earth day 2010

EARTH DAY NETWORK

# Global Day of Conversation on Climate Change, Energy and the Green Economy

# Citizens' Guide

## Partnering organizations

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LOCAL GOVERNMENTS FOR SUSTAINABILITY

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YALE SCHOOL OF FORESTRY & ENVIRONMENTAL STUDIES

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# The importance of local emissions reduction goals

## Why Local Action on Climate Change?

- Scientists currently estimate that avoiding dangerous climate change would require significant emissions reductions below 1990 levels by 2050. In addition to preventing dangerous impacts from climate change such as sea level rise and severe weather events, climate action can promote economic prosperity, energy security, more livable communities, and create ample cost-saving opportunities for businesses and homes.
- Successfully reaching the deep emissions reduction goals called for by scientists will require action at all levels of society. Local governments are uniquely situated to implement measures at the community level that impact everyone's ability to reduce their emissions in cost-effective ways. In addition, local governments play a special role in educating the public on how to live sustainably and what resources are available in the community to help you do so.
- Taking action to address global warming can enhance local economic and social objectives. Reducing emissions requires using energy more efficiently, and doing so cuts back on energy bills. Investing in public transit, biking infrastructure, and walkable communities can improve the local quality of life and make it easier for people to save money when gas prices spike. Developing clean renewable energy sources, promoting local food production, and weatherizing and insulating buildings can all help reduce emissions. In that way, climate action projects can create new green jobs that make communities more resilient in the face of economic downturns.
- There are many ways that your actions as an individual will add up to help meet local emissions reduction goals, national goals, and ultimately the goal of reducing global emissions enough to prevent the effects of catastrophic climate change such as flooding of low-lying areas, threats to endangered species, and more severe weather events including droughts, hurricanes, tornadoes, etc. In so doing, your efforts will help your community become more sustainable and economically resilient and will help you reap energy cost-savings down the road.

## Climate Change Policy

- Two international agreements (the United Nations Framework Convention on Climate Change and the Kyoto Protocol) call upon nations to reduce greenhouse gas emissions in order to avoid dangerous climate change impacts.
- President Obama and the 111th Congress are expected to adopt national greenhouse gas emission reduction goals. In the meantime, many U.S. states and Canadian provinces have passed climate change legislation and are working together to create regional cap and trade programs to help reduce emissions in their states.
- Local governments are setting reduction targets and establishing climate action plans for their own operations and for the whole community. To successfully meet these goals, every sector of the community must play a part.



# Understanding and Reducing Greenhouse Gas Emissions

- Understanding your "carbon footprint" can guide you to cost-effective ways to reduce your greenhouse gas emissions. Your carbon footprint measures the direct and indirect emissions that your daily activities generate over the course of a year. It is a reflection of many factors, but lifestyle and consumption choices are the ones you most directly control. State and local energy policies determine how much greenhouse gases are emitted per unit of energy you use and also influence the range of lifestyle options available to you. Reducing your emissions can take the form of changes in personal choices (which can often lead to cost-savings as well) or getting involved in community efforts to reduce waste, offer more transportation options and generate energy more sustainably. This guide takes you through ways to reduce your carbon footprint in each of five areas: transportation; your home energy use; solid waste; food; and urban development.
- In 2004, the average carbon footprint of a U.S. resident was 20.6 tons of carbon dioxide, whereas the average footprint of all high income countries was 13.3 tons of carbon dioxide per person. By contrast, the average global carbon footprint in 2004 was 4.5 tons of carbon dioxide per person. How does your footprint measure up? Try calculating your carbon footprint. Many tools are available online, but here are a few that we recommend:
  - EPA Personal Emissions Calculator
    http://www.epa.gov/climatechange/emissions/ind_calculator.html
    Allows you to calculate your household's emissions as well as the estimated savings associated with specific reduction commitments.
  - UC Berkeley Cool Climate Carbon Footprint Calculator
    http://coolclimate.berkeley.edu/
    Gives a rough estimate of your household emissions and how they compare to similar households as well as national and global averages. It includes graphs showing the relative contributions of major types of activities (such as transportation, heating and powering your home, and so on) to your overall footprint.
  - Climate Culture
    Access through http://www.climateconversation.org/index.php?id=9555
    Climate Culture integrates a household emissions calculator with social networking tools that allow you to interact with your community to see what other people in your area are doing to reduce their energy usage. The site considers multiple factors – local weather patterns, the type of home you live in, the amount of people in your household, and other details that make your energy use unique – when calculating your emissions and providing relevant tips for reducing them.



