CRE-10. R&D for Emerging Technologies and Corresponding Incentives

Policy Description

R&D of emerging technologies to develop demonstration projects and eventual commercialization of reasonable-cost generation technologies with low or zero GHG emissions is critical to solving the global climate change challenge. Technology areas often cited as requiring such reasonable-cost developments are CCS (e.g., in deep saline aquifers or coal seams) for fossil fuel facilities, and large-scale baseload renewable energy or technologies that can transform intermittent renewables into baseload generation (e.g., batteries, compressed air storage).

Given the magnitude of the task, an Apollo-like research program to create and field test such technologies that are commercially viable is needed. At present, such funding is not a significant portion of a rate-regulated utility's budget or the budgets of federal and state government agencies. Nonetheless, even a small fee per kWh of electricity could generate significant funding. However, funding is only half of the equation; strategies to use such funds to implement a focused program to commercialize generation technologies with low or zero GHG emissions must also be developed.

Policy Design

Goals: The goals of this policy, though unquantifiable in terms of emissions, are:

- By 2009, identify the likely funding mechanisms and policy tools that would provide further stimulus for the development of new, reasonable-cost, low- and zero-GHG-emitting electricity generation in Iowa.
- By 2009, analyze the costs and benefits of R&D program scenarios to help reach the 50% and 90% reductions targets from 2005 emission levels by 2050.
- By 2010, begin to implement the R&D funding mechanisms.
- By 2015, identify and begin characterizing areas within and near Iowa that are likely candidates for CCS, and begin larger-scale field studies of baseload renewable energy and technologies that can transform intermittent renewables into baseload generation.
- By 2020, complete larger-scale field studies and demonstrations of baseload renewable energy and technologies that can transform intermittent renewables into baseload generation. Prior to 2020, verify small-scale CCS test projects within suitable formations, and initiate larger-scale projects.
- By 2025, fully commercialize baseload renewable energy and technologies that can transform intermittent renewables into baseload generation, and fully integrate CCS into new coal-fueled power plants.
- By 2030, commercialize reasonable-cost CCS technology for coal-fueled power plants that were not originally designed for sequestration. Baseload renewable energy and technologies

that can transform intermittent renewables into baseload generation will be cost competitive without subsidies or incentives.

Timing: See above.

Parties Involved: Iowa Legislature, IUB, electric utilities, and potentially other appropriate state government entities, such as the Office of Energy Independence, Iowa Power Fund, Iowa Department of Economic Development, and State Regents Institutions.

Other: The Iowa Power Fund is an example of a new state government board designed to help stimulate the research, development, and commercialization of new clean energy sources in Iowa.

Implementation Mechanisms

This policy may require the adoption of incentives by the Iowa Legislature, IUB, and potentially other appropriate state government entities.

Related Policies/Programs in Place

CRE-4 could provide a source of funding for this option.

Type(s) of GHG Reductions

Avoiding electricity generation from fossil fuel sources results in GHG reductions primarily from CO_2 emissions, but also trace amounts of CH_4 and N_2O emissions.

Estimated GHG Reductions and Costs or Cost Savings

Not quantified.

Data Sources: Not applicable.

Quantification Methods: Not applicable.

Key Assumptions: Not applicable.

Key Uncertainties

There is a risk that GHG reductions are overstated and the costs per ton of CO_2e reductions are understated if high-CO_2-intensity resources are assumed to be redispatched or not built due to increased renewables (the avoided CO_2 methodology).[11]

Additional Benefits and Costs

None identified.

Feasibility Issues

None identified.

[11] Annex A defines the rationale behind the assumption used for the avoided CO_2 methodology in these analyses.

Status of Group Approval

Approved.

Level of Group Support

Unanimous.

Barriers to Consensus

None.