Living Lightly

2017 Bellingham Cohousing Eco Audit Report

Eco-Interest Group
October, 2017

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INTRODUCTION

At Bellingham Cohousing we define our collective sense of community through our principles, the seventh of which reads:

We live lightly on the Earth.

What does it mean to live lightly on the Earth? Where is it most helpful to put our energy? How do we decrease our contribution to climate change? Do individual efforts make a difference to the whole? What would it look like if our community fully embodied our seventh principle? How well are we fulfilling it now?

The 2017 Eco Audit Report provides a starting place around which these questions can be explored.

At our 2015 community retreat, members indicated a strong interest in sustainability, with everyone in the group registering a medium to high level of concern for ecological issues. Members envisioned Bellingham Cohousings's future to include things like rainwater catchment, less space devoted to parking, and a fleet of bikes and eco-cars.

During the 2016 retreat, environmental sustainability goals emerged as three of our community's highest priorities: a community-wide ecological audit; increased solar energy production; and expanded car sharing. Member responses on Maikwe's Principles and Values Survey indicated our community had a sizable gap between our high excitement level about ecological living and and our lesser estimation on how well we believed we were fulfilling our living lightly principle. Soon afterwards, the Eco Interest group formed to address this gap and explore how Bellingham Cohousing might move more closely into alignment with our seventh principle. We decided our inquiry needed to start with a clear and thorough look at where we are right now. We chose our first project to be the creation of a in-depth assessment of factors contributing to Bellingham Cohousing's carbon footprint.

By no means exhaustive or comprehensive, this report presents what we found. We see this report as a beginning point from which the community might further ask questions.

Where do we want to go from here?

How do we get there?

02
METHODS

Eco Interest Group members collected and analyzed data from a number of sources to create the Eco Audit.

Puget Sound Energy, Cascade Natural Gas, and City of Bellingham water usage data were downloaded for analysis into Energy Star Portfolio Manager data collection software.

Solar electricity generation data was downloaded into our Portfolio Manager account by Puget Sound Energy. Solar hot water data came from periodic meter reading of the Common House solar hot water equipment.

The Eco Audit Household Survey gathered information on household rain barrel usage, on-site food cultivation, composting, and transportation. Thirty-two of our thirty-three households participated.

Waste stream data was gathered from Sanitary Service Company bills. Eco Interest conducted an internal waste audit, which tracked weekly percent full for each type of waste bin from May-August, 2017. Free table totals were estimated based on carloads of goods transported for reuse. Common House food composting data was reported by the Common House Committee.

Diet choice and common meal information was obtained from the meal preference spreadsheet posted on the refrigerator in the Common House kitchen and from 2017 meal team records.

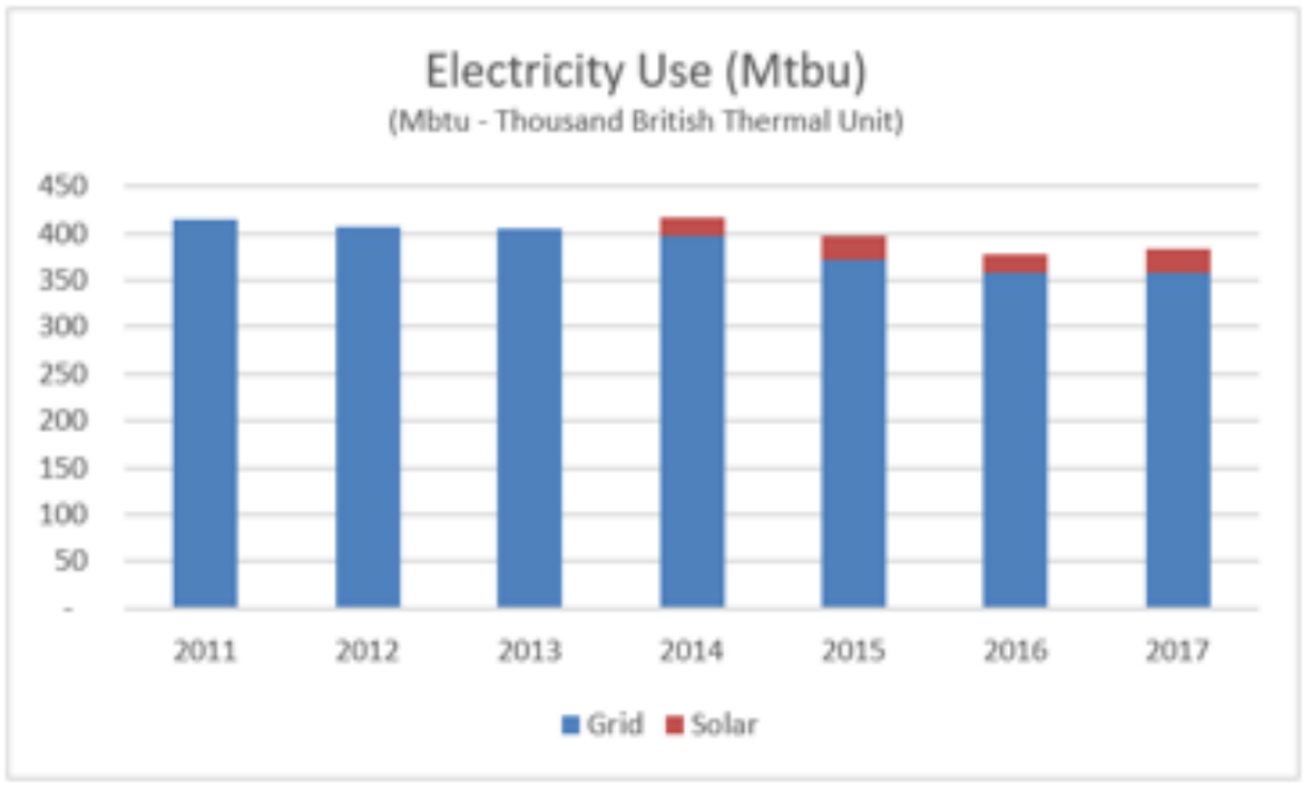
Some of these data sources are still evolving in accuracy. We anticipate building better systems of measurement for upcoming audits.