# Getting Around

## How transportation choices affect your emissions

- Transportation accounted for almost 28% of national greenhouse gas (GHG) emissions in 2007. [1]
- Gas mileage, fuel choice, and miles travelled all determine your direct transportation emissions.
- Mode of transportation: walking and biking have no direct emissions, while mass transit options emit less than cars and airplanes.

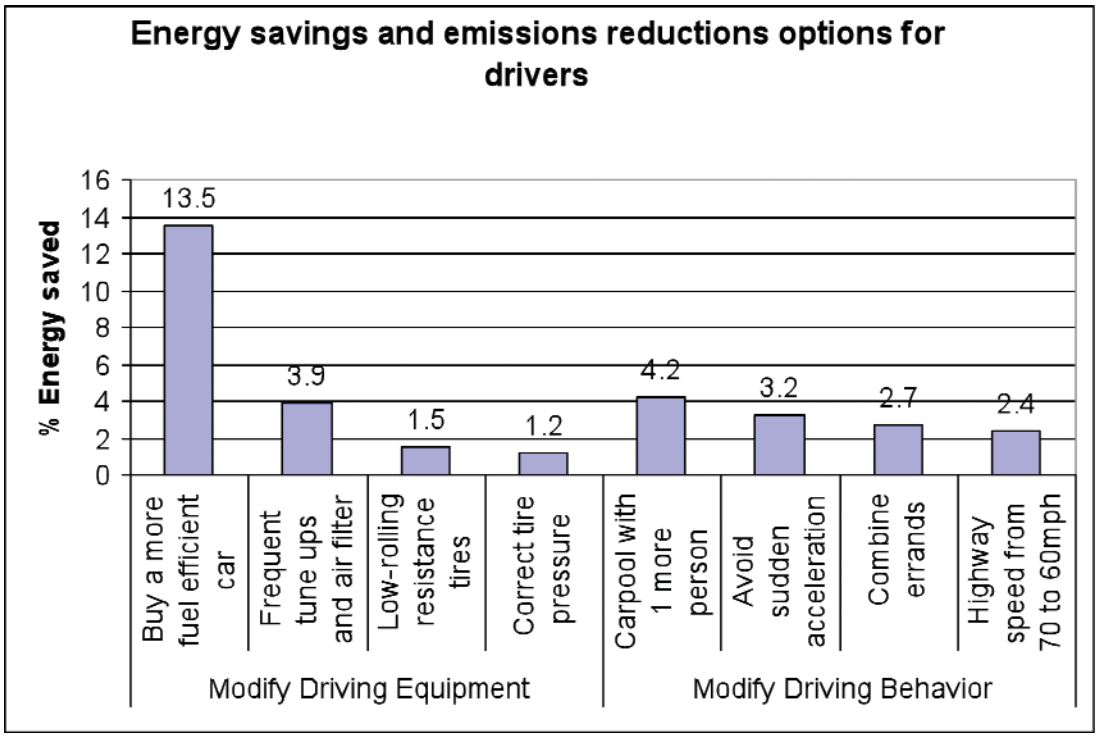
## Reduce your emissions from driving [2]

