



Sustainable Things You Can Do...

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<http://www.the-mcelroys.com/>

2018







Green Roof Pictures

Installed in June 2005, still doing great in 2018



Green Roof Benefits

- Savings:
 - Avoiding new roof installation
 - Air Conditioning and heating savings
 - Pays for itself in ~10 years
- Environmental benefits
 - Restoring vegetation, home for insects
 - Filtering air & water
 - Lowering ambient temperature
 - Minimize use of asphalt to make roof
 - Eliminate fuel, labor, transport associated with roof replacement
 - Fight global warming: plants take CO₂ out of the air, plus less electricity used for air-conditioning



Chicago City Hall





Solar Considerations

- South-facing roof best, must be within 45° of S
 - No shade 10 am -3 pm desired; take photos before installation
- 30% federal tax credit
- Financing available
- Cost drop:
 - \$10/W installed in 2009 to <\$2.50/W today
- Pays for itself in 10 years
 - Same as 9% tax-free investment

3000-gal rainwater cistern & rain garden



EVs

- We have 2 EVs
- I will never buy another gas car

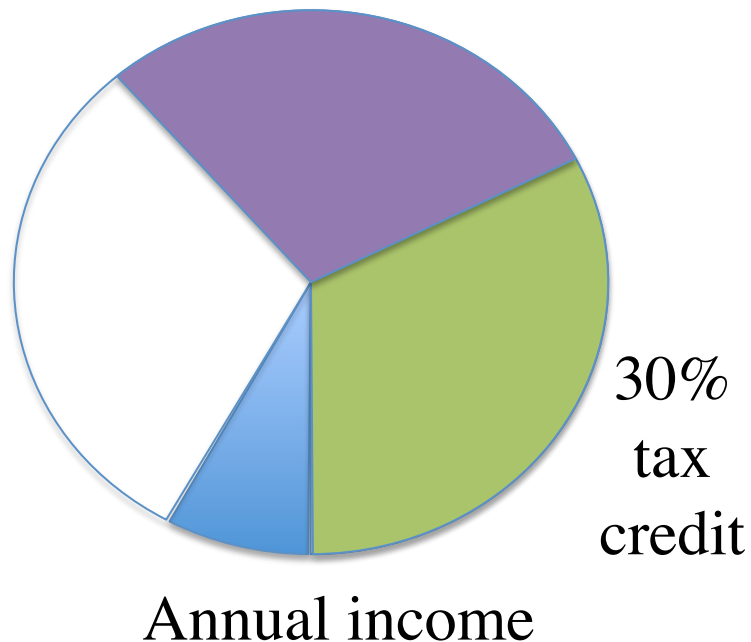


Ways to Do Solar

- Yourself (10 year payback)
- Loan (50% back first year, rest over 5 yrs)
- Business (50% back first year, rest over 5 yrs)
- Municipalities (no cost RFP)
- Non-profits (5 year payback via LLC)
- See <http://solar.the-mcelroys.com/>
 - Template LLC
 - Template PPA
 - Financing method descriptions

Business (Commercial) Solar

Depreciation
> 30% savings on tax bill



➤ **60% of the system paid off in the first year**

- Annual income 8% of purchase price
- Investment tax credit 30%
 - Assumes enough tax liability to take credit
- Depreciation: additional savings >30%
 - Can feed forward 20 yrs
- Payoff time: ~ 5 yrs
- ~15% tax-free investment

Cities in VA that used Solar RFPs

- [City of Richmond Public Schools RFP](#)-- 2.6 MW PPA with Secure Futures, 10 schools
- [Arlington RFP](#)
- [Harrisonburg RFP](#)
- [Middlesex County—SunTribe](#)
- [Albermarle County—Secure Futures, 6 schools](#)
- [Bath County](#)
- [Lexington—Secure Futures](#)
- [Augusta County Public Schools](#)-- 1.8 MW PPA with Secure Futures over 7 schools

Unity Renaissance Church

- Worked with Convert Solar and installed solar on Chesapeake church via PPA
- 66 Solar Panels, 22 kW, production [link](#)
- 40%-50% of facility consumption



Installation at Norfolk Academy

- \$1M solar array using LLC of parents
 - \$1.49/W = 660 kW array
 - LLC owns panels first 6 years; parents fully paid back after 6 years
 - School pays LLC for electricity via PPA (Power Purchase Agreement)
 - School gets solar with no money out-of-pocket
- First building done May 2018
- Lower and Middle school install started Sept 2018









