Stabilize and Optimize Coal Power Program Portfolio
Phase I Kickoff Meeting
October 6-7, 2026

DE-FE0032739: RETROFITTING CWLP WITH A COAL AND NATURAL GAS CO-FIRING SYSTEM

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Project Overview

Multi-phase project funded by US DOE

OBJECTIVES

The overall goal of this project is to implement a simple and cost-effective technology to retrofit the coal-fired boiler at Dallman Unit 4 at City Water, Light and Power (CWLP) to enable coal / natural gas co-firing up to 40% natural gas heat input from minimum load to Maximum Continuous Rating (MCR). This will be achieved through hardware modifications in the burners combined with innovative controls that integrate the new burner fuel supply controls with distinct hardware features in the existing boiler, resulting in a higher flexible design that ensures continuous and efficient plant performance with reduced emissions.

IMPACT

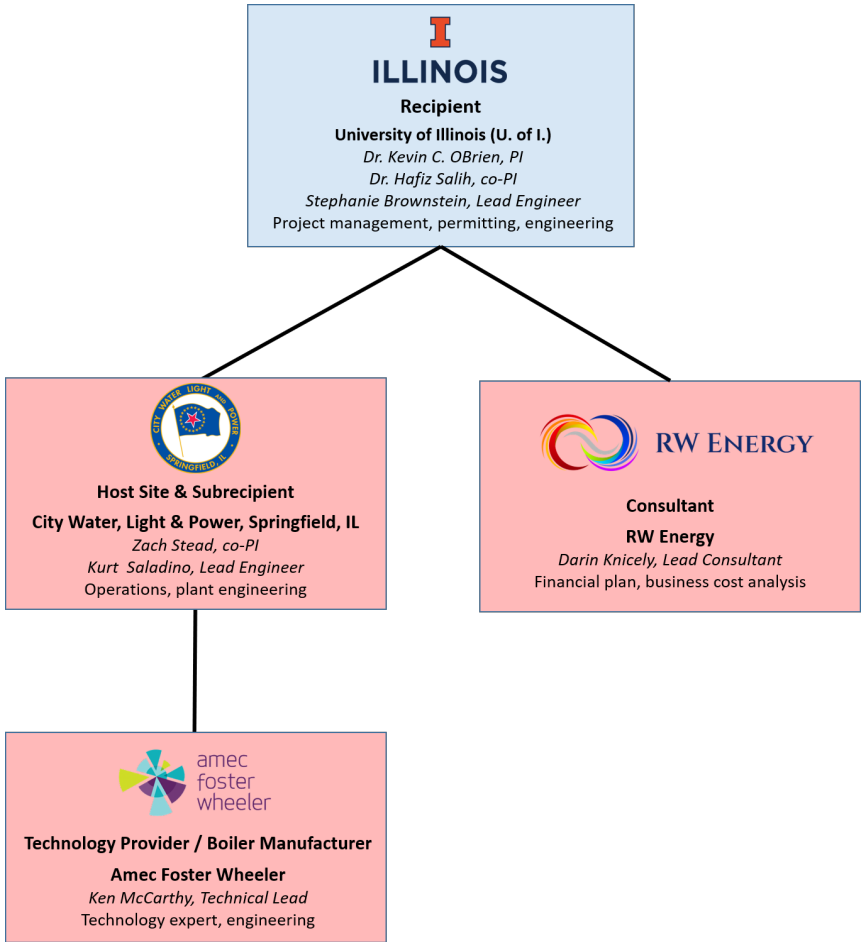
Co-firing would reduce emissions, improve efficiencies, and enable the plant to response to fluctuations in market demand. This project leverages previous DOE funded project and municipally funded projects at host site CWLP.

