Outline & Summary - Carbon Pricing 101

Series Overview and Objectives (00:00:04)

- The Citizens Climate Lobby (CCL) and Resources for the Future (RFF) have partnered to host a six-session education series focused on carbon pricing (00:00:14).
- The series aims to provide a foundational understanding of carbon pricing, examine international and domestic developments, and help participants build effective climate advocacy strategies (00:01:12).
- All sessions will be recorded and made available for later viewing, and participants are encouraged to provide feedback through sessions hosted by the CCL carbon pricing action team (00:04:35).

Organizational Background (00:02:27)

- CCL is a nonpartisan, nonprofit grassroots organization dedicated to building political will for federal climate solutions that reduce emissions and protect the environment (00:02:35).
- RFF is a research institution that has provided policy advice for decades regarding the intersection of environmental health and economic stability (00:03:03).

Speaker Introduction (00:05:42)

- Mark Hafstead is a fellow at RFF and the director of its carbon pricing initiative (00:05:50).
- His research focuses on the design and evaluation of climate and energy policies, including the distributional and employment impacts of carbon pricing and the implementation of state-level cap-and-invest programs (00:06:14).

Organization Overview and Resources (00:07:12)

- Resources for the Future (RFF) is an independent, non-profit institution based in Washington, D.C., that provides objective information to policymakers without advocating for specific public policies (00:07:32).
- The organization maintains various research areas, including climate risk, electric power, land use, transportation, and energy transition, with details available on their website (00:08:05).
- RFF provides several public tools, including a carbon pricing calculator for past legislative proposals, a carbon pricing bill tracker, an explainer series, and a video overview of carbon pricing (00:08:33).

Education Series Schedule (00:09:57)

- The carbon pricing education series is scheduled for the first Thursday of each month, excluding December (00:09:57).
- Upcoming sessions will cover affordability and distributional impacts in October, policy trends and carbon border adjustments in November, intensity standards in January, state and local developments in February, and a global perspective in March (00:10:10).

Climate Policy and Global Carbon Pricing (00:10:55)

- The series will examine climate change facts, greenhouse gas data, the theory and evidence behind policy options, carbon pricing design, and the use of economic models to evaluate policy outcomes (00:10:55).
- While the United States lacks a federal carbon price, it currently maintains an average of approximately $2 per ton of CO2, accounting for regional programs like the Regional Greenhouse Gas Initiative (RGGI) and cap-and-trade systems in California and Washington (00:12:04).
- Carbon pricing is actively utilized globally, and RFF has contributed to the development of the World Carbon Pricing Dashboard, a data tool that tracks these policies across different sectors and timeframes (00:11:40).

Trends in Atmospheric Carbon Dioxide (00:12:45)

- Atmospheric carbon dioxide concentrations have reached record highs, currently measuring approximately 426 parts per million (00:12:45).
- Data from the last 800,000 years indicate that current CO2 levels are unprecedented, as concentrations remained below 300 parts per million until roughly 1950 (00:13:21).
- These rapid increases are not attributed to natural cycles, and elevated greenhouse gas levels are linked to rising temperatures, sea-level rise, shrinking ice caps, and ocean acidification (00:13:48).
- Ocean acidification, which has increased since the pre-industrial era, lowers pH levels and threatens marine life and fisheries (00:14:28).

Global and National Emission Sources (00:15:06)

- Global CO2 emissions have grown sixfold since 1950, with China currently serving as the largest annual emitter, while the United States holds the highest cumulative emissions since 1950 (00:15:06).
- In the United States, carbon dioxide accounts for 79.7% of gross greenhouse gas emissions, with 93% of those CO2 emissions resulting from fossil fuel combustion as of 2022 (00:18:26).
- The electric power and transportation sectors are the primary contributors to U.S. fossil fuel combustion emissions (00:18:34).

