Green zone: After two years, did all her eco-friendly projects pay off?

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It started with gray water, then escalated to chickens, composting toilets and rain barrels. I'm talking about the two years I've spent transforming my humble California bungalow into a test case for sustainable living -- an experience that's cost me hundreds of hours of my time and thousands of dollars, an endeavor that has tested the limits of not only my checkbook but also my sanity -- and my DIY skills.

When I first delved into the subject, the idea was to look at environmentally promising home improvement projects through the eyes of a budget-minded consumer. I had seen so much media coverage that heaped praise on newly constructed eco-manses or expensive retrofit products, but the stories didn't answer my biggest question: For the green-minded person writing the checks, are the improvements worth the time, effort and expense?

Although everything I retrofitted seemed wise at the time I did it, hindsight tells a different story. Over time, I occasionally questioned the wisdom of some actions.

The idealist in me finds value in every improvement, but the realist can't deny that some have been far better in payback -- if not financially, at least morally. The systems that easily fold into my busy life are the ones I've enjoyed most.

What's been worth the money and effort, and what hasn't?

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WORTH IT: PROJECTS THAT REALLY PAID OFF

GRAY WATER

First place

Gray water is the waste generated from faucets, showers and laundry machines -- water that accounts for 54.2 percent of all water used inside a home, according to the U.S. Environmental Protection Agency. With California deep into a drought, in August 2008, I retrofitted the plumbing on my laundry machine to send its gray water onto my landscape. Over the last two years, that simple switch has sent 9,720 gallons to passion fruit vines instead of the sewer, and it required only one change to my usual routine. I had to swap laundry detergents because my usual brand, like many, contained salt and other ingredients that kill plants.

When I first installed a gray-water system, it wasn't legal. Making it legal would have required a permit, extensive filtering apparatus and lots of cash. But in August 2009, these laundry-to-landscape systems were legalized in California, as long as homeowners followed 12 guidelines.

I've been so pleased with this low-cost, high-impact system that I hired a plumber to expand it in January, tying the wastewater from my bathtub, shower and bathroom sink into the same gravity-fed plumbing line that handles my laundry water. This so-called simple system also was legalized in California in 2009. Its legal status has since been rescinded, so once again I've gone rogue. I estimate my additional savings to be roughly 1,120 gallons per month.

Financially, this system is paying for itself, just slowly. The Los Angeles Department of Water and Power charges me less than half a penny per gallon, so technically, gray water has saved me only $95 in water costs so

far. But it's also reduced my sewer charge by about one-third, saving me an extra $3.30 per month. In drought-prone Southern California, gray water feels like the right thing to do. It's been the easiest, most sensible, hassle-free, sustainable system I've put in place at my house.

Cost: $1,988 ($312 for the laundry-to-landscape plumbing, $1,676 for bathtub and bathroom sink tie-in)

Resources: Greywater Action, www.greywateraction.org; Oasis Design, oasisdesign.net

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SOLAR POWER

Second place

Photovoltaic systems pay off most quickly for consumers who use a lot of energy because tiered rates impose a penalty for heavy use, but solar electric still makes sense for low-energy users such as myself.

So much of Americans' carbon footprint results from buildings -- about 43 percent, according to the U.S. Department of Energy. I'm a household of 1 1/2 (mom and 7-year-old), and we use only about 4 kilowatt hours of electricity per day, something we've managed through behavioral changes, such as turning off the lights in rooms after we've exited, and through in-home efficiencies, such as swapping out incandescent light bulbs for compact fluorescents and using power strips that can turn off DVD players, coffee makers and other energy vampires.

Using less electricity means I can get by with a smaller, less expensive photovoltaic system that not only covers my use but also produces a credit on my power bill. Going solar also meant my house was upgraded with a time-of-use meter. This type of meter allows me to receive credit

for the electricity I generate during peak hours when electricity costs the most, but pay the least for the electricity during off-peak hours, when I recharge my cellphone and laptop and perform other tasks requiring power.

The downsides are that I am tied in to the grid and still susceptible to power outages, and I now have panels that need to be cleaned. It's a subject of debate, but my installer, REC Solar, said dirty panels decrease energy production by 6 percent to 8 percent. Many panel manufacturers recommend cleaning panels at least once during the summer. I wash mine whenever they look dirty or dotted with bird droppings, which is about every other week.

I think $6,000 is a small price to pay, not only for panels that should generate my next 20 years of electricity, but also for the greenhouse-gases I'm not creating.