PHASE I BUDGET AND TIMELINE

Work Period: October 1, 2026 – August 30, 2027

Phase I Project Total	
DOE Funds	Cost Share
$400,000	$100,000

KEY PROJECT PARTICIPANTS

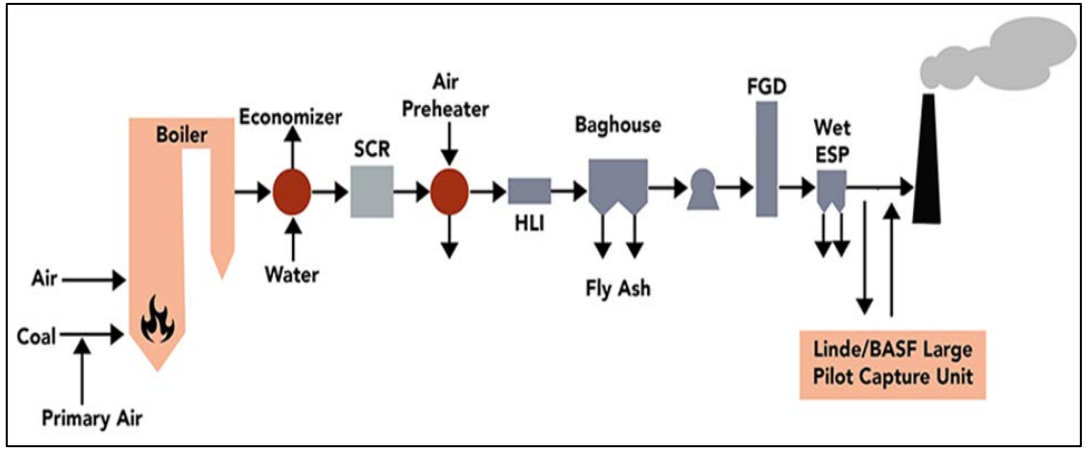


Project Background

CWLP Dallman Unit 4 and Pilot Plant Configuration

DE-FE0031581 Large Pilot capture plant

Dallman Unit 4 configuration



PROJECT IMPLEMENTATION

CWLP planned outages:

- Typically two outages per year – one short (2 weeks) and one long (4 weeks)
- Typically one in spring and one in fall
- Future installation of cofiring will try to maximize overlap with a planned outage

CWLP DALLMAN UNIT 4

Capacity: 230 MW (gross) / 205 MW (net)
Installation: 2009
Coal type: Bituminous (high sulfur, Illinois coal)
Pollution control:

- NOx – low NOx burners, SCR
- SO_2 – wet FGD
- Fine particulates – fabric filter bag house
- Acid mist / ultra-fine particulates – wet ESP

Project Scope / Technical Approach

Activity, schedule and milestones

Phase I Activity Summary

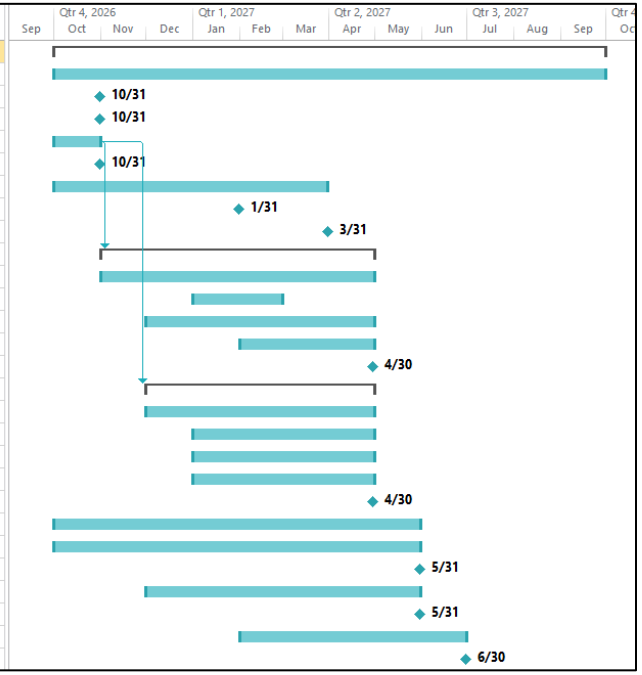
Phase I will be a single 12-month budget period focused on technical, financial, regulatory, and permitting activities. The project will begin by selecting a co-firing design, which will define the appropriate scope for completion of a pre-FEED and Environmental Information Volume. Financial planning and cost share will be established for future phases, and an EPC contractor and NEPA contractor will be selected. Milestones have been strategically placed throughout Phase I to ensure the project stays on track and deliverables are successfully completed.

