# Key Elements of the U.S. Tax System

## What tax incentives encourage energy production from fossil fuels?



**Q. What tax incentives encourage energy production from fossil fuels?**

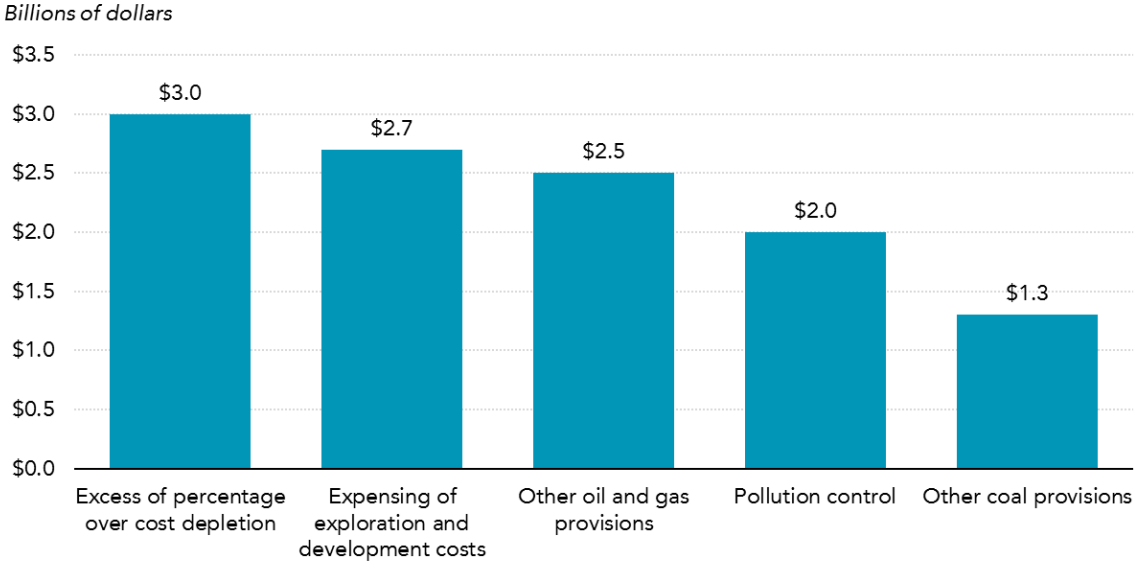
**A. Provisions of the federal income tax that subsidize domestic production of fossil fuels include the expensing of exploration, development, and intangible drilling costs; the use of percentage depletion instead of cost depletion to recover drilling and development costs of oil and gas wells and coal mines; and numerous smaller incentives for production and distribution of oil, coal, and natural gas.**

Tax subsidies for oil, gas and coal development are expected to reduce federal revenue by $11.5 billion from 2019 to 2023 (figure 1). The two largest subsidies are excess of percentage over cost depletion ($3 billion) and expensing of exploration and development costs ($2.7 billion).

FIGURE 1

### Tax Incentives for Energy Production from Fossil Fuels

Revenue losses, fiscal years 2019–2023




**Source:** Joint Committee on Taxation. "Estimates of Federal Tax Expenditures for Fiscal Years 2019-2023," December 2019.
**Notes:** Estimates include both personal income and corporate income tax expenditure amounts. "Other oil and gas provisions" include amortization of geological and geophysical expenditures for oil and gas exploration, depreciation recovery periods for natural gas distribution line, and exceptions for publicly traded partnerships with qualified income. "Otther coal provisions" include production credits and credits for investments in clean coal facilities.

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Excess of percentage over cost depletion allows producers to deduct a fixed percentage of gross revenue as capital expenses each year, without regard to how much they have invested. By contrast, conventional cost depletion allows deduction of actual costs as the resources from a well or mine are depleted. Federal tax law allows independent producers—but not integrated companies—to deduct 15 percent of gross revenue from their oil and gas properties as percentage depletion.

Exploration and development costs include labor and materials needed for drilling and developing oil and gas wells and coal mines. Independent oil and gas producers (i.e., those without related refining and marketing operations) may deduct these costs from income in the year incurred, even though, as capital investments, they produce returns over many years. Integrated oil and gas companies may deduct 70 percent of these costs in the first year and recover the remaining 30 percent over the next five years.