Cost: $5,939 ($11,564, minus a $3,898 DWP rebate and a $1,727 federal tax credit)

Resources: California Public Utilities Commission, www.cpuc.ca.gov ; 1 Block Off the Grid, www.1bog.org ; REC Solar, www.recsolar.com

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RAIN BARRELS

Third place

I was a rain barrel skeptic before I joined L.A.'s rainwater harvesting pilot program last fall and received a 55-gallon pickle barrel. Though rainwater holds such enormous potential for supplementing Southern California's dwindling reserves of imported water, rain barrels seem like such thimbles. During a normal L.A. winter, my 1,500-square-foot roof

generates 13,500 gallons of water -- a tidal wave compared to what a little barrel can handle.

Having lived with rain barrels for a year, I've learned that their small size makes them manageable and affordable. The water they catch isn't stored only for summer use. It can be drained in between rains to water nearby plants. An added perk: reducing storm-water runoff to the ocean.

I have three rain barrels -- one from the city and two that I purchased separately. They're along the edge of my house, at the halfway point in a row of kiwi vines and berries. The 175 gallons they hold were a lot more useful than I'd expected for feeding my exceptionally thirsty fruit plants. The water they held lasted about a month into the summer.

I never had mosquitoes. I did, however, have some algae growing in the plastic tubes connecting my rain barrels, but it wasn't significant enough to reduce flow. Water pressure was problematic only for the last few gallons of each barrel.

I still think larger rain catchment systems are preferable. Alas, larger systems frequently need electric pumps and are far more expensive. In this economy, affordability rules. And it's affordability that could lead to mainstream adoption and significant water savings for our parched city.

Cost: $500 ($300 for rain barrels, $200 for installation and parts)

Resources: L.A. Rainwater Harvesting, www.larainwaterharvesting.org; Rain Bud, www.rainbud.com

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EARTH WORKS

Fourth place

Rainwater isn't only a resource. It's also a potential pollutant if it runs off property onto pavement, picking up fertilizers and automotive fluids that are washed, unfiltered, into the ocean.

To prevent my home's contributions to runoff, which could be as much as 10,000 gallons per year, according to L.A.'s Bureau of Sanitation, I've sculpted my landscape to retain as much rainwater as possible.

The parkway between the sidewalk and the curb is concave and mulched. My backyard is home to a 15-foot-wide hole in the ground that is fed with gutters from my roof. During the rainy season, this infiltration pit can hold as many as 500 gallons at a time, allowing it to gradually replenish groundwater. During the dry season, it's been doing double duty as a skateboard pit.

Cost: Not easy to determine because it was part of a larger landscape project, but for DIYers, potentially free

Resources: Rainwater harvesting books by Brad Lancaster, www.harvestingrainwater.com

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NOT WORTH IT: TASKS THAT LEFT HER MORE BLUE THAN GREEN

WATERWALL

The Waterwall is an Australian product that is exactly what its name implies: It's a wall that catches and stores water. Water channeled from the roof and gutter drains into a tank shaped like a thick concrete-block wall. It operates similarly to a rain barrel but holds six times as much water and is better looking. It's also modular, allowing water to flow freely from one wall into another in series.

The Waterwall was expensive, and installation was a nightmare. It's an excellent idea that simply wasn't worth the money for a person of my means. If California's drought persists and water prices start going through the roof, I'm likely to change my attitude. But so far, the $4,078 I've spent to store 634 gallons of water I could have bought from the city for about $3 is an embarrassment, particularly with so many ways to conserve.

Even worse, it's been annoying to use. I put my Waterwall near a trio of stone-fruit trees that would happily drink in the water. Unfortunately, the water pressure drops along with the level of water in the wall, and running the water through a relatively short, 15-foot length of hose or even lifting the hose above the spigot decreases its flow rate.

I love the Waterwall in theory, and I still think I would've ringed my backyard with Waterwalls if I'd known about them 10 years ago, when I installed an appallingly expensive redwood fence.

Cost: $4,078 ($2,300 for two walls, plus $944 for shipping and taxes, plus $834 for installation)

If I had to do it over again: I'd go with a cistern or a large, agricultural above-ground tank.

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EDIBLE LANDSCAPING

When the economy was freefalling two years ago, I couldn't shake the fear that the American infrastructure was about to crumble and that I should start growing my own food. Thus began an incredibly long, expensive and back-breaking journey. Not only did I have soil that was high in lead, but I also had critters that liked to dig and destroy. Then there's the water issue. It takes a lot of the wet stuff to grow most fruit

and vegetables.

