

## Siding Comparison

### Problems with New Vinyl Siding

- Faux graining
- J channels
- Seams overlapped and “doubled up”
- Curved profile
- Color selections
- Limited “exposure” sizes
- Recessed windows on retrofit projects
- Water penetration

### Problems with Aged Vinyl Siding

- Color fading
- Becomes brittle
- Difficult to patch
- Attracts dirt
- Limited life span

### Fiber Cement Advantages

- Smooth finish and profiles look like wood
- More stable than cedar
- Does not rot
- Paint lasts longer than cedar
- Installation cheaper than cedar
- Cheapest 50 year life-cycle cost

### Fiber Cement Disadvantages

- Tougher to install
- Limited products options
- Cannot be tooled
- Contains crystalline silica
- High embodied energy to produce
- Reliant on sealants
- Currently not recyclable
- Costs less to repair and maintain existing cedar than to replace with fiber cement

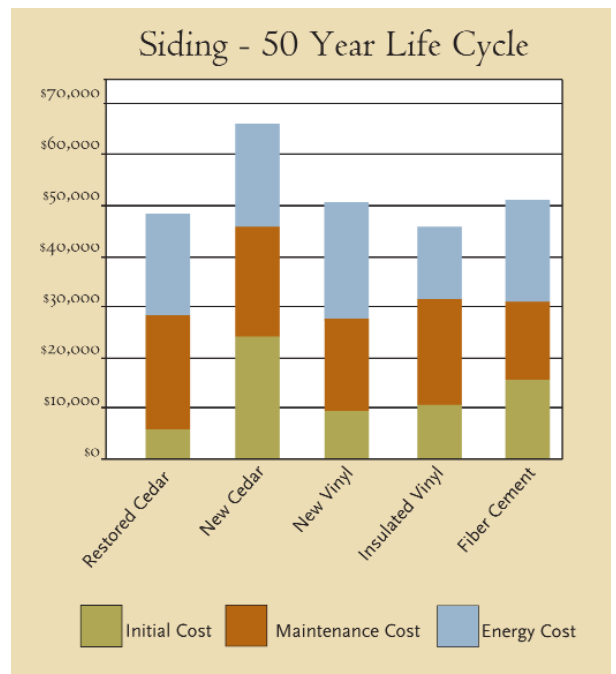
### Cedar’s Environmental Benefits

- Cedar is renewable resource
- Cedar is recyclable
- Cedar is biodegradable
- Vinyl production releases chlorine
- Vinyl is toxic when burned
- Vinyl uses over 3x the embodied energy of cedar in a typical installation

### Summary

#### Cedar Siding vs Vinyl Siding

- Cheaper to maintain cedar than to replace
- Life cycle costs are similar
- More color, size, & profile options with cedar
- Cedar is better for environment
- Cedar is more historically appropriate



# Low-Cost, Low-Maintenance Mirage

Architecture  
Preservation  
Planning  
Landscape  
Interiors

Voith & Mactavish Architects  
1616 Walnut Street, 24th Floor  
Philadelphia, PA 19103  
phone 215-545-4544 fax 125-545-3299  
voithandmactavish.com

## Windows Comparison

### The Case for Wood

- Authentic look
- More size / profile options
- Easy to change color
- Easy to repair
- Longest possible lifespan
- Environmentally friendly

### Problems with

#### New Vinyl Windows

- Mitered / welded corners
- Can't be painted
- Track liners
- Poor fit in existing openings
- Interpane muntins
- Snap-in grids and bad muntin profiles

### Problems with

#### Aged Vinyl Windows

- Color fading
- Meeting rail sag
- Insulated glass failure
- Jamb liner failure
- Joint failure
- Attracts dirt
- Limited life span & hard to repair
- Never-ending replacement cycle

### What About Vinyl Clad?

- Installation cost similar to painted wood windows
- Lower maintenance costs than wood windows
- Can't change color
- Similar environmental issues as with vinyl windows
- Long term insulated glass failure
- Question of durability of dissimilar materials holding glass in place and creating gaps for water penetration.

