

Lesson 6: Carbon Tax

A round table discussion



Question	How would a carbon tax work to reduce greenhouse gas emissions?
Age-Level	High School
Objective	Students will be introduced to the basics of a carbon tax. Students will role-play a round table discussion investigating the possibilities for a carbon tax. Students will summarize and reflect on potential strengths and weaknesses of a carbon tax.
Time Needed	At least one 45-minute period
Materials	Small placards and markers

ASK YOUR STUDENTS TO SUMMARIZE WHAT THEY ALREADY KNOW ABOUT CLIMATE CHANGE. (2 min)

The following points should be reiterated:

- Heat trapping gasses (greenhouse gasses) released into the atmosphere as a result of human activities are driving climate change.
- Greenhouse gases such as CO₂ are very long-lived in the atmosphere and their build up has consequences over the course of centuries.
- 85% of U. S. energy use comes from burning fossil fuels (coal, oil, and gas). This is the biggest driver of climate change.
- Climate change impacts can disrupt the planet's crucial life-support systems.
- There is a lag between when greenhouse gases are emitted and when the climate fully responds.
- Leading scientists say we must drastically reduce our emissions to avoid the most catastrophic changes. They say we must start now to achieve these reductions.

Sources:

IPCC Fourth Assessment Report, Summary for Policy Makers. 2007.

Navigating by the Numbers, World Resources Institute. 2005.

ASK YOUR STUDENTS TO RECALL THE LESSON ON CAP-AND-TRADE. ASK THEM TO SUMMARIZE THE MEANING OF WHAT ECONOMISTS CALL A "MARKET FAILURE" AS IT RELATES TO EMISSIONS OF GREENHOUSE GASSES. THE FOLLOWING POINTS SHOULD BE REITERATED: (2 min)

- Increasing greenhouse gas emissions have a cost (for example, more severe droughts, floods, storms, disease, rising sea levels, collapsing ecosystems, species extinction).
- The emitters of these gasses, however, do not have to pay the cost. Currently they can dump emissions into the atmosphere for free.
- Therefore the prices they charge for their products do not reflect their full cost.
- Economists call this a "market failure."
- Introducing a cost for carbon emissions can help correct the market failure.

Source:

The Economics of Climate Change, Stern Review Report. 2006.



Lesson 6: Carbon Tax

A round table discussion

INTRODUCE YOUR STUDENTS TO THE IDEA OF A CARBON TAX. (5 min)

Similar to a cap and trade system, a carbon tax is a market-based approach to lowering greenhouse gas emissions and stabilizing global warming. Like a cap-and-trade system, a carbon tax introduces a cost for carbon emissions.

- A carbon tax taxes the amount of carbon emitted through burning fossil fuels.
 - To fairly reflect carbon content, the taxes would be based on BTU's (British Thermal Units, a measure of energy), instead of on something like weight or volume.
 - When burned, each type of fossil fuel emits a specific amount of carbon per BTU. Different types of coal contain different amounts. Assuming the emissions are not sequestered and instead are released to the atmosphere, all kinds of coal emit more carbon per BTU than petroleum. Petroleum in turn emits more carbon per BTU than natural gas.
 - Fuels that are "cleaner" (emit less carbon per BTU) would carry less tax than more dirty fuels.
- A carbon tax would be phased in gradually. Rates would increase on a set schedule.
 - As prices for "dirty fuels" became more and more expensive, there would be more market pressure to switch from coal to cleaner fossil fuels like natural gas.
 - Prices for energy from non-fossil fuels (like wind, solar, and biomass) would become more competitively priced per BTU because they would not be subject to the carbon tax.
 - Companies that burn fossil fuels and therefore pay the carbon tax would pass on much of their increased cost to consumers. This would encourage reduced consumption.

ASK YOUR STUDENTS FOR THEIR INITIAL THOUGHTS AND REACTIONS TO THE IDEA OF A CARBON TAX. (2 min)

Potential responses may include:

- Taxes are already high enough—no politicians will be able to pass more taxes.
- A tax on carbon would be a hardship for low-income people who are already overburdened.
- Just because fossil fuel is more expensive doesn't necessarily mean people will use less of it—can a carbon tax really lower carbon emissions?