Simulation of Complete Norfolk Academy Install



RVA Solar Fund

- Richmond Community Foundation
 - Grants for non-profits to go solar
 - <http://www.rvasolarfund.org>
- We could do something similar here with Hampton Roads Community Foundation



We need more people
installing solar and
other renewables

Mayor's Covenant

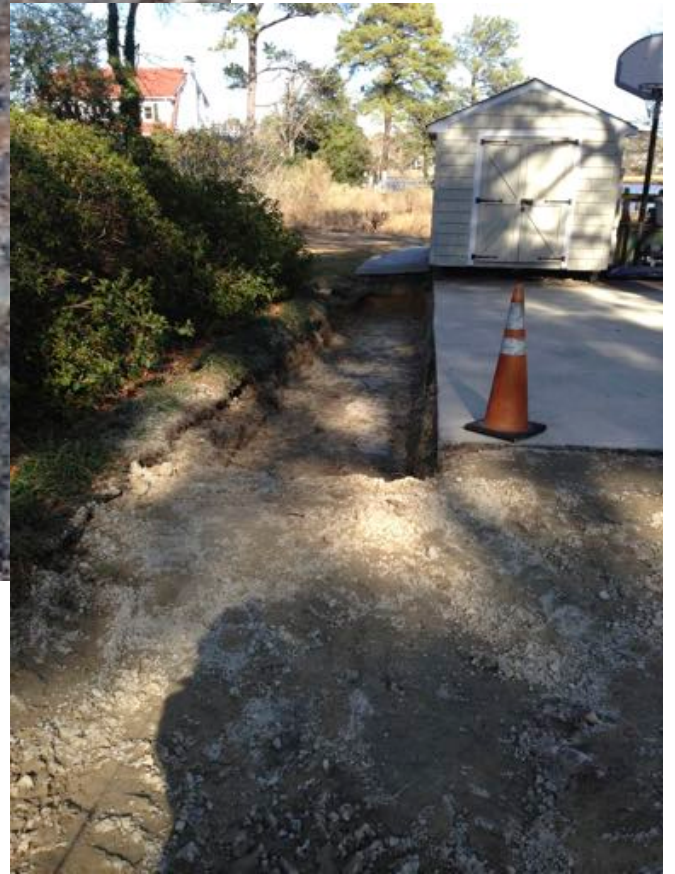
- I am member of *Norfolk Mayor's Commission on Climate Change Mitigation*
- Good Climate Action Plans from Roanoke, Blacksburg, Arlington
- I have sized solar + battery backup systems for Norfolk emergency shelters
- I have mapped homes and businesses with good solar potential in low-income neighborhoods for possible action

Our composters...



Permeable Pavers

- Our driveway was originally:
 - Asphalt
 - Very bumpy with pine roots
 - Subject to major puddling
 - Caused heavy runoff to the Bay
- Installed pavers with permeable edge sections
 - Graded so runoff went to 4'-8' holes (French drains)
 - All runoff captured
 - No more puddling
 - It's beautiful!









Wetlands Buffer

- We live on the Lafayette River
- Much of our property is wetlands buffer
- We have marsh grass and native wetlands plants, rather than a seawall or rip-rap
- We encourage others to do this:
many benefits
for health of the
Bay





Questions?

<http://the-mcelroys.com/>

Why Use Native Plants?

- Need less water
- Thrive in local conditions
- No need for chemicals
- Rescue natives from extinction
- Local insects thrive, providing food for local birds and fledglings
- Re-create wildlife ecosystems/habitats
 - Hedgerow is a wonderful wildlife sanctuary
- For more, read *Bringing Nature Home*



Why Not Use Alien Plants?

- Can take over and destroy native plants and eco-system
- Can require large amounts of nitrogen fertilizer, herbicides, etc.
- Foreign diseases can be imported with plant, destroying native population
- Foreign pests can be imported with plant, and become runaway (no natural predators)
- Can require excessive watering
- No benefit to local ecosystem

Energy

We...

- Use solar power!
- Drive an all-electric i3 and a Tesla
- Telecommute 2 days per week
- Carpool to work intermittently
- Kids carpool to school
- Carpool to kids' activities where possible
- Use fluorescent or LED light bulbs
- Use LED Christmas lights (and replaced halogens with LED)
- Maximize time that we have heating and A/C turned off -- goal is 3 months in spring and 3 months in fall
- Use a whole house fan
- Don't dry clothes all the way in dryer -- hang dry after short time in dryer
- Turn oven off before end of cooking time
- Use just enough water to cover when cooking pasta (not 6 quarts!)
- Until December 2008, we bought 100% wind generated electricity from Pepco, with Dominion as our distributor. Then Dominion won an SEC case that pushed Pepco out of the Virginia market.



