Unveiling the Energy Roadmap

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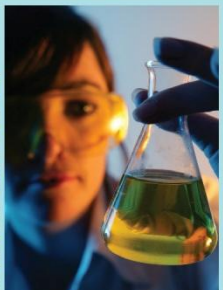


Advanced Coal with Carbon Capture and Storage (CCS)

(Subgroup of the Renewable Electricity & Advanced Coal with CCS Advisory Group)

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Advanced Coal with CCS

- Advanced Coal with CCS is a necessary component for achieving the energy security and emissions reductions goals and objectives of the MGA.

- Implementation of the 2007 Energy Security & Climate Stewardship Platform included a set of work products that were used to identify strategies and to develop recommendations for achieving the MGA Platform goals for advanced coal and CCS.

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MGA Platform Regional Goals for Advanced Coal with CCS

- **BY 2010:** A regional regulatory framework for carbon capture and storage will have been implemented.
- **BY 2012:** A multi-jurisdiction pipeline will have been sited and permitted to transport CO2 captured from one or more new advanced coal plants and potentially biofuels plants to an appropriate reservoir for use in enhanced oil and gas recovery (EOR).
- **BY 2012:** The region will have operating at least one commercial-scale integrated gasification-combined cycle (IGCC) power plant with CCS that uses bituminous coal.

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MGA Platform Regional Goals for Advanced Coal with CCS

- **BY 2015:** Three or more commercial-scale IGCC plants with CCS operating with bituminous coals;
- Operating at commercial scale at least two IGCC plants with CCS that use sub-bituminous and lignite coals, respectively;
- Commercial scale post-combustion capture of CO2 emissions at one or more pulverized coal plants; and

BY 2020: All new coal gasification and coal combustion plants will capture and store CO2 emissions.

BY 2050: The region's fleet of coal plants will have transitioned to CCS.

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Projected Electricity Production with Regional RESs and CCS Credit, by Technology

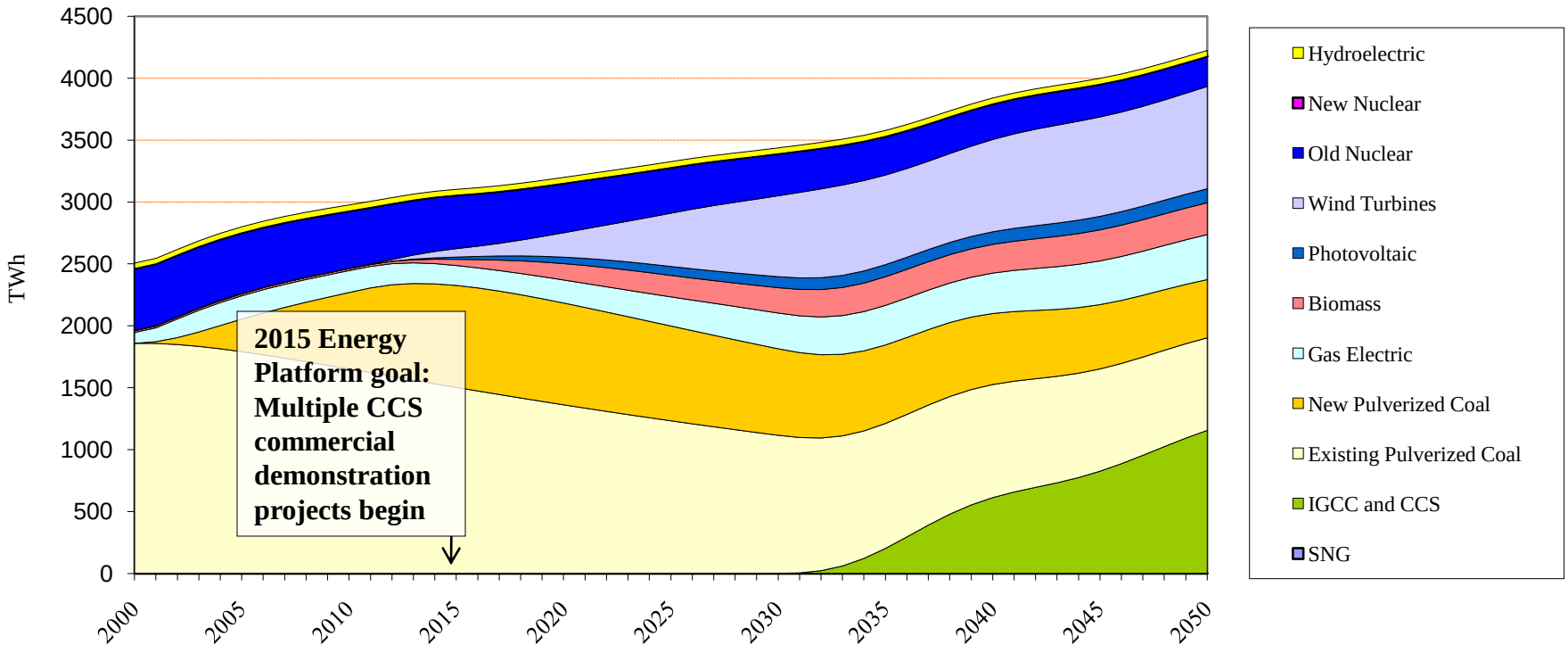

Figure 24: Projection illustrating a more rapid deployment of IGCC and CCS when a $30/ton CO_2 storage credit is added to a regional RES in the Midwest, from 2000 to 2050. Although this chart does not report significant levels of IGCC and CCS until the year 2033, the Energy Platform calls for a wide range of CCS demonstration projects by 2015 in order to enable wide-scale deployment later. The platform also calls for integration of CCS into new coal plants by 2020, which is not shown in this chart.