03
RESULTS

a. Energy Use & Production

Electricity

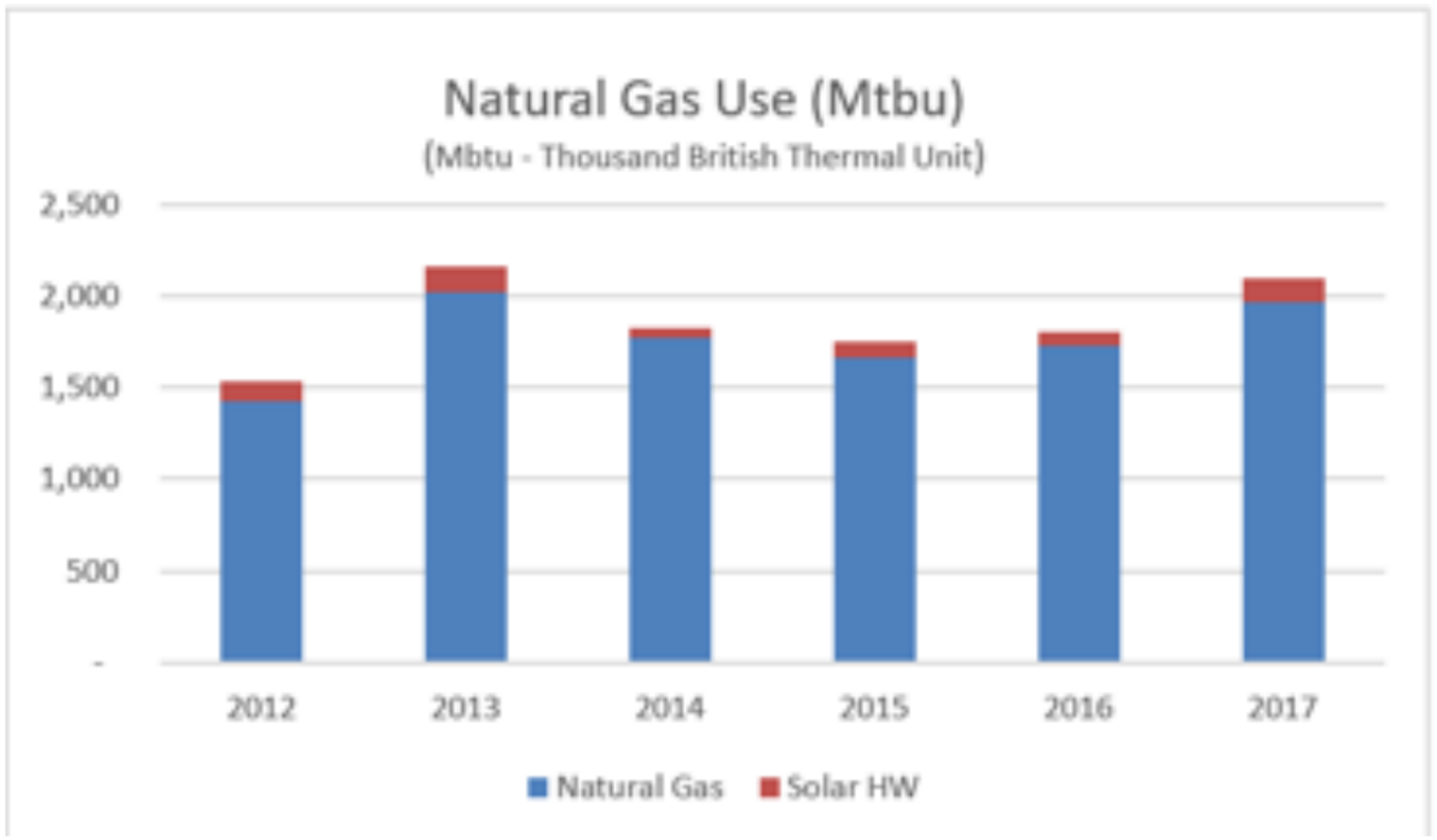
Electricity is primarily generated from non-renewable sources and accounts for 38% of global carbon footprint. In the US, households are responsible for 36% of the total electrical use. [1]



Source: Puget Sound Energy.
Note: 2017 total is based on actual October 2016 to September 2017 usage.

1. http://www.overshootday.org/portfolio/household-energy-consumption/

Natural Gas



Source: Cascade Natural Gas, solar hot water meter readings.

Natural gas is the most abundant greenhouse gas in the Earth's atmosphere and new studies suggest natural gas emissions may be worse for the ozone layer than coal. [2]