Recycling / Reuse

- Use all recycled paper products, including toilet paper, paper towel, napkins, copy paper, sticky notes
- Use compostable tree-free paper plates (don't use often)
- Use recycled toothbrushes that we send back for re-recycling into plastic furniture (Preserve toothbrushes)
- Recycle all feasible materials in our household
- Use scrap paper where possible
- Grocery shop (and other shopping) using cloth and string bags
- Re-use plastic grocery bags
- Re-use egg cartons (take back to store for re-use by poultry farm)
- Use reusable water bottles instead of disposable plastic: see <http://storyofstuff.org/movies/story-of-bottled-water/> for why to avoid plastic
- Use rechargeable batteries
- Save and re-use all bubble wrap and Styrofoam peanuts
- Recycle all home appliances and electronics at e-cycle days
- Save children's clothes/toys; offer to other families, then take to second-hand clothing store; buy some of kids' clothes from second-hand store



Food / Kitchen



- Small garden for growing some of our own food
- Buy organic where possible
- Milk (in glass) delivered from local dairy
- Don't eat imported shrimp (after I read *Stolen Harvest*)
- Eat low on the food chain
- Member of a CSA (community supported agriculture) to get produce from local farmers
- Started healthy snack program at my kids' school where we buy all organic whole-grain snacks, and serve fresh produce
- Grind own flour, use natural sweeteners
- Prepare food fresh, rather than canned, frozen, or pre-packaged
- Participate in soup kitchen for homeless (donate cases of fruit, eggs); save holiday candy for that rather than discarding
- Use non-petroleum, non-phosphate laundry detergent and dishwasher soap
- Buy bamboo products rather than wood or plastic

Recycling



- Aluminum Recycling Facts
 - Making one aluminum drink can from raw materials uses the same amount of energy as making 20 recycled cans
 - Recycling 1 kg of aluminum saves 8kg of bauxite, 4kg of chemical products and 14 kW of electricity
- Plastic Recycling Facts
 - Americans drink about 167 bottles of water each, but only recycle 23%, leaving 38 billion bottles in landfills
 - Bottled water costs \$1 - \$4 per gallon -- 90 percent of the cost is in the bottle, lid and label
 - The average American consumed 1.6 gal of bottled water in 1976. In 2006 it was 28.3 gal
 - It takes over 1.5 million barrels of oil to make a year's supply of bottled water - enough oil to fuel 100,000 cars
 - Plastic bottles take 700 years before they begin to decompose in a landfill
- Paper Recycling Facts
 - Americans use over 700 pounds of paper per year – each
 - More than 90% of US paper is from virgin trees – half of all logged trees
 - To make a ton of paper from virgin tree fiber requires 2-3 tons of trees (versus using 1 ton of recycled stock)
 - Manufacturing recycled paper takes less water and energy, and produces less air pollution
- Our rolling blue bins take all scrap paper, cardboard, aluminum, glass, plastics #1-6 (must have a neck)

Environmental Action

- Have a huge lending library of environmental books
 - Send environmental books to selected political leaders
- Annually submit shareholder resolution to Dominion Resources on renewable energy
- Invest in socially and environmentally conscious funds, invest in community notes, give to Heifer International and similar groups
- Kids ask for donations to charitable groups rather than birthday presents at their birthday parties
- Give blood
- Clean the Bay Day – cleaning up our local waterfront!
- Volunteer for elections where environmental issues are at stake
- Give environmentally related lectures to various groups like this one!

More info

- <http://www.the-mcelroys.com/> has this and more
 - Book recommendation list
 - Excel sheet of solar costs and payback times, financing options
 - Information on selling solar renewable energy credits (SRECs)
 - List of all the things we do (and you can too!)
- Solar financing
 - <http://solar.the-mcelroys.com/>
- Environmental shareholder resolutions
 - <http://www.ceres.org/investor-network/resolutions>

Encouragements – Get Active!

- Ask your Virginia state congressmen to create Virginia renewable portfolio standard. Push for incentives for electric utility efficiency
- Ask your city council to install solar at no cost like other Virginia cities
- Ask your school board to install solar at no cost like other VA school systems
- Email Governor Northam and ask him increase renewables and stop supporting the ACP
- Email your federal representatives and push for a greenhouse gas emission cap or tax
- Become a Dominion stockholder and vote on how your electricity is produced
- Vote for representatives who will aggressively install renewables
- Comment on cases brought to the VA SCC
- Read IPCC report – we need to be net-zero by 2050
- **Read, read, read !!!**