

Treading Lightly

Calculating and Reducing your Carbon Footprint

Andrew Kreider
US EPA Region 3
March 9, 2010

What's a "Carbon Footprint"?

- total greenhouse gas (GHG) emissions
- carbon dioxide (CO₂) or CO₂e
- home and car (and other travel)
 - what you buy (food, furnishings, etc.)

You already know the 'Why?'

Using energy =

greenhouse gases =

climate change

Global warming is not an environmental crisis...

it's an energy crisis

The energy crisis is not about supply...

it's a crisis of consumption

3 Simple Actions

- Courtesy of the IPCC
- Eat less meat
- Ride a bike
- Buy less stuff



BUY PRODUCTS THAT MAKE A DIFFERENCE

U.S. Environmental Protection Agency • U.S. Department of Energy

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Partner Resources

Products

Find ENERGY STAR Products

How a Product Earns the Label

Save Energy at Home

Join Our Movement

Home > Products > Find ENERGY STAR Products

Find ENERGY STAR Products

All Products

For Your Home

Business & Government

Products in Development

Can't Find a Product?

Appliances

- » Clothes Washers
- » Dehumidifiers
- » Dishwashers
- » Freezers
- » Refrigerators
- » Room Air Cleaners & Purifiers
- » Water Coolers

Building Products

- » Home Sealing - Insulation & Air Sealing
- » Roof Products
- » Windows, Doors and Skylights

Computers & Electronics

- » Audio/Video
- » Battery Chargers ?
- » Combination Units, TV/DVD & VCR/DVD
- » Computers
- » Cordless Phones
- » Digital to Analog Converter Box
- » Displays ?
- » External Power Adapters ?
- » Imaging Equipment ?
- » Set-top Boxes & Cable Boxes
- » Televisions

Heating & Cooling

- » Air Conditioning, Central
- » Air Conditioning, Room
- » Boilers
- » Dehumidifiers
- » Fans, Ventilating
- » Furnaces
- » Heat pumps, Air Source
- » Heat pumps, Geothermal
- » Home Sealing - Insulation & Air Sealing
- » Room Air Cleaners & Purifiers

