Sustainability:

It Covers More Than You Might Think

By Jim Smith

With Input From Steve Stevens

What is "Sustainability"?

sus·tain·a·bil·i·ty
/səˌstānəˈbilədē/ 🔊

noun

the ability to be maintained at a certain rate or level.
"the sustainability of economic growth"

- avoidance of the depletion of natural resources in order to maintain an ecological balance.
  "the pursuit of global environmental sustainability"

The World Bank pegged Sustainability to Quality of Life:

"Sustainability is defined as a requirement of our generation to manage the resource base such that the average quality of life that we ensure ourselves can potentially be shared by all future generations. ... Development is sustainable if it involves a non-decreasing average quality of life."

[Geir B. Asheim, "Sustainability," The World Bank, 1994]

What Would Reduce Your Children's Quality of Life?

Depletion of energy resources, leading to higher cost
Climate change, if it causes:
    * Increased severe weather and mean temperatures
    * Sea level rise resulting in population movement
    * Economic disruption of all kinds including disaster
        relief costs, agricultural losses, tourism reduction
    * Damage to infrastructure, such as bridges and roads
    * Diseases due to ecological imbalance
Loss of easy worldwide and local travel
More air and water pollution

You Can Make Your Own Life More Sustainable:

Save money by:
    * Generating your own electricity from the sun
    * Reducing and even eliminate use of natural gas
    * Eliminating automobile expenses by going
        electric and using bicycles and public transit

Generating Your Own Electricity:
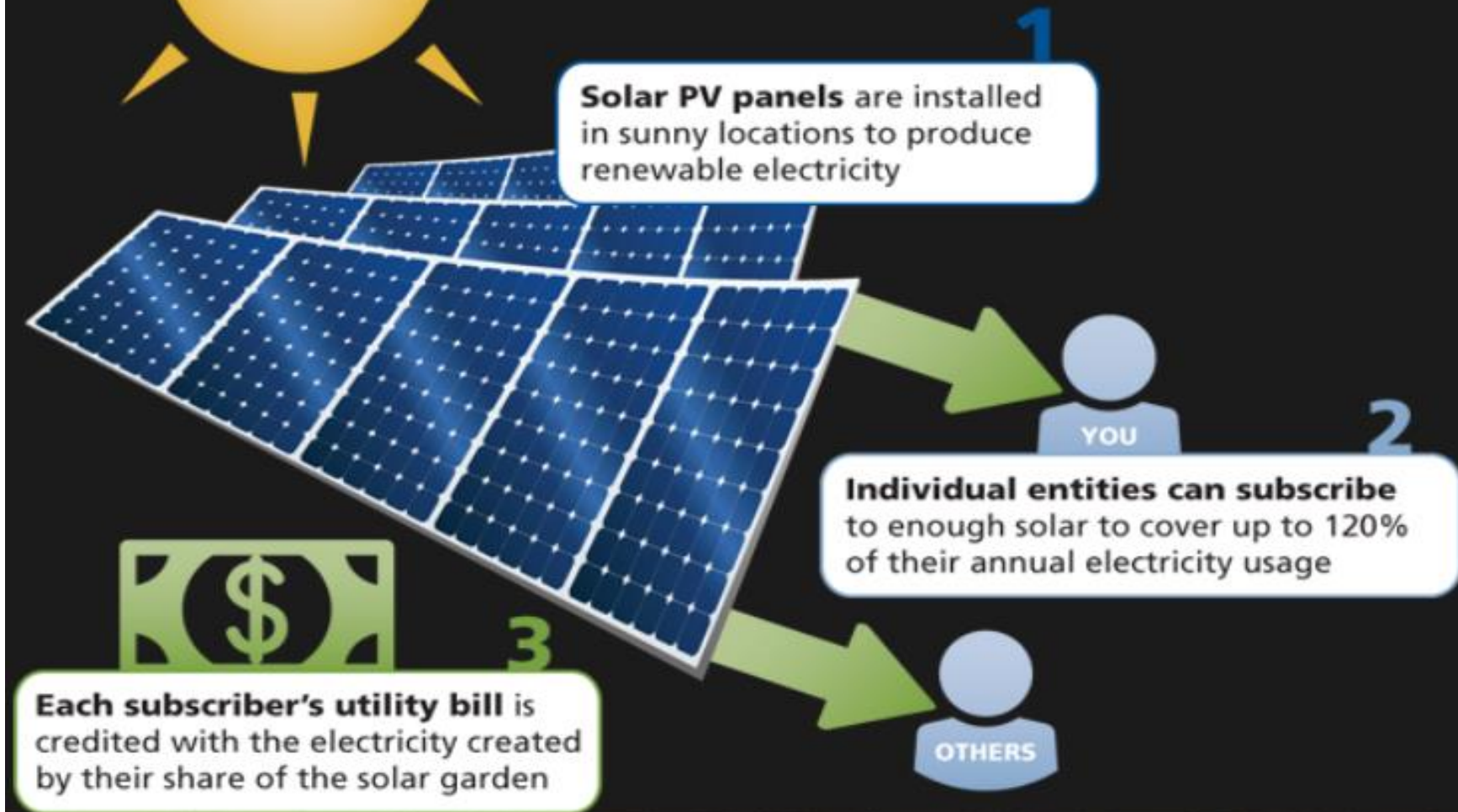
Everyone's situation is different

