Our Objective

Design a residential community for:

– Comfort
– Affordability
– Efficiency
– MARKETABILITY

GreenLEAF – Green Living. Efficiently and Affordably for Families
Project Evolution

• Third Semester
  – IPRO 323 (Fall 2009)
    • Zero CommunIITy – Developed an almost completely self-sustaining house

– IPRO 358 (Fall 2010)
  • Green Class Community – Expounded upon 323’s ideas and further reduced energy consumption
Market Research

- **Target Market:**
  - Mostly 2-person households
  - 1 or less occupants per room
  - 3 bed-rooms are popular

- **Survey added information**
  - Garage
  - Central Park
    - Garden
  - Home Control System re-evaluation
Industry Information

• Where is market heading?

• Price-sensitive consumers

• Average listing price

• What about eco-friendly?

• Environmentally friendly ...with focus on savings

• Upfront costs repaid
Basement Level
Ground Level
Building Envelope

- **Advanced Framing**
  - Less wood, more cost effective
  - Less heat loss

- **R-28 Blown Insulation**
Passive Design

High Efficiency Windows
- Double Low E

Window shades (automatic)
- Reduce unnecessary solar heat gain in summer months
**Active Systems**

Geothermal (GSHP)
- Extremely efficient
- Used in both heating and cooling applications
- Serves as a preheater to domestic hot water

Solar Hot Water Heating Panels
- Carries demand for domestic hot water

Energy Recovery Ventilator (ERV)
- Extracts heat from exhaust air and heats intake air used in ventilation
- Controls humidity in house
Energy Use

11,430 kWh
ANNUAL ELECTRIC CONSUMPTION
Energy Comparison

76% REDUCTION

Active System Payback time < 8 years
Home Control System

Luxury market only?

“Cool” Factor

Energy Savings Factor

How We Use Energy in Our Homes

- Space Heating: 31%
- Space Cooling: 8%
- Water Heating: 9%
- Lighting: 12%
- Computer & Electronics: 11%
- Appliances: 12%
- Refrigeration: 9%
Home Control System

**Lighting and Shading**

- **Sensors**
  - Daylight and Occupancy
  - Natural vs Artificial
  - Unoccupied Spaces
- **Controls Solar Heat Gain**
- **Heating/Cooling**
  - Reduction of 10%
- **Reduces Glare**

**Energy Monitoring**

- Real Time
- Highly Accurate

<table>
<thead>
<tr>
<th>Dimming Lights</th>
<th>Electricity Savings</th>
<th>Extends bulb life</th>
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<tbody>
<tr>
<td>10%</td>
<td>10%</td>
<td>2 times longer</td>
</tr>
<tr>
<td>25%</td>
<td>20%</td>
<td>4 times longer</td>
</tr>
<tr>
<td>50%</td>
<td>40%</td>
<td>20 times longer</td>
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Financials

40% • Investor Funded
60% • Bank Funded

• Offer investors 18.36% return

Sold Immediately
• Reduce Interest
• Assist with investor return

Rent to Buy Scheme
• Draw in uncertain customers

• Selling price: $400,000

GreenLEAF
Community