

# **Rob and Melani Walton Sustainability Solutions Initiatives**

**Lessons from the  
North American Net Zero Leadership Summit**

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**[sustainabilitysolutions.asu.edu](http://sustainabilitysolutions.asu.edu)**

## At the core: solutions





[Summit Overview](#)

[Register](#)

[Agenda](#)

[Participation](#)

[Contact](#)

Irvine, California

**October 8-10<sup>th</sup> 2013**

In conjunction with the U.S. Department of Energy Solar Decathlon 2013



UC Davis West Village Community. (Photo by Karin Higgins/UC Davis)

[Register](#)

Registration is now closed

[Agenda](#)

[Participate](#)

*A ground-breaking summit that will result in  
"mapping the path to zero" for net-zero energy  
homes and communities across North America.*

[Learn more](#)



Inquiries

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Connect with us



# What is a Zero Net Energy Home?

- Energy consumption = energy production
- On-grid vs. off-grid
- Site energy vs. source energy
- Zero net energy vs. zero carbon
- Zero net energy vs. zero \$ utility bills

2003



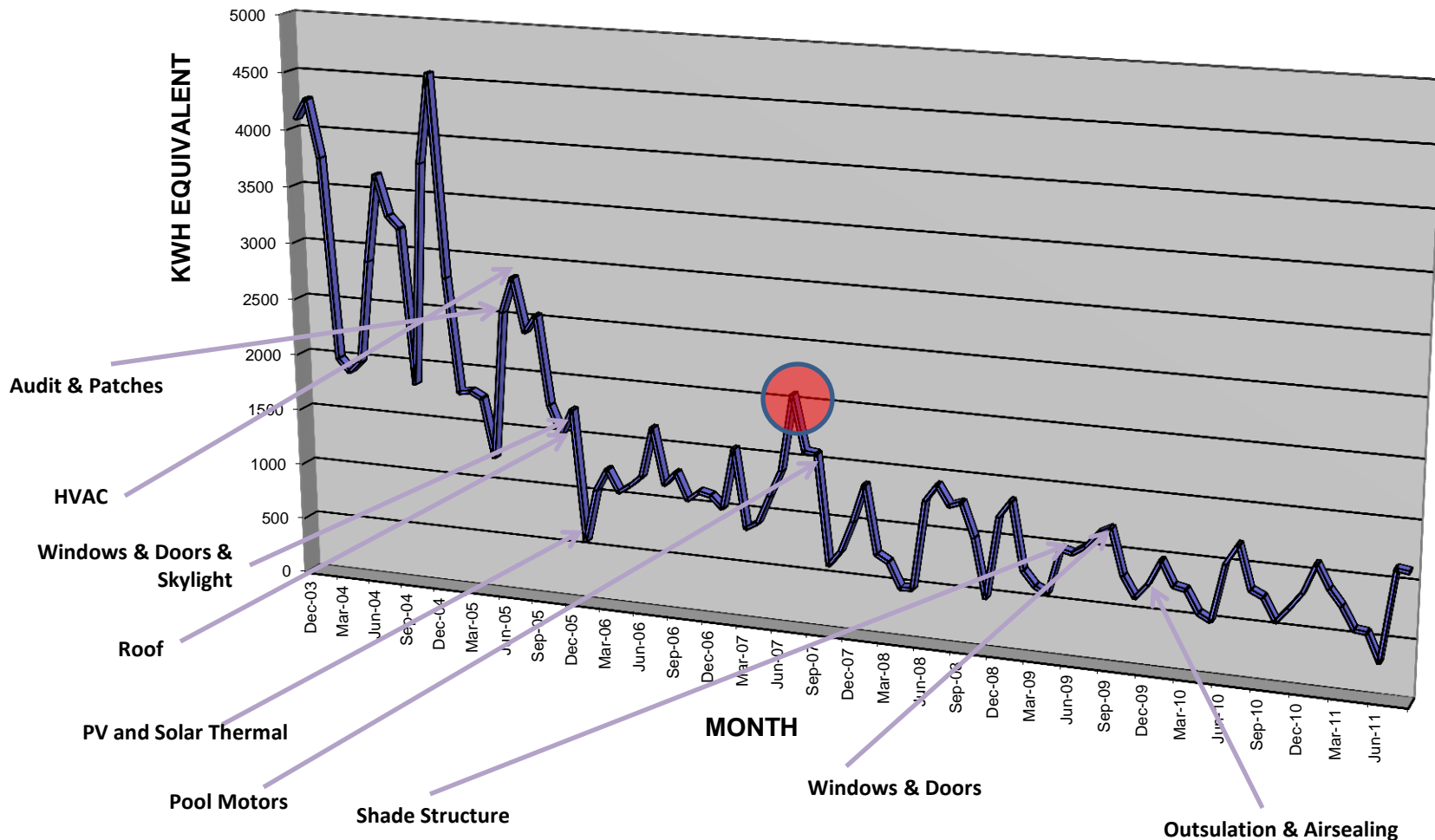


**76% reduction  
in annual KWH  
Equivalent  
energy usage  
(2012 vs. 2004)**





## NET GRID KWH EQUIVALENT ENERGY USAGE





## Costs and ROI

ECM Costs	Energy Cost Savings
\$42,682	\$1144 current annual
	Divided by 75% =
	\$3432/year
Simple Payback	<b>12.44 Years</b>
	Assumes no energy inflation

Low Hanging Fruit	Assume 25% of savings
\$150 + \$100 for audit	$\$3432 \times 25\% = \$858$
Simple Payback	$\$250 / \$858 = 0.3 = \mathbf{4 \text{ mos}}$
But that doesn't get us to	where we need to go