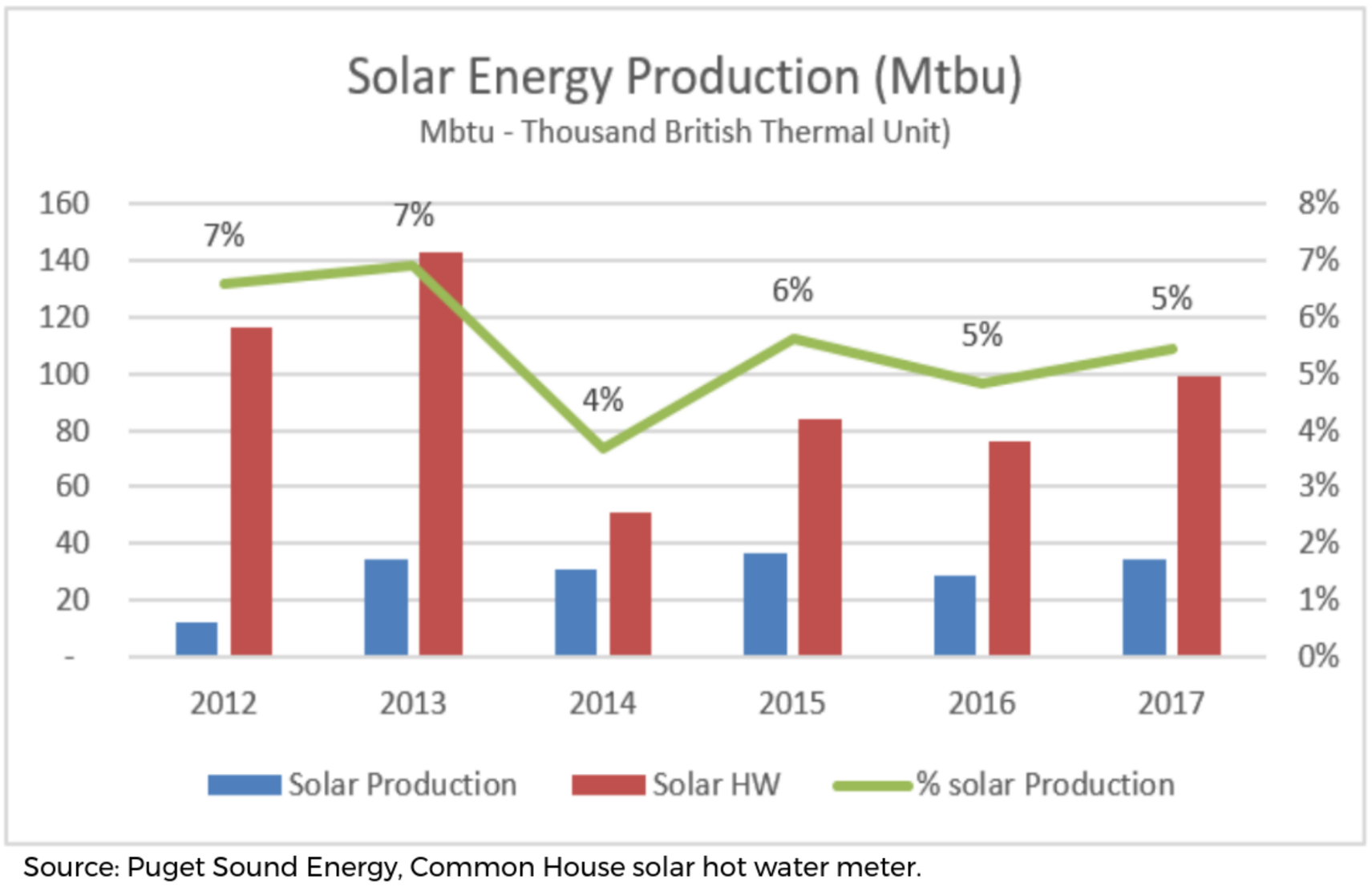
2. http://science.howstuffworks.com/environmental/energy/emissions-natural-gas.htm

Solar Energy Production

Bellingham Cohousing has two sources of on-site solar energy production.

1. Solar panels on the Common House roof generate electricity which we return to Puget Sound Energy in exchange for a decrease in our electricity bill.