Project Milestones

Task/ Subtask	Milestone Title & Description	Planned Completion Date
1.0	Updated Phase I PMP	10/31/26
1.0	Kickoff Meeting	10/31/26
2.0	Co-firing Design Selection	10/31/26
3.0	CCUS Technology Down-Selection	1/31/27
3.0	CCUS Conceptual Design Completed	3/31/27
4.0	Pre-FEED Completed	4/30/27
5.0	EIV Completed	4/30/27
7.0	Commitment Letters Obtained	5/31/27
8.0	Preliminary BCA Completed	5/31/27
9.0	Phase I Topical Report Completed	6/30/27

Project Schedule

Task Name	Start	Finish
Phase I (12 months)	**10/1/26**	**9/30/27**
1.0 Project Management and Planning	**10/1/26**	**9/30/27**
Updated Phase I Project Management Plan	10/31/26	10/31/26
Kickoff Meeting	10/31/26	10/31/26
2.0 Co-Firing Design Selection	**10/1/26**	**10/31/26**
Co-Firing Design Selection	10/31/26	10/31/26
3.0 CCUS Conceptual Design	**10/1/26**	**3/31/27**
CCUS Technology Down-Selection	1/31/27	1/31/27
CCUS Conceptual Design Completed	3/31/27	3/31/27
4.0 Co-Firing Pre-FEED	**11/1/26**	**4/30/27**
4.1 Preliminary Engineering	11/1/26	4/30/27
4.2 Preliminary Hazard and Operability Study (HAZOP)	1/1/27	2/28/27
4.3 Cost Estimate	12/1/26	4/30/27
4.4 Project Plan for Phases II and III	2/1/27	4/30/27
Pre-FEED Completed	4/30/27	4/30/27
5.0 Environmental, Safety, and Permitting	**12/1/26**	**4/30/27**
5.1 Environmental Information Volume (EIV)	12/1/26	4/30/27
5.2 Safety, Security, Regulatory, and Permitting Requirements	1/1/27	4/30/27
5.3 Environmental Health and Safety (EHS) Risk Assessment	1/1/27	4/30/27
5.4 Identify and Select NEPA Contractor for Phases II and III	1/1/27	4/30/27
EIV Completed	4/30/27	4/30/27
6.0 Identify and Select EPC Contractor for Phases II and III	**10/1/26**	**5/31/27**
7.0 Commitment Letters	**10/1/26**	**5/31/27**
Commitment Letters Obtained	5/31/27	5/31/27
8.0 Initial Business Case Analysis	**12/1/26**	**5/31/27**
Preliminary Business Case Analysis Completed	5/31/27	5/31/27
9.0 Phase II Application Package	**2/1/27**	**6/30/27**
Phase I Summary Document Completed	6/30/27	6/30/27



Performance Metrics and Risk Management

Success criteria

Decision Point	Date	Success Criteria
Co-Firing Design Selection	10/31/2026	Down-selection and verification of a natural gas co-firing design that meets all Topic Area-3 technical objectives specified in NOFO 3606. Specifically, the design must achieve stable, continuous co-firing operation utilizing a natural gas heat input of 20% to 50% of the total boiler thermal input, limit retrofit costs to approximately $50/kW, and reduce SOx, NOx, Hg, and CO_2 emissions by 20-50% during peak co-firing conditions (50% natural gas input) relative to the pre-retrofit, coal-only baseline.
CCUS Technology Down-Selection	1/31/2027	Down-selection and technical verification of a commercially viable post-combustion CCUS technology configuration based on TRL, efficiency, cost, and host-site spatial integration constraints.
CCUS Conceptual Design	3/31/2027	Completion of a pre-FEED ready CCUS Conceptual Design sized to process 100% of Dallman Unit 4 flue gas according to SOPO Task 3.0 description.
Preliminary engineering, cost estimate and Pro Forma	4/30/2027	Completion of the pre-FEED study per SOPO Appendix D guidelines. Cost estimates for co-fired system within budget for funding and cost share in Phases II and III; - pre-FEED cost estimate and Pro Forma meeting AACE Class 4 accuracy: –15% to –30% (low); +20% to +50% (high)
NEPA & EIV	4/30/2027	Completion of the EIV report per SOPO Appendix B guidance and execution of the EHS risk assessment per SOPO Appendix F.
Team commitments and cost share agreements	5/31/2027	Signed commitment letters and cost-share funds from team members for Phase II and developed a realistic plan for securing cost share in Phase III
Business Case Analysis	5/31/2027	Preliminary Business Case Analysis completed for the cofiring and CCUS retrofit per SOPO Appendix E guidance which quantifies the projected financial parameters (e.g., operating costs, operating revenues, financing cash flows, EBITDA, tax credits/liabilities, ROI) over the project lifespan; payback period ≤20 years; IRR ≥7%; CAPEX ≤$40MM and retrofit cost ≤$50/kW.
Phase I Topical Report	6/30/2027	Successful completion and submission of the Phase I Topical Report per SOPO Appendix A.
Go / No-Go Phase II Application	6/30/2027	Submission of Phase II Application package