Having transitioned my low-water ornamental landscape to edibles, I'd say this is a project for people with time, money and a love of gardening and cooking. It isn't a job for single mothers with high-stress jobs who'd rather not spend their precious down time watering, pulling weeds and bringing in their harvest.

I've resigned myself to the fact that I won't likely learn as much as I should to maximize my yields. At this point, I'm just hoping this whole project won't end up being a high-cost intellectual exercise that bears little fruit. Passion fruit and tomatoes have had the biggest payoff so far. Beans, corn and kale? Not so much. It's so easy to get high-quality produce from a CSA, or community supported agriculture group, which is what I've been doing for the last year: spending $18 a week for organic, locally grown produce conveniently delivered to my son's school.

Cost: outrageous

If I had to do it over again: I would install one or two planter boxes. I'd buy the rest of my produce from a community-supported agriculture group such as Equitable Roots.

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COMPOSTING TOILET

Water is a precious resource, and we flush an awful lot if it away. At my house, my low-flow toilet uses 1.6 gallons per flush. If it's flushed 10 times a day, that's 16 gallons of imported drinking water that's pooh-poohed and sent 23 miles to a wastewater treatment plant that uses precious electricity to process it, then has to dispose of leftovers.

The final frontier of green living, the composting toilet is a low-tech option. There are a surprising number of commercial composting toilets on the market that look nice, cost a fortune and can't handle heavy use, which is why I went with something called a Separett. Developed in Sweden, it's a piece of plastic foam that looks like a toilet seat except it's outfitted with two holes -- yes, No. 1 and No. 2. Each empties into its own 5-gallon bucket I access through a trap door on the side of my house.

I'll admit, as committed as I am to living green, this is not a system I use all the time. In fact, I use it rarely, and only for No. 1

As much as I support the premise of a composting toilet, I'm more devoted to the traditional porcelain god. I just try to flush less.

Cost: $627 ($127 for Separett, $500 for construction labor and materials to convert built-in cabinet to toilet)

If I had to do it over again: I might need more clearance under my house, but I'd go with a commercial composting toilet from Clivus Multrum.

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CHICKENS

This is one of the projects I was most excited about and one that's turned out to be among my biggest failures. After buying a chicken coop, feed and hens procured through L.A. Animal Services, I got only four eggs.

L.A. may be a sprawling metropolis, but it isn't devoid of wild animals. Some people have coyotes. I've got possums and raccoons, which breached my coop and gobbled down my ladies.

A forensic investigation revealed the intruder had dug under its edges, so

I fixed the problem by driving stakes deep into the ground and nailing pieces of wood to other possible areas of entry. Although I wasn't 100 percent confident that these beady-eyed villains wouldn't return to the scene of the crime, I nevertheless journeyed back to the animal shelter to purchase two more chicks, only to be woken up at 1 in the morning to the sound of distress. Running outside, I found a lady bird dangling from the mouth of a shiny-eyed raccoon. The other chicken was missing.

I've been buying eggs at the store ever since, but I was hipped to my local egg underground. Last week, I got my first dozen eggs from a neighbor who's more game than I for the challenge of raising chickens.

Cost: $530 for coop, feed and chickens

If I had to do it over again: I would skip the coop and find a local alternative.

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SMALL, EASY WAYS TO LIVE GREENER

Green home improvement doesn't have to mean elaborate new systems or expensive construction projects. Some small steps for a greener life:

Laundry line

Clothes dryers account for 5 percent to 10 percent of a home's energy use. I have one, but I use it only if I'm desperate. My laundry line is strung unobtrusively across my backyard deck, and the sun dries clothes in mere hours. For me, the low-tech laundry line is about the easiest and simplest thing I can do to reduce energy use and greenhouse gas emissions. Cost: about $50 for equipment.

Diet

My home improvement retrofits have convinced me that more environmental savings could be obtained by eating less meat and dairy. The cattle business creates more greenhouse gases than the transportation industry, according to a 2006 United Nations report. So, although I love burgers and can't give them up entirely, I eat fewer, and I'm mostly substituting almond and soy milk for dairy.

Composting

About 26 percent of the U.S. municipal solid waste stream is yard and food waste, according to the Environmental Protection Agency. Composting that waste is how I produce only a small grocery bag's worth of trash every other week. It's one of my greatest achievements. About a quarter of my trash savings comes from composting food scraps. Cost: $20 for a bin through a city of Los Angeles composting workshop.

Recycling

The other three-quarters of my trash savings comes from recycling, for which I have an almost-religious fervor. About 80 percent of what Americans throw away is recyclable, yet only 28 percent actually is recycled. Cost: nothing but the time it takes to throw something in the blue bin.