U.S. Emissions Inventory and Sector Performance (00:16:43)

- Electric power sector emissions peaked around 2005 and have since declined by 36%, largely driven by a 57% reduction in emissions from coal generation (00:16:43).
- Transportation emissions have remained relatively flat, decreasing by less than 6% since 2005 (00:18:51).
- The official U.S. greenhouse gas inventory, last published in 2024 with 2022 data, is no longer being produced by the federal government, leading to reliance on private sector and academic organizations, such as the University of Maryland, to track emissions data (00:17:09).

Climate Change Policy Options (00:18:57)

- Emissions reduction strategies include carbon pricing (cap-and-trade or carbon taxes), government regulations like performance and efficiency standards, and direct government investment in technologies such as hydrogen hubs and direct air capture (00:19:11).
- Carbon pricing functions as a market-based mechanism that reduces emissions by lowering emissions intensity per unit of demand, incentivizing consumers to reduce demand for carbon-intensive goods, and encouraging investment in cleaner technologies (00:20:46).
- Economists favor carbon pricing for its flexibility, ability to equalize incentives across sectors to achieve reductions at the lowest cost, and potential to generate government revenue (00:22:46).

Evaluating Carbon Pricing Mechanisms (00:23:54)

- Determining the optimal carbon price is difficult because the marginal damage of emissions is uncertain, and the social cost of carbon estimates vary significantly, with some recent projections reaching $170 per ton or higher (00:24:26).
- Cap-and-trade systems provide a relatively guaranteed level of emissions reductions by setting a hard limit, though they face challenges regarding price volatility and the political complexity of distributing emissions allowances (00:26:12).
- Carbon taxes offer price certainty and are easier to implement, but they leave the total level of emissions reductions uncertain and do not automatically adjust to economic shocks (00:28:41).

Addressing Unilateral Implementation and Leakage (00:29:40)

- Unilateral carbon pricing can lead to environmental and economic leakage, where emissions reductions in one jurisdiction are offset by increased emissions or the relocation of factories to regions without similar policies (00:29:55).
- Jurisdictions can mitigate leakage through output-based allocation of allowances, which incentivizes firms to maintain production locally, or by implementing carbon border

adjustment mechanisms to apply tariffs on imports from regions with less stringent policies (00:30:59).

Alternative Policies and Historical Examples (00:32:08)

- Regulatory standards can reduce emissions intensity but often fail to promote conservation or account for varying abatement costs across firms, potentially leading to inefficient outcomes (00:32:16).
- Historical examples of carbon pricing include the U.S. Acid Rain Program, the EU Emissions Trading System, and programs in California, Washington, and British Columbia (00:33:18).
- Evaluating the effectiveness of these policies is complex because it is difficult to isolate the causal impact of a specific policy from broader economic trends, such as global recessions (00:34:44).

Case Study: British Columbia (00:35:10)

- British Columbia implemented a carbon tax in 2008 that covered approximately 70% of its greenhouse gas emissions, with a legal requirement that all revenue be returned to taxpayers through tax reductions (00:35:10).
- While emissions in British Columbia fell following the policy's implementation, the decline coincided with the 2008 global economic recession, making it challenging to determine the exact causal impact of the tax (00:36:10).
- Evidence suggests a decoupling of economic growth and emissions in British Columbia, where the economy grew significantly while emissions remained relatively flat, indicating the potential effectiveness of the carbon pricing approach (00:37:08).

Carbon Pricing Design and Stringency (00:37:37)

- Economic theory suggests setting a carbon price equal to the marginal cost of damages, though the social cost of carbon remains uncertain and often politically unrealistic (00:37:50).
- Policymakers must balance environmental benefits against economic costs when determining price levels and stringency (00:38:08).
- Various pricing paths exist, including the "hockey stick" approach, which keeps prices low for current politicians and shifts higher costs to future administrations (00:38:42).
- When prices do not align with the social cost of carbon, the primary goal for economists is to identify a politically feasible policy (00:39:04).

Policy Coverage and Regulation (00:39:10)

- Policymakers must decide which sectors and gases to cover, as policies do not necessarily need to be economy-wide (00:39:15).

