = 9.1</u> <i>4" brick, 8" CMU</i>	%EUI Reduction from 132	Simple Payback (years)
R = 13.3" 4" brick, 8" CMU	0.3%	<1.0
R = 25, 4" brick, 8" CMU	0.6%	75.3
ICF R = 22, 4" brick	0.5%	335
R = R37, 4" brick, 6" Steel Stud	0.6%	Lower initial Cost**

Air Barriers		
<u>Base 0.5 Air change /hour</u>	%EUI Reduction from 132	Simple Payback (years)
0.2 Air change/hour	0.7%	52
0.1 Air change/hour	-0.1%	No return

\*\* lower initial costs ignores load bearing steel frame costs and likely condensation and maintenance issues

For more details See: "Cost Effective Energy Efficient School Design" Report (McGinley 2011)

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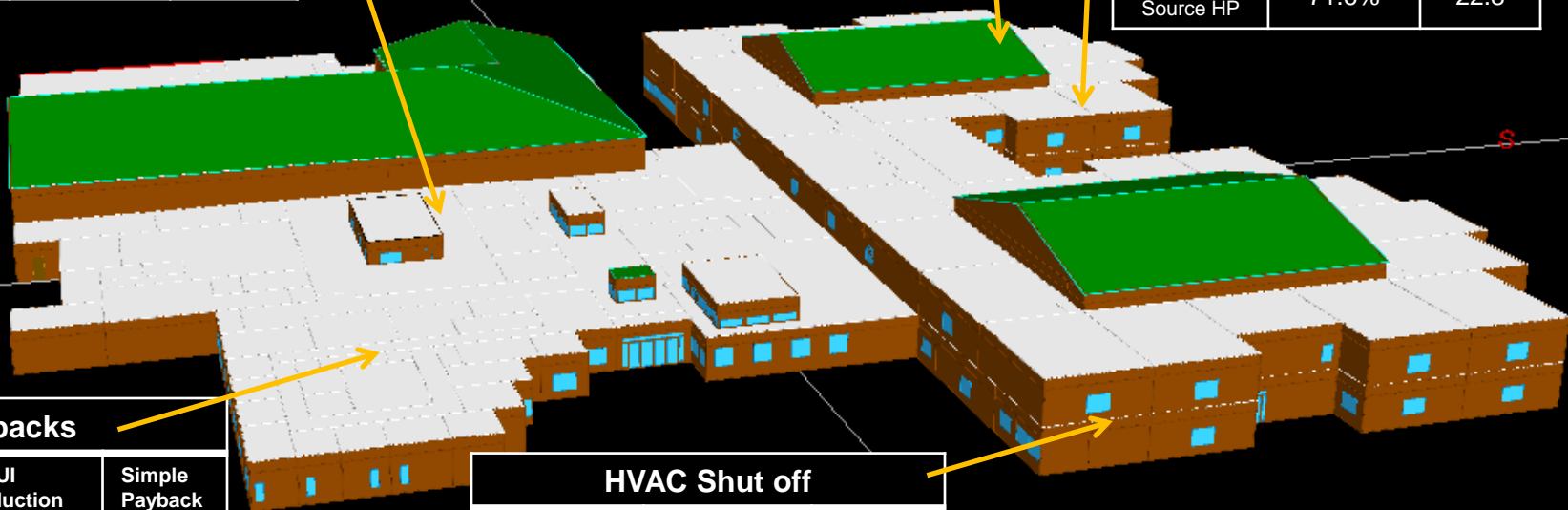
Boilers		
<u>Base 80%</u>	%EUI Reduction from 132	Simple Payback (years)
90%	6.5%	0.2

Combination Conventional		
<u>Base – see report</u>	%EUI reduction from 132	Simple Payback (years)
Conventional VAV All- R 13 walls, Set backs Orientation, Controls, etc.	58.5%	2.5

HVAC Systems		
<u>Base VAV Chiller Boiler</u>	%EUI reduction from 132	Simple Payback (years)
Water Source HP	69.8%	23.2
Ground Source HP	71.6%	22.8

Set backs		
<u>Base 64 and 80</u>	%EUI Reduction from 132	Simple Payback (years)
Increase set backs to 55 and 90	18.7%	No cost

HVAC Shut off		
<u>Run HVAC at Min Settings</u>	%EUI Reduction from 132	Simple Payback (years)
Turn off HVAC fans/pump 7pm -6am except as needed for set back temp	1.1%	2.8



For more details: See “Cost Effective Energy Efficient School Design” Report (McGinley 2011)