

A Year of Zero Energy Homes

Li Ling Young, Efficiency Vermont
VECAN Annual Conference 2014

Do you want to keep paying for heat?

-Eric Corey Freed

A simple wooden stool with a round, dark brown seat and three light brown, slightly curved legs. The legs are joined at the base by a horizontal wooden crossbar. The stool is positioned in the center of the frame against a plain, light blue background.

Energy Efficiency

Heat Pumps

Renewable Energy

Smaller Systems are More Stable



Heat Pumps

Energy Efficiency

Renewable Energy

Least Cost Zero Energy Home



Mini-split

**Near-Deep Energy
Retrofit**

Roof Mounted PV

Asbestos

Lead

OBSTACLE COURSE

Vermiculite

Mold

Structural Problems

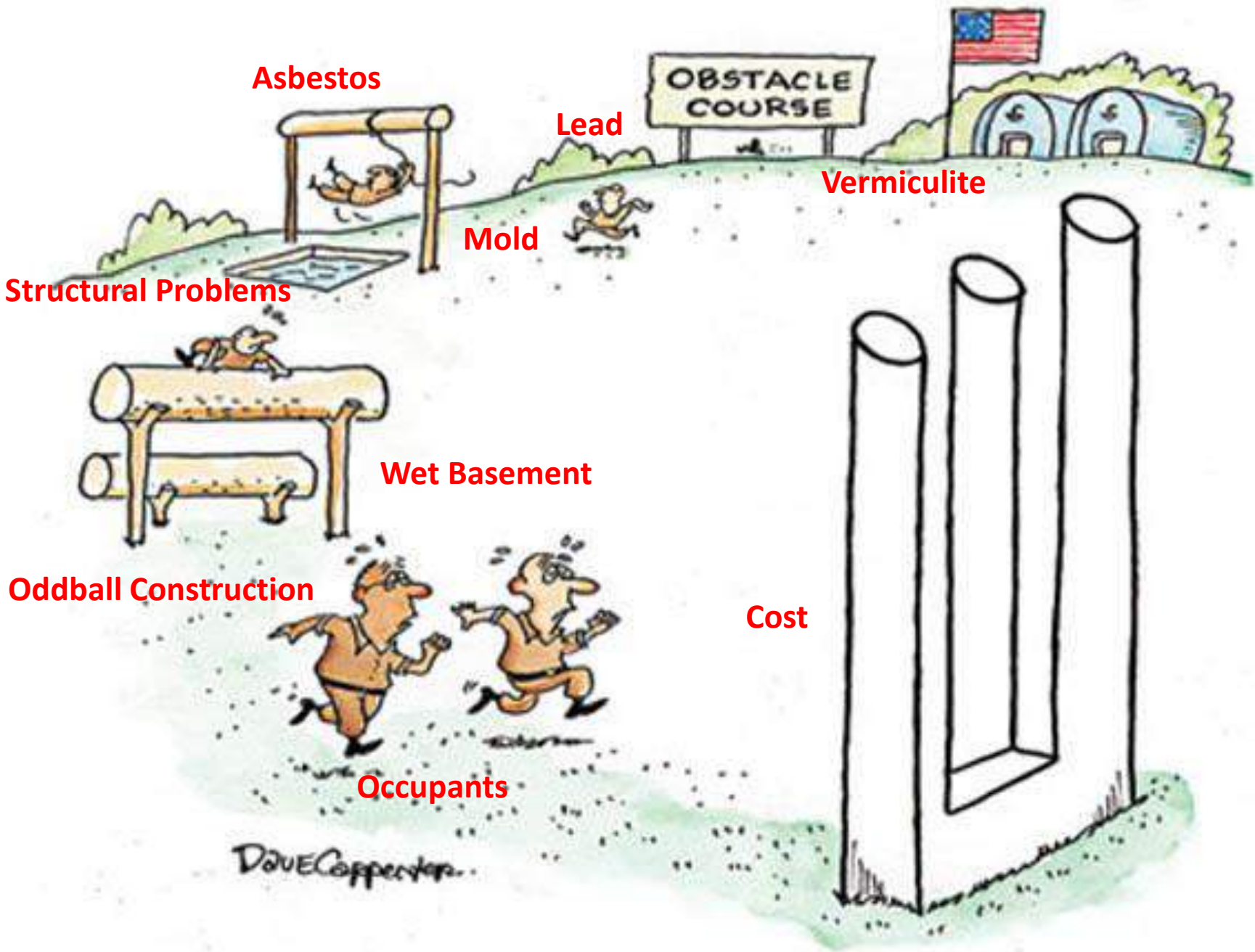
Wet Basement

Oddball Construction

