Technical Change in Energy Related Methane Abatement

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Modeling changes in technologies over time is crucial in demonstrating an economy's ability to adapt and reduce emissions cost-effectively. USEPA and RTI have developed a framework for estimating technical change in non-CO_2 greenhouse gas mitigation over time, especially in the energy-related methane sources. Changes in emissions over time depend on both the rate of technical change in mitigation technologies and technology adoption. The framework represents accepted economic principles related technical change and the engineering relationships particular to non-CO_2 GHG emissions mitigation. Estimates of technical change incorporate increased efficiency in current technologies, reduction of cost in mitigation technologies over time, and the entrance of new technologies into the market. Among the many factors influencing the rate of technology adoption are its irreversibility, postponability and uncertainty. In this approach, the decision-maker compares the total annualized costs of the new technology with its net operating costs of the old technology. The irreversibility consideration in the decision making process is captured by including sunk costs associated with the mitigation technology in this evaluation. The postponable nature of technology adoption is captured by explicitly incorporating the technology trends in the adoption decision framework. The uncertainty in technology adoption is addressed by recognizing that decision-makers see the variables in the calculation of total annualized costs as uncertain whereas they have more certainty regarding the current net operating costs. Final calculations of the marginal abatement curves based on technical change and adoption estimates over time will be presented. The final calculations are based on data from energy related methane emitting sectors in the U.S.

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