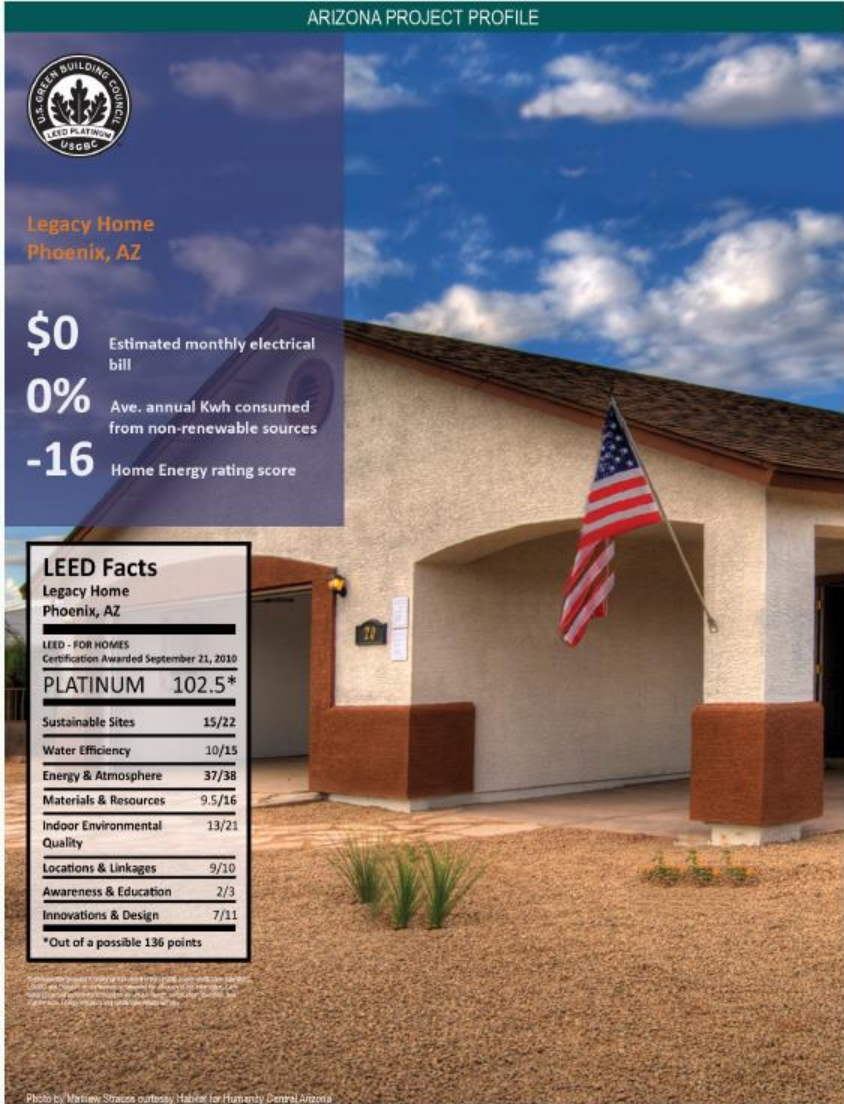
## Apply the lessons







ARIZONA PROJECT PROFILE



**U.S. Green Building Council  
LEED PLATINUM  
USGBC**

**Legacy Home  
Phoenix, AZ**

**\$0** Estimated monthly electrical bill

**0%** Ave. annual Kwh consumed from non-renewable sources

**-16** Home Energy rating score

**LEED Facts**  
Legacy Home  
Phoenix, AZ

LEED - FOR HOMES  
Certification Awarded September 21, 2010

**PLATINUM 102.5\***

Sustainable Sites	15/22
Water Efficiency	10/15
Energy & Atmosphere	37/38
Materials & Resources	9.5/16
Indoor Environmental Quality	13/21
Locations & Linkages	9/10
Awareness & Education	2/3
Innovations & Design	7/11