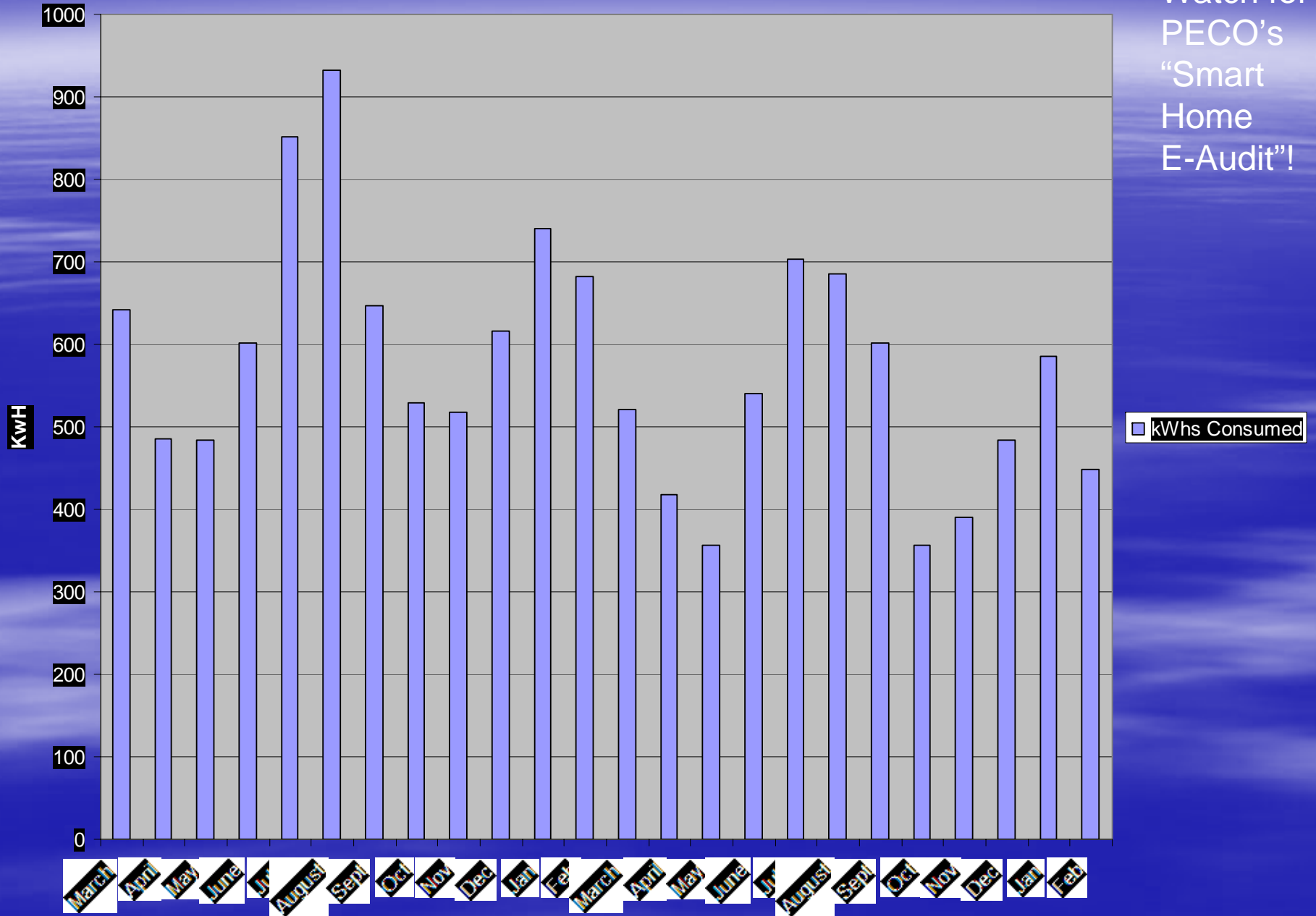
Lighting and Fans

- » Decorative Light Strings
- » Fans, Ceiling
- » Light bulbs (CFLs)
- » Light Fixtures
- » Residential LED Lighting

Plumbing

- » Water Heater, Gas Condensing
- » Water Heater, Heat Pump
- » Water Heater, High Efficiency Gas Storage
- » Water Heater, Solar
- » Water Heater, Whole Home Gas Tankless

Andrew's Electric Use



Watch for PECO's "Smart Home E-Audit"!



YOUR HOME CONTRIBUTES TO THE QUALITY OF THE ENVIRONMENT

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- Products
- Home Improvement
- New Homes
- Buildings & Plants
- Partner Resources

Home Improvement

Home > Home Improvement

- Common Home Problems
- Home Energy Yardstick
- Home Energy Audits
- Air Seal & Insulate
- Heat & Cool Efficiently
- Home Performance with ENERGY STAR
- Home Improvement FAQs
- For Contractors
- For Insulation Manufacturers



Home Improvement: Improve Your Home's Energy Efficiency with ENERGY STAR

Making your home more energy efficient with ENERGY STAR can help to reduce high energy bills, improve comfort and help to protect the environment. Improving energy efficiency is also an important first step for homeowners interested in green remodeling. ENERGY STAR can guide you in making your home more efficient — whether you do-it-yourself or hire a qualified professional.

Assess Your Home



Use ENERGY STAR tools to evaluate your home or work with a professional to do a comprehensive home assessment.

- Common Home Problems
- Home Energy Yardstick
- ENERGY STAR Home Advisor
- Home Energy Audits

Helpful Tools & Resources





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- Products
- Home Improvement
- New Homes
- Buildings & Plants
- Partner Resources

Home Improvement

Home > Home Improvement > Home Energy Yardstick

- Common Home Problems
- Home Energy Yardstick
- Home Energy Audits
- Air Seal & Insulate
- Heat & Cool Efficiently
- Home Performance with ENERGY STAR
- Home Improvement FAQs
- For Contractors
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ENERGY STAR Home Energy Yardstick

WHAT'S YOUR SCORE?

Compare your household's energy use to others across the country and get recommendations for improvement.

What you need to know to get started

- **Your energy use and costs for the last year:** You'll need your last 12 months of utility bills OR a 12-month summary statement from your utility company.
- **Energy sources for your home:** natural gas, electricity, fuel oil, propane and/or kerosene?
- **The square footage of your home.**

Your Home

What is your zip code?