Performance Metrics and Risk Management

Risk assessment

Perceived Risk	Risk Rating: L, M, H			Mitigation and Response Strategy
	Prob.	Impact	Overall	
Financial				
Cost share insufficient	L	H	L	• Cost share commitment letters obtained. • All entities providing cost share are financially sound.
Cost / Schedule				
Project costs and/or schedule overruns	L	H	L	• Team has previous experience conducting DOE FEED & pilot projects on budget and on time.
Tasks require significantly more time than expected	L	H	M	• Preliminary results from prior engineering studies provide a good basis of understanding.
Technical / Scope				
Challenges to predict accurate boiler performance after retrofit	L	M	L	• A performance model and computational fluid dynamics (CFD) simulation of the boiler operations with natural gas co-firing were previously developed as part of a boiler rating study and a retrofit prefeasibility study, which will serve as basis for this project. • The boiler designer and manufacturer is a member of the team and will model the boiler performance utilizing previous models as basis.
Challenges to identify suitable suppliers of key equipment.	L	M	L	• Previous engineering studies identified availability of U.S. suppliers for each alternative evaluated (high-capacity ignitors versus natural gas burners). • Key equipment suppliers will be contacted during the pre-FEED to confirm equipment performance and availability.
Difficulties in scaling up to meet capacity.	L	M	L	• Successful conversions for coal-fueled boilers have been made in the past with older boilers of comparable capacity. • Key equipment suppliers will be contacted during the pre-FEED to confirm equipment performance and availability.
Inadequate pressure/flow for 40% gas firing.	L	L	L	• The existing gas metering and regulating (M&R) station can support the higher gas flow and pressure for 40% gas firing with some modifications. • CWLP already in talks with the gas supplier for installing a new lateral line to supply gas to the M&R station at 250 psig and no less than 900 MMBtu/hr.
Difficulties in maintaining adequate air flow and velocity through boiler, or controlling steam temperatures after co-firing	L	M	L	• The boiler OEM is included as part of the team, to assess any possible retrofits necessary to ensure adequate circulation through the boiler, as well as controlled final and reheat steam temperatures. • A Computational Fluid Dynamics (CFD) model of the boiler, based on a previously validated model, is planned for Phase II of this project to verify adequacy of air flow and velocity, and if any modifications to existing dampers are needed.
Challenges on the conceptual design for an integrated, full-scale carbon capture, utilization, and storage (CCUS) system	L	M	L	• Modularization strategy should be defined at the beginning of the pre-FEED. • Considering multiple technology and arrangement options that could fit the pre-FEED.
Management, Planning, and Oversight				
Unrealistic planning base may result in delays of project implementation	L	M	M	• Planned timeline created in collaboration with designers and engineers. • Scenario-based planning, using conservative assumptions and adequate contingency time for activities on the critical path. • Bottom-up planning.
Deficient project management may result in delays and inefficiencies	L	M	M	• Integrated, holistic project management set up. • Qualified project management personnel. • Detailed milestone planning. • Structured meeting, monitoring, and reporting. • Decision-making structures and processes.
EH&S and Permitting				
Proposed plant retrofits may impact waste and emissions.	L	M	L	• Previous prefeasibility study estimates reduction of emissions (SO_x, NO_x) from natural gas co-firing, as well as reduction of coal ash quantities and wastewater.
Distributed Control System (DCS) modifications for NG co-firing may trigger a required NFPA 85 compliance review of Burner Management System (BMS)	M	L	L	• Project team plans to conduct a preliminary code compliance screen during pre-FEED. • Wood Group who is the OEM for the Foster Wheeler boiler, is a part of the project team and they are well-versed in the safety logic updates that are required for dual-fuel or co-firing conversions.
External Factor				
Negative Stakeholder response	L	M	L	• State-owned power generation company supports the project and has invested in preliminary studies before this proposal. • Project outcome is expected to provide benefits to the community and improve the performance and reliability of the coal power plant.

Acknowledgement

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THANK YOU