2. Thermal collectors on the Common House roof heat water used in the Common House.

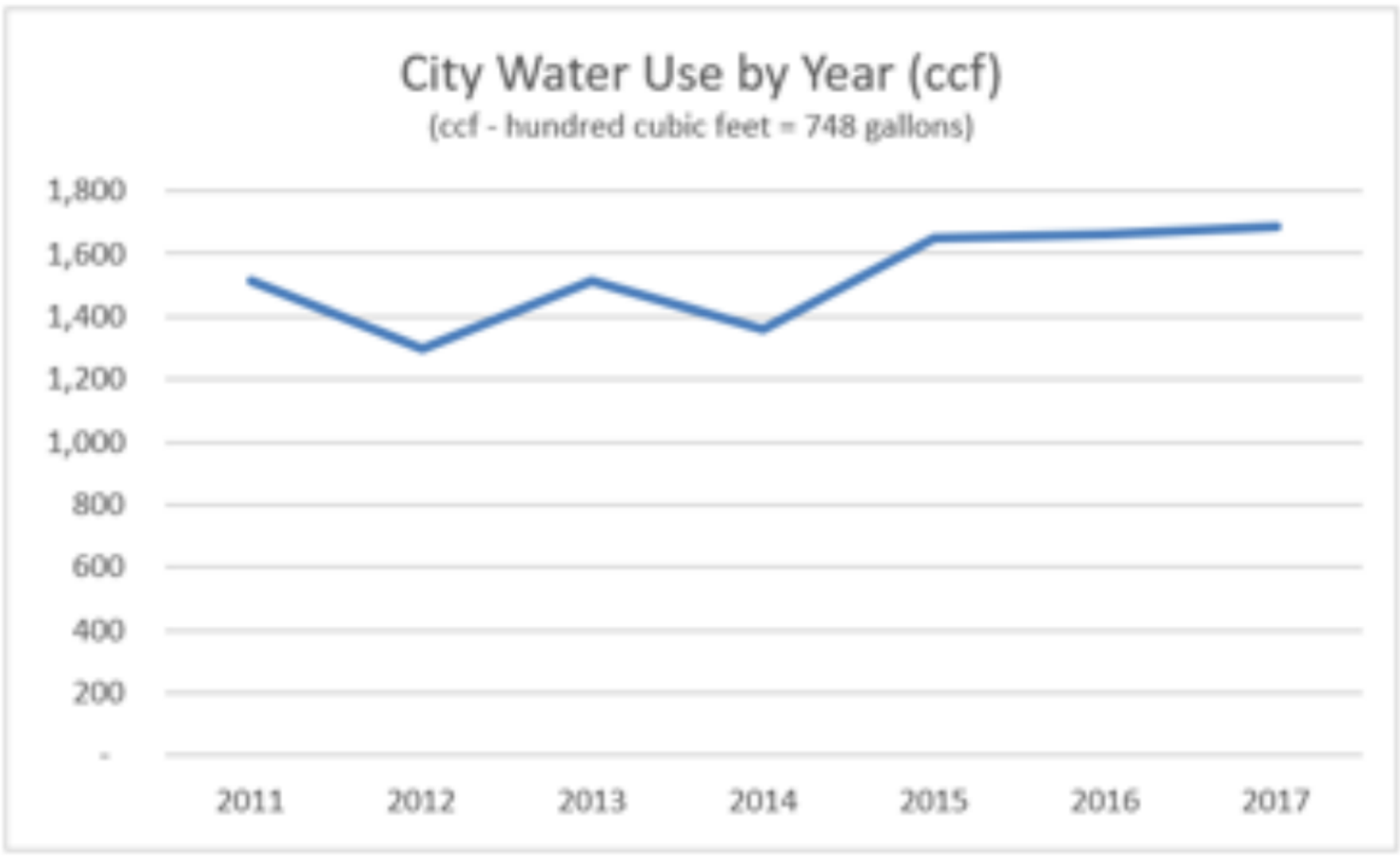


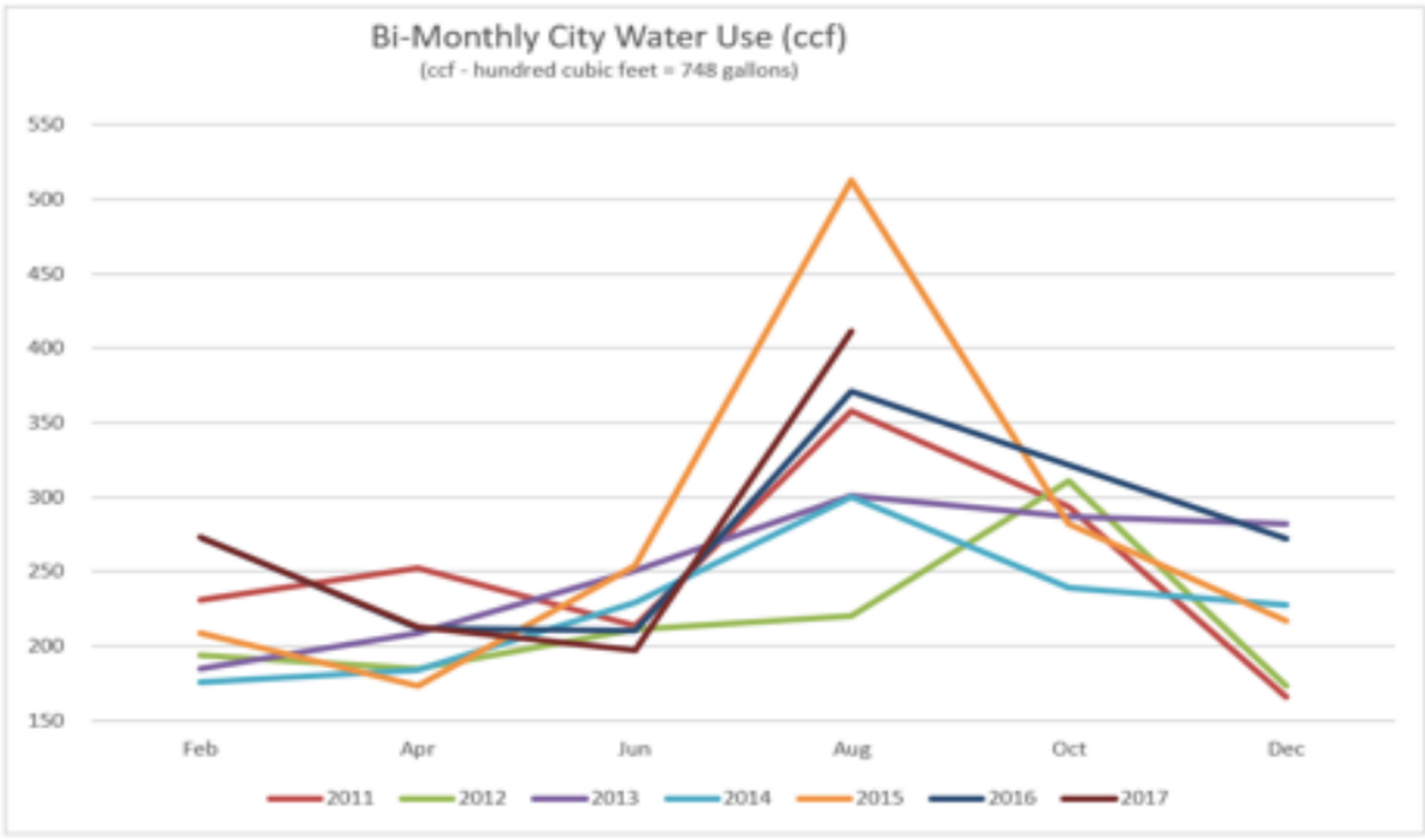
Source: Puget Sound Energy, Common House solar hot water meter.

From 2012-2017, an average of 5.7% of Bellingham Cohousing's total energy use was generated by on-site solar power collection.

b. Water Use

City of Bellingham Water





Source: City of Bellingham water bills for Bellingham Cohousing.
Note: 2017 total is based on actual October 2016 to September 2017 usage.

