

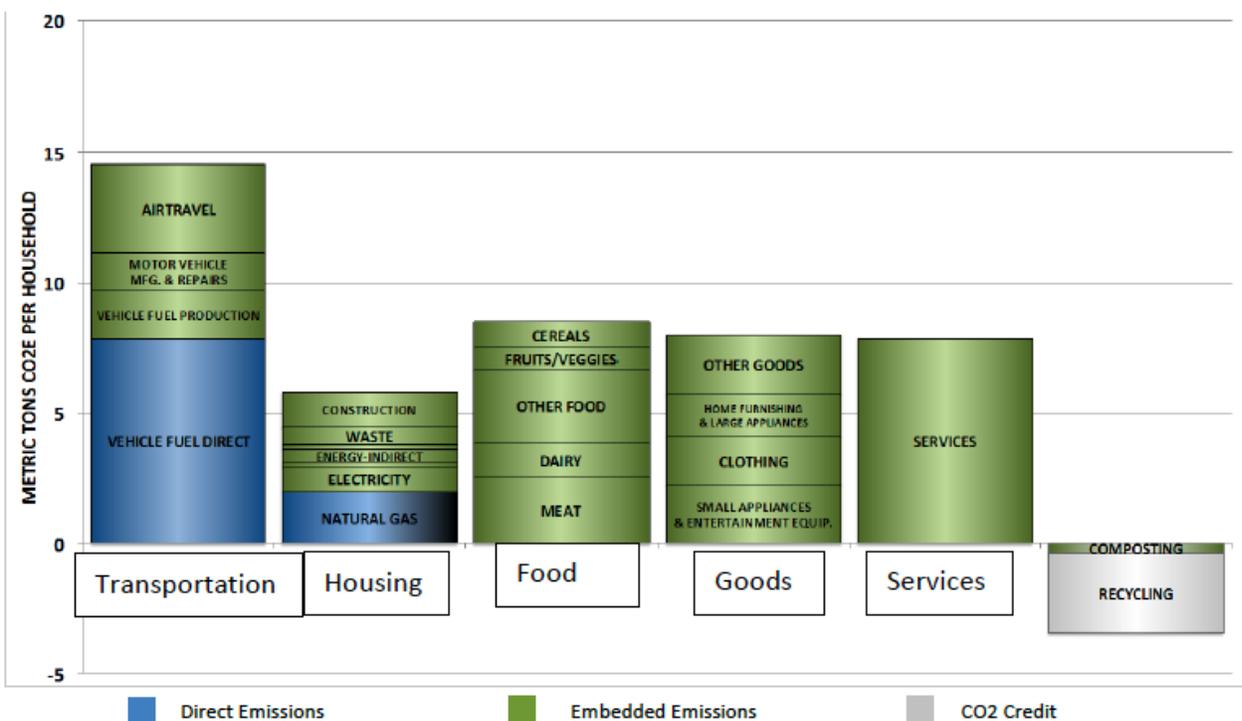
# What Can You Do About Climate Change?

By David Coale

As our electricity grid gets cleaner and cleaner with California's Renewable Portfolio Standards (RPS) increasing the percentages of renewables to 50% by 2030<sup>1</sup> and with many communities opting for Community Choice Energy where this will happen even sooner and at a lower price, the switch to electric energy to do our bidding is getting more attention.

With a cleaner energy source coming on-line, our next easiest opportunity to address climate change 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 30% of the remaining carbon emissions for most residents.

Figure 1. Average SF Bay Area Household GHG Footprint (44.3 metric tons per year)



From <http://coolclimate.berkeley.edu/> a consumption-based GHG inventory of the SF Bay Area.

As our electricity gets cleaner, our next best opportunities for GHG reductions are transportation, natural gas use and food. Your CO2 footprint will vary.

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 long time 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, better health and exercise, can beat an EV anytime. With our good weather and 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 local Farmer's 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 CO<sub>2</sub> as burning 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 each day this leak was equal to the emissions of 4.5 million cars. Natural gas is more than 80 times stronger than CO<sub>2</sub> in its greenhouse gas effect in our atmosphere over a 20-year period<sup>2</sup>. 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 its self 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. PG&E has a \$500 rebate program for this and there is also a Federal tax credit of \$300, 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 heat pump, 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 cook top with an electric induction cook top. For many this change is non-negotiable, but when you talk to people who have made the switch, they all say they would never switch back. The induction cook top 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 near 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. PG&E (<http://www.pge.com/en/myhome/saveenergymoney/rebates/index.page>) and Energy Upgrade

California (<https://energyupgradeca.org>) have rebates for many energy saving appliances and lots of good information on how to reduce your energy use. And don't forget the simple things like a clothesline, which has the fastest payback of any other measure.

### **What about solar?**

There are many reasons one might consider installing a solar photovoltaic (PV) system. The current pay-back for a solar PV system is about 8 to 10 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. Even though our grid is getting cleaner (less carbon intensive), 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 and if you are installing solar PV, just add a few more panels to cover your HPWH electricity usage.

### **Other emissions**

Other indirect emissions shown in the bar graph are associated with food, things we buy, and services. 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 You do About Climate Change?” is: A lot! For fuel switching, conservation and efficiency there are many options and rebate programs to help. Will this really make a difference? I think so, as what we do here in California is an example to others 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 Silicon Valley 350.org Climate Solutions team and member of Carbon Free Palo Alto.

<sup>1</sup> [http://www.pv-magazine.com/news/details/beitrag/california-governor-brown-signs-50-renewable-portfolio-standard-into-law\\_100021447/#axzz41V0oVvpp](http://www.pv-magazine.com/news/details/beitrag/california-governor-brown-signs-50-renewable-portfolio-standard-into-law_100021447/#axzz41V0oVvpp)

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

Carbon Free Palo Alto:  
<http://carbonfreepaloalto.org>