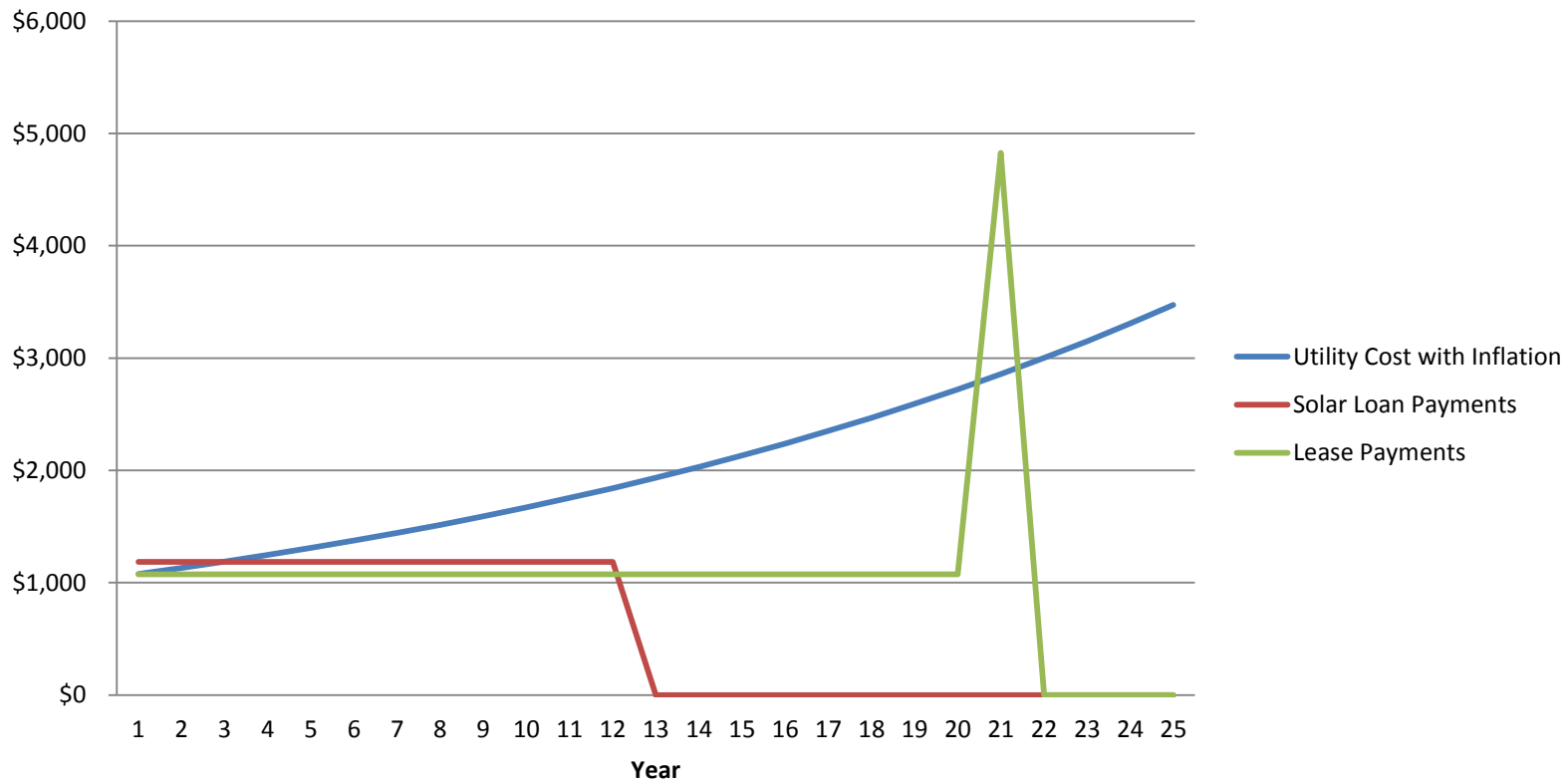
Cost

Occupants

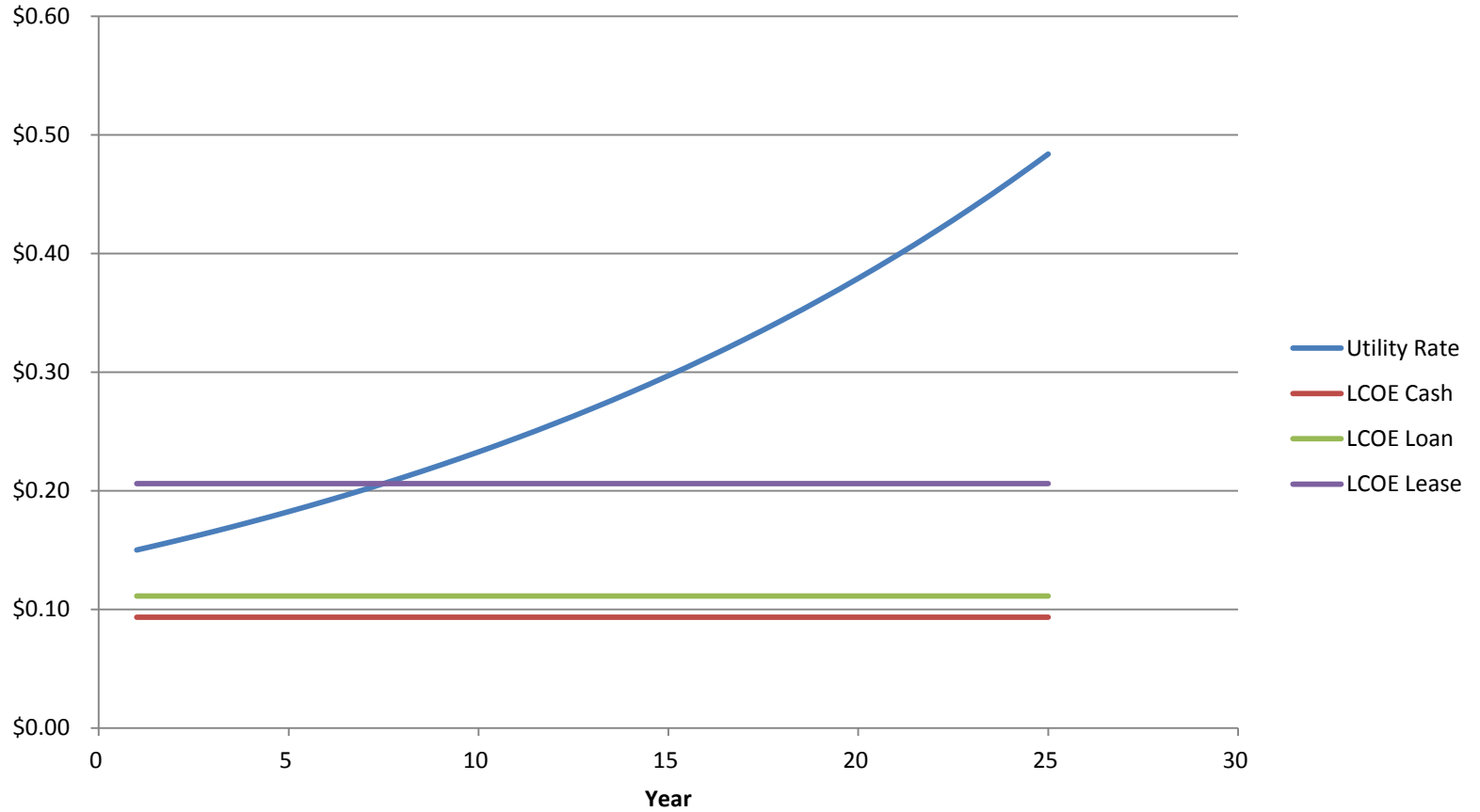
Dave Copper



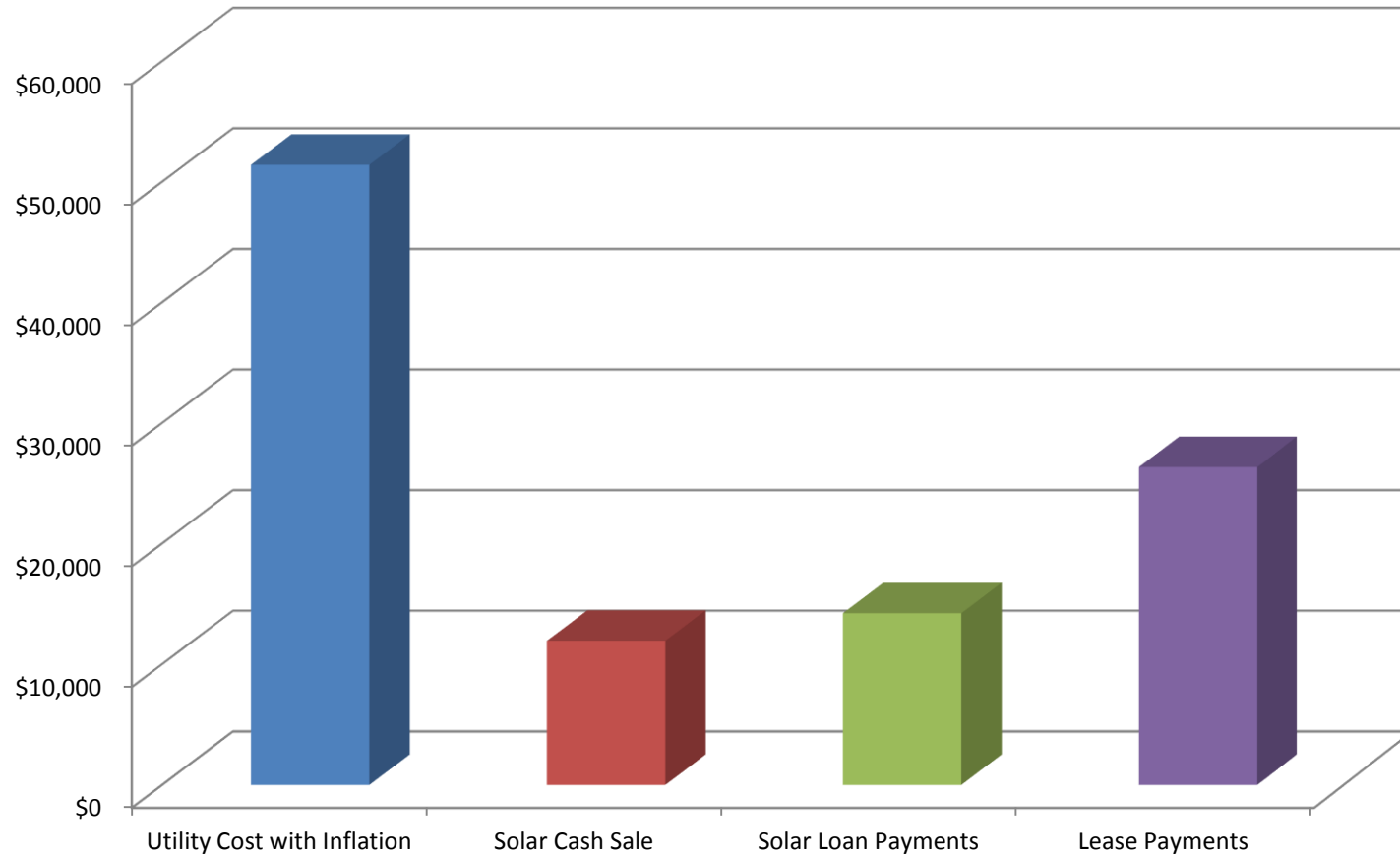
Electricity Cost Over 25 Years



Electric Rates Over 25 Years



Total Cost Over 25 Years





- Removed oil furnace, oil water heater
- Improved insulation and air sealing
- Installed wood stove, 2 mini-splits, heat pump water heater
- 7 kW Solar PV

- Newly finished basement
- Huge new “shed”
- Sorely needed new siding and correction of rain intrusion

		Energy							
		Before		After				Total Savings	
		565 gal oil, 2 cords wood	Heat	\$ 2,610.00	\$ 415.00	1 cord+ 1500 kWh			
		123 gal	DHW	\$ 494.00	\$ 64.00	400 kWh			\$ 2,625.00
		3489 kWh	electricity	\$ 521.92	521.91951				
			total	\$ 3,625.92					
			Insulation and Air Sealing		Incentives				Net Costs