### Wood Windows' Environmental Benefits

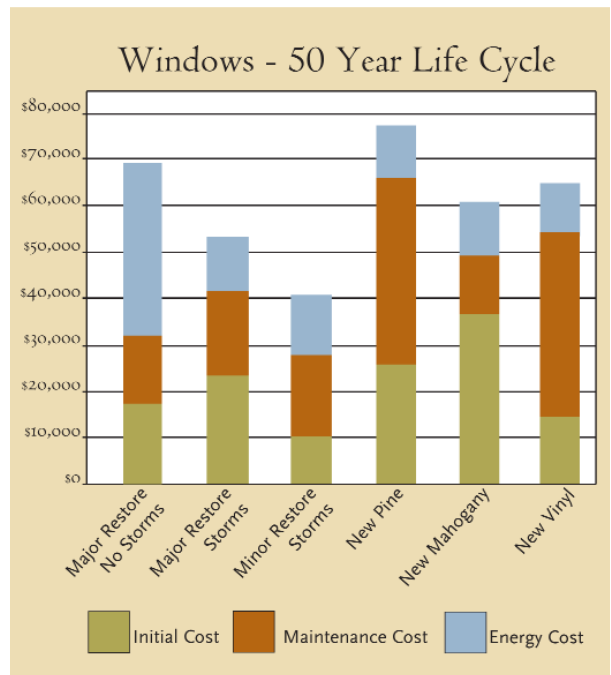
- Wood is renewable resource
- Wood is recyclable
- Wood is biodegradable
- Vinyl production releases chlorine
- Vinyl is toxic when burned
- Vinyl uses over 3x the embodied energy of wood in a typical installation

### Summary

#### Restoring Wood vs Replacing with Vinyl

- Old growth wood is extremely durable
- Initial and life cycle costs are higher for vinyl
- Easier to paint wood than to replace vinyl
- Wood windows are more environmentally responsible
- Restoration maintains historic integrity & character

VMA



# Low-Cost, Low-Maintenance Mirage

Architecture  
Preservation  
Planning  
Landscape  
Interiors

Voith & Mactavish Architects  
1616 Walnut Street, 24th Floor  
Philadelphia, PA 19103  
phone 215-545-4544 fax 125-545-3299  
voithandmactavish.com

## Roofing Comparison

### The Case for Slate

- Longest lifespan
- Texture
- Natural variegation
- Easy to repair
- 100 year warranty
- Natural slate looks like slate

### Problems with New Asphalt Shingles

- Uniformity in color and sizes
- Lack of thickness
- Bad scale / texture on large roofs
- Does not look like slate or cedar

### Problems with Aged Asphalt Shingles

- Damage to granules
- Torn shingles
- Curling
- Uneven wearing with age
- Mildew streaks

### What About

#### Composite Shingles?

- 1/2 to 1/3 price of slate
- Thickness / edge look like slate
- Color variations possible; variegation inconsistent
- 50 year warranty
- Made of recyclable products
- Lack of track record

### Slate's Environmental Benefits

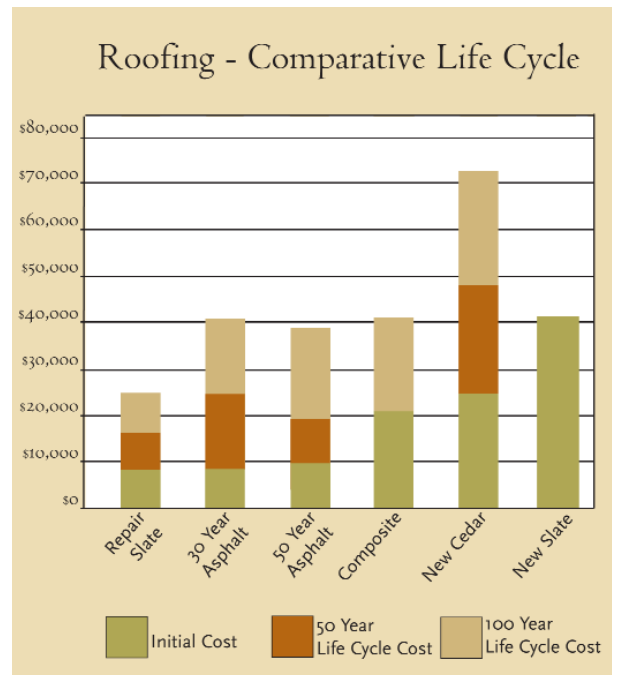
- Natural - non-renewable but relatively abundant
- Durable (100 years+)
- Half of embodied energy of asphalt
- Reusable on other buildings