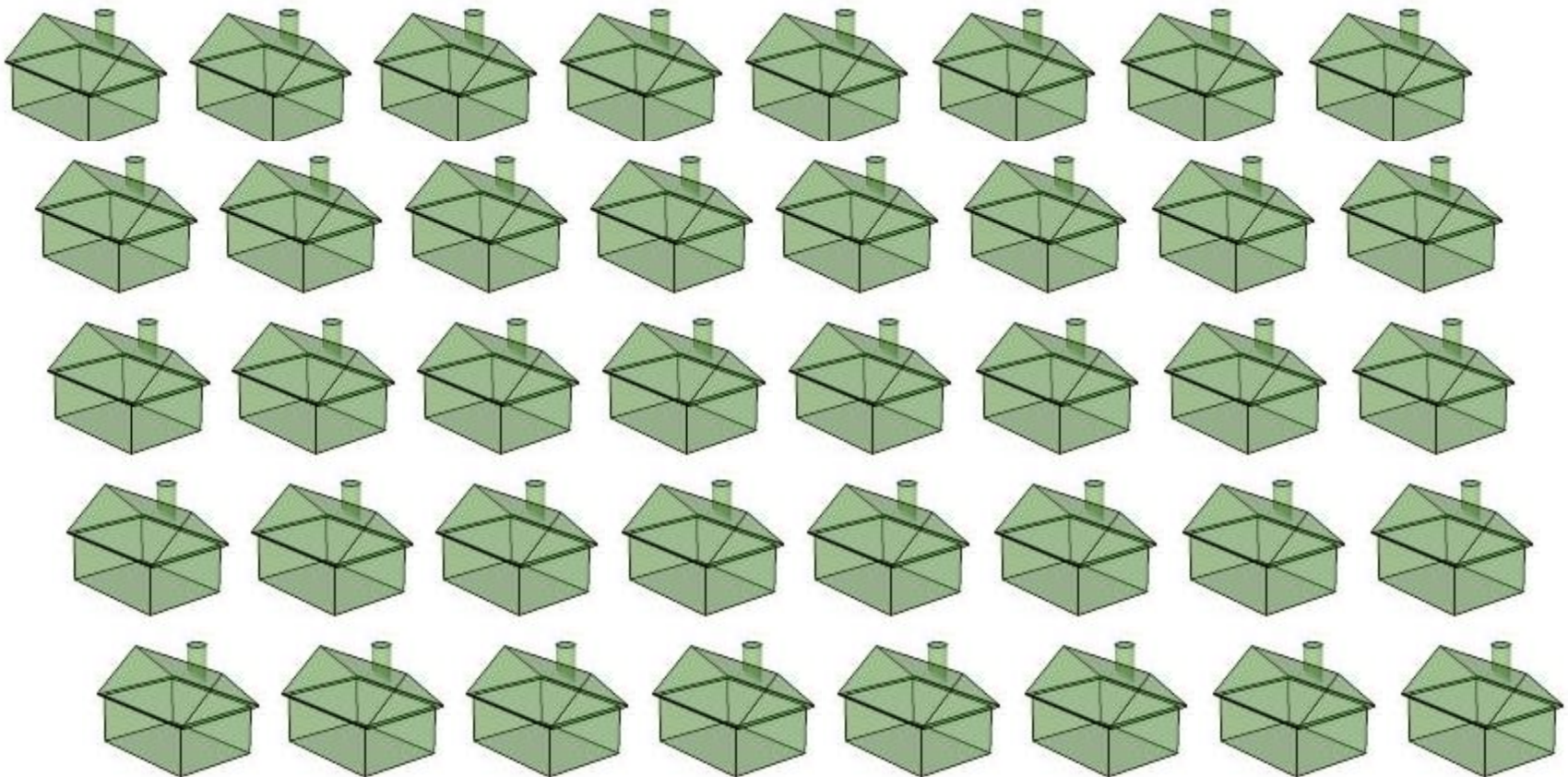
\*Out of a possible 136 points

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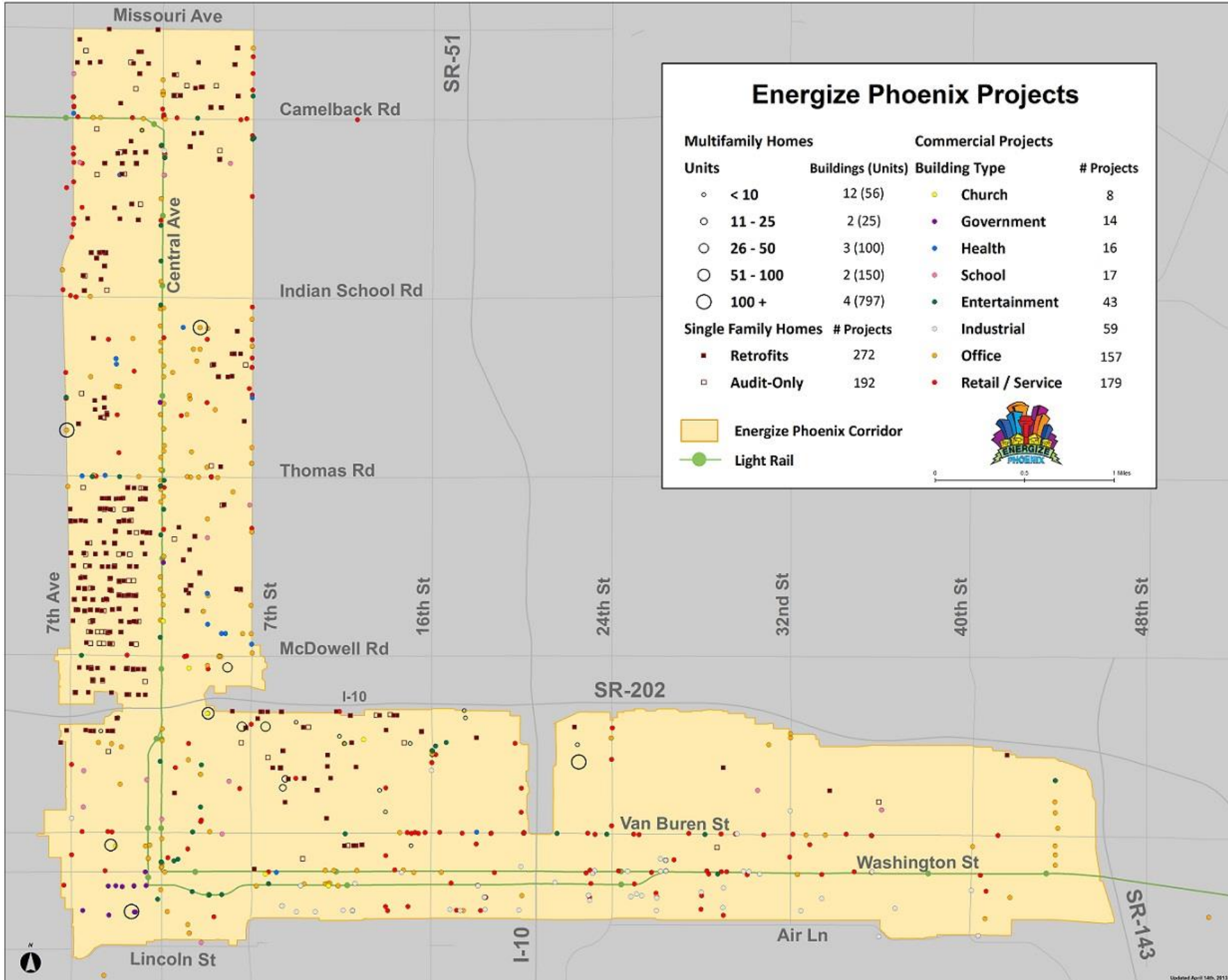
Photo by: Matthew Strassman courtesy: Habitat for Humanity Central Arizona



## So how do you scale?







## Energize Phoenix Projects

### Multifamily Homes

#### Units

◦	< 10	12 (56)
○	11 - 25	2 (25)
○	26 - 50	3 (100)
○	51 - 100	2 (150)
○	100 +	4 (797)

### Single Family Homes

■	Retrofits	272
□	Audit-Only	192

### Commercial Projects

Building Type	# Projects
● Church	8
● Government	14
● Health	16
● School	17
● Entertainment	43
● Industrial	59
● Office	157
● Retail / Service	179

 Energize Phoenix Corridor

 Light Rail



0 0.5 1 Miles



## GOODBYE UTILITY BILLS.

Our Net Zero homes provide some of the best perks to living in a beautiful Meritage home—improved energy savings, comfort and health. And, best of all, the possibility of never paying a utility bill again.





## **Key Challenges/Opportunities:**

- Utility business models, regulation and infrastructure costs
- The smart grid goes both ways
- On-site or community storage
  - See Above
  - Microgrids
- Market Valuation
- Behavior
- Passive and low-maintenance solutions



## Utility capacity duplication

Electric utilities are required by law to have enough capacity to serve the system at all times. They are required to design and operate the system so that the loss-of-load probability is less than one day in ten years.