			\$ 7,700.00		\$ 870.00	EVT incentive			\$ 36,235.00
			Mini-splits						
			\$ 10,000.00						
			Solar		\$ 1,750.00	state incentive			
			\$ 25,900.00		\$ 7,245.00	fed tax credit			
			HPWH						
			\$ 2,900.00		\$ 400.00	EVT incentive			
Analysis									
Before		loan payment							
monthly bills	\$ 302.16	(\$259.60)		(\$239.13)	(\$420.72)				
		interest rate	6%	5%	7%				
		term, years	20	20	10				

Zero Energy Homes

- 10 Presentations



Chelsea



Manchester

✓ Baseline energy-consciousness
in the community matters

Zero Energy Homes

- From left field, right field, and in-house

✓ There is an unmet need

Zero Energy Homes

- Consultations are enjoyable and LONG



✓ A coach/advocate is essential

Zero Energy Homes

- These are complex jobs.

✓ Zero Energy Academy needed

Zero Energy Homes

- Big cost, but people are doing it.

✓ Leverage the early enthusiasm



Zero Energy Homes

- Baseline energy consciousness matters
- There is an unmet need for support of ZEH
- A coach/advocate is essential
- Zero Energy Academy needed
- Leverage the early enthusiasm

Get on the Path to a Zero Energy Home

- Doing nothing is losing you money
- Make a plan
- Every bit of work must align with the plan
- Don't waste your money or your time
- Recognize this is probably a multi-phase process
- Get started now
- Work with your neighbors for community supported energy

Path to Zero Energy

Community Solar

Air sealing and
insulation

Fuel displacement

Window treatment

Water heater
replacement

Roof-mounted solar

Rebuild the walls

Mini-splits

Electric car

Water conservation

