

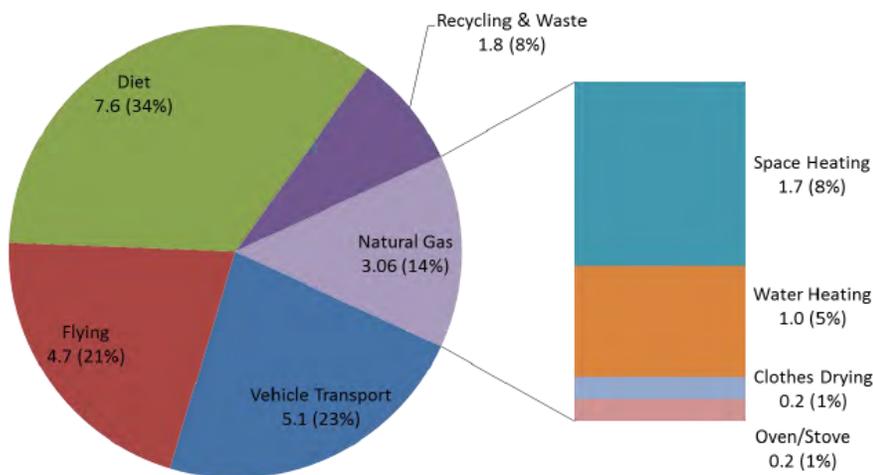
What Can Palo Alto Residents Do About Climate Change?

by David Coale

In 2013, the Palo Alto City Council, at the urging of concerned residents and with no rate increases, decided to go 100% carbon neutral for our electricity supply for all residents and businesses¹. This one action reduced the carbon footprint of all residents by about 20% with no other changes required.

Now with a clean energy source in place, our next opportunity is to switch to using this clean energy for as much as possible as we go about our daily lives. With the recent advances in technology, switching to electricity to meet our daily needs is now more available than ever before and cost effective as well. As we look at our remaining carbon footprint, we find that transportation accounts for about 45% of the remaining carbon emissions for most residents.

Figure 3: Example Estimated Annual Household GHG Emissions (MT CO₂e)



Source: CPAU

GHG Emissions from City of Palo Alto Utilities

For most of us, getting around town requires a car. With the purchase of an electric vehicle (EV) our daily trips can now be carbon free. Most EVs have a range of 90 to 100 miles, which is about twice the daily average of 40 miles that most Americans drive each day. If you look at the total cost of the EV over 10 years, it is actually cheaper to drive one of the more affordable EVs when compared to an equivalent-sized gas car. The economics are even better with some of the lease options now available. Walt Hays, a longtime Palo Alto resident and member of Carbon Free Palo Alto, wrote a great piece on all the advantages of driving an EV:

<http://www.paloaltoonline.com/news/2016/01/23/guest-opinion-do-your-part-to-combat-climate-change-151-get-an-ev>

Of course, riding your bike for the short trips around town, with the multiple benefits of no congestion, no parking problems, exercise, and better health, can beat an EV anytime. With our good weather, flat terrain, and good bike paths, the bike should be our first choice for many of our shorter local trips. One of my favorite bike trips is to the Cal Ave Farmers' Market on Sunday mornings.

The next item to look at is natural gas use in the home. While natural gas was once thought to be a cleaner transition fuel as we move away from coal-fired power plants, we are now finding out that although natural gas is relatively clean burning, it still emits half as much CO₂ as coal, and leakage during the extraction and transmission means the effects of natural gas are on par with coal use. The recent natural gas leak in Southern California has brought this to our attention. One estimate is that this leak was equal to the emissions of 4.5 million cars each day. Natural gas is 80 times stronger than CO₂ in its greenhouse gas effect in our atmosphere over a 20 year period². So reducing our natural gas use in the home and replacing it with high efficiency electric appliances powered by clean electricity is an important step we can take to address climate change.

The first, most cost effective way to do this is to replace the hot water heater, before it fails, with an electric heat-pump-based water heater (HPWH). The HPWH is three times more efficient than a gas or regular electric water heater and will pay for itself in about 4 to 9 years depending on the installation costs. It takes much less energy to move heat (heat pump) from one place to another than to create heat. The HPWH works in a similar manner as your refrigerator, but in the opposite direction, moving heat from the ambient air to the water in a tank. The City of Palo Alto will soon have a rebate program for this, so that will make it even more attractive. What you need to do now is to plan for this, so that when your water heater goes out, or hopefully just before that, you are ready with this cost-effective, cleaner option, instead of buying a gas-fired replacement in a panic when you don't have any hot water.