Explain to your students that groups worried about the effects and effectiveness of a carbon tax have raised those same concerns (and many more). Groups advocating for a carbon tax, on the other hand, have offered potential solutions to those concerns.

INTRODUCE THE ROLE-PLAYING ROUND TABLE DISCUSSION (5 min)

Explain to your students that they will have the opportunity to role-play a round table discussion about the carbon tax:

- You will distribute to groups of students handouts with descriptions of roles.
- Three of the group roles will be advocates of the carbon tax and two will be groups with concerns about the carbon tax.

Lesson 6: Carbon Tax

A round table discussion



- The advocates will include spokespeople who will summarize the strengths of the carbon tax. The advocates will also include groups of experts in certain aspects of carbon tax policy.
- The handouts will give background information the students will need to read and understand.
- Each group will have a few minutes to decide on their most important points and how to convey them most persuasively.
- Groups should also try to anticipate what about their statements other groups with contrasting views might question.
- Groups should try to strategize a way to respond that will clarify their position and possibly alleviate the other group's concerns.
- You, the teacher, will act as moderator of the round table. The discussion will begin with the spokespeople for the carbon tax stating their case for a carbon tax.
- The discussion will continue as each group with concerns takes turns expressing their concerns. The appropriate group of experts advocating the carbon tax will respond.
- The discussion will end once each group has had a chance to state their position or concerns and respond to any concerns or questions raised by other groups.

ROLE-PLAY ROUND TABLE DISCUSSION (20 min)

Distribute role handouts to groups, give groups time to read and plan statements, facilitate the discussion.

ASK STUDENTS TO SUMMARIZE AND REFLECT ON THE POTENTIAL STRENGTHS AND WEAKNESSES OF A CARBON TAX AS A WAY TO REDUCE EMISSIONS OF GREENHOUSE GASSES. (5 min)

Potential strengths include:

- It is market-based. Market-based solutions can help achieve cost-effective greenhouse gas emission reductions.
- Putting a cost on carbon emissions helps correct the market failure.
- A carbon tax is more straightforward to implement and to understand than a cap and trade scheme.
- In contrast to the volatility in price that could come with a cap and trade scheme, with a carbon tax companies know what the price of carbon will be at certain points in the future. This allows them to plan.
- A carbon tax could be “revenue neutral” and could be designed to be progressive (benefiting lower-earning households).
- Potential weaknesses include:
 - The term “tax” could make it politically unpopular. This makes it difficult for the U.S. Congress to pass. Even if it were successfully written into law, there is a risk it would be revoked or that companies would successfully lobby for exemptions.
 - Increased costs of fossil fuels will be passed on to consumers. Without mechanisms in place to alleviate the burden on low-income families, the tax could cause hardship.



Lesson 6: Carbon Tax

A round table discussion



Notes to Teachers:

- Print one handout for each member of each group—each student will need his or her own copy to read and use as reference during the group statements.
- Give each group a placard and a marker to make their group name clear to the rest of the class.
- For more information about carbon tax proposals, visit the Carbon Tax Center, a not-for-profit nonpartisan NGO composed of experts in economics, law, public policy, and engineering, and dedicated to promoting a carbon tax as a method for reducing greenhouse gasses. <http://www.carbontax.org>
- For a comparison of carbon tax versus cap and trade, visit <http://www.pewclimate.org/DDCF-Briefs/Taxes>



- The lack of a “cap” reduces the certainty of lowering greenhouse gas emissions to a specified target level.

HOMEWORK:

While the thoughts are fresh, each student should add a journal entry about opinions and thoughts raised by the lesson. The journal will serve as the starting point for each student to craft a position statement. The position statements will cover topics from each lesson. The more specific details each student includes in his or her journal, the easier it will be to write a position statement. A recommended format would be to record several ideas or opinions, each with at least three supporting statements, based in concepts presented in the lesson.

Lesson 6: Carbon Tax

A round table discussion



1 ROLE: CARBON TAX SPOKESPEOPLE (DECIDE ON A NAME FOR YOUR GROUP)

Your group will open the round table discussion by summarizing the basics of a carbon tax.

- Read and understand the background information presented below.
- Decide how to introduce the idea of the carbon tax.
- Decide which points are the most important to share.
- Highlight the potential strengths of a carbon tax.
- Speak in a clear and persuasive manner—do not just read off the sheet!