Other tax subsidies for fossil fuels include: Publicly traded partnerships, which allow pass-through oil and gas partnerships to publicly list their shares (a privilege generally reserved for higher-taxed C-corporations); amortization of geological and geophysical expenditures associated with oil and gas exploration; accelerated depreciation of natural gas infrastructure; investment credits for clean coal facilities; and energy production credits for coal.

Subsidizing investment in fossil fuel development diverts capital from investments in other assets with higher pretax yields. Several studies have found that the effective marginal tax rate—the extent to which all applicable tax provisions reduce the after-tax return on new investment—is much lower for oil, gas, and coal development than for other assets.

Subsidizing domestic production of fossil fuels is inconsistent with the policy goal of reducing fossil fuel use to counter global climate change. Supporters justify these tax incentives as a means of reducing US dependence on imported oil, but the incentives also encourage more rapid exhaustion of domestic supplies, which may increase dependence on imports in the long run.

In general, the adverse effects of the incentives on climate change are likely minor, because any increase in domestic production they induce mostly displaces imports rather than raising domestic fuel consumption. Some research concludes that the incentives reduce the world market price of oil by less than 0.1 percent and thus have little effect on consumption. A recent study by the National Academy of Sciences (Nordhaus et al, 2013) finds that subsidies for oil and gas production may slightly reduce greenhouse gas emissions by accelerating the conversion of electricity production from coal to natural gas.

A very small yet controversial subsidy is offered for investment in carbon capture technologies, which reinject carbon emissions from fossil fuel combustion into the ground. Proponents argue that carbon capture mitigates the environmental harm from US energy consumption, which currently relies predominantly on fossil fuels. Opponents regard development of carbon capture technology as deterring full decarbonization of the US economy.

*Updated May 2020*

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### Data Sources

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# Key Elements of the U.S. Tax System

## What tax incentives encourage energy production from fossil fuels?



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# What tax incentives encourage alternatives to fossil fuels?

## Q. What tax incentives encourage alternatives to fossil fuels?

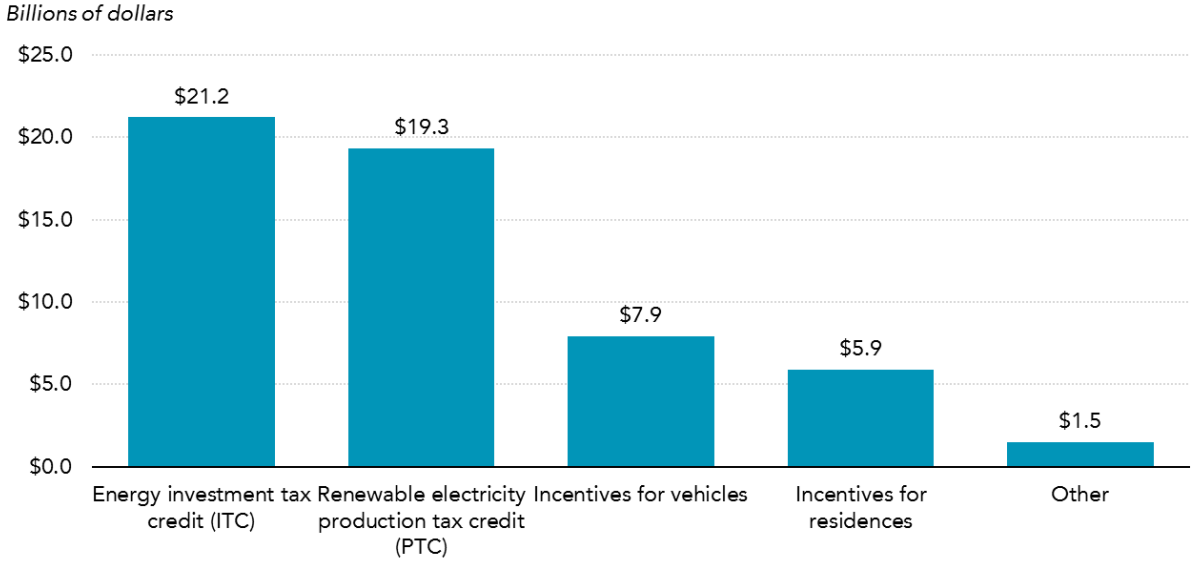
**A. The federal tax code includes more than a dozen incentives for alternatives to fossil fuels. These provisions support electricity production from solar, wind, and other renewable sources and, to much lesser extent, from nuclear facilities. They also support alternative transportation fuels, especially electricity, and encourage energy efficiency in homes and commercial buildings.**

The federal government provides roughly $10 billion per year in tax subsidies that encourage non-fossil fuels (figure 1). The two largest are the energy investment tax credit (ITC) and the renewable electricity production tax credit (PTC), followed by incentives for electric vehicles and residential energy.

