

# **The Pursuit of Net Zero De\$ign**

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*What are the  
barriers for the real  
estate development  
community in  
pursuing net zero  
design?*

# Net Zero Design

**CAPEX** vs. **OPEX**

# Net Zero Design

## *CAPEX*

- Valuation Matters
- Budgets must be within valuations
- Bank financing
- Competitive Marketplace

# Net Zero Design

## *Operating Expenses*

- Class "A" Office buildings range between \$6.50 - \$8.00 per square foot
  - A 200,000 SF building will have operating expenses of approximately \$1,500,000 annually
- Retail Developments average around \$4.50 - \$5.50 per square foot
- Multi-Family Developments average between \$5.00 - \$7.00 per square foot
- Single-Family Homes have a larger variance, but should average about \$5.00 - \$8.00 per square foot

# Net Zero Design

Property Type	OPEX/SF	Square Feet	\$'s Annually	
Class-A Office	\$7.00	200,000	\$1,400,000	
Retail	\$5.00	230,000	\$1,150,000	
Multi-Family	\$6.00	900	\$5,400	
Single-Family	\$5.00	3,000	\$15,000	

# Net Zero Design

*Where can we save?*

- 1. Mechanical**
- 2. Electrical**
- 3. Skin Systems**
- 4. Thermal Bridging**
- 5. Piping**

# Net Zero Design

## *Mechanical*

- Mitsubishi VRF – water-cooled / air-cooled
- Heat Pump
- Solar Heating

# Net Zero Design

## *Electrical*

- Solar Panels
- Automation Controls (window shades, light harvesting, motion sensors)
- Battery Storage



# Net Zero Design

## Electrical Analysis: LED vs. Incandescent

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
<b>HALIDE</b>											
Initial Purchase	100,175										
Operating Costs		9,888	9,888	9,888	9,888	9,888	9,888	9,888	9,888	9,888	9,888
Replacement Cost	-	-	-	-	-	18,700	-	-	-	-	18,700
Annual Cost	100,175	9,888	9,888	9,888	9,888	28,588	9,888	9,888	9,888	9,888	28,588
Cummulative	100,175	110,063	119,952	129,840	139,729	168,317	178,205	188,094	197,982	207,871	236,459
Total Cost (25 years)	440,885										
<b>LED</b>											
Initial Purchase	140,175										
Operating Costs		4,412	4,412	4,412	4,412	4,412	4,412	4,412	4,412	4,412	4,412
Replacement Cost	-	-	-	-	-	-	-	-	-	-	-
Annual Cost	140,175	4,412	4,412	4,412	4,412	4,412	4,412	4,412	4,412	4,412	4,412
Cummulative	140,175	144,587	149,000	153,412	157,825	162,237	166,650	171,062	175,475	179,887	184,300
Variance	(40,000)	(34,524)	(29,048)	(23,572)	(18,096)	6,080	11,555	17,031	22,507	27,983	52,159
Total Cost (25 years)	287,887										
<b>25-year Savings</b>	<b>152,998</b>										
<b>Based on a 7.0% Cap Rate:</b>						<b>87,427</b>					

# Net Zero Design

## *Skin Systems*

- Zip System – Huber Engineered Woods
  - Eliminating thermal bridging



- Air/moisture Barriers – standard wrapping vs. silicone air barrier

# Net Zero Design

## Piping

### ■ Aquatherm

- Local Utah County company
- Produce and distribute polypropylene (PP-R) pipe for use in pressurized plumbing and mechanical systems of all sizes
- Has a built in insulation factor
- Can run at higher velocities than metals
- The system can be designed for the actual load and not oversized to allow for scale and corrosion in the future
- Pumps on the system will be more efficient and perform longer
- Higher flow rates allow for smaller pipe sizes to be used to deliver the proper load
- Will be the same total installed cost or less than metal systems
- Energy Savings on power and fuel
- 60+ year design life

*Capital Expenditures*

*Vs.*

*Operating  
Expenses*