- The point of regulation determines who is responsible for paying the tax or submitting allowances, with options including upstream, mid-stream, and downstream approaches (00:39:53).
- Upstream pricing targets fossil fuel producers at the point of extraction, while mid-stream pricing targets the first purchaser of the fuel (00:40:00).
- Downstream pricing, which would charge households directly at the pump, is generally considered administratively unfeasible (00:40:37).
- While economists typically favor the point of regulation with the lowest administrative burden, the economic impact on consumers and producers remains largely the same regardless of where the tax is applied (00:40:50).

Revenue Utilization Strategies (00:41:09)

- Revenue use is a significant policy choice, with options including returning funds to households as dividends, such as the tax and dividend approach (00:41:15).
- Other proposals, like the Market Choice Act, have suggested using revenues to restore the federal highway trust fund while eliminating the federal gas tax (00:41:28).
- Revenues can also be used to reduce personal, corporate, or payroll tax rates (00:41:41).
- While different revenue-use strategies may result in similar environmental outcomes, they produce distinct economic, efficiency, and distributional effects (00:41:53).

Economic Modeling of Climate Policy (00:42:07)

- Economists utilize various models to evaluate climate policies, acknowledging that no single model is sufficient for all purposes due to computational trade-offs (00:42:13).
- Evaluations focus on three primary criteria: the effectiveness of emissions reductions, the efficiency or cost of those reductions, and the distributional effects across different households, sectors, and regions (00:42:37).
- Modeling efforts examine how climate policies influence energy supply and demand, broader price levels for goods and services, and interactions with the fiscal system over time (00:43:58).

Policy Design and Revenue Utilization (00:44:16)

- The stringency of a carbon price profile can be adjusted to meet specific emissions reduction targets, with the power sector typically providing the majority of reductions in economic models (00:44:29).
- While overall costs vary based on how revenues are utilized, climate policies consistently generate significant non-climate benefits, such as reductions in local air pollutants like PM2.5 and sulfur dioxide (00:44:54).
- Revenue use significantly impacts the distributional outcomes of a carbon price; for instance, lump-sum dividends can make a policy progressive by benefiting lower-income households, whereas other uses of revenue may be regressive (00:45:30).

Key Findings on Carbon Pricing (00:46:14)

- Federal climate policies can produce significant net benefits, with non-climate co-benefits often exceeding the direct climate-related benefits (00:46:28).
- Carbon pricing is generally identified as the most cost-effective method for reducing emissions at a moderate to large scale compared to alternatives like clean electricity standards or gasoline taxes (00:47:01).
- A $1 carbon price corresponds to approximately a 1-cent increase in gasoline prices, a change that is relatively small compared to typical market fluctuations in fuel costs (00:47:35).
- Although carbon pricing impacts industries, households, and states unevenly, strategic revenue use can mitigate adverse effects and improve political feasibility, even if it requires a slight trade-off in overall economic efficiency (00:48:04).

Feedback and Future Sessions (00:48:58)

- A feedback session hosted by the carbon pricing action team is scheduled for September 16th to allow participants to share insights and learnings from the current presentation (00:49:19).
- The next session in the series will take place on October 1st and will focus on the affordability and distributional impacts of carbon pricing (00:50:06).
- Research from Resources for the Future (RFF) will be presented in the upcoming session to demonstrate how carbon pricing revenues can be utilized to improve affordability for households (00:50:44).

Resources and Organizational Information (00:51:00)

- Volunteers can log their attendance for the session, and recordings, slides, and relevant links will be made available on the event page within a few days (00:51:00).
- Citizens Climate Lobby (CCL) hosts informational sessions every Wednesday at 8:00 p.m. Eastern time for those interested in learning more about the organization (00:51:30).
- Further information regarding the partner organization, RFF, can be found on their website at rff.org (00:51:46).
- Additional training resources, local chapter information, and discussion forums are accessible through the Citizens Climate Lobby community website (00:52:35).