Greenfield, Massachusetts
Rural Development, Inc.

US Energy Consumption

INDUSTRY 25%
TRANSPORTATION 27%
BUILDINGS 48%

Source: Energy Information Administration Statistics (Architecture 2030)
http://architecture2030.org/current_situation/building_sector.html

Wisdom Way Solar Village
Mixed Income  Mixed Ability
Twenty Zero Net Energy Homes
Ten Duplexes

Architecture by Austin Design, Inc. of Colrain, Massachusetts
Wisdom Way Solar Village Features

<table>
<thead>
<tr>
<th>Energy Efficiency</th>
<th>Green Building</th>
<th>Renewable Energy</th>
<th>Amenities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triple pane U.15 windows N, E, &amp; W</td>
<td>Low flow plumbing fixtures</td>
<td>2.85 – 3.42 kW PV systems</td>
<td>More than 1 acre open</td>
</tr>
<tr>
<td>Double pane higher SHGC on South</td>
<td>Dual flush toilets</td>
<td>Solar H2O collectors for DHW</td>
<td>Community garden</td>
</tr>
<tr>
<td>R-43 cellulose walls</td>
<td>On demand gas hot water back-up</td>
<td></td>
<td>Cedar playground</td>
</tr>
<tr>
<td>R-50 cellulose ceiling</td>
<td>One gas heater, cook stove, dryer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offset double stud walls</td>
<td>No VOC paints</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy Star appliances</td>
<td>Locally grown hardwood floors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100% compact fluorescents</td>
<td>Marmoleum resilient flooring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tight air sealing</td>
<td>30% fly ash concrete</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust only ventilation</td>
<td>Fiber cement siding</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Renewable Energy

- 2.85 – 3.42 kW PV systems
- Solar H2O collectors for DHW

Amenities

- More than 1 acre open
- Community garden
- Cedar playground

Best Practices

- Homeowner education
- Native plants; none invasive
- All homes wheelchairs visitable

Certifications

- Energy Star® Tier III
- LEED® Platinum

Home Energy Rating System (HERS)

- Average American Home – 130 – 150
- Code Built Home – 100
- Energy Star Maximum – 85
- Building America Challenge maximum – 70
- WWSV – between 8 and 15
- Zero Net Energy Home – 0

Best: 0

Worst: 150
To date SIX homes in the Wisdom Way Solar Village have attained LEED Platinum certification. All twenty are expected to achieve this highest level of certification from the U.S. Green Building Council.

Wisdom Way Solar Village

Which way is south?

Leadership in Energy and Environmental Design
### Wisdom Way Energy Modeling

#### 3 Bedroom Wisdom Way Home

<table>
<thead>
<tr>
<th></th>
<th>Gas Use [Therms]</th>
<th>Gas Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline Home</td>
<td>1,331</td>
<td>$2,263</td>
</tr>
<tr>
<td>Wisdom Way Home</td>
<td>381</td>
<td>$648</td>
</tr>
</tbody>
</table>

71% Savings

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### Wisdom Way Energy Modeling

#### 3 Bedroom Wisdom Way Home

<table>
<thead>
<tr>
<th></th>
<th>Elec. Use [kWh]</th>
<th>Elec. Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline Home</td>
<td>6,687</td>
<td>$1,137</td>
</tr>
<tr>
<td>Wisdom Way Home</td>
<td>4,631</td>
<td>$767</td>
</tr>
<tr>
<td>Solar System (3kW)</td>
<td>(3,370)</td>
<td>($573)</td>
</tr>
<tr>
<td>Net Energy</td>
<td>1,261</td>
<td>$214</td>
</tr>
</tbody>
</table>

81% Savings

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### Wisdom Way Energy Modeling

#### 3 Bedroom Wisdom Way Home

<table>
<thead>
<tr>
<th></th>
<th>Total Energy Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline Home</td>
<td>$3,400</td>
</tr>
<tr>
<td>Wisdom Way Home</td>
<td>$862</td>
</tr>
</tbody>
</table>

$2,538 Savings
Air Temperatures Data

Robb Aldrich, P.E., Steven Winter Associates

It Takes a Village to Build a Village

CONSTRUCTION FINANCING for Wisdom Way Solar Village

Housing Assistance Council - SHOP 2004 & SHOP 2007
Massachusetts Housing Partnership
The Life Insurance Initiative
Community Economic Development Assistance Corporation

OTHER PARTNERS

Home Depot Foundation - USGBC LEED verifications
DOE Building America - Mechanical Engineering support
United States Department of Agriculture/Rural Development - mortgages
Franklin County Regional Housing and Redevelopment Authority - administrative

FUNDING SOURCES for the Wisdom Way Solar Village

US Department of Energy $363,900.00
Town of Greenfield CDBG* $126,900.00
Enterprise Green Communities $5,900.00
TD BankNorth Foundation $15,900.00
HAP, Inc. & Massachusetts Technology Collaborative (MTC) $307,800.00
Small Renewables Initiative (MTC) $119,130.00
Western Massachusetts Electric Company $26,900.00
Massachusetts New Homes for Energy Star $31,500.00
Home Depot Foundation $45,208.00
MA Dept. of Housing and Community Development HOME* $715,000.00
MA Affordable Housing Trust Fund* $900,000.00
MA Community Based Housing $256,458.00
Proceeds from Home Sales $2,890,000.00
Duplex Construction $159.38/sq ft Total Development Cost $215,574/ sq ft Total $5,884,420.00
Some Reasons for Success

• Excitement and support from so many organizations, both private and public;
• Building in a rural area is an advantage due to the small population pool;
• The new public awareness of climate change and the need to make our homes energy efficient and healthy to live in;
• RDI is a small organization that serves as both Developer and General Contractor.

Some Barriers to Success and to Future Development

• Incredible amount of paperwork and reporting requirements overwhelm the typically small program staff in rural areas;
• The economy is inhibiting sales of homes for moderate income buyers;
• Lack of HOME and other funds for home ownership in the near future;
• Lack of funding for Deep Energy Retrofits.

Recommendations

• Keep affordable homeownership a national priority along with rental;
• Prioritize the USDA 502 direct mortgage (rather than the 502 guaranteed);
• Keep the Section 8 to Home Ownership program viable for low-income buyers;
• Reduce or consolidate reporting requirements across all agencies;
• Insist on high energy efficiency standards in all construction that has federal funding;
• Provide funding for Deep Energy Retrofits.