1,100 sf
2 bedroom
1.5 bath
3 occupants
Key to Graphs

- Each building type is analyzed for Code, Net Zero Ready, and Net Zero.

Code NZR Net Zero

GREEN (costs)
- Efficiency capital

PURPLE (PV costs)

RED (finance costs)

BLUE (operating costs)
Residential 1st Year Costs

Photovoltaics financed at the same rates

• 4% fixed interest

Funding 30-year loan
<table>
<thead>
<tr>
<th>Family</th>
<th>Single</th>
<th>Duplex</th>
<th>Quadplex</th>
<th>NZR Net Zero</th>
<th>Code Net Zero</th>
<th>NZR Quadplex</th>
<th>Code Quadplex</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,500</td>
<td></td>
<td></td>
<td></td>
<td>$9000</td>
<td>$9000</td>
<td>$9000</td>
<td>$9000</td>
</tr>
<tr>
<td>$1,500</td>
<td></td>
<td></td>
<td></td>
<td>$1,000</td>
<td>$1,000</td>
<td>$1,000</td>
<td>$1,000</td>
</tr>
</tbody>
</table>

Residential 1st Year Costs

Financing cost for energy efficiency
Residential 1st Year Costs

- Finance costs for P.V. loan

- Additional Energy Efficiency Capital costs loan

- Quadplex
  - Nzr
  - Duplex
  - Nzr Single
  - Nzr Duplex
  - Nzr Double

- Family Single
  - Nzr Single
  - Nzr Double

- Single Family
  - Nzr Single

- Duplex
  - Nzr Single

- Quadplex
  - Nzr Single

- Additional Solar P.V. loan

- $900
- $1,000
- $1,200
- $1,500
- $2,000
- $2,500
- $3,000
- $3,500
- $4,000
- $5,000
- $5,500
Residential 1st Year Costs

- Heating Costs

FAMILY	SINGLE

QUADPLEX	DUPLEX
Residential 1st Year Costs

- Excludes other rebates/incentives
- 30% Federal tax credit for PV
- With 30% Federal Tax Credit for PV
- Tax Credit for PV
<table>
<thead>
<tr>
<th>Quadplex NZR</th>
<th>Quadplex Net Zero</th>
<th>Quadplex Duplex</th>
<th>Additional Mechanical Capital Costs</th>
<th>Additional Envelope Capital Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>$131,000</td>
<td>$213,000</td>
<td>$213,000</td>
<td>$78,000</td>
<td>$78,000</td>
</tr>
<tr>
<td>$94,000</td>
<td>$173,000</td>
<td>$173,000</td>
<td>$78,000</td>
<td>$78,000</td>
</tr>
</tbody>
</table>

**Additional energy efficiency capital costs**

Residential 30-year Costs
Residential 30-Year Costs

Py Capital Costs

Quadplex

Duplex

Single Family

Additional Envelope Capital Costs

Additional Mechanical Capital Costs

Additional Photovoltaics Cost
Residential 30-Year Costs

- Quadplex
- Duplex
- Single Family

30-Year cumulative financing interest

Net Zero Energy and GHG Impact Calculator

Additional Envelope Capital Costs

Additional Mechanical Capital Costs

Photovoltaics cost

Finance Interest

Net Zero

Duplex

Quadplex

Family Single

Code Single

Net Zero NZR Single

$0

$20,000

$40,000

$60,000

$80,000

$100,000

$120,000

$140,000
Residential 30-Year Costs

- Operating costs

- Single Family
- Duplex
- Quadruplex

Costs: Net Zero, Operating Costs, Finance Interest, Operating Costs
Residential 30-Year Savings

- Single Family: $59,000
- Duplex: $45,000
- Quadruple: $39,000

Savings
Residential 30-Year Costs

- Tax Credit for PV with 30% Federal
- Excludes other rebates/incentives
- 30% Federal tax credit for PV
- Net Zero Financed

$39,000

$59,000
Residential Finance Options

- Home Equity Loans:
  - 15 Yr Fixed 4.5%
  - 5 Yr Fixed 2.74%
- Unsecured:
  - Home Equity Loans
  - Unsecured and Home Equity Loans

- VSECU - V4green - Energy Savings Loan Program
  (https://www.vsecu.com/energy-saving-loans)
- Northfield Savings Bank - Energy Improvement Loans
  (https://www.nsb.com/borrow/energy-improvement-loans/)
- Home Efficiency Vermont - Financing
  (https://www.efficiencyvermont.com/for-my-
   efficiency-vermont-database)
- Residential Financing Options
Office Building

- Code closed office
- Code open office
- Net Zero Ready closed office
- Net Zero Ready open office

Four office configurations:

- 2 floors
- 13,000 sf
2 floors of office along the south 10,000 total sf
1 floor manufacturing/warehouse space 17,000 sf
27,000 sf total

Office/Manufacturing Building
Assumptions

Commercial Finance

Photovoltaics financed at the same rates starting at 4.6% and increases by 2% every 5 years.

- 20-Year Variable loan rate to finance the incremental capital costs
Commercial 1st Year Costs

- Closed office cost an additional $320,000 = $25,000/year when financed.

<table>
<thead>
<tr>
<th>OPEN OFFICE</th>
<th>CLOSED OFFICE</th>
<th>OFFICE/ MANUFACTURING</th>
</tr>
</thead>
<tbody>
<tr>
<td>$70,000</td>
<td>$60,000</td>
<td>$60,000</td>
</tr>
<tr>
<td>$50,000</td>
<td>$40,000</td>
<td>$40,000</td>
</tr>
<tr>
<td>$30,000</td>
<td>$20,000</td>
<td>$20,000</td>
</tr>
<tr>
<td>$10,000</td>
<td>$10,000</td>
<td>$10,000</td>
</tr>
</tbody>
</table>

- Code Office Open
- NR Office Open
- Net Zero Open Office
- Code Office Closed
- NR Office Closed
- Net Zero Closed Office
- Code Manufacturing
- NR Manufacturing
- Net Zero Manufacturing

**Loan Payment for Closed Offices**

Source: McKinsey & Company
MANUFACTURING

OFFICE

OFFICE

CLOSED

OFFICE

OPEN

Total finance costs including PV

Commercial 1st Year Costs
Manufacturing
Office
Closed

Office
Open

Commercial 1st Year Costs

- Heating and Cooling Costs