Rainwater Collection

2

Number of rain barrels

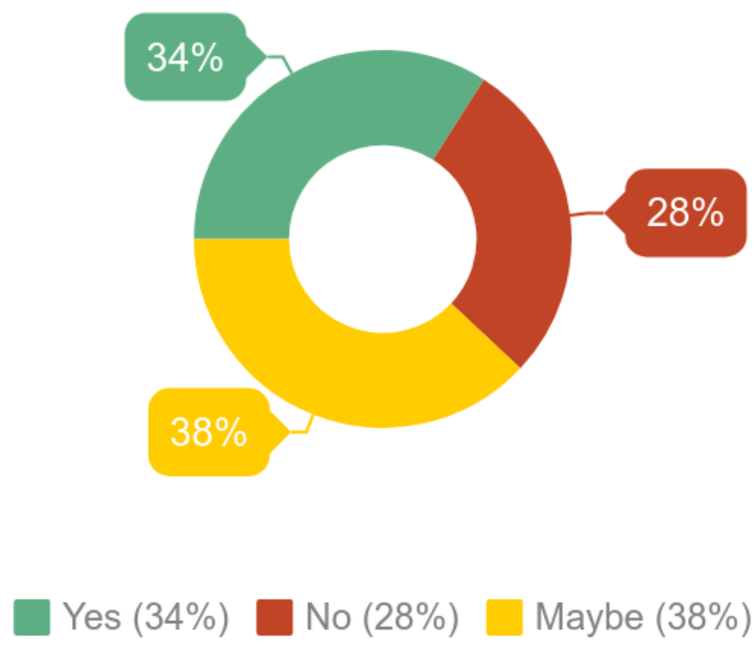
66%

Members who would like or might like a rain barrel

1800

Estimated gallons of rainwater used in 2017

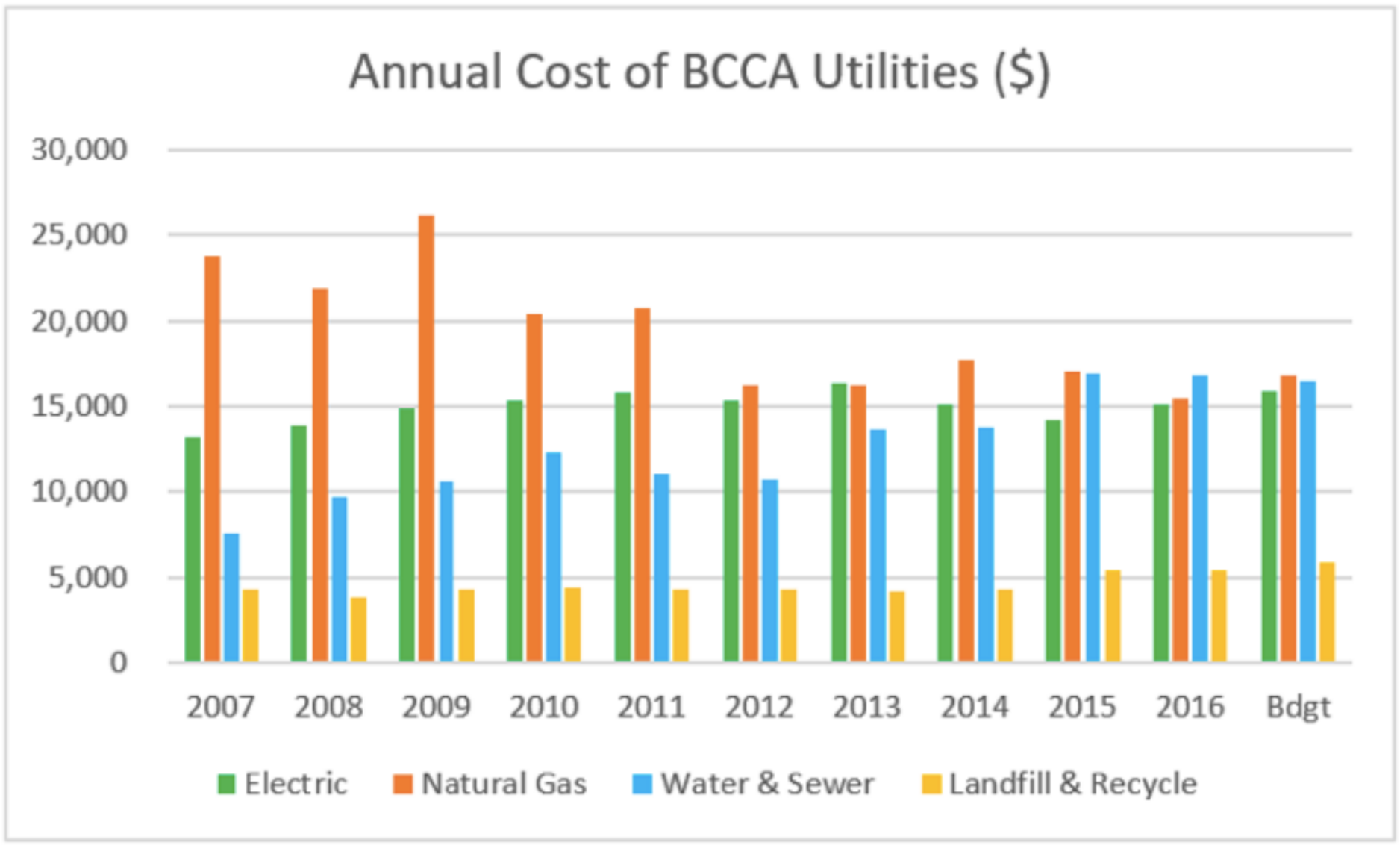
Percentage of Members Interested in Using Rain Barrels



Water-related energy use in the United States is comparable to the electricity output of 150 typical coal-fired power plants and the carbon emissions are roughly equal to the combined greenhouse gas emissions of 11 states: Alaska, Delaware, Hawaii, Idaho, Maine, Nebraska, Nevada, New Hampshire, Oregon, Rhode Island and Vermont. [3]

3. https://www.rivernetwork.org/wp-content/uploads/2015/10/Toolkit_Emissions2-8-12.pdf

Utility and Water Costs



Source: Puget Sound Energy, Cascade National Gas, City of Bellingham paid bills.

Our bioswale discount saves us about $2,600 annually off our water and sewer costs.

c. Transportation

Transportation accounts for approximately 27% of US greenhouse gas emissions. [4]