<http://www.nerc.com/files/BAL-502-RFC-02.pdf>





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## The smart grid goes both ways

Poll: *How long will it be until the first major incident of the power grid being hacked and part of it being taken down?*

- Less than one year
- 1- 5 years
- 5-10 years
- > 10 years
- Not gonna happen

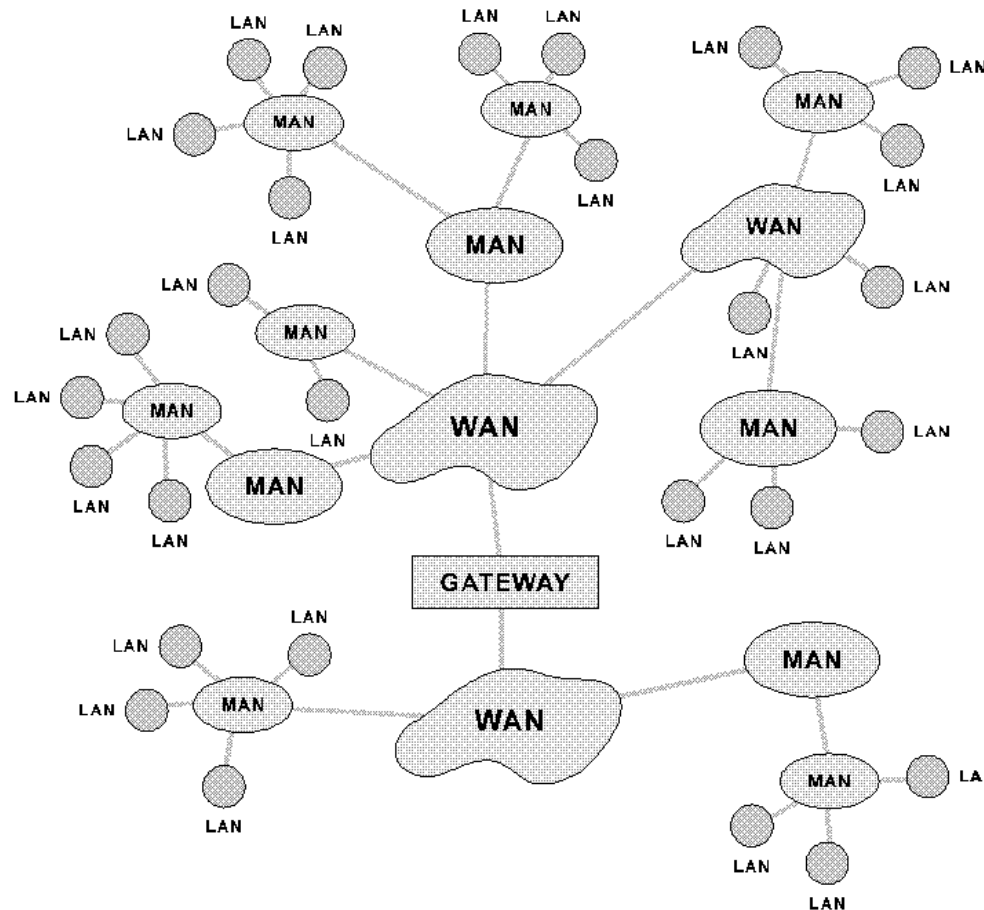




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# What if the grid looked more like the internet?



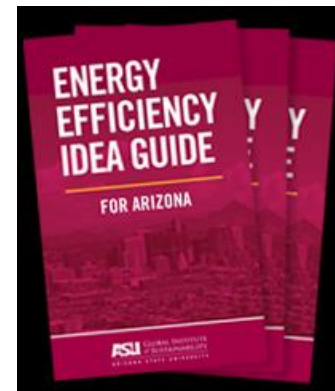
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# Market Valuation of Improvements

## Appraiser's Added Value Approach

- Home appraised in early 2012 for refinance
  - Estimated that energy efficiency and solar panels reduced monthly utilities by \$250 or \$3000/yr
  - Used a 5.1% discount rate and 10 year expected life to calculate \$23,053 of added value
- Rounded to \$25,000 added value





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## Unpredictable Behavior



- Vacations
- Pool Turns Green
- Construction Project
- Icemaker Door Breaks
- Fridge Door Cracked Open
- Hot tub
- Work Schedules
- New Appliances

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Photo by William Hermann/The Arizona Republic

Passive strategies are  
powerful and durable