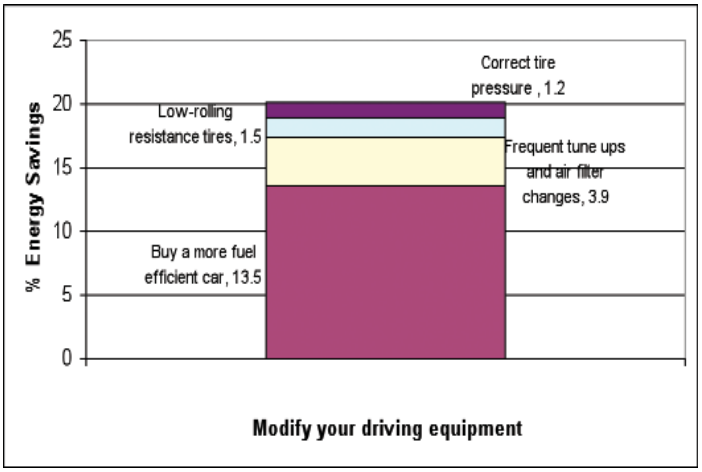
- When you do choose to drive, you can reduce your car's emissions using two approaches: 1) modifying your driving equipment; and 2) modifying your driving behavior. Both ways save money because they reduce your energy needs. Equipment improvements, however, often require spending significant money up front, for greater payback financially and in emissions reductions over the long haul.
- Here are the top equipment modifications that can cut your energy costs and reduce your emissions:
  - Buy a more fuel efficient car (30.7mpg versus 20mpg): 13.5% energy savings. For the fuel economy, carbon footprint, and gas costs of various car models, check out http://www.fueleconomy.gov.
  - Frequent tune ups and air filter changes: 3.9% energy savings.
  - Buy low-rolling resistance tires: 1.5% energy savings.
  - Maintain correct tire pressure: 1.2% energy savings.
- Here are the top behavior changes in your driving that can cut your energy costs and reduce your emissions:
  - Carpool to work with one other person: up to 4.2% energy savings. Many online services exist to help match rides between people with similar commutes. See for example, http://www.nuride.com and http://www.erideshare.com/.
  - Avoiding sudden acceleration and stops: up to 3.2% energy savings.
  - Combining errand trips to one-half current mileage: up to 2.7% energy savings.
  - Cut highway speed from 70mph to 60mph: up to 2.4% energy savings.

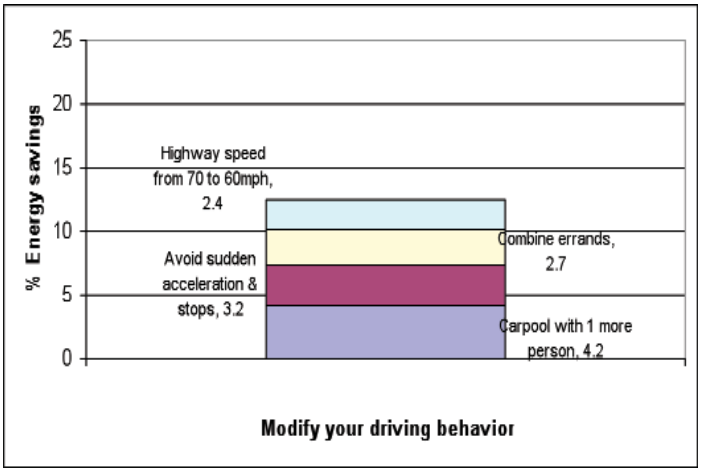
[1] While emissions come from energy used by all modes of transportation, the recommendations in this section focus on ways to reduce emissions from cars.

[2] Emissions reductions in this section (driving) and the next one (at home) are calculated as a percentage of annual energy used by the average American household.






- If you're planning to move, consider the transportation options available from your new home. Keep the following in mind:
  - Living close to work requires less driving and makes it more possible to bike or walk to work.
  - Mass transit is a more efficient way to get around than driving alone. Are transit options easily accessible from your neighborhood?
  - Can you conduct any errands by bike or on foot? Not emitting at all is the most effective way to reduce emissions!



