



CHUGACH ELECTRIC ASSOCIATION, INC.  
ANCHORAGE, ALASKA

OPERATIONS COMMITTEE MEETING

AGENDA

Mark Wiggin, Chair  
Jim Nordlund, Vice Chair

Sisi Cooper, Director  
Bettina Chastain, Director  
Sam Cason, Director

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**April 10, 2024**

**4:00 p.m.**

**Chugach Board Room**

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- I. CALL TO ORDER *(4:00 p.m.)*
  - A. *Roll Call*
- II. APPROVAL OF THE AGENDA\* *(4:05 p.m.)*
- III. APPROVAL OF THE MINUTES\* *(4:05 p.m.)*
  - A. *March 13, 2024 (Hamilton)*
- IV. PERSONS TO BE HEARD *(4:10 p.m.)*
  - A. *Member Comments*
- V. NEW BUSINESS\* *(scheduled) (4:20 p.m.)*
  - A. *Website Redesign Update (Hasquet) (4:20 p.m.)*
  - B. *Cooper Lake Unit 2 Runner Replacement\* (Ori) (4:40 p.m.)*
  - C. *Integrated Resource Plan (Rudeck) (4:50 p.m.)*
  - D. *Decarbonization Program Projects Report (D. Highers) (5:15 p.m.)*
  - E. *NREL Study Results (D. Highers) (5:30 p.m.)*
- VI. EXECUTIVE SESSION\* *(scheduled) (6:00 p.m.)*
  - Break (20 minutes)
  - A. *Eklutna Project (Laughlin/Hasquet) (6:20 p.m.)*
  - B. *Personnel Matters (Orendorff/Wilson/Millen) (7:00 p.m.)*
  - C. *Gas Supply Update (Rudeck) (7:20 p.m.)*
- VII. NEW BUSINESS *(none)*
- VIII. DIRECTOR COMMENTS *(7:35 p.m.)*
- IX. ADJOURNMENT\* *(7:50 p.m.)*

\* *Denotes Action Items*

\*\* *Denotes Possible Action Items*

4/10/2024 3:47:04 PM

**CHUGACH ELECTRIC ASSOCIATION, INC.**  
**Anchorage, Alaska**

**March 13, 2024**  
**Wednesday**  
**4:00 p.m.**

**OPERATIONS COMMITTEE MEETING**

Recording Secretary: Ky'yanna Hamilton

**I. CALL TO ORDER**

Chair Wiggin called the Operations Committee meeting to order at 4:18 p.m. in the boardroom of Chugach Electric Association, Inc., 5601 Electron Drive, Anchorage, Alaska.

*A. Roll Call*

*Committee Members Present:*

Mark Wiggin, Chair  
Jim Nordlund, Vice Chair  
Bettina Chastain, Director  
Sam Cason, Director

*Board Members Present:*

Susanne Fleek-Green, Director  
Rachel Morse, Director

*Guests and Staff Attendance*

*Present:*

Arthur Miller	Dan Herman	Hans Thompson
Andrew Laughlin	Eugene Ori	Julie Hasquet
Matthew Clarkson	Jean Kornmuller	Bart Armfield, Consultant
Sherri Highers	Randal Chicola	Kate Ayers
Allan Rudeck	Steve Gerlek, Consultant	David Caye
Tiffany Wilson	Scarlett Masten	Dustin Highers
Dean Ratcliff	Bernie Smith, Member	Russ Thornton
Mike Brodie	Bill Herman	Emily Muller
Mark Henspeter	Trish Baker	Sean Skaling

*Via Teleconference:*

Sandra Cacy	Todd McCarty	Jason Motyka, Member
Heather Slocum	Sean Skaling	Julian Ramirez, Member
Todd Lindley, Member	Josh Travis	George Donart, Member
Dan Rogers, Member	Alex Petkanas, Member	Chennery Fife, Trout
Robert Power, Member	Josh Travis	Unlimited

## **II. APPROVAL OF THE AGENDA**

Director Cason moved, and Director Nordlund seconded the motion to approve the agenda. The motion passed unanimously.