Your Fuel Types

In addition to electricity, which fuel type(s) does your home use? Select all that apply. **Maximum 2.**

Home Improvement
FAQs

For Contractors

For Insulation
Manufacturers

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What you need to know to get started

- **Your energy use and costs for the last year:** You'll need your last 12 months of utility bills OR a 12-month summary statement from your utility company.
- **Energy sources for your home:** natural gas, electricity, fuel oil, propane and/or kerosene?
- **The square footage of your home.**

Your Home

What is your zip code?

How many people live in your home?

What is the square footage of your home, including the basement?

[More information](#)

Your Fuel Types

In addition to electricity, which fuel type(s) does your home use? Select all that apply. **Maximum 2.**

- | | |
|--------------------------------------|-----------------------------------|
| <input type="checkbox"/> Natural Gas | <input type="checkbox"/> Propane |
| <input type="checkbox"/> Fuel Oil | <input type="checkbox"/> Kerosene |

Your Energy Use

Would you like to use **annual** or **monthly** billing information to enter your household's energy use? [?](#)

- Annual
 Monthly

Select the Start Date for the year covered: [?](#)

Enter Totals for the year:

kWh dollars

SUBMIT

Would you like to include the Home Energy Yardstick on your website? [Click here for instructions](#) (196KB) or [contact Tech Support to find out how!](#)

- Home Energy Yardstick
- Home Energy Audits
- Air Seal & Insulate
- Heat & Cool Efficiently
- Home Performance with ENERGY STAR
- Home Improvement FAQs
- For Contractors
- For Insulation Manufacturers

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ENERGY STAR Home Energy Yardstick • RESULTS

The Home Energy Yardstick compares a household's energy use to similar homes and gives it a score between 0 and 10 (10 being the most energy efficient). An average household scores a 5.

Yardstick Score: 5.1*

Annual pollution resulting from energy use in this household is 9,020 lbs of greenhouse gas emissions - the equivalent of 1 cars.



About Your Home

Zip code: 19460
People living in your Home: 4
Square Footage: 1,700

Fuel Types

Electricity
Fuel Oil

Energy Use

Energy Use from 01-Feb-2009 to 31-Jan-2010

Electricity Use: 5,500 kWh
Electricity Cost: \$0
Fuel Oil Use: 900 gal
Fuel Oil Cost: \$0

Total Source
Energy Consumption: 188,748 kBtus

Improve your Score Today!

ENERGY STAR's Home Energy Advisor. Tell us more about your home and get customized recommendations to improve efficiency and comfort.

How Do You Cool Your Home?

Please Select

How Do You Heat Your Home?*

Please Select

What Type of Water Heater Do You Have?*

Please Select

* Required field.

Get a Home Energy Audit.

Contact your utility to see if they offer free or

Federal Tax Credits for Consumer Energy Efficiency

If you purchase an energy-efficient product or renewable energy system for your home, you may be eligible for a federal tax credit. Below you will find an overview of the federal tax credits for energy efficiency.

Please note, not all ENERGY STAR qualified products qualify for a tax credit. ENERGY STAR distinguishes energy efficient products which, although they may cost more to purchase than standard models, will pay you back in lower energy bills within a reasonable amount of time, without a tax credit.

What You Need to Know

- What is included in the Federal Tax Credit?
- [How do I apply for my Federal Tax Credit?](#)
- [Top ten Frequently Asked Questions](#)

What is included in the Tax Credit?

Tax Credit: [30% of cost up to \\$1,500](#)

Expires: December 31, 2010

Details: Must be an existing home & your [principal residence](#). New construction and rentals **do not** qualify.

- ▶ Biomass Stoves
- ▶ Heating, Ventilating, Air Conditioning (HVAC)
- ▶ Insulation
- ▶ Roofs (Metal & Asphalt)
- ▶ Water Heaters (non-solar)
- ▶ Windows & Doors

Other Tax Information

- [Cars](#) **EXIT**
- [Home Builders](#)
- [Commercial Buildings](#)
- [Stimulus Info for State and Local Governments](#)



What Can my Business Do?