Cars at Coho

47
Total cars on-site

.64
Average cars per person, including kids

9,813
Estimated average annual miles per household

1.44
Average cars per household

314,010 = 50
Estimated miles driven by Coho members in last 12 months

Number of trips from Bellingham to Boston and back

4. https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions

Alternative Transportation

7

Number of hybrid cars at Coho

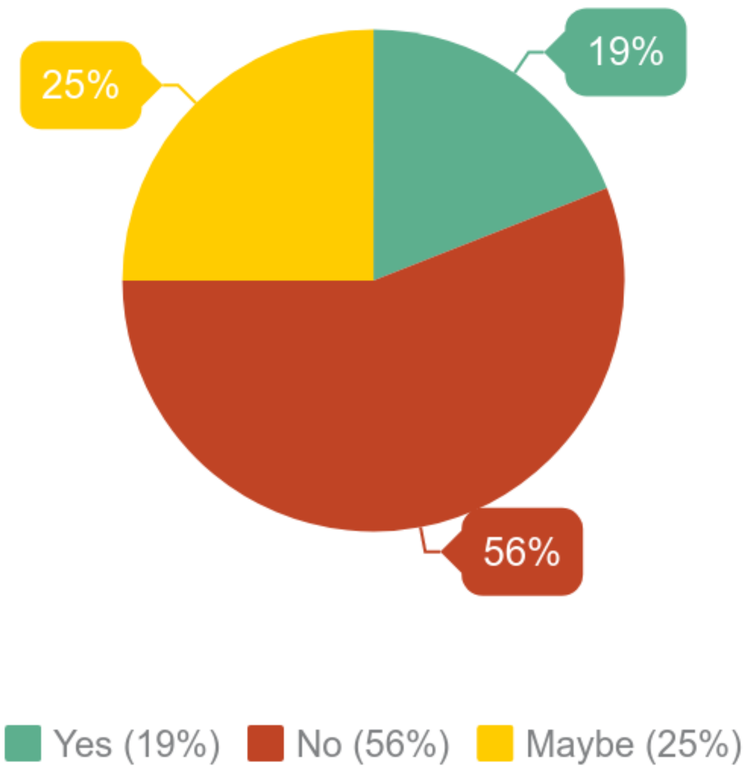
57,800

Estimated total hybrid miles driven in last 12 months

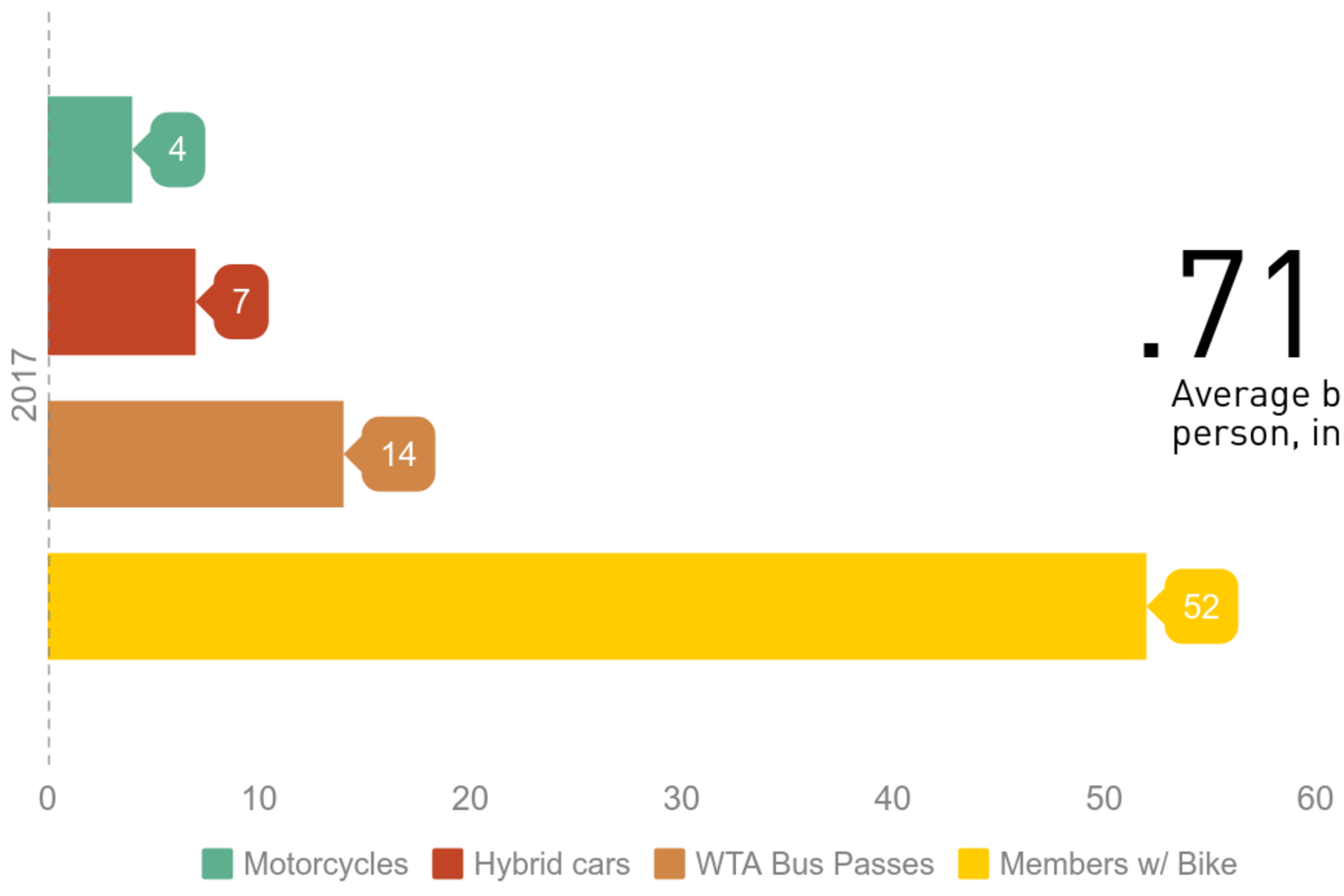
44%

Members who are, or might be, interested in car share

Percentage of Members Interested in Joining a Carshare



Alternatives to Cars at Coho



.71

Average bikes per person, including kids

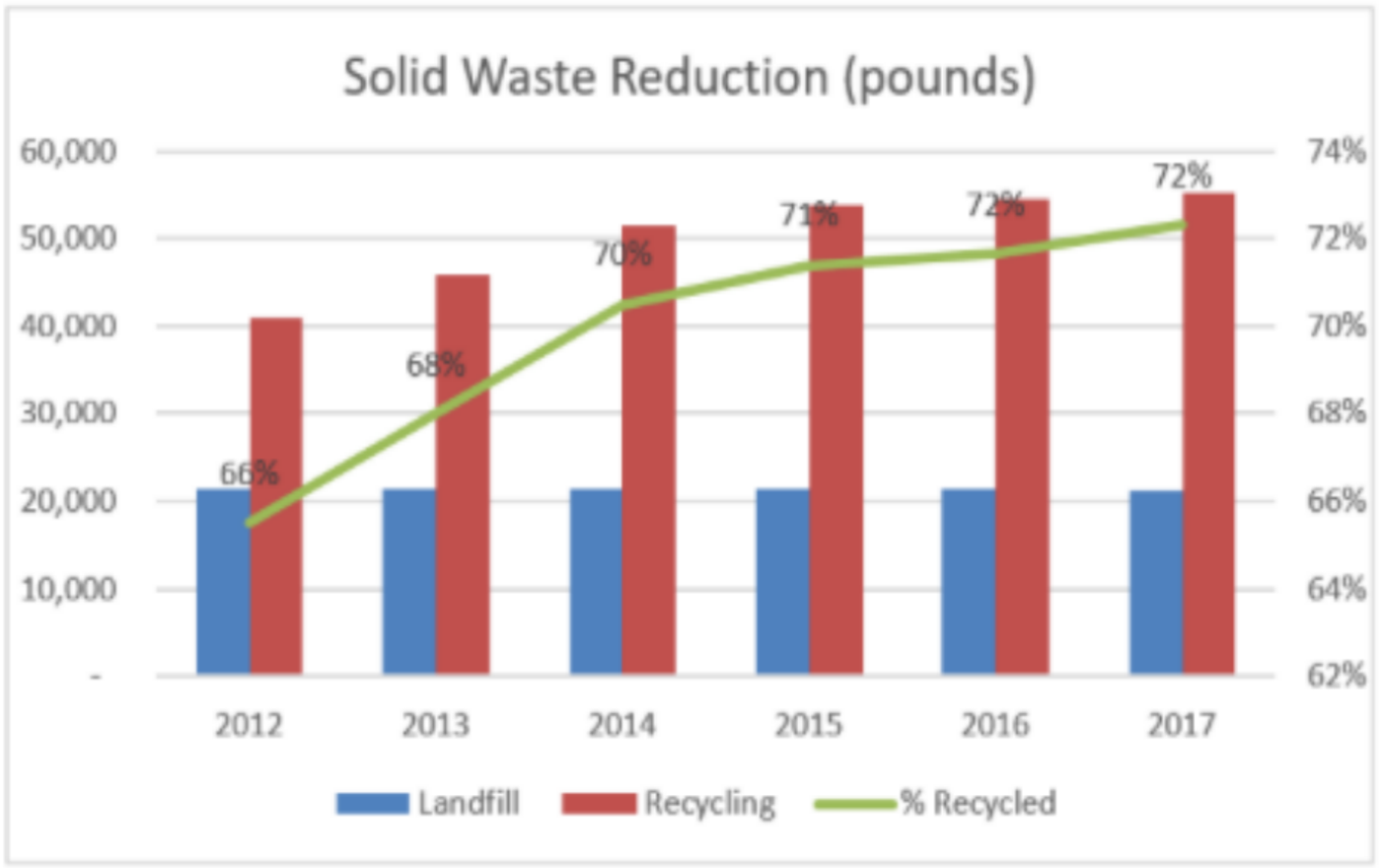
d. Solid Waste Reduction

Contribution to Waste Stream

Over forty percent of US greenhouse gas (GHG) emissions are directly tied to making, moving, and disposing of all the things we use – and throw away – every day. [5]

5. http://indianarecycling.org/curb-your-carbon/

Recycling



Source: Sanitary Service Company bills, EnergyStar Portfolio, Household Eco Audit Survey, Bellingham Cohousing internal waste audit.

Creating products from recycled materials uses up to 98 percent less energy than producing things from new materials. [6]

"Recycling" includes the free table and on-site composting. The increase in total waste recycled between 2012 and 2017 (from 66% to 72%), was due to our rental of additional Food Plus and yard waste toters.