FIGURE 1

### Tax Incentives for Energy Production from Non-Fossil Fuels

Revenue losses, fiscal years 2019–2023




**Source:** Joint Committee on Taxation. "Estimates of Federal Tax Expenditures for Fiscal Years 2019-2023," December 2019.
**Note:** Estimates include both personal income and corporate income tax expenditure amounts. "Incentives for vehicles" include tax credits for plug-in electric vehicles and alternative technology vehicles. "Incentives for residences" include the residential energy-efficient property credit and exclusion of conservation subsidies provided by public utilities. "Other" includes the credit for manufacturing facility investment in advanced energy property and the credit for holders of clean renewable energy bonds.

# Key Elements of the U.S. Tax System



## What tax incentives encourage alternatives to fossil fuels?

### ELECTRICITY PRODUCTION

The ITC (also known as the Section 48 credit) provides a one-time credit—currently, 10 percent—for new investment in qualifying facilities. Solar generators are its main recipients, with small amounts going to fuel cells, combined heat and power systems, and other projects. The PTC (also known as the Section 45 credit) provides a per kilowatt hour subsidy—current, 1.5 cents—to qualifying facilities during their first 10 years of operation. Wind-powered generators are the main recipients, but some geothermal, biomass, solid waste, and hydro facilities also claim it.

Two very small tax subsidies also target nuclear energy. Existing nuclear facilities get a special deduction for some contributions to future decommissioning funds. A production tax credit for advanced nuclear power facilities is little used to date.

### ELECTRIC VEHICLES

The tax code provides a substantial tax credit to individuals and businesses who purchase or lease plug-in electric light passenger vehicles and trucks. The credit starts at $2,500 and increases to $7,500 based on battery capacity. Plug-in hybrids typically qualify for credits of $4,000 to $6,000, while all-electric vehicles get the full $7,500. The credit phases out over the course of a year once a manufacturer reaches 200,000 qualifying vehicles. Tesla and General Motors reached that limit in 2018 and 2019, respectively. A smaller tax credit is available for electric motorcycles and other two-wheeled vehicles. There are also two small tax credits for fuel cell vehicles and alternative vehicle refueling.

### RESIDENTIAL

The tax code also encourages homeowners to improve energy efficiency and switch to alternative sources. The largest of these benefits is residential energy-efficient property tax credit, known as Section 25D, which supports home installation of solar electric and water heating systems. The residential energy efficiency credit provides up to $500 for energy efficiency improvements in existing homes, including insulation improvements and high-efficiency heating, cooling, and water heating. Also, energy conservation subsidies provided by public utilities are excluded from taxable income.

### OTHER

Manufacturing facilities can claim a tax credit for investment in advanced energy property that generates clean power and/or improves efficiency. Commercial buildings get a special deduction of up to $1.80 per square foot for investments in lighting, heating, cooling, water heating, and building envelopes that substantially improve energy efficiency.

The federal government provides a financing subsidy for certain bonds issued to invest in renewable energy and energy conservation projects.

### EXPIRING PROVISIONS

Most of these incentives are part of a larger phenomenon of expiring tax provisions, which sunset every few years but are frequently extended; they are therefore referred to collectively as the "tax extenders". Some, such as the second-generation biofuel tax credit, have been allowed to expire. Others, such as the credit for

residential solar, are slated to expire in the near future.

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# What is a carbon tax?

