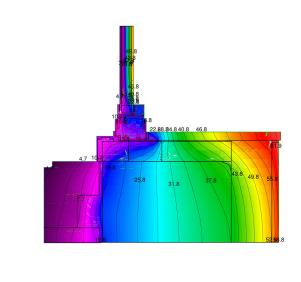
## Washington County Housing Types









### Type 1:

Farmhouse, 150 yrs. 1,600 ft<sup>2</sup> 12,000 ft<sup>3</sup>

Window-wall ratios:

N:.25, S:.30, E/W: .17

Avg. Envelope U: .12 Annual Fuel Use: \$4,000

10-yr. Fuel Use: \$40,000

Typical Fix: \$10/ft^2 Initial Cost: \$16,000.

10-yr. fuel use: \$18,000

Total: \$34,000

10-yr Simple Payback:

\$6,000/37.5%

### Type 2:

Modular, 15 yrs.

1,000 ft^2

8,000 ft^3

Window-wall ratios:

N:.20, S:.20, E/W: .15

Avg. Envelope U: .17

Annual Fuel Use: \$3,000

10-yr. Fuel Use: \$30,000

Typical Fix: \$10/ft^2 Initial Cost: \$10,000.

10-yr. fuel use: \$12,000

Total: \$22,000

10-yr Simple Payback:

\$8,000/36.4%

### Type 3:

Cape, 120 yrs.

1,200 ft^2

9,600 ft^3

Window-wall ratios:

N:.20, S:.25, E/W: .20

Avg. Envelope U: .25

Annual Fuel Use: \$4,000

10-yr. Fuel Use: \$40,000

Typical Fix: \$25/ft^2 Initial Cost: \$25,000.

10-yr. fuel use: \$18,000

Total: \$43,000

10-yr Simple Payback:

\$-3,000/ -15%

Space Cool 0.05 1.29 1.50 2.04 3.44 1.90 0.13 10.  teat Reject	rojecy italii. 100i	NDERS ENV	LLOFL - De	aseiine Des	<u>ign</u>						Run D	ate/Time:	03/04/12	
(x000) (x000,000) 300 300 300 300 300 300 300 300 300	E	lectric (	Consun	nption	(kWh)	1			Gas	Consu	mption	(Btu)		
Area Lighting   Exterior Usage   Water Heating   Heat Rejection   Space Cooling	<b></b>			-			(v0	00 000)			-			
Area Lighting   Task Lighting   Misc. Equipment   Exterior Usage   Pumps & Aux.   Ventilation Fans   Venti							(XU							
Area Lighting Task Lighting T	10							-						
Nisc. Equipment   Ventilation Fans   Space Heating   Space Cooling   Space Cool   Spac	-	Area	Lighting	Jul Aug	Exterio	or Usage		Jar Water H	leating		Refrigera	tion	Oct Nov D	ec ec
Heat Reject.    Peter Reject   Peter														
Refrigeration	Electric Consu				Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Heat  IP Supp.  IP S	Electric Consu  Space Cool			Mar								Nov -	Dec -	
HP Supp.	Space Cool Heat Reject.	Jan -		Mar -	0.05	1.29	1.50		3.44	1.90	0.13	Nov - -	Dec - -	
Hot Water	Space Cool Heat Reject. Refrigeration	Jan - -	Feb - -	Mar -	0.05	1.29	1.50 -	2.04	3.44 -	1.90	0.13 -	-	-	
Vent. Fans	Space Cool Heat Reject. Refrigeration Space Heat	Jan - -	Feb - -	Mar -	0.05	1.29 - - -	1.50 -	2.04 - - -	3.44 -	1.90	0.13 -	-	-	
Pumps & Aux.	Space Cool Heat Reject. Refrigeration Space Heat HP Supp.	Jan	Feb	Mar	0.05 - - - -	1.29 - - - -	1.50 - - - -	2.04 - - - -	3.44 - - -	1.90 - - - -	0.13 - - - -	- - - -	- - - -	
Ext. Usage	Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water	Jan	Feb	Mar	0.05 - - - - -	1.29 - - - - -	1.50 - - - - -	2.04 - - - - -	3.44 - - - - -	1.90 - - - - -	0.13 - - - - -	- - - -	- - - -	10.3 - - - -
Aisc. Equip. 6.29 7.22 6.29 5.93 8.33 6.13 4.04 4.51 6.72 7.99 7.62 3.92 75.  Fask Lights	Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans	Jan 0.90	Feb 1.06	Mar 0.90	0.05 - - - - - - 0.84	1.29 - - - - - 1.23	1.50 - - - - - - 1.11	2.04 - - - - - - 0.92	3.44 - - - - - 1.05	1.90 - - - - - - 1.07	0.13 - - - - - 1.17	- - - - - 1.12	- - - - - 0.50	10.3
Task Lights 4.96 5.63 4.96 4.68 6.47 4.47 2.69 2.95 5.12 6.22 5.94 3.21 57.  Total 13.03 14.71 13.03 12.19 17.63 13.33 9.69 11.97 14.90 16.01 15.46 8.51 160.  Task Consumption (Btu x000,000)    Jan   Feb   Mar   Apr   May   Jun   Jul   Aug   Sep   Oct   Nov   Dec   Total	Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans Pumps & Aux.	Jan 0.90 0.88	Feb  1.06 0.80	Mar 0.90 0.88	0.05 - - - - - 0.84 0.69	1.29 - - - - - 1.23 0.32	1.50 - - - - - 1.11 0.11	2.04 - - - - - 0.92	3.44 - - - - 1.05 0.01	1.90 - - - - - 1.07 0.09	0.13 - - - - 1.17 0.50	- - - - - 1.12 0.78	- - - - - 0.50	Total 10.30
Area Lights	Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans Pumps & Aux. Ext. Usage	Jan 0.90 0.88	Feb  1.06 0.80	Mar 0.90	0.05 - - - - - 0.84 0.69	1.29 - - - - - 1.23 0.32	1.50 - - - - - 1.11 0.11	2.04 - - - - - 0.92 -	3.44 - - - - 1.05 0.01	1.90 - - - - - 1.07 0.09	0.13 - - - - 1.17 0.50	- - - - 1.12 0.78	- - - - - 0.50 0.87	10.36 - - - - - 11.8 5.9
