High-Tunnel Growing Season Extension
Location: Hastings, MN

System Description
Two 40ft² Solar Air Heat (SAH) collectors mounted at 90 degrees. Solar thermal energy heats soil in the high-tunnel hoop-house to extend the growing-season.

Site Description and Load
- Small organic farm and orchard with local food production for market and direct sales to stores and restaurant
- Client wanted to heat soil inside the high-tunnel hoop-house to extend the growing season to 11 months per year

Production Estimate
The system provides 9.2 MMBtu of consumed energy annually.

System Cost
The owner installed their own system.
$4,000
$435/MMBtu ($1.48/Watt)

Energy Savings and Financial Performance
The total net value of the additional produce grown varies with the crops grown, market prices, agricultural expenses, and labor inputs.

<table>
<thead>
<tr>
<th>Value of 10 years thermal energy supplied (propane)</th>
<th>$3,395*</th>
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</thead>
<tbody>
<tr>
<td>25-year Internal Rate of Return (IRR)</td>
<td>14.19%*</td>
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<tr>
<td>Years to cost recovery</td>
<td>9* (not including additional agricultural production)</td>
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</tbody>
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*first year fuel cost of $2.06/gal., annual fuel escalation rate of 5.32%, offsetting 80% efficient furnace, 33% tax bracket, 5 year solar depreciation,