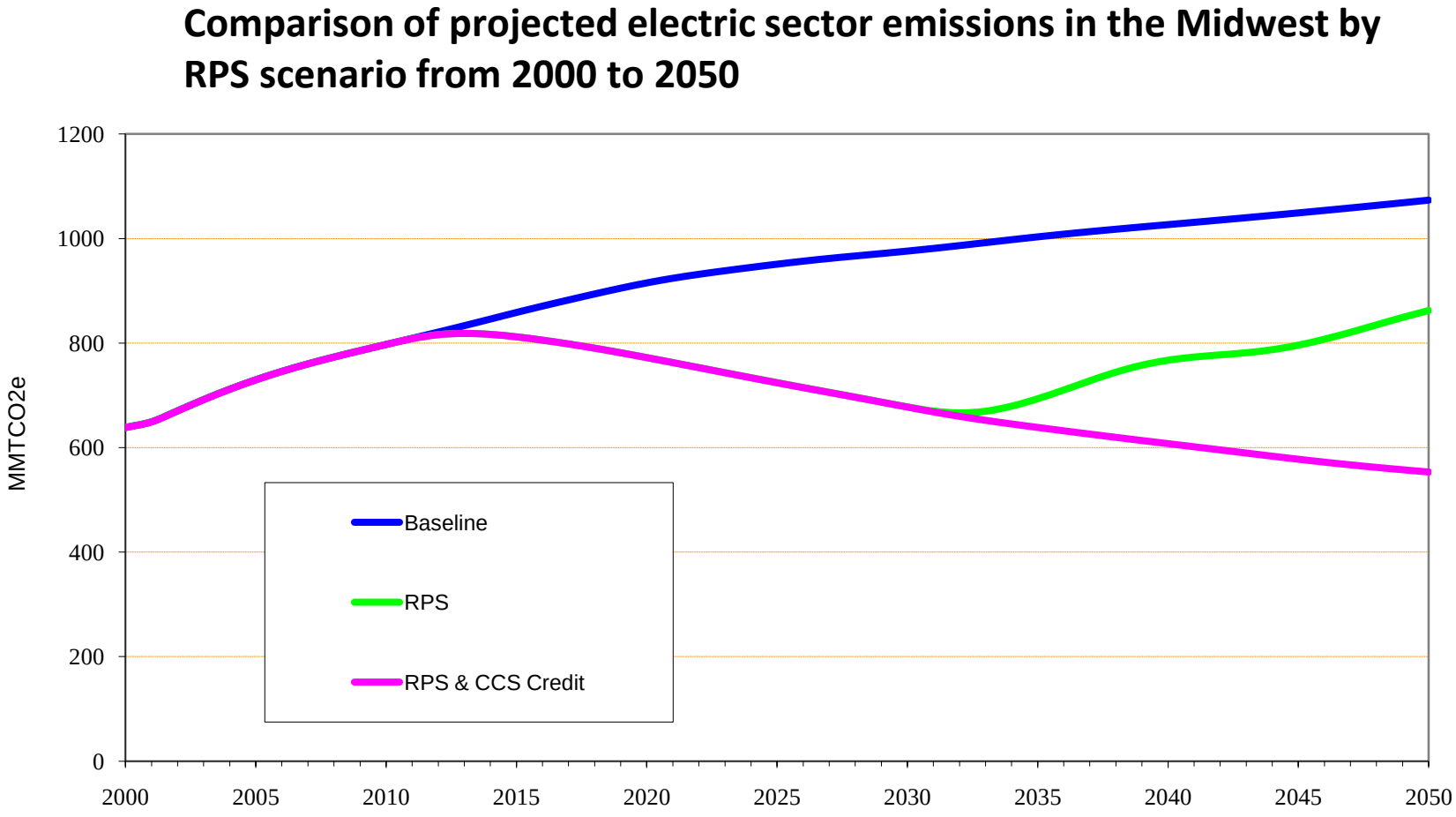

Figure 24: Projection illustrating how projected electric sector emissions are impacted by an RPS and by an RPS plus a CCS credit in comparison to the projected baseline.

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Advanced Coal with CCS Work Products

Several work products were completed, including:

- A Commercial Plan for the commercial deployment of CCS.
- Design recommendations for the development of a Geologic Storage Utility or Utilities.
- An assessment of the potential for CO_2 (EOR) in the MGA region.
- Development of a Toolkit to identify the state/provincial legal and regulatory issues for transporting and storing CO_2.

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Advanced Coal with CCS: Priority Policy Priority Recommendations

Develop, or enhance as needed, statutes and rules to have a comprehensive **statutory and regulatory framework** for CO_2 transport and storage in place by 2010.

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Advanced Coal with CCS: Priority Policy Priority Recommendations

Cooperatively develop design recommendations to allow for the **establishment of geologic carbon-sequestration utilities** operating on a state and provincial, or inter-jurisdictional, geologic basin-wide scale.

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Advanced Coal with CCS: Priority Policy Priority Recommendations

Allow for **tax credits** per ton of CO_2 captured for commercial EOR operations and enhanced coal bed methane (ECBM) operations using anthropogenic CO_2 that result in net storage of CO_2. These credits should supplement expected federal per-ton payments for CO_2 stored in EOR and deep saline operations, if deemed necessary for a project to be commercially viable.

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Advanced Coal with CCS: Priority Policy Priority Recommendations

Allow for **tax credits** or **tax abatement** for new or expanded CCS project development to reduce the capital costs of investments in capture and compression components and in the build-out of the transportation infrastructure.

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