

ELECTRICITY COMMITTEE Energy and Regulatory Transitions: State Updates

Electricity Committee

Moderator

Hon. Judith Williams Jagdmann, Virginia Panelists

Hon. Kara Fornstrom, Wyoming Hon. Charlotte Mitchell, North Carolina Hon. Anthony O'Donnell, Maryland Hon. Richard Lozier, Jr., Iowa



Energy and Regulatory Transitions: State Updates

Kara B. Fornstrom, Chairman, Wyoming Public Service Commission November 18, 2019

Today's Presentation

- Why the Future of Coal Matters to Wyoming
- Pressures on Coal-Fired Electricity
- Wyoming's Response
- What's Impeding Utilities from Investing in CCUS
 Technology?
- Potential Regulatory Mechanisms
- Conclusion/Questions

Why the Future of Coal Matters to Wyoming

- Wyoming Coal Mines
- Wyoming Coal-Fired Generation Plants

2017 U.S. Coal Production by State



■ Wyoming ■ West Virginia ■ PA ■ IL ■ KY ■ TX ■ MT ■ IN ■ ND ■ 16 Other States

Wyoming's Coal Mines





Coal-Fired Power Plants Fueled by the Powder River Basin



Wyoming's Coal-Fired Plants



Coal Revenue for Wyoming



Pressures on Coal-Fired Electricity

- National Energy Policy
- Natural Gas Prices
- Legal Rulings
- State Energy Policy
- Impact on Wyoming

State Energy Policy

States and territories with Renewable	States and territories with a voluntary	States and territories with no
Portfolio Standards	renewable energy standard or target	standard or target



100% Clean or Renewable Electricity Targets

Anticipated, Proposed or Enacted 100% Standards and Studies



Impact on Wyoming: Coal Production: 1970-2016



Change in Tax Revenue, Adjusted for Inflation

50 states Wyoming



Wyoming's Response = LEAD

- Legal Framework: State and Federal
- Technology: CCUS & Integrated Test
 Center
- CO2 Pipeline Corridors
- Regulatory Incentives?

Technology: Integrated Test Center

- Carbon XPrize
 - Breathe (Bangalore, India)
 - C4X (Suzhou, China)
 - Carbon Capture Machine (Aberdeen, Scotland)
 - CarbonCure (Dartmouth, Canada)
 - Carbon Upcycling UCLA (Los Angeles, CA, USA)
- Japan Coal Energy Center (JCOAL) and Kawasaki Heavy Industries, Ltd.
- University of Kentucky Center for Applied Energy Research (CAER)







CO2 Pipeline Corridors: Wyoming's Infrastructure



Citation: "Carbon Capture and Sequestration in the Cowboy State: A Primer for the Wyoming Lawyer, Kipp Coddington, March

Are Regulatory Incentives the Missing Piece?



What's Impeding Utilities From Investing in CCUS Technology?

Traditional Rate Making Model

Utility Risk Profile - Risk Tolerance

Utility Risk Profile: Risk Profile By Industry



Are Regulatory Mechanisms the Missing Piece?



CCUS Regulatory Mechanisms

- Integrated Resource Planning
- Innovative Ratemaking

CO2 as a Revenue Stream

- How can CO2 be turned into a profitable commodity?
- Treated as Pass-On Application?
- Sharing Bands?
- CO2 Revenues outside Calculation of Return on Equity
- Novel Concepts
 Encouraged



Conclusion/Questions?

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EVOLUTION of ELECTRIC GENERATION in IOWA

The Answer is Blowing in the Wind

Richard Lozier



Iowa Wind Facts (2019)

1st state to adopt an RPS in 1983 ~ 105 MW

#2 in nation for percent of electricity generated by wind: 33.7%

#2 in nation for installed capacity: 8,957 MW

#3 in nation for the number of turbines: 4,859



Source: https://www.awea.org/Awea/media/Resources/StateFactSheets/Iowa.pdf

Iowa Utilities Board

Iowa's Wind Landscape



Iowa Generation Mix 2007 v. 2017

	2007		2017	
	MWh	Percent	MWh	Percent
Coal	37,985,566	76%	25,358,230	44%
Wind	2,756,855	6%	21,372,752	37%
Nuclear	4,518,875	9%	5,213,509	9%
Natural Gas	3.090.879	6%	4.567.447	8%
Hydro & Other Renewables	1.125.306	2%	1.250.909	2%
Petroleum	311 915	1%	146 719	0.3%
Total	49,789,396	100%	57,909,566	100%

Source: U.S. Department of Energy, Energy Information Administration Reports 906, 920 and 923.

Iowa Utilities Board

Iowa Generation Mix 2007 v. 2017



Source: U.S. Department of Energy, Energy Information Administration Reports 906, 920 and 923.



Advanced Ratemaking Principles

- 2001 Legislation (lowa Code § 476.53)
- Purpose: to encourage the development of generating facilities in Iowa by reducing the risk of rate recovery for new generating facilities.
- Allows a rate-regulated utility to receive binding regulatory assurances related to the treatment of electric power generating facilities, when the costs of the new facility are included in electric rates.



Advanced Ratemaking Principles

- Applies to:
 - Electric generation constructed, leased or owned by any lowa rate-regulated utility.
- Electric Generation includes:
 - New baseload electric generating facility > 300 MW.
 - Combined-cycle electric power generating facility.
 - Alternate energy production facility as defined in Iowa Code § 476.42.
 - Any significant alteration of any existing electric generating facility.

(such as: conversion of coal fueled facility into a gas fueled facility; addition of biomass fueled capability to a coal fueled facility; or repowering of an alternate energy production facility.)

Tax Credits

- lowa offers:
 - Production tax credits
 - Wind energy tax credits (§ 476B).
 - Renewable energy tax credits (§ 476C).
 - Investment tax credits
 - Solar energy system tax credits (§ 422.11L).



Tax Incentives

- lowa offers:
 - Property tax exemptions
 - Methane gas conversion property (§ 427.1(29)).
 - Wind conversion property (§ 427B.26).
 - Renewable energy systems (§ 441.21(8)).
 - Sales tax exemptions:
 - Wind energy conversion property (§ 423.3(54)).
 - Solar energy equipment (§ 423.3(90)).



SOLAR

- Solar Development in Iowa has lagged behind other states.
- Recent Solar Projects:
 - 100 MW Project in Eastern Iowa
 - First Utility Scale Solar Project in Iowa
 - Generating Certificate Issued
 - Construction Ready to Begin



SOLAR

- Four Projects Pending in North Iowa
 - 300 MW in Northeast Iowa Petition filed
 - 300 MW in North Central Iowa Petition filed
 - 149 MW in North Central Iowa Petition filed
 - 250 MW in Northwest Iowa Petition on hold for now; anticipate will be filed in next few months



CONCLUSION

New Technologies Coupled with Forward Looking Policies and Legislation Have Enabled and Encouraged Significant Expansion and Diversification of Electric Generation in Iowa, Resulting in over \$16 Billion Investment in Wind Energy and an Additional Anticipated \$1 Billion to be Invested in Solar Energy.





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