- Remember the three simple actions
- Be an example
- “Benchmark” your building
- Become a partner



SUPERIOR ENERGY MANAGEMENT CREATES ENVIRONMENTAL LEADERS

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Products

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New Homes

Buildings & Plants

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Home > Buildings & Plants > Small Business

Guidelines for Energy Management

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Green Buildings

Getting Started for...

Government

Healthcare

Higher Education

Hospitality

Small and Medium Sized Manufacturers

K-12

Real Estate/Multifamily

Retail



ENERGY STAR for Small Business

En Español

Whether you own your building or are a tenant, you typically need lighting, heating, air conditioning, power for office equipment, and other services to stay in business. With free, unbiased information and technical support from ENERGY STAR, you can more easily improve your company's financial performance by reducing energy waste and energy costs, while protecting the earth's environment.

What You Get

- Free, accurate, unbiased information
- Technical support through our [Email a Technical Question](#) service and [Technical Resources](#)
- ["How-to" guide](#) for analyzing and upgrading your facility
- An even more detailed guide, the [Building Upgrade Manual](#) is available
- Find Finance Resources and Success Stories in your state
- Energy equipment and service contractors and utilities
- Information about ENERGY STAR labeled products
- National and local recognition
- [Public relations materials](#) to promote your efforts

What You Can Do

News

New! Now accepting 2010 Small Business Award Applications (84KB)

2009 ENERGY STAR Leaders Achieve Record Savings (132KB) | [Press Release](#)

[Winter 2010 Business & Industry Newsletter](#)

[2010 ENERGY STAR Awards Ceremony](#)

Selected Resources

Publications Home

Program

ENERGY STAR General (12)

Home Improvement Products (12)

New Homes (5)

Buildings and Plants (12)

ENERGY STAR Challenge (28)

Small Business (2)

Congregations (2)

Earth Day (1)

Archive (15)

Publication Type

Activity Book (3)

Annual Report (10)

Booklet (13)

Brochure (15)

Fact Sheet (27)

Other (2)

Postcard (3)

Poster (7)

Home > ENERGY STAR Publications

ENERGY STAR Publications

All publications are offered free of charge. All publications are also available electronically. If you need to request larger quantities, contact the ENERGY STAR Hotline at hotline@energystar.gov or call 1-888-782-7937.

Be advised that ENERGY STAR can ship only one copy per publication to international addresses, unless a valid FedEx account number is provided.

Featured Publications by Program

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ENERGY STAR General

Showing 1 - 3 of 12 [View All](#)

[2008 Annual Report](#)

- Type: Annual Report
- Pages/Size: 80 pages
- Language: English
- Date of Publication: Dec 2009
- Primary Audience: Partner

On Back Order until February. Order now and we'll deliver the item when it's available.

[Join Us in the Fight Against Global Warming](#) (674.99 KB)

- Type: Booklet
- Pages/Size: 12 pages (5 1/2 * 8 1/2)
- Language: English
- Date of Publication: March 2009
- Primary Audience: Consumer

[Lorax Activity Book](#) (1.51 MB)

- Type: Activity Book
- Pages/Size: 6 pages, 8.5*11



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Buildings & Plants

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Commercial Building Design

Green Buildings

Getting Started for...

- Government
- Healthcare
- Higher Education
- Hospitality/ Entertainment
- Industrial
- K-12
- Real Estate/ Multifamily
- Retail



Waikiki Beach Marriot
2552 Kalakaua Avenue
Honolulu, HI 96815

Buildings & Plants

Improving the energy efficiency of the places where we work, play and learn helps us save energy, save money, and fight global warming. Look for facilities that have earned the ENERGY STAR – the national mark of excellence in energy performance – and know with confidence that the facilities are energy efficient and have a smaller carbon footprint.

[View All Labeled Facilities](#)



Strategy

[Guidelines for Energy Management](#)

Get started by applying our proven strategy to set performance goals, create and implement action plans, assess performance and progress, and recognize your organization's achievements.

[Commercial Building Design](#)

Make energy performance a priority in your next building's design. Use [Target Finder](#) to set your energy performance target.