BACKGROUND INFORMATION (Source: <http://www.carbontax.org>):

The burning of fossil fuels releases carbon into the atmosphere that speeds global warming. To avoid catastrophic climate changes, leading scientists agree we must drastically reduce emissions. Currently, however, there are few market incentives to do this.

The emission of carbon into the atmosphere has a cost. The cost includes climate-change-related impacts like more severe droughts, floods, storms, disease, and rising sea levels. The polluters, however, do not currently have to pay the cost. This means the price they charge for their products does not reflect the products' true cost. This is what economists call a market failure.

A carbon tax would help correct the market failure by adding a cost to carbon emissions. A carbon tax would tax the carbon content of fuels. The tax would be added far "upstream" in the supply chain—to extractors, processors, and importers of fossil fuels that will be burned. They would pass their expenses down the chain to other businesses and eventually to consumers.

The carbon tax would increase market incentives for carbon-reducing measures. These would include increases in energy efficiency and conservation, renewable energy, and cellulosic biofuels (as long as they are verified as low carbon).

The taxes would be phased in slowly and would increase on a set schedule. This set schedule would allow companies to know how much carbon would cost at different points

in the future. This would help them plan and would assure them a certain return on investments in cleaner energy. The set schedule of increases would also remove the volatility in prices of a cap and trade system.

A carbon tax could be collected through the tax-collecting systems already in place. In contrast to a cap and trade system, it would not need a new market to be established and monitored. The tax system would be much less complicated than a cap and trade system so it could be implemented more quickly. The simplicity of it would also reduce the likelihood of loopholes and preferential treatment to certain companies or industries.

A carbon tax would be based on the amount of carbon a certain fossil fuel emits per unit of energy (BTU). In general, a BTU from coal produces 30% more carbon emissions than a BTU from oil, and 80% more than a BTU from natural gas. Thus taxing the carbon per BTU would put a proportionately higher tax on coal than on oil or gas. This would encourage burners of fossil fuels to switch from coal to cleaner fuels like natural gas.

Carbon taxes are already in place in certain areas. Finland was the first to introduce a carbon tax. Sweden and Great Britain have also enacted carbon taxes as well as the Canadian provinces of Quebec and British Columbia and the U.S. city of Boulder, Colorado.





Lesson 6: Carbon Tax

A round table discussion

#2 ROLE: ANTI-TAX BUSINESS GROUP (DECIDE ON A NAME FOR YOUR GROUP)

After the spokespeople for the carbon tax introduce their proposal, your group will be the first one to have an opportunity to raise concerns and ask questions.

- Read and understand the background information presented below.
- Decide which points are the most important to share.
- Highlight your most critical concerns about a carbon tax.
- Speak in a clear and persuasive manner—do not just read off the sheet!

BACKGROUND INFORMATION (Source: <http://www.carbontax.org>):

Certain business groups worry about the impact a carbon tax would have on them. When fuel prices rise many businesses struggle. They have to either pass their increased costs on to customers and risk losing competitiveness or try to absorb the costs into their bottom line. A carbon tax would further increase fuel prices.

Rising fuel costs could impact rural businesses the hardest. They have to drive long distances to pick up essentials. Also their customers have to drive long distances to reach them.

Rising fuel costs would also be a hardship for truckers and shipping companies. They would have to pass some of their costs onto consumers. That would raise the prices of goods that are transported long distances or that contain parts or that were shipped long distance.

Rising fuel costs would also impact the price of food. The increase in price would come not only from the transport of food to markets, but also through the energy used to produce the food. Corn, for example, is energy-intensive to harvest and dry. Corn is an ingredient in a large majority of processed foods. Furthermore animals are fed corn to fatten them before slaughter, so the cost for meat would increase as well.

As the price of food and goods increases, the low-income and middle-class people will be affected the most. As their budgets become tighter, they will cut back on their spending. This will impact businesses that rely on consumer spending.

Certain business groups worry that adding a carbon tax could also make the goods produced in this country less competitive with goods produced in other countries that do not have carbon taxes. In the domestic market cheap imports from countries like India or China will out-compete American-made products. In foreign markets, U.S. exports will have a more difficult time competing.