## **III. APPROVAL OF THE MINUTES**

Director Cason moved, and Director Nordlund seconded the motion to approve the February 07, 2024, Operations Committee Meeting minutes. The motion passed unanimously.

## **IV. PERSONS TO BE HEARD**

- A. *Member Comments were made at this time.*

## **V. NEW BUSINESS**

- A. *Legislative Update (Baker)*  
Trish Baker, Manager of Government and Business Affairs, presented a Legislative Update and responded to questions from the Committee.
- B. *Reliability Statistics (Thornton)*  
Russell Thornton, V.P. of System Control, presented on the Natural Gas Supply and responded to questions from the Committee.
- C. *Renewable Generation Project Updates*
  - 1. *Decarbonization Plan Overview (D. Highers)*  
Dustin Highers, V.P. Corporate Programs, presented the Decarbonization Plan Overview and responded to questions from the Committee.
  - 2. *Utility Scale Wind and Solar (Rudeck)*  
Allan Rudeck, Chief Strategic Officer, presented on the Utility Scale Wind and Solar project and responded to questions from the Committee.
  - 3. *Southcentral Power Project & Sullivan Solar (Ori)*  
Eugene Ori, V.P. Power Production, presented on the 3. Southcentral Power Project & Sullivan Solar Project and responded to questions from the Committee.
- D. *Eklutna Project Update (Laughlin/Hasquet)*  
Andrew Laughlin, Chief Operating Officer, and Julie Hasquet, Sr. Manager of Corporate Communications, presented an Eklutna Project Update and responded to questions from the Committee.
- E. *Natural Gas Supply (Rudeck)*  
Allan Rudeck, Chief Strategic Officer, presented on the Natural Gas Supply and responded to questions from the Committee.

## **VI. EXECUTIVE SESSION**

- A. *Eklutna Project Update (Laughlin/Hasquet/Owen/Glass)*
- B. *Natural Gas Supply (Gerlick/Armfield/Rudeck)*
- C. *Utility Scale Wind and Solar (Rudeck/D. Highers)*

At 6:27 p.m., Director Nordlund moved and Director Cason Move that pursuant to Alaska Statute 10.25.175(c)(1) and (3), the Board of Directors go into executive session to: 1) discuss and receive reports regarding matters the immediate knowledge of which would clearly have an adverse effect on the finances of the cooperative; and 2) discuss with its attorneys matters the immediate knowledge of which could have an adverse effect on the legal position of the cooperative. The motion passed unanimously.

*The meeting reconvened in open session at 9:05 p.m.*

**VII. NEW BUSINESS** (*None*)

**VIII. DIRECTOR COMMENTS**

Comments were made at this time.

**IX. ADJOURNMENT**

At 9:13 p.m., Director Cason moved, and Director Nordlund seconded the motion to adjourn. The motion passed unanimously.



# Cooper Lake Power Plant Unit 2 Major Overhaul

Chugach Electric Association, Inc.

Operations Committee Meeting

April 10, 2024



FERC Project No. 2170

# Cooper Lake Unit 2 Major Overhaul

## Introduction:

- Motion for Project Authorization for major overhaul of the Cooper Lake Power Plant (CLPP), Unit 2:
  - Major Overhaul on CLPP, Unit 2
  - Purchase and replacement of Runner with an Original Equipment Manufacturer (OEM) Runner
  - Additional turbine parts supplementing the Runner
  - New Runner will support peaking operations for renewables integration and islanding

## Background:

- The Cooper Lake hydro facility has two 10 MW Francis style Leffel hydro-turbines:
  - 14 years since the last major overhaul Unit 2 in 2010
  - Damage was found on the blades of the runner and wicket gate during a 2023 inspection