### Get engaged in your community: transportation options

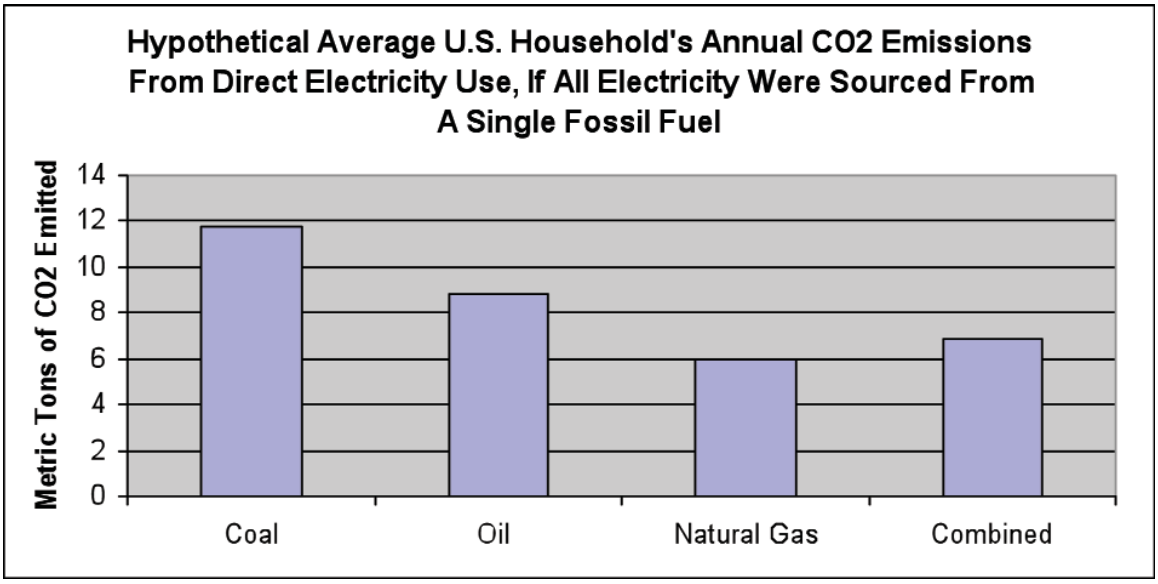
- Encourage your local government, business and other local organizations you're affiliated with to adopt climate friendly transportation policies.
  - Help pass or enforce a local No Idling Policy.
  - Encourage the creation of a well-connected network of bike lanes to make biking safer and more enjoyable.
  - Set up or join car-sharing programs (like Zipcar, Hour Car) and bike-sharing programs. Go here to find out if a car sharing service already exists in your community: http://www.carsharing.net/where.html.
  - Create carpooling programs to work and other civic and religious events. Many online services exist to help businesses match rides for their employees. See for example, http://www.goosenetworks.com/. State and local governments can also create ridesharing services for their residents. See for example, http://www.gwregion.org/gwrideconnect.html and http://www.commute.com/.
  - Urge your government to purchase more fuel efficient or alternative fuel vehicles.
  - Promote telecommuting at your workplace.
- Support your local government in linking transportation and land-use planning to bring more public transit options to your community. See the section on growing the city for more ideas.

## On the Home Front

### How your home energy use affects your emissions

- Altogether, the energy Americans consume at home — for cooking, heating, cooling and electricity — accounted for almost 17.6% of national GHG emissions in 2007.
- Electric utilities emit greenhouse gases when they generate the electricity you use at home. How much they emit depends on the fuel source utilities use to make electricity. Coal emits the most greenhouse gases, natural gas emits less, and wind and solar power have no direct emissions. The following chart shows how the fuel source your utility uses can impact the emissions from your electricity use. To see how the mix of energy sources your local utility uses affects your emissions go to: http://www.epa.gov/cleanenergy/energy-and-you/how-clean.html






- Heating: the fuel source you use to heat your home also influences your emissions in the same way the chart above shows, with one exception. In terms of direct emissions, it is more efficient to burn oil and gas at home. When utilities supply electricity from oil or gas, they produce extra emissions due to the additional fuel burned to overcome transmission losses and compensate for waste heat. Indirect emissions include emissions from transporting the oil and gas to your home and depend on the shipping distance.
- Green buildings: The way your home is built in part determines how much energy you need to light the interior, heat it in the winter and cool it in the summer.
- The efficiency of your appliances and the amount of time you use them also determines your home energy use.