Some opponents of tax increases believe the government wastes and mismanages the tax revenue it already has. Giving it more tax revenue would just increase government waste.

Certain business groups worry the challenges presented to businesses by a carbon tax will further damage the U.S. economy. It will make recovery from economic recession more slow and difficult.



Lesson 6: Carbon Tax

A round table discussion



#3 ROLE: ADVOCATES: EXPERTS ON TAX CONCERNS (DECIDE ON A NAME FOR YOUR GROUP)

After the spokespeople for the carbon tax present their proposal, the first group to have a chance to express their concerns will be a group of anti-tax businesspeople. Once they finish their statements, you will have an opportunity to address some of their concerns.

- Read and understand the background information below.
- Decide which information would be the most important to share to alleviate potential concerns of anti-tax business groups.
- Highlight the strengths of the carbon tax.
- Speak in a clear and persuasive manner—do not just read off the sheet!

BACKGROUND INFORMATION (Source: <http://www.carbontax.org>):

Advocates of a carbon tax propose a carbon tax that would be “revenue neutral.” Revenue neutral means that the government would not keep the money it collects from the carbon tax. It would return the vast majority of the money to the public. The government might keep only a small amount to invest in programs to help provide energy efficient technology to low-income and rural people who would be most negatively affected by rising fuel costs.

One way to make the carbon tax revenue neutral would be to divide all the tax income equally among every citizen and return it in a monthly check. This method would favor low-income and middle-class people. For every gallon of fuel used by the poorest 20% of Americans, the richest 20% uses three to four gallons. Because the dividend checks would be divided equally among all Americans, the poorest people would receive three to four dollars back for every dollar of tax they paid.

Another proposal to make the tax revenue neutral would be to “shift” taxes away from existing taxes. For example federal payroll taxes or state sales taxes might be reduced or eventually eliminated.

The amount of carbon tax money refunded to any particular individual would be independent from the amount of fossil fuel that individual used. This would preserve the incentive for each individual to cut back on his or her fossil fuel usage, because regardless of how much carbon tax an individual pays, he or she will get the same amount back.

Advocates of a carbon tax claim the taxes will have a positive effect on the competitiveness of U.S. goods. Higher fossil fuel prices will encourage innovation in clean, efficient technologies that are highly sought-after in world markets. A U.S. carbon tax would create a level playing field with our long-term trading partners in the European Union and in Japan. It would also open the door for India and China to create a similar tax. Until India and China follow suit, the U.S. could use “border tax adjustments” to equalize the prices of imports from countries without a carbon tax.

Advocates of a carbon tax reject the idea that a carbon tax would damage the U.S. economy and slow its recovery from the recession. They argue that the real threat to the economy is catastrophic climate change. They argue that businesses can manage increases in the cost of fuel as long as the increases are regular and known in advance. They argue that what has traditionally upset markets is not high energy prices, but rather price volatility (wide and unpredictable swings in price).

A carbon tax would create a strong “market pull” towards clean energy and energy-efficient technology. This would eventually remove or reduce the need for the government to create subsidies for clean technologies or to earmark spending for mass transit or biofuels or hybrid cars, etc.





Lesson 6: Carbon Tax

A round table discussion

ROLE #4: COALITION OF ENVIRONMENTAL GROUPS (DECIDE ON A NAME FOR YOUR GROUP)

After the spokespeople for the carbon tax present their proposal, the first group to have a chance to express their concerns will be a group of anti-tax businesspeople. After the carbon tax advocates respond to those concerns, your group will have a chance to express your concerns.

- Read and understand the background information presented below.
- Decide which points are the most important to share.
- Highlight your most critical concerns about a carbon tax.
- Speak in a clear and persuasive manner—do not just read off the sheet!

BACKGROUND INFORMATION (Source: <http://www.carbontax.org>):

Some environmental groups worry that a carbon tax would be too politically unpopular to pass. This is due in part to Americans being accustomed to cheap energy prices and to the anti-tax movement over the past 25 years. They point to the example of President Clinton's proposed energy tax which was defeated.

Some environmental groups highlight the fact that most major politicians propose a cap and trade rather than a carbon tax. This includes Obama, who is working on a nation-wide cap and trade scheme designed to cut carbon emissions 80% by 2050.