An internal waste audit tracked weekly percent full data for each type of waste bin from May-August 2017. Annual values were extrapolated based on audit results. Sanitary Service Company bills indicate number, size and frequency of collection of waste containers. EnergyStar Portfolio Manager provides average weights per volume associated with each type of waste.

Free Table Mania

949

Estimated cubic feet of Free Table used goods kept out of waste stream annually (does not include items taken home by members or brought to consignment).

6. http://channel.nationalgeographic.com/channel/human-footprint/trash-talk2.html

e. Food Production

Each ingredient in a U.S. meal has traveled an average of 1,500 miles. If we all ate one meal per week of local, organic food, we'd save 1.1 million barrels of oil per week. [7]

Private Gardens

44%
Members cultivating private gardens

1320
Estimated square feet of private food garden space at Coho

114
Estimated pounds of produce in last year from private gardens*
*Mostly wild guesses. Likely not accurate.

Community Gardens

800
Estimated square feet of common food garden space at Coho

100
Estimated pounds of produce in last year from common gardens

Sources: Coho Garden Interest Group, Eco Audit Household Survey.

Approximately 15% of food-related greenhouse gases come from food transport. [8]

7. http://channel.nationalgeographic.com/channel/human-footprint/trash-talk2.html
8. http://pubs.acs.org/doi/abs/10.1021/es702969f

f. Food Waste

Approximately 10 percent of U.S. energy use goes into growing, processing, packaging, and shipping food—about 40 percent of which just winds up in the landfill. [9]