The next item to consider is the gas furnace when it needs replacing. With a forced-air unit, you will get air conditioning as well. These heating systems will require an outside fan coil unit as part of the heat pump installation like that of a central A/C system. This is definitely a larger project/expense, but worth looking at when your old furnace needs replacing.

The last item to think about is replacing your gas cooktop with an electric induction cooktop. For many, this change appears non-negotiable, but when you talk to people who have made the switch, they all say they would never switch back. The induction cooktop heats the pans directly, without a lot of extra heating of the area around the cooking surface, and is as quick to heat and cool off as a gas

stove and safer too. Also think about replacing a gas clothes drier with electric when the time comes or use a clothesline.

With all these appliances, the best time to switch is when the old unit is at the end of life or if you are planning on a remodel. Do your homework ahead of time, so that if your appliance should suddenly fail, you will have a plan in place and not make a less informed panic purchase of older technology that will leave you with an appliance-lifetime of low efficiency and high greenhouse gas emissions.

What about conservation and efficiency?

Yes, conservation and efficiency are still the best and most cost effective ways to reduce your utility bill. As we switch to electric appliances, we will be putting a greater load on the electricity grid, so that our other conservation efforts, such as lighting with CFLs and LED bulbs and turning off other appliances when not needed, will play a large role in reducing our energy loads. The city has rebates for many energy-saving appliances and a free energy advisor program to help you with energy efficiency in the home. Call 650-713-3411 to access this, or you can have a more complete energy audit done for a modest cost. See:

http://www.cityofpaloalto.org/gov/depts/utl/residents/programs/home_efficiency_genie.asp

What about solar?

There are many reasons one might consider installing a solar photovoltaic (PV) system. The current payback for a solar PV system in Palo Alto is about 10 to 12 years based on avoided cost and does not account for return on investment or electricity rate increases, both of which would make solar PV even more favorable. Since our electricity is already carbon neutral, solar PV will not really change your carbon footprint. That said, any addition of renewable energy to the grid will displace other brown power someplace else, and when you see the meter running backwards, that is priceless!

Solar hot water systems are more expensive in terms of avoided cost and will not completely cover your hot water needs, so that you will still have to have a backup water heater. In this case you are better off going with a HPWH in the first place or, if you are installing solar PV, just add a few more panels to cover your HPWH electricity usage.

Other emissions

Not shown on the Palo Alto carbon pie are the emissions associated with goods and services and other indirect emissions, to name a few. This can be as much as 50% of our personal carbon footprint

depending on our activities. For food, it is best to shop local and eat organic and lower on the food chain – more fruits and vegetables and less beef and lamb. Like many solutions to climate change, this one also has multiple benefits. Eating less meat is better for you, reduces water use (2500 gallons required to produce just one pound of beef) and is easier on the planet. For goods and services, remember the four Rs: Reduce, Re-use, Repair and Recycle. For a very complete carbon calculator see: <http://www.coolcalifornia.org/calculator>

Summary

So the answer to “What can Barron Park residents do about climate change?” is: A lot! For fuel switching, conservation, and efficiency, the city has many rebate programs to help. Will this really make a difference? I think so, as what we do here in Palo Alto is an example to other cities on what they can do. For me, it is a better way of life; the more I ride my bike and eat less meat, the happier and healthier I am. I am doing my part to address climate change and improve local air quality too and that feels good. So I invite you to take a look at your own daily life and see if there are opportunities that will save you money, address climate change, and improve your quality of life as well, so that you can realize these multiple benefits!

David Coale is a member of the Barron Park Green Teams, long time Acterra Member, and member of Carbon Free Palo Alto.

Notes

¹ <http://www.paloaltoonline.com/news/2016/02/05/utility-rates-set-to-rise-in-palo-alto>

² <https://www.edf.org/methane-other-important-greenhouse-gas>

For more information, please look at the following websites:

City of Palo Alto Sustainability website:

<http://www.cityofpaloalto.org/services/sustainability/>

Fighting Climate Change in Palo Alto:

<http://www.paloaltoonline.com/print/story/2014/10/31/guest-opinion-fighting-climate-change-8212-if-not-palo-alto-then-who>

Carbon Free Palo Alto:

<http://carbonfreepaloalto.org>