# CLPP Unit 2 Runner Upgrade - Justification

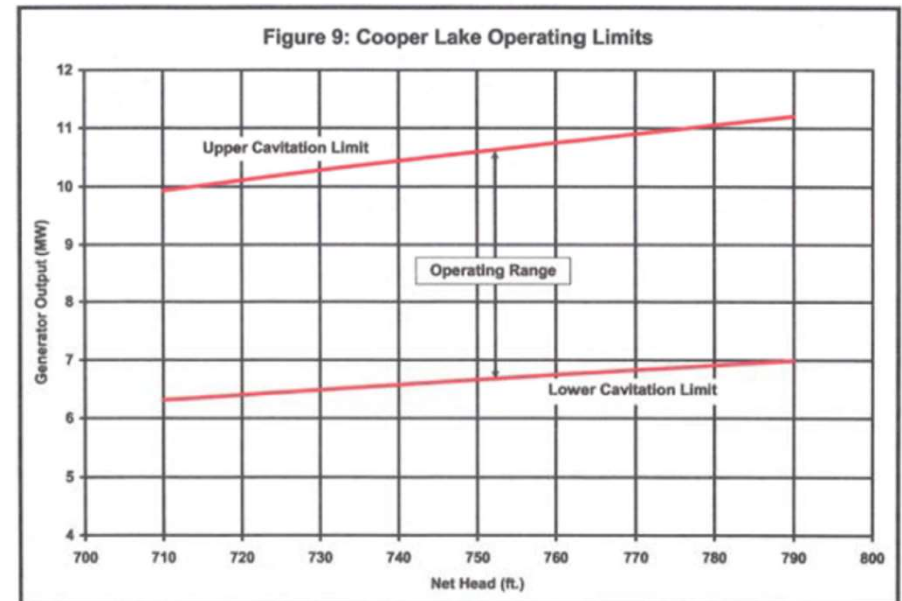
## Issues:

- The Cooper Lake hydro facility upgraded runners in 2000 for a higher output system
- Low plant output causes severe cavitation and damage
- CLPP unable to island due to cavitation within the operating range

## Solution:

- Revert to the original specifications to make CLPP Unit 2 be more responsive across its operating range for:
  - Islanding
  - It will allow the use of the unit for regulation

## Existing Operating Limits



American Hydro Corporation  
February 18, 2009

**CHUGACH ELECTRIC ASSOCIATION, INC.**  
**Anchorage, Alaska**

**OPERATIONS BOARD OF DIRECTORS' MEETING**  
**AGENDA ITEM SUMMARY**

**April 10, 2024**

**ACTION REQUIRED**

**AGENDA ITEM NO. V.B.**

**Information Only**  
 **Motion**  
 **Resolution**  
 **Executive Session**  
 **Other**

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**TOPIC**

Project Authorization – Cooper Lake Power Plant Unit 2 Major Overhaul

**DISCUSSION**

Built in the 1960s, Chugach Electric Association, Inc.'s (Chugach) Cooper Lake Power Plant (CLPP) was originally installed as a 16.6 MW Hydroelectric Power Plant. The plant is owned and operated by Chugach. It currently provides base load hydroelectric power for the Chugach system. The plant consists of the Cooper Lake reservoir, tunnel, penstock, power plant with two Francis style hydroelectric turbines and tail race located on Kenai Lake.

In 2000, the Runners of the two turbines were replaced with higher output runners. The plant was able to produce an additional 1.5 MW per turbine increasing the total output of the plant to 19.6 MW; however, this caused cavitation within specific areas of the turbines' operating range. Over time the cavitation has caused damage to the Runners.

In this major overhaul of Unit 2, its Runner will be replaced. The new Runner will be manufactured by the Original Equipment Manufacturer (OEM) to its original specifications. These specifications will reduce the power output of the unit by 1.5 MW, but it will be operable over its full range without cavitation.

This overhaul and Runner replacement will increase the operating range of the unit through a larger set of conditions without damage caused by cavitation, which allows Chugach to island its load on the Kenai Peninsula. The project will also enhance Chugach's ability to regulate variable energy resources. The total installed cost of the project is estimated to be \$3,200,000.