Quick Finder

- [Portfolio Manager Login](#)
- [Target Finder](#)
- [ENERGY STAR Challenge](#)
- [ENERGY STAR Leaders](#)
- [Earn the ENERGY STAR](#)
- [Purchasing & Procurement](#)
- [Service Providers Directory](#)

Benchmark Your Energy Use

K-12 Schools



Offices



Hospitals



Supermarkets



Hotels



Med. Office Bldgs.



**Warehouses, Residence Halls, Courthouses, Financial Centers, Retail,
Wastewater Treatment Plants, Houses of Worship**

Home > My Portfolio > Philly Bldg

Facility Summary: Philly Bldg

[How do I use this page?](#)

Building ID: 1655643
 Level of Access: Building Data Administrator

Electric Distribution Utility: Excelon - PECO Energy Co
 Regional Power Grid: [RFC East](#)
[Select my Power Generation Plant](#) to calculate my electric emissions rate
 Electric Emissions Rate (kgCO₂e/MBtu): 152.3 ([what is this?](#))

[Generate a Statement of Energy Performance](#) for uses other than applying for the ENERGY STAR.

General Information Edit	
Address: Arch Street , Philadelphia, PA 19103	
Year Built: 1990	
Property Type: Single Facility	
Baseline Rating: 71	Current Rating: 71
View Period Ending Dates	
Water Period Ending Dates Current: N/A Baseline: N/A	Energy Period Ending Dates Current: December 2008 Baseline: December 2008
Eligibility for the ENERGY STAR	
Not Eligible: Rating must be 75 or above	

Facility Performance [Set Baseline Periods](#) | [Set Energy Performance Target](#)

Select View: Summary: Energy Use [Create View](#) | [Edit View](#)

12 Months Ending	Current Rating (1-100)	Current Site Energy Intensity (kBtu/Sq. Ft.)	Current Source Energy Intensity (kBtu/Sq. Ft.)	Change from Baseline: Energy Use Intensity (kBtu/Sq. Ft.)	Change from Baseline: Adjusted Energy Use Intensity (kBtu/Sq. Ft.)	Energy Use Alerts
December 2008	71	78.7	263.0	0.0	0.0	Data > 120 days old



BE A LEADER—CHANGE OUR ENVIRONMENT FOR THE BETTER

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Home > Partner Resources

Partner Resources



We just launched the Change the World, Start with ENERGY STAR Campaign!

[▶ See how you can participate](#)

Headlines

- New Agreement between EPA and DOE on ENERGY STAR
- New ENERGY STAR Requirements for Audio/Video Equipment
- One Million ENERGY STAR Qualified Homes Built in the US
- EPA Raises the Bar for ENERGY STAR TVs

[▶ Newsroom](#)

Spotlight On...

ENERGY STAR Award for Excellence Winner



[▶ Learn More](#)

Become a Partner

Join today! Partnership offers unique opportunities to leverage the trusted ENERGY STAR name.

[▶ Join ENERGY STAR](#)

My Account Login

Access your company information, plus the tools and resources you need to work with ENERGY STAR

Get Involved

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- [▶ Training Resources](#)
- [▶ Meetings](#)
- [▶ Awards](#)

Find Partners & Product Info

- [▶ Partner Directory](#)

Specific Resources for:

- Manufacturers
- Retailers
- New Home Builders, Raters, Sponsors, & Lenders
- Utilities/Regional Energy Efficiency Program Sponsors
- Buildings & Plants

Now we calculate...

- Handout
- Thanks to Mt Airy Greening Net
- www.mtairygreening.net

Form

Department of Natural Treasury—Atmospheric Revenue Service

Estimated time to complete this form is 30 minutes

CO2EZ

For Computation of Yearly CO₂ Emissions to Worldwide Ecosystem

2008

Transportation

Estimate annual amounts.

1 Number of miles traveled by primary vehicle last year : _____
 ÷ by average miles per gallon _____ :
 x by 20 lbs CO₂/gallon of gas : _____ lb CO₂

1a Repeat the above for all additional cars, motorcycles etc.
 and add: _____ lb CO₂

2 Number of miles of air travel per year (all household
 members): _____
 x 0.7 lb CO₂/mile : _____ lb CO₂

3 **Total Transportation Emissions (in lbs of CO₂)**
 Add (1), (1a), (2) _____ lb CO₂

Electricity

Look at most recent utility bills.