Some environmental groups think the support by industry and business of a cap and trade system might make it more likely to pass than a carbon tax. Some of the largest corporations in the U.S. support cap and trade plans. These include ConocoPhillips, Deere, Dow Chemical, DuPont, Ford Motor Company, Johnson & Johnson, and PepsiCo.

Some environmental groups worry that a carbon tax won't do enough to cut consumption. They argue that even though gas prices have risen over the past several

years, people have not significantly changed their driving behavior. They argue increases in corporate average fuel-efficiency (CAFE) standards would be more effective at lowering consumption.

Some environmental groups think a tax on carbon emissions is not necessary. They agree that renewable and alternative sources of energy need to be able to compete more effectively with fossil fuels. They argue, however, that this could be accomplished by mandates (for example, passing a law that 20% of energy production must be from renewables by the year 2020) or through subsidies (for example, providing money to help with the construction of windmills or ethanol plants).

Some groups also argue that instead of passing a carbon tax, the government could just end subsidies on fossil fuels. Currently the fossil fuel industry receives tax breaks and fiscal subsidies of about \$25 billion a year. If the government ended these giveaways, perhaps renewable and alternative sources of fuel could be more economically competitive.



Lesson 6: Carbon Tax

A round table discussion



ROLE #5: ADVOCATES: POLICY EXPERTS (DECIDE ON A NAME FOR YOUR GROUP)

The final group to present their concerns about the carbon tax will be a coalition of environmental groups. They agree that carbon emissions must be lowered to slow global warming, but they are not sure that a carbon tax is the best way to do it. Once they finish their statements, you will have an opportunity to address some of their concerns.

- Read and understand the background information below.
- Decide which information would be the most important to share to alleviate concerns.
- Highlight the strengths of the carbon tax.
- Speak in a clear and persuasive manner—do not just read off the sheet!

BACKGROUND INFORMATION (Source: <http://www.carbontax.org>):

Big business has tended to support cap and trade schemes over carbon taxes. In January of 2009, however, the chief executive of ExxonMobil, the world's largest oil company, said Exxon could support a carbon tax. He said it was more transparent, more fair, and more effective than a cap and trade scheme.

Advocates of a carbon tax argue that Americans' opposition to the idea of a "tax" could be lessened. This could happen if proposals were clearly "revenue neutral" (meaning the government returns all the tax collected to the people through either monthly checks or reductions in other taxes). Americans might also reduce their resistance to a tax if they understood that it could be designed to be progressive (benefiting lower-income people).

Advocates claim Americans are becoming willing to pay more for energy to fight global warming. They cite polls like a 2006 New York Times/CBS poll that found significant support for an increased gasoline tax to reduce global warming.

Advocates claim rising fuel costs would reduce fuel consumption. They point to the first half of 2008 when gas prices rose 24% over the previous year. U.S. gasoline usage fell more than 3% even though economic activity rose more than 2% during that same period.

Advocates argue that a carbon tax would be even more effective at reducing fuel consumption than the rise in prices that happened during the first half of 2008. Over the last five or six years, gasoline prices fell about as often as they rose. This let people think prices would eventually go

back down. This makes people less likely to make lifestyle changes. In contrast, with a carbon tax people would know energy prices would continue to go up.

Tax advocates argue that standards by themselves are not enough. They argue that standards are a "blunt instrument." For example the corporate average fuel-efficiency (CAFE) standards set for auto manufacturers do not influence consumers' vehicle usage. Also political arguments have continued for years over what level the CAFE standards should set. In fact the fuel-efficiency for cars and light trucks in U.S. has not changed much since 1987. In addition some car manufacturers choose to pay penalties rather than comply with the CAFE standards.

Carbon tax advocates argue mandates and subsidies are also "blunt instruments." An example of a mandate would be passing a law that 20% of energy must be from renewable sources by the year 2020. A subsidy would mean, for example, providing money for construction and operation of a wind farm. Tax advocates argue there have been few examples of energy subsidies or mandates resulting in substantial amounts of new energy.

Carbon tax advocates agree with other groups who suggest it would be helpful to remove the \$25 billion in tax breaks and subsidies the government currently gives the fossil fuel industry. They argue, however, ending these giveaways would raise prices of fossil fuel only two to three percent, not enough to reduce consumption enough to slow global warming.