## Reduce your emissions at home

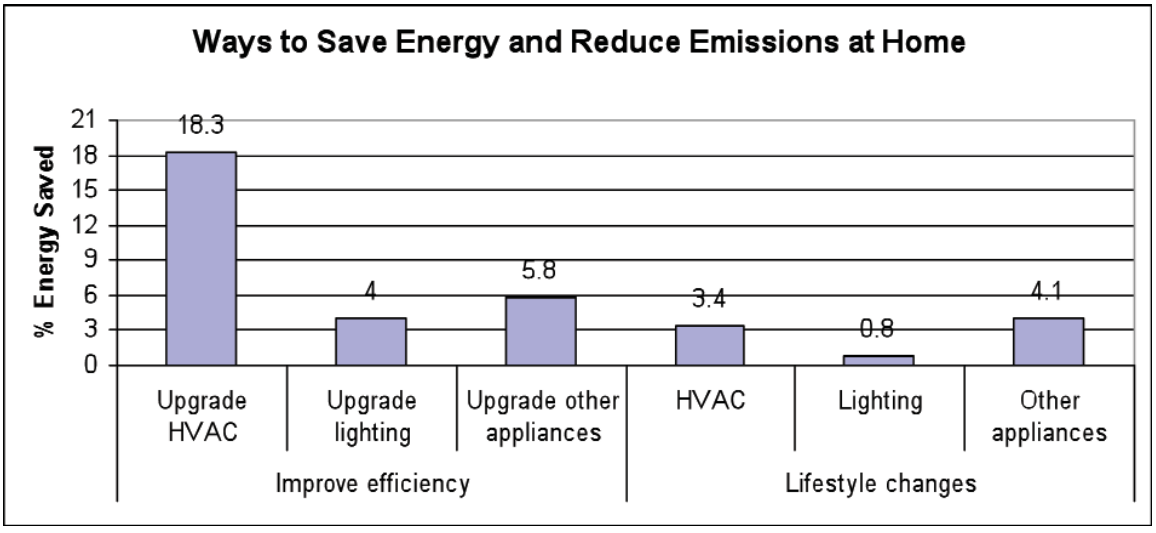
- As with transportation, you can reduce your emissions using two approaches: 1) improving the energy efficiency of your home; and 2) modifying your behavior to use less energy. In both cases, energy savings result in real cost savings. Home improvements, however, often require spending significant money up front, for greater payback financially and in emissions reductions over the long haul.
- To increase the energy efficiency of your home the most:
  - Upgrade the heating, ventilation and air-conditioning systems: up to 18.3% energy savings.
    - Install/upgrade attic insulation and ventilation: up to 7.0% energy savings.
    - Install more efficient heating and A/C units: 5.1% energy savings. [3]
    - Replace poor windows with high-efficiency windows: up to 3.7% energy savings.

[3] These savings are based on an upgrade to a 92% efficient heating, seasonal energy efficiency 13 standard "SEER 13" or energy efficiency rating "EER 12" air conditioner.



- Caulk/weather strip home: up to 2.5% energy savings.
- Upgrade Lighting: replace 85% of all incandescent bulbs with equally bright compact fluorescent bulbs: 4.0% energy savings.
- Upgrade other appliances: 5.8% energy savings.
  - Install a more efficient water heater: 1.5% energy savings. [4]
  - Install a more efficient refrigerator/freezer (replace 1993-2000 model with a new Energy Star unit): 1.9% energy savings.
  - Purchase or trade in 52" Projection HD TV instead of a 48" Plasma HD TV: 1.3% energy savings.