4 Kilowatt hours of electricity used per year (if using
 100% renewable energy enter "0") : _____

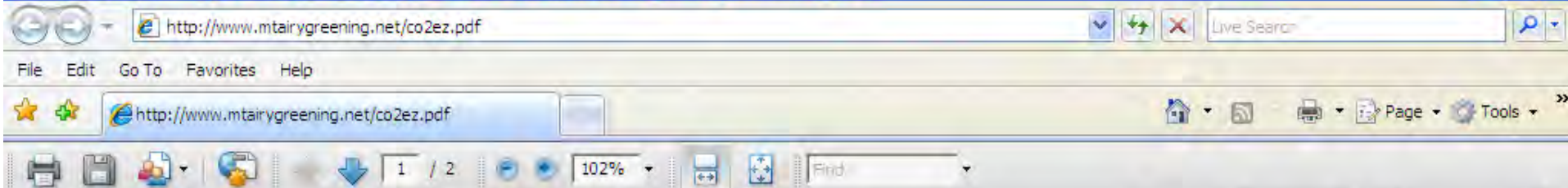
5 **Total Electricity Emissions (in lbs of CO₂)**
 x 1.5 lb CO₂/kWh : _____ lb CO₂

Heating

Look at most recent utility bills.

Done

Unknown Zone



Heating

Look at most recent utility bills.

6 Therms of natural gas per year (or "cf" or 100 x cubic feet) : _____
 x 12 lb CO₂/therm : _____ lb CO₂

7 Gallons of heating oil per year (if heating by oil): _____
 x 25 lb CO₂/gal : _____ lb CO₂

8 **Total Home Heating Emissions (in lbs of CO₂)**
 Add (6), (7) _____ lb CO₂

Total

9 **Total Emissions, per year, for household (in lbs of CO₂)**
 Add (3), (5), (8) _____ lb CO₂

10 **Total Emissions, per year, for household (in tons of CO₂)**
 ÷ by 2200 lb/ton _____ tons

Sign Here

Your signature	Date	Number in household
----------------	------	---------------------

Your name (& contact info if you want to be contacted)

Check here to indicate that you are signing your household up to exceed the Kyoto Protocol, by ALSO committing to reducing your household emissions 5% annually until our ecosystem regains its balance.

Transportation

Estimate annual amounts.

- 1 Number of miles traveled by primary vehicle last year : 8286
 ÷ by average miles per gallon 22 : 377
 x by 20 lbs CO₂/gallon of gas : 7540 lb CO₂
-
- 1a Repeat the above for all additional cars, motorcycles etc.
 and add: 4160 lb CO₂
-
- 2 Number of miles of air travel per year (all household
 members): —
 x 0.7 lb CO₂/mile : — lb CO₂
-
- 3 **Total Transportation Emissions (in lbs of CO₂)**
 Add (1), (1a), (2) 11,700 lb CO₂

Electricity

Look at most recent utility bills.

- 4 Kilowatt hours of electricity used per year (if using
 100% renewable energy enter "0") : 5,500
-
- 5 **Total Electricity Emissions (in lbs of CO₂)**
 x 1.5 lb CO₂/kWh : 8,250 lb CO₂

Heating

Look at most recent utility bills.

- 6 Therms of natural gas per year (or "ccf" or 100 x cubic feet) : —
 x 12 lb CO₂/therm : — lb CO₂
-
- 7 Gallons of heating oil per year (if heating by oil): 900
 x 25 lb CO₂/gal : 22,500 lb CO₂
-
- 8 **Total Home Heating Emissions (in lbs of CO₂)**
 Add (6), (7) 22,500 lb CO₂

Total

- 9 **Total Emissions, per year, for household (in lbs of CO₂)**
 Add (3), (5), (8) 42,450 lb CO₂
-
- 10 **Total Emissions, per year, for household (in tons of CO₂)**
 ÷ by 2200 lb/ton 19.30 tons

Questions?

- Andrew Kreider, 215-814-3301
kreider.andrew@epa.gov
www.energystar.gov
- Remember:
 - federal tax incentives
 - PECO discounts and rebates
 - PA rebates