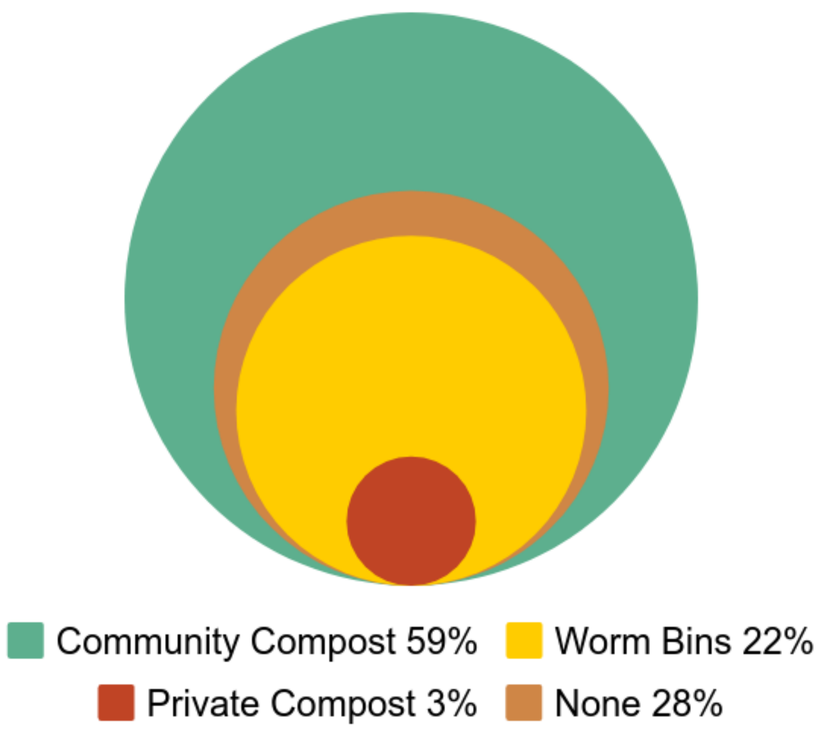
On-site Composting

2135
Gallons of household compost processed on-site, annually

208
Gallons of Common House compost processed on-site, annually

14,820
Pounds of city Food Plus compost generated annually by Coho

Percentage of Members Using On-Site Compost



Source: Eco Audit Household Survey
Note: "Community Compost" refers to the bins behind the East dumpsters

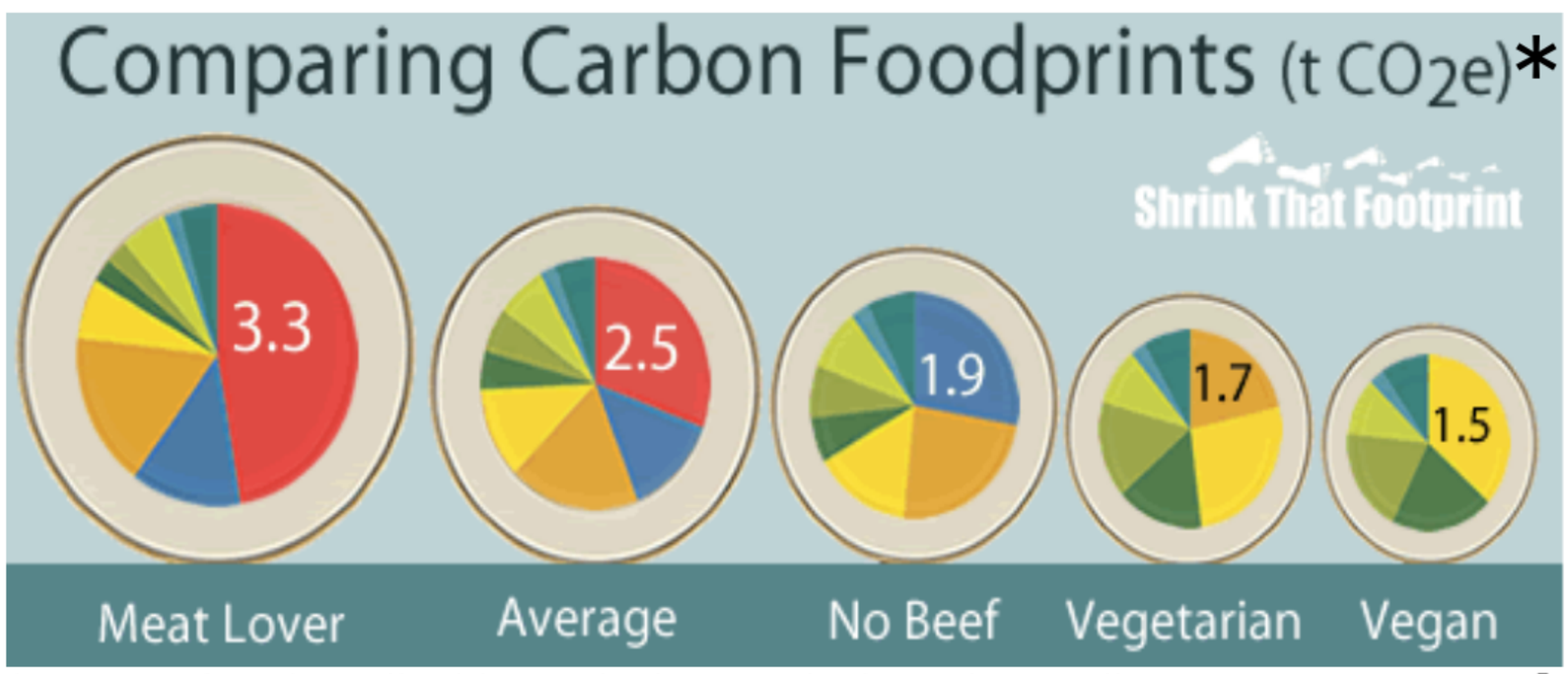
America throws out more than 400 pounds of food per person per year...consumers are the largest generators of food waste.

Wasted food consumes:
21 percent of freshwater used by the U.S. agricultural industry
18 percent of fertilizer used in the United States,
19 percent of U.S. cropland—an area the size of New Mexico.

Wasted food generates:
climate change pollution equivalent to 37 million cars per year. [10]

9. https://www.nrdc.org/stories/how-you-can-stop-global-warming
10. https://foodtank.com/news/2017/09/natural-resource-defense-council-food-waste/

g. Diet Choices



*tonnes of carbon dioxide equivalent emissions due to diet, per year [11]

6
Pescatarians at Coho

3
Vegetarians at Coho

0
Vegans at Coho

18%
Common meals featuring a fish entree, since Jan 2017 (6/34)

26%
Common meals featuring only a vegetarian entree, since Jan 2017 (9/34)

Eat less meat, especially beef. An average family of four that cuts its meat intake in half will avoid roughly three tons of emissions annually. [12]

11. http://shrinkthatfootprint.com/food-carbon-footprint-diet
12.http://www.ucsusa.org/sites/default/files/legacy/assets/documents/global_warming/Cooler-Smarter-Top-Ten-List.pdf