## Q. What is a carbon tax?

**A. Emissions of carbon dioxide and other greenhouse gases are changing the climate. A carbon tax puts a price on those emissions, encouraging people, businesses, and governments to produce less of them. A carbon tax's burden would fall most heavily on energy-intensive industries and lower-income households. Policymakers could use the resulting revenue to offset those impacts, lower individual and corporate taxes, reduce the budget deficit, invest in clean energy and climate adaptation, or for other uses.**

### WHY TAX CARBON, AND HOW MUCH?

Emissions of carbon dioxide, methane, nitrous oxide, and other greenhouse gases are increasing global temperatures, raising sea levels, shifting rainfall patterns, boosting storm intensity, and harming coral reefs and other marine life. Greenhouse gas emissions thus create a host of potential economic and environmental threats, including property damage from storms, human health risks, reduced agricultural productivity, and ecosystem deterioration (Environmental Protection Agency 2017; National Aeronautics and Space Administration 2018).

Energy prices do not currently reflect these costs of greenhouse gas emissions. Those who benefit from burning fossil fuels generally do not pay for the environmental damage the emissions cause. Instead, this cost is borne by people around the world, including future generations. Imposing a carbon tax can help to correct this externality by raising the price of energy consumption to reflect its social cost.

Estimates of the environmental cost of carbon emissions are sensitive to scientific and economic assumptions and thus differ greatly. A global study by Ricke, et al. (2018) found substantial cost variance by region, with a level of around $50 for the US. This is comparable to the cost found by the US Interagency Working Group on Social Costs of Greenhouse Gases (2016), which the Obama administration used to formulate policy. By contrast, current US charges on fossil fuels--chiefly the federal excises on automotive fuels--amount to only about $5 per ton (IMF, 2019). The Trump administration, which considers only the US cost of carbon emissions and discounts the needs of future generations, uses a social cost of carbon of $1-$7 per ton.

### HOW WOULD A CARBON TAX AFFECT WELFARE?

A carbon tax would increase the price of burning fossil fuels and any resulting goods or services. A tax of $40

per ton would add about 36 cents to the price of a gallon of gasoline, for example, or about 2 cents to the average price of a kilowatt-hour of electricity (Marron, Toder, and Austin 2015). Higher energy prices would raise costs for industry and households, resulting in lower profits, wages, and consumption. Conversely, however, reduced carbon consumption would lower the real costs of climate change and air pollution.

The impact of a carbon tax would differ among economic groups depending on the extent of energy price changes and on regional energy production and consumption patterns. Clearly, a carbon tax would fall more heavily on workers and investors in carbon-intensive industries as well as on regions that depend heavily on carbon-intensive fuels, particularly coal.

The distributional impact of a carbon tax would depend on the extent to which businesses could pass higher energy costs to their customers. If demand for goods is less "elastic" (that is, responds less) to price changes than the supply of goods, then consumers will bear more of the carbon tax burden than investors and workers.

Because low-income households consume a more energy-intensive basket of goods than do wealthier households, a carbon tax would be regressive; it would cost poorer households a higher share of their income than wealthier households (Marron, Toder, and Austin 2015). A carbon tax of $20 per ton would account for about 0.8 percent of pretax income for households in the lowest income quintile, as compared to 0.5 percent for the highest income quintile.

The environmental benefits from reduced emissions would be shared by people around the world. Combatting climate change thus poses a fundamental collective action problem. US reductions will be most valuable if they are accompanied by comparable reductions in other nations. Nonetheless, most countries would reap substantial domestic benefits from lowering carbon emissions, which increase disease and deaths from air pollution, among other harms (IMF, 2018).

## DEPLOYING THE REVENUE

A carbon tax could raise substantial revenue. The Joint Committee on Taxation and the Congressional Budget Office estimated, for example, that a broad-based carbon tax starting at $25 per ton in 2017 and rising at 2 percent more than inflation would have raised $1 trillion over its first decade (Congressional Budget Office 2016). This is close to the amount that the United States currently raises with all its other excise taxes—about 0.5 percent of gross domestic product per year.

The welfare impact of a carbon tax package would depend on how those revenues are used. Rebating the revenues to households on a per capita basis would render the policy progressive, as lower-income households would be more than compensated for higher energy costs, while upper-income households would pay a net tax. Using revenues to increase transfers, reduce Social Security contributions from low-income households, or compensate workers in carbon-intensive industries would also soften the regressive impact of the carbon tax. Revenues from a carbon tax could also be used to finance cuts in existing taxes that discourage growth. Revenues could also be used to reduce personal income taxes, to reduce future deficits, or to invest in clean energy and climate adaptation. What combination to choose depends on political, social, and economic considerations (Marron and Morris 2016).

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