Homeowners may not
have a suitable roof

Renters don't own a roof

If you're selling your home anytime soon, it wouldn't pay to install solar panels.

Solar Gardens Are One Way

Solar PV panels are installed in sunny locations to produce renewable electricity

Individual entities can subscribe to enough solar to cover up to 120% of their annual electricity usage

Each subscriber's utility bill is credited with the electricity created by their share of the solar garden

Insulating Your Home Saves Money

Even a 1970's brick ranch can become a zero-energy home through effective insulation

<u>Heating aspects</u>:
* Cellulose blown into attic
* Basement walls and rim joist insulation
* Cellulose blown into exterior walls
* Added exterior insulation
* Air locks can reduce cold air intake at entrances
* Insulating foundation, inside and out
* Creating sun-rooms to capture and hold heat
* Install high-efficiency furnace

Cooling aspects:
* Passive solar concepts to consider
  - Larger eaves on sun-facing walls
  - Automatic blinds or simply be smart about
    adjusting window coverings based on time of day
  - Venting to flush hot air
* Have warm air returns, not just cold-air returns for
    your furnace
* Consider a "mini-split" system – could replace
    furnace as well as A/C

Blueridge
30,000 BTU (2.5 Ton)
21 SEER Ductless Mini-Split Quad-Zone Heat Pump System
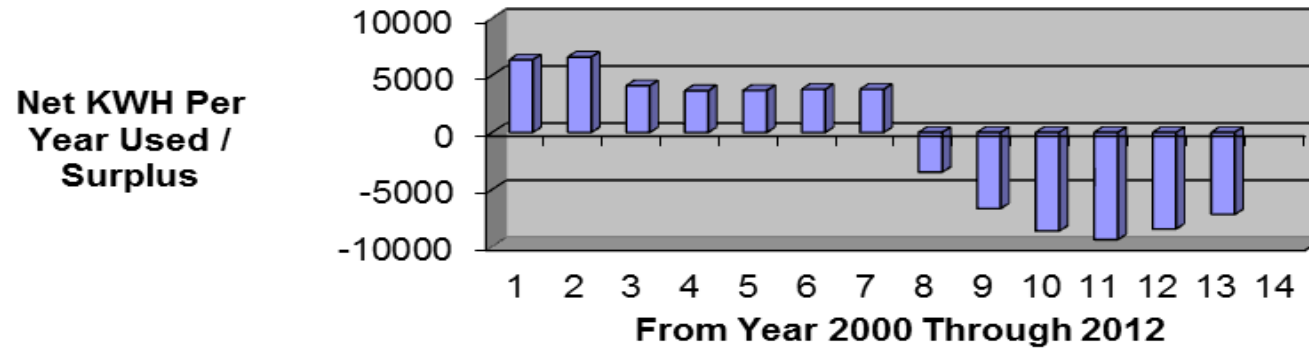
You Can Also Save Money by Reducing Energy Consumption

Even if you get free electricity from the sun, you can reduce your demand for it by:

* Installing Solatubes® ("sun tunnels")
* Installing LED light bulbs
* Installing a heat-pump water heater
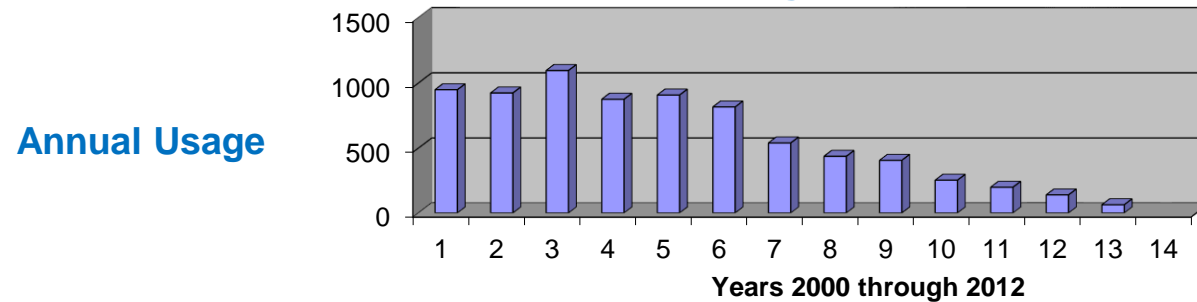* Using timers, motion sensors and photocells

Case Study: Steve Stevens' House:

Electricity Usage Per Year - KWH

Net KWH Per Year Used / Surplus

From Year 2000 Through 2012

Natural Gas Usage Per Year - Therms

Annual Usage

Years 2000 through 2012

Use That Saved Electricity to Fuel Your Automobile!

An electric car goes 3 to 4 miles on 1 kW-hour of electricity.

   * That's 3 to 4 cents per mile if you buy your electricity from Xcel Energy, less with the new "Time of Use" rates

   * You pay almost nothing for maintenance and repair, compared to your gas-powered automobile

For Example, My 2012 Chevy Volt:

70,000 miles
Lifetime MPG: 210
Maintenance: 1 oil change
Range on full charge: 30 winter, 40 summer
Cost of full charge using Xcel: $1.25

Costs of a Typical 2012 Gas-Fueled Car:

MPG: 18 city, 29 highway

Fuel cost @ $2.30/gal. to go 70,000 miles: $6,700

Maintenance: 5 oil changes, 2 emissions tests, brake job

Possible repairs: transmission tune-up or repair, timing belt, catalytic converter, radiator, power steering pump

Case Study:
Regenerative Braking in My Tesla

8.9 Miles from Genesee Exit to I-70 to my office in Golden.

My Tesla generated 1.5 kWh of electricity, while the cars around me burned ~1 quart of gas.

Electrics Cars Are:

* Powerful & Safe
* Cheap to Operate
* Even Cheaper to Maintain
* Drive Train Warrantied for 8 Years
* Can Be Fueled for Free at Home or Work and on Long Trips
* Will Have Great Resale Value

It Costs Less to <u>Build</u> an Electric Car

According to Der Spiegel, the components related to internal combustion engines represent nearly **half the cost** of building a conventional car. For a battery electric car, replace those costs with battery, electric motors and little else.

Let's Talk Food

Grow your own organic food

Join a local farm share, such as Go-Farm.

Improve your health, in addition to saving money.

By buying locally produced food you reduce the carbon footprint of your food, eat fewer preservatives and may even save on health costs!

Other Sustainable Practices to Consider:

Walk and bicycle more!
   Electric bikes are a great solution!

Buses & Light Rail accept bikes – go multi-modal!

Buy used or repurposed materials when possible

Bring your Styrofoam to Golden Real Estate!

Reuse your trash bags!

Open and close your window coverings by time of day.

Let's Talk Water

We need to be smart about water consumption.

Install low-water landscaping. No Kentucky Bluegrass!

Turn your sprinkler system off based on weather forecast.

Install chair-height (ADA) dual-flush toilets ($87 at Costco!)

Consider recirculating system for instant hot water

Do You Want to Get Involved?

Consider joining the Colorado Renewable Energy Society, Jeffco Chapter. Meets monthly on 4th Thursday at Jefferson Unitarian Church in Applewood.

Attend the Metro Denver Green Homes Tour, first Saturday in October.

Visit the NREL Education Center and sign up for their monthly brown bag lunch.

Google!

Thank you!

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