- Lifestyle changes you can easily make to save energy in your home without buying anything:
  - Heating and air conditioning: 3.4% energy savings.
    - Turn thermostats down from 72°F to 68°F during winter days and down to 65°F at night: 2.8% energy savings.
    - Turn up A/C from 73°F to 78°F in the summer: 0.6% energy savings.
  - Lighting: 0.8% energy savings.
    - Do not leave one 60-watt bulb on all night: 0.5% energy savings.
    - Replace two 100-watt kitchen bulbs with 75-watt bulbs: 0.3% energy savings.
  - Other appliances: 4.1% energy savings.
    - Turn down water heater thermostat from 140°F to 120°F: 0.7% energy savings.
    - Turn up the refrigerator thermostat from 33°F to 38°F and the freezer thermostat from –5°F to 0°F: 0.5% energy savings.
    - Change clothes washer temperature settings from hot wash, warm rinse to warm wash, cold rinse: 1.2% energy savings.
    - Line-dry clothes 5 months of the year: 1.1% energy savings.
    - Watch 25% fewer hours of TV each day: 0.6% energy savings.




[4] Saving based on an upgrade to a .7 EF (energy factor) unit.

- Other suggestions for home energy and emissions reductions:
  - Buy green power from your utility.
  - Get an energy audit for your home to figure out the best ways to start reducing your energy costs and emissions. These are often offered free or below cost by local utilities.
  - Install solar photovoltaics or solar water heating systems on your roof.
  - Rebates for energy efficient appliances and other products: http://www.energystar.gov/index.cfm?fuseaction=rebate.rebate_locator
  - Go here to find efficiency and renewable energy incentives available to you: http://www.dsireusa.org/



## Get engaged in your community: home energy efficiency

- Help create an energy audit program for homes and buildings in your community.
- Check your state's energy efficiency requirements and urge your local government to tap into funding to help implement efficiency improvements in your community. http://www.pewclimate.org/what_s_being_done/in_the_states/efficiency_resource.cfm



# Throwing Stuff Away

## How trash affects emissions

- Landfills directly emitted about 2% of the nation's greenhouse gases in 2007. While this may seem insignificant, waste contains a lot of embodied energy — energy used to produce a product and transport it to stores. To understand waste emissions, consider that many of the products we consume are now produced overseas. Indeed, China recently overtook the U.S. to claim the title of the largest greenhouse gas emitting nation in the world. These emissions are not counted directly in our own carbon footprints, but buying products made elsewhere implicates us in the rising emissions in other countries.

## Reduce your emissions from solid waste

- Opt for reusable products over disposables.
- Bring your own reusable bag when you shop.
- Buy products with less packaging.
- If a product is not reusable, give preference to a product you can recycle and be sure to recycle it after use.
- To reduce some of the emissions associated with getting a product from the manufacturer to your local store shelf, buy locally produced items when possible.

## Get engaged in your community: garbage

- Expand and promote recycling programs.
  - Support your local government's recycling goals and help create an action plan to meet them.
  - Educate the public about existing recycling programs.
- Participate in or help create a composting program in your community.
- Encourage reuse and the purchase of durable rather than disposable goods.
- Support your local government capturing and generating electricity from landfill methane.



# Eating

## How what you eat and where you get it affect your emissions

- About 33% of global greenhouse gas emissions come from agricultural practices and land use changes, and about 8% of the U.S.'s emissions come from agriculture.
- Commercial agricultural practices today often rely on heavy machinery, fertilizer, pesticides and shipping products across the country or the world. All of these practices require fossil-fuel inputs and release greenhouse gases.
- As a result, the food you buy may have a significant carbon footprint.
- Deforestation to create new agricultural land is another major contributor of emissions.
- Raising livestock requires much more energy inputs and their manure is a major global emitter of methane — a potent greenhouse gas. Notably, beef production has a higher carbon footprint compared with that of producing other protein sources. Producing a pound of beef emits about 4 times as many greenhouse gases as a pound of pork; about 5 times as much as a pound of dairy products; about 13 times as much as a pound of chicken; and around 12–57 times as much as a pound of fruit and vegetables (depending on the choice of produce and how far and how efficiently it is transported). The differences are smaller when you compare emissions per calorie, but even using this method beef production emits more than twice as many emissions as compared to dairy production and even more than that compared to other foods.