**MOTION**

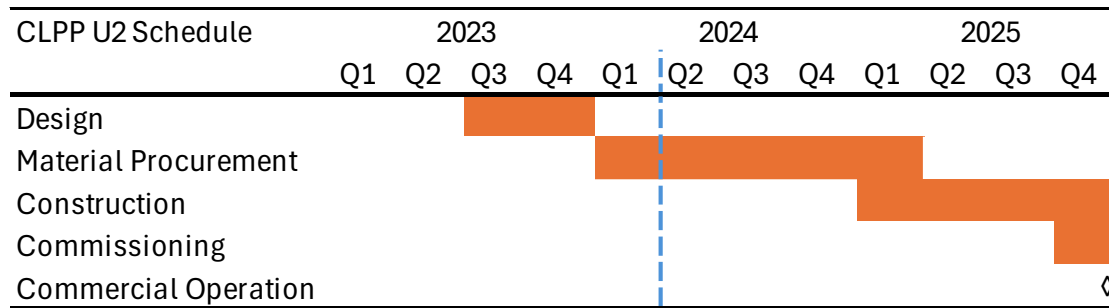
Move that the Operations Committee recommend the Board of Directors authorize the Chief Executive Officer to acquire, construct and install the Cooper Lake Power Plant, Unit 2, Major Overhaul for an estimated total installed cost of \$3.2 million.

# CLPP Unit 2 Runner Upgrade - Overall Summary

## Estimated Total Installed Cost:

- \$3,200,000

## Schedule:



*Powering Alaska's Future:*  
**INTEGRATED  
RESOURCE  
PLAN**

Operations Committee  
April 10, 2024



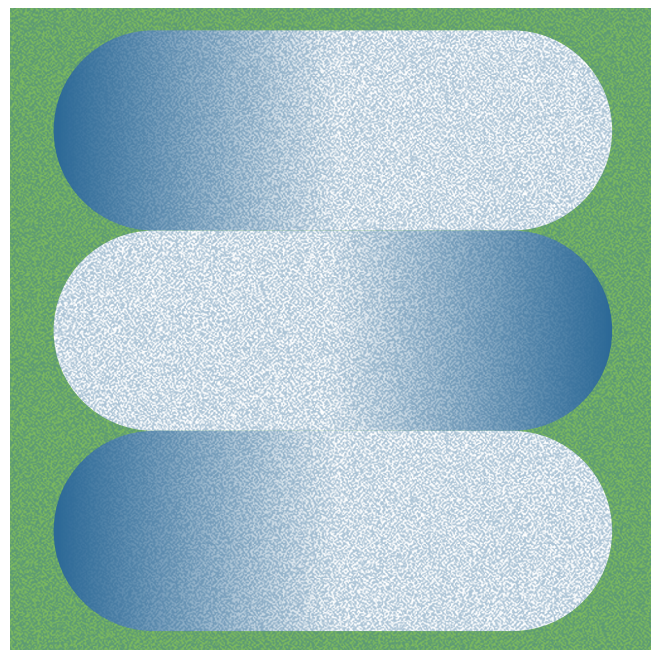
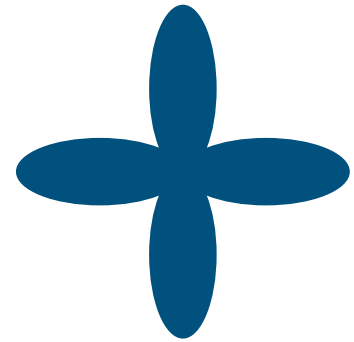




# *What is an* Integrated Resource Plan (IRP)?

- Long term resource strategy
- Size, type and timing
- Emerging technology
- Emission profiles
- Regularly updated and ongoing process
  
- It does not evaluate:
  - Real-time operations and regulation
  - Detailed project design/siting plans
  - A specific project(s)

# Studies in Context



