



Formerly the NC Solar Center

# NC CLEAN ENERGY TECHNOLOGY CENTER

Advancing Clean Energy for a Sustainable Economy

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## Comparing subsidies for conventional and renewable energy

### Rationale for Government Subsidies

Federal energy subsidies have been implemented in the U.S. to achieve a variety of economic, employment, environmental, socioeconomic, political, national security, and technological development goals. The primary economic rationale for government intervention via subsidies in electricity markets is the presence of one or more **market failures**, including externalities, principal-agent problems and information asymmetries, barriers to market entry, and public goods.

### The Cost of Energy Subsidies

- **Historically, the vast majority of energy subsidies have gone to fossil fuels and nuclear energy.** Estimates of annual U.S. energy subsidies range from \$37 billion for direct federal financial interventions and subsidies, to \$502 billion for all post-tax energy subsidies, to \$2 trillion for all energy subsidies inclusive of pollution damages with no market signals. Through 2010, cumulative historic subsidies for non-biofuels renewable energy totaled \$6 billion, whereas U.S. government subsidies for fossil fuels and nuclear energy totaled approximately \$630 billion.
- **The amount of direct energy subsidies allocated to clean energy has increased in recent years.** According to the U.S. Energy Information Administration (EIA), 70% of federal energy subsidies between 2007 and 2011 went to fossil fuels and 8% to renewable energy. Renewable energy subsidies have increased substantially in the past several years.

### Differences between Renewable and Conventional Energy Subsidies

- **Historically, renewable energy subsidies have been quite modest in size relative to conventional energy (fossil fuels and nuclear power) subsidies.** For more than 50 years, all federal subsidies went to conventional energy resources. No federal support for renewable energy and energy efficiency was available until the 1970s.
- **Subsidies for fossil fuels and nuclear energy have tended to be *permanent, predictable, and hidden in the tax code or inherent in the regulatory structure*.** Conventional energy sources have had robust federal and state government support for 100 years, including direct spending and tax expenditures; favorable regulatory frameworks that shielded them from free-market competition; and a lack of price signals to correct externalities like pollution.
- **Renewable energy subsidies have tended to be *temporary, uncertain, and visible*.** For example, the primary federal renewable energy subsidies are the Production Tax Credit (PTC), which expired at the end of 2014, and the Investment Tax Credit (ITC), which, starting in 2017, decreases from 30% to 10% of eligible costs for commercial projects and expires for residential projects.

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## Examples of Energy Subsidies to Coal, Natural Gas, Oil, and Nuclear Energy

Conventional energy industries benefit from numerous government subsidies, many of which are either not available or applicable to renewable energy industries.

### **Tax Benefits**

New nuclear plants are eligible for a \$0.018 per kilowatt-hour production tax credit for the first 8 years of electricity production, or approximately a \$1 billion tax credit for a typical 1,200 megawatt nuclear plant. The oil and gas industry also benefits from a special tax provision that provides \$3 per barrel and \$0.50 per 1000 cubic centimeters of natural gas produced from marginal wells. Coal projects can claim a 20% tax credit on the cost of integrated gas combined cycle (IGCC) plants or a 15% credit for other advanced coal-based projects.

The U.S. tax code includes numerous other preferential tax provisions beyond tax credits for the conventional energy industry, including the depletion allowance, which allows oil companies to deduct 15% of their gross income from taxable income; accelerated depreciation schedules for fossil fuel and electricity-related assets; the manufacturing tax deduction, which allows a 6% deduction for energy companies from their net income; and the *last in, first out* accounting methodology, which allows coal, gas, and oil companies to substantially reduce tax liability by allowing cost deduction of the most expensive extracted resources. A percentage depletion allowance allows conventional energy companies to deduct a larger cost from their taxable income than incurred. Energy companies can capitalize intangible drilling costs, which can then be amortized over time, thereby reducing tax liability. In addition, the cost of leasing land for resource extraction is allowed a 100% tax deduction through cost depletion.

### **Access**

Conventional energy companies have low-cost access to resources on leased public lands. Whereas oil and gas companies pay royalties of 12.5% to the federal government for onshore resource extraction on leased public lands (which is substantially less than royalty rates of many countries and western states), the Mining Law of 1872 completely exempts uranium from royalty payments. The power of eminent domain used to construct roads and railroads in addition to free rights-of-way granted for railroads, pipelines, and transmission lines substantially reduces costs for conventional energy resources, subsidizing transportation of conventional energy resources from the point of extraction to the place where it is converted to electricity.

### **Loans, Loan Guarantees, and Research and Development Grants**

The federal government provides loan guarantees for the construction of nuclear and fossil fuel plants, lowering the cost of capital by reducing project risk to investors. For example, a new nuclear plant is eligible for a federal loan guarantee up to 80% of the project cost. Between 1978 and 2010, the federal government provided more than \$121 billion for energy-related research and development the vast majority of which went to nuclear and fossil fuel energy. For example, hydraulic fracturing technology were developed using more than \$100 million in federally-funded research and billions in tax breaks.

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## ***Risk Mitigation***

The Price-Anderson Act caps the liability of a nuclear plant accident to \$13.2 billion, and the Energy Policy Act of 2005 provided federal risk insurance of \$2 billion for delays in construction for six nuclear plants. The Oil Pollution Act of 1990 established a public trust fund for up to \$1 billion per oil spill accident as supplemental coverage to commercial insurance.

## ***Environmental Externalities***

There is no pricing mechanism in the electricity market to capture the associated human health and environmental quality benefits associated with renewable energy. Federal environmental laws allow conventional energy companies to contribute to environmental externalities through the regulatory permitting process for many types of pollution. Furthermore, nearly every major federal environmental law includes specific exemptions and exclusions for some or all fossil fuels.

## ***Electricity Regulation and Cross-Subsidies***

The existing electricity regulatory structure financially rewards most investor-owned utilities for building large, centralized fossil fuel and nuclear generation. Large energy construction projects are provided guaranteed rate recovery and other favorable cost recovery practices, such as states allowing "Construction Work in Progress (CWIP)," which allows utilities to immediately increase customer rates to cover the cost of a future nuclear plant, even if the plant is never built. Subsidized electricity prices to rural users are an example of a cross-subsidy that disguises true line maintenance and construction costs and undermines the potential value proposition of off-grid renewable energy applications. Rural cooperative electricity generation, transmission, and distribution networks was paid for with \$57 billion in low-cost federal loans since 1936.

## ***Favorable Financing***

Access to capital tools such as Master Limited Partnerships (MLPs) allow low cost capital financing for large construction projects, primarily pipelines for oil and natural gas companies. MLPs are exempt from paying corporate income tax and offer numerous other tax advantages but are not available to renewable energy companies.

## ***Information Provision***

The federal government uses public funds to conduct surveys to identify energy resource locations and provide other important information to the energy industry. Public resources are also used by federal agencies to determine nuclear plant siting risks.

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