## Reduce your emissions from food production

- Reduce your consumption of meat and dairy products. If you eat red meat, switching your consumption of beef once a week to another source of protein could reduce your emissions as much as buying local food.
- When possible buy local and organic food. Local food requires less energy to transport. Organic practices require fewer energy inputs (in the form of fertilizer, pesticides, and heavy machinery) and may also be able to help the soil store more carbon.
- Try growing some of your own food using sustainable and organic practices.
- Eat what's in season where you live.
- Opt for fresh produce over processed foods.

## Get engaged in your community: food

- Support your local farmers' market. Find one near you at: http://www.localharvest.org/farmers-markets/.

- Join a community supported agriculture (CSA) program to support your local farmer and get fresh, locally grown produce. Search for a CSA program near you: http://www.localharvest.org/csa/.
- Ask your local government to offer garden plots where residents can grow their own food.
- Work with your local government to create a local food network, through which residents can work together in community gardens to grow and share their food.
- Help incorporate food education into the K-12 curriculum and give students a chance to grow and harvest food from the community gardens. For a working model, curriculum ideas, and additional resources visit: http://www.edibleschoolyard.org/.

# Growing the Community

## How the built environment affects emissions

- The way your community is built determines many of the structural elements that underlie your carbon footprint. The energy sources that generate your community's electricity, local transportation options, and building and zoning codes all influence your emissions and the options you can take to reduce your footprint.

## Reduce emissions from the built environment

- Get involved in your community to promote smart, sustainable planning strategies.
- Let your mayor, city council members, and county commissioners know that reducing local emissions is a priority you support.
- Listed below are some ideas of what your community can do to reduce local emissions.

## Get engaged in your community: developing more sustainably

- Renewable Energy:
  - Encourage renewable energy deployment in your community. See, for example, Berkeley FIRST, which makes the cost of installing solar panels reasonable for homeowners by issuing municipal bonds for the purpose. http://www.ci.berkeley.ca.us/ContentDisplay.aspx?id=26580
  - Many states have passed laws requiring utilities to supply a certain percentage of renewable energy. Encourage your local government and utility to work together to make funds available to residents and businesses that want to install renewable energy on their property as a way to help meet the statewide target. Check your state's renewable energy target: http://www.pewclimate.org/what_s_being_done/in_the_states/rps.cfm
  - Go here to find efficiency and renewable energy incentives available to your workplace and other institutions: http://www.dsireusa.org/
- Land Use and Zoning:
  - Promote sustainable local agriculture – to reduce emissions from transporting food and to reduce artificial fertilizer and pesticide inputs, which require a lot of energy to produce. Create a community garden program.
  - Plant trees to sequester carbon.
  - Reduce unnecessary mowing in city parks to save energy costs and cut back on emissions.

- Plan for mixed-use development: achieving a smart balance of residential, commercial and recreational uses can promote walkability and reduce the amount of travel time to get around in your community.
- Encourage denser development around transit stations.
- Support the creation of more transportation options in your community (car/bike sharing in addition to buses).

- Green Buildings:
  - Encourage your community to adopt green building standards.
  - Encourage your local government staff to become LEED [5] Accredited Professionals.
  - Encourage your local government to require all new construction and retrofit projects to become LEED certified.
  - Work with your local government to provide green building information to the public.
  - Create a network to share the efforts and knowledge of the community's green building resources.



[5] "Leadership in Energy and Environmental Design (LEED) is a third-party certification program and the nationally accepted benchmark for the design, construction and operation of high performance green buildings." For more information, see http://www.usgbc.org/DisplayPage.aspx?CMSPageID=222.



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## Eating

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