Total 13.03 14.71 13.03 12.19 17.63 13.33 9.69 11.97 14.90 16.01 15.46 8.51 160.    Sas Consumption (Btu x000,000)	Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans Pumps & Aux. Ext. Usage Misc. Equip.	Jan	Feb 1.06	Mar	0.05 - - - - 0.84 0.69 - 5.93	1.29 - - - - 1.23 0.32 - 8.33	1.50 - - - - 1.11 0.11 - 6.13	2.04 - - - - 0.92 - - 4.04	3.44 - - - - 1.05 0.01	1.90 - - - - 1.07 0.09 - 6.72	0.13 - - - - 1.17 0.50 - 7.99	- - - - - 1.12 0.78 - 7.62	- - - - - 0.50 0.87 - 3.92	10.3 - - - - - 11.8 5.9
Space Cool	Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans Pumps & Aux. Ext. Usage Misc. Equip. Task Lights	Jan 0.90 0.88 - 6.29	Feb  1.06 0.80 - 7.22	Mar	0.05 - - - - 0.84 0.69 - 5.93	1.29 - - - - 1.23 0.32 - 8.33	1.50 - - - - 1.11 0.11 - 6.13	2.04 - - - - 0.92 - - 4.04	3.44 - - - 1.05 0.01 - 4.51	1.90 - - - - 1.07 0.09 - 6.72	0.13 - - - - 1.17 0.50 - 7.99	- - - - - 1.12 0.78 - 7.62	- - - - 0.50 0.87 - 3.92	10.36 
Space Cool	Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans Pumps & Aux. Ext. Usage Misc. Equip.	Jan 0.90 0.88 - 6.29 - 4.96	Feb  1.06 0.80 - 7.22 - 5.63	Mar 0.90 0.88 - 6.29 - 4.96	0.05 - - - - 0.84 0.69 - 5.93 - 4.68	1.29 - - - 1.23 0.32 - 8.33 - 6.47	1.50 - - - - 1.11 0.11 - 6.13 - 4.47	2.04 - - - 0.92 - 4.04 - 2.69	3.44 - - - 1.05 0.01 - 4.51 - 2.95	1.90 - - - 1.07 0.09 - 6.72 - 5.12	0.13 - - - 1.17 0.50 - 7.99 - 6.22	- - - - 1.12 0.78 - 7.62	- - - - 0.50 0.87 - 3.92 - 3.21	10.3 
Heat Reject.	Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans Pumps & Aux. Ext. Usage Misc. Equip. Task Lights Area Lights Total	Jan 0.90 0.88 - 6.29 - 4.96 13.03	Feb  1.06 0.80 - 7.22 - 5.63 14.71	Mar	0.05 - - - - 0.84 0.69 - 5.93 - 4.68	1.29 - - - 1.23 0.32 - 8.33 - 6.47	1.50 - - - - 1.11 0.11 - 6.13 - 4.47	2.04 - - - 0.92 - 4.04 - 2.69	3.44 - - - 1.05 0.01 - 4.51 - 2.95	1.90 - - - 1.07 0.09 - 6.72 - 5.12	0.13 - - - 1.17 0.50 - 7.99 - 6.22	- - - - 1.12 0.78 - 7.62	- - - - 0.50 0.87 - 3.92 - 3.21	10.3 
Refrigeration	Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans Pumps & Aux. Ext. Usage Misc. Equip. Task Lights Area Lights Total  Gas Consumpt	Jan	Feb	Mar	0.05 - - - 0.84 0.69 - 5.93 - 4.68 12.19	1.29 - - - 1.23 0.32 - 8.33 - 6.47 17.63	1.50 - - - - 1.11 0.11 - 6.13 - 4.47 13.33	2.04 - - - 0.92 - 4.04 - 2.69 9.69	3.44 - - - 1.05 0.01 - 4.51 - 2.95 11.97	1.90 - - - 1.07 0.09 - 6.72 - 5.12 14.90	0.13 - - - 1.17 0.50 - 7.99 - 6.22 16.01	- - - - 1.12 0.78 - 7.62 - 5.94 15.46	- - - - 0.50 0.87 - 3.92 - 3.21 8.51	10.3 
Space Heat 245.3 161.4 121.4 71.2 13.3 3.2 - 0.0 1.3 28.7 87.2 171.4 904   HP Supp	Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans Pumps & Aux. Ext. Usage Misc. Equip. Task Lights Area Lights Total  Gas Consumpt	Jan	Feb	Mar	0.05 0.84 0.69 - 5.93 - 4.68 12.19	1.29	1.50 - - - 1.11 0.11 - 6.13 - 4.47 13.33	2.04 - - - 0.92 - 4.04 - 2.69 9.69	3.44 - - - 1.05 0.01 - 4.51 - 2.95 11.97	1.90 - - - 1.07 0.09 - 6.72 - 5.12 14.90	0.13 - - - 1.17 0.50 - 7.99 - 6.22 16.01	- - - - 1.12 0.78 - 7.62 - 5.94 15.46	- - - - 0.50 0.87 - 3.92 - 3.21 8.51	10.3 
AP Supp	Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans Pumps & Aux. Ext. Usage Misc. Equip. Task Lights Area Lights Total  Space Cool Heat Reject.	Jan	Feb	Mar	0.05 0.84 0.69 - 5.93 - 4.68 12.19	1.29 1.23 0.32 8.33 6.47 17.63	1.50 - - - 1.11 0.11 - 6.13 - 4.47 13.33	2.04 - - - 0.92 - 4.04 - 2.69 9.69	3.44 - - - 1.05 0.01 - 4.51 - 2.95 11.97	1.90 - - - 1.07 0.09 - 6.72 - 5.12 14.90	0.13 1.17 0.50 - 7.99 - 6.22 16.01	- - - - 1.12 0.78 - 7.62 - 5.94 15.46	- - - 0.50 0.87 - 3.92 - 3.21 8.51	10.3 
Hot Water 19.0 22.4 19.8 18.3 23.3 14.4 7.7 8.0 14.6 18.8 19.4 11.5 1977   Pent. Fans	Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans Pumps & Aux. Ext. Usage Misc. Equip. Task Lights Area Lights Total  Space Cool Heat Reject. Refrigeration	Jan	Feb	Mar	0.05	1.29	1.50 - - - - 1.11 0.11 - 6.13 - 4.47 13.33	2.04 - - - 0.92 - 4.04 - 2.69 9.69	3.44 - - - 1.05 0.01 - 4.51 - 2.95 11.97	1.90 - - - 1.07 0.09 - 6.72 - 5.12 14.90	0.13 1.17 0.50 - 7.99 - 6.22 16.01	- - - - 1.12 0.78 - 7.62 - 5.94 15.46	- - - 0.50 0.87 - 3.92 - 3.21 8.51	10.3 11.8 5.9 75.0 57.3 160.4
Vent. Fans	Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans Pumps & Aux. Ext. Usage Misc. Equip. Task Lights Area Lights Total  Space Cool Heat Reject. Refrigeration Space Heat	Jan	Feb	Mar	0.05 0.84 0.69 - 5.93 - 4.68 12.19  Apr 71.2	1.29	1.50 - - - - 1.11 0.11 - 6.13 - 4.47 13.33	2.04 - - - 0.92 - 4.04 - 2.69 9.69	3.44 1.05 0.01 4.51 2.95 11.97  Aug 0.0	1.90 - - - 1.07 0.09 - 6.72 - 5.12 14.90 Sep	0.13 1.17 0.50 - 7.99 - 6.22 16.01  Oct 28.7			10.3 11.8 5.9 75.0 57.3 160.4
Pumps & Aux	Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans Pumps & Aux. Ext. Usage Misc. Equip. Task Lights Area Lights Total  Space Cool Heat Reject. Refrigeration Space Heat HP Supp.	Jan	Feb	Mar	0.05 0.84 0.69 5.93 4.68 12.19  Apr 71.2	1.29	1.50 - - - 1.11 0.11 - 6.13 - 4.47 13.33	2.04 - - - 0.92 - 4.04 - 2.69 9.69	3.44 1.05 0.01 4.51 2.95 11.97  Aug 0.0	1.90 - - - 1.07 0.09 - 6.72 - 5.12 14.90 Sep	0.13 1.17 0.50 - 7.99 - 6.22 16.01  Oct 28.7			10.3 11.8 5.9 75.0 57.3 160.4
Ext. Usage	Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans Pumps & Aux. Ext. Usage Misc. Equip. Task Lights Area Lights Total  Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water	Jan	Feb	Mar	0.05 0.84 0.69 5.93 4.68 12.19  Apr 71.2 18.3	1.29	1.50 1.11 0.11 - 6.13 - 4.47 13.33	2.04 - - - 0.92 - 4.04 - 2.69 9.69 Jul	3.44 1.05 0.01 4.51 2.95 11.97  Aug 0.0 8.0	1.90 - - - 1.07 0.09 - 6.72 - 5.12 14.90 Sep	0.13 1.17 0.50 - 7.99 - 6.22 16.01  Oct 28.7 - 18.8			10.3  11.8 5.9  75.0  57.3 160.4  Total
Aisc. Equip. 2.1 2.5 2.1 2.0 2.9 1.9 1.1 1.2 2.2 2.7 2.6 1.2 24  Task Lights	Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans Pumps & Aux. Ext. Usage Misc. Equip. Task Lights Area Lights Total  Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans	Jan	Feb	Mar	0.05 0.84 0.69 5.93 4.68 12.19  Apr 71.2 18.3	1.29	1.50 1.11 0.11 - 6.13 - 4.47 13.33	2.04 0.92 - 4.04 - 2.69 9.69  Jul 7.7	3.44 1.05 0.01 4.51 2.95 11.97  Aug 0.0 8.0	1.90 - - - 1.07 0.09 - 6.72 - 5.12 14.90 Sep	0.13 1.17 0.50 - 7.99 - 6.22 16.01  Oct 28.7 - 18.8	1.12 0.78 7.62 - 5.94 15.46 Nov 87.2 - 19.4		11.8 5.9 75.0 57.3 160.4 Total 904.
ask Lights	Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans Pumps & Aux. Ext. Usage Misc. Equip. Task Lights Area Lights Total  Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans Pumps & Aux.	Jan	Feb	Mar	0.05 0.84 0.69 5.93 4.68 12.19  Apr 71.2 18.3	1.29	1.50 1.11 0.11 - 6.13 - 4.47 13.33	2.04 0.92 - 4.04 - 2.69 9.69  Jul	3.44 1.05 0.01 4.51 2.95 11.97  Aug 0.0 8.0	1.90 1.07 0.09 - 6.72 - 5.12 14.90  Sep 1.3 - 14.6	0.13 1.17 0.50 - 7.99 - 6.22 16.01  Oct 28.7 - 18.8	1.12 0.78 7.62 - 5.94 15.46 Nov 87.2 - 19.4		11.8 5.9 75.0 57.3 160.4 <b>Total</b> 904.
Area Lights	Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans Pumps & Aux. Ext. Usage Misc. Equip. Task Lights Area Lights Total  Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans Pumps & Aux. Ext. Usage	Jan	Feb	Mar	0.05 0.84 0.69 5.93 4.68 12.19  Apr 71.2 18.3	1.29	1.50 1.11 0.11 - 6.13 - 4.47 13.33	2.04 0.92 - 4.04 - 2.69 9.69  Jul	3.44 1.05 0.01 4.51 2.95 11.97  Aug 0.0 8.0	1.90 1.07 0.09 - 6.72 - 5.12 14.90  Sep 1.3 - 14.6	0.13 1.17 0.50 - 7.99 - 6.22 16.01  Oct 28.7 - 18.8	1.12 0.78 5.94 15.46 Nov 87.2 - 19.4		10.3  11.8  5.9  75.0  57.3  160.4  Total  904.
	Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans Pumps & Aux. Ext. Usage Misc. Equip. Task Lights Area Lights Total  Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans Pumps & Aux. Ext. Usage Misc. Equip.	Jan	Feb	Mar	0.05 0.84 0.69 5.93 4.68 12.19  Apr 18.3 2.0	1.29 1.23 0.32 8.33 6.47 17.63	1.50	2.04 0.92 - 4.04 - 2.69 9.69  Jul 7.7 1.1	3.44 1.05 0.01 4.51 2.95 11.97  Aug 0.0 8.0 1.2	1.90 1.07 0.09 - 6.72 - 5.12 14.90  Sep 1.3 - 14.6 2.2	0.13 1.17 0.50 - 7.99 - 6.22 16.01  Oct 18.8 2.7			11.8 5.9 75.0 57.3 160.4 Total
MANUE COURT 10010 17310 2110 1710 1710 1717 77 101 107 1077 10411 1178	Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans Pumps & Aux. Ext. Usage Misc. Equip. Task Lights Area Lights Total  Space Cool Heat Reject. Refrigeration Space Heat HP Supp. Hot Water Vent. Fans Pumps & Aux. Ext. Usage Misc. Equip. Task Lights	Jan	Feb	Mar	0.05 0.84 0.69 5.93 4.68 12.19  Apr 18.3 2.0	1.29 1.23 0.32 8.33 6.47 17.63	1.50 1.11 0.11 6.13 4.47 13.33   Jun 3.2 14.4 1.9	2.04 0.92 4.04 2.69 9.69  Jul	3.44 1.05 0.01 4.51 2.95 11.97  Aug 0.0 8.0 1.2	1.90 1.07 0.09 6.72 5.12 14.90  Sep 1.3 14.6 2.2	0.13 1.17 0.50 - 7.99 - 6.22 16.01  Oct 28.7 - 18.8 2.7			11.8 5.9 75.0 57.3 160.4 Total

## A Public/Private Partnership

### **Board of Directors**

Areas of Expertise:

Initial Funding

Organizational Development

**Existing Players** 

Design/Construction

**Financial Controls** 

Community Outreach

Governmental Affairs

**Energy Services** 

### Kick-Off Steps

Elevator Pitch
Identify Requirements
Initial Funding Sources
First Hire!
Incorporate
Write Business Plan
Federal/State Liaison

# Getting to Scale Identify Investors

CEI

Private Sources

MDF

MCF

#### Crunch numbers:

Survey Housing Stock Realistic Interventions Public Good Component