### Summary

#### Restoring Slate vs Replacing with Asphalt

- Initial costs similar
- 20% lower lower life cycle cost for slate at 50 years
- Slate is more environmentally responsible
- Slate maintains historic integrity and character
- Slate is the ultimate "no maintenance" material

VMA



# Low-Cost, Low-Maintenance Mirage

Architecture  
Preservation  
Planning  
Landscape  
Interiors

Voith & Mactavish Architects  
1616 Walnut Street, 24th Floor  
Philadelphia, PA 19103  
phone 215-545-4544 fax 125-545-3299  
voithandmactavish.com

## Energy Saving Strategies

### “Typical” Old House

- Wood siding
- No insulation in walls
- No insulation in attic
- Single glazed wood windows (U-1.0)
- Old boiler (60% efficiency)

Heat Loss (btu/hr)	130,000 btu/hr
Annual Energy Bill	\$8,000

### Change 2 - Wall Insulation

- Wood Siding
- Add R-10.5 blown-in insulation in wall cavities
- No insulation in attic
- Single glazed wood windows
- Old boiler

Cost of Change	\$14,000
Energy Savings	27.7%
Savings in Heat Loss	36,000 btu/hr
Savings in Annual Bill	\$ 2,200
Energy Payback	6.5 years

### Change 4 - Storm Windows

- Wood Siding
- No insulation in walls
- No insulation in attic
- Install storm windows with regular glass - U-0.5
- Old boiler

Cost of Change	\$4,800
Energy Savings	15.0%
Savings in Heat Loss	19,600 btu/hr
Savings in Annual Bill	\$ 1,200
Energy Payback	4 years

### Change 6 - New Boiler

- Wood Siding
- No insulation in walls
- No insulation in attic
- Single glazed wood windows
- Install more efficient boiler (90% efficiency)

Cost of Change	\$6,000
Energy Savings	33%
Savings in Heat Loss	43,400 btu/hr
Savings in Annual Bill	\$2,650
Energy Payback	2.5 years

### Change 1 - New Siding

- Install insulated vinyl siding (adds R-3 to walls)
- No insulation in walls
- No insulation in attic
- Single glazed wood windows
- Old boiler

Initial Cost of Change	\$10,600
Energy Savings	15.0%
Savings in Heat Loss	19,500 btu/hr
Savings in Annual Bill	\$ 1,200
Energy Payback	9 years

### Change 3 - Attic Insulation

- Wood Siding
- No insulation in walls
- Add R-19 batt insulation to attic floor
- Single glazed wood windows
- Old boiler

Cost of Change	\$1,400
Energy Savings	39.0%
Savings in Heat Loss	50,800 btu/hr
Savings in Annual Bill	\$3,100
Energy Payback	< 1 year

### Change 5 - New Windows

- Wood Siding
- No insulation in walls
- No insulation in attic
- Install insulated vinyl windows - U-0.33
- Old boiler

Cost of Change	\$13,500
Energy Savings	18.1%
Savings in Heat Loss	23,600 btu/hr
Savings in Annual Bill	\$ 1,450
Energy Payback	9.5 years

### Change 7 – “The Best”

- Maintain wood siding
  - No insulation in walls
  - Add insulation in attic
  - Add storm windows
  - Install high efficiency boiler
- |                        |               |
|------------------------|---------------|
| Cost of Change         | \$12,100      |
| Energy Savings         | 70%           |
| Savings in Heat Loss   | 88,000 btu/hr |
| Savings in Annual Bill | \$5,400       |
| Energy Payback         | 2.25 years    |

Assumptions in Energy Comparison Calculations:

- \$3 / gallon fuel.
- 40% heat loss due to infiltration.
- 60% efficient boiler.

Note: All values and calculations have not been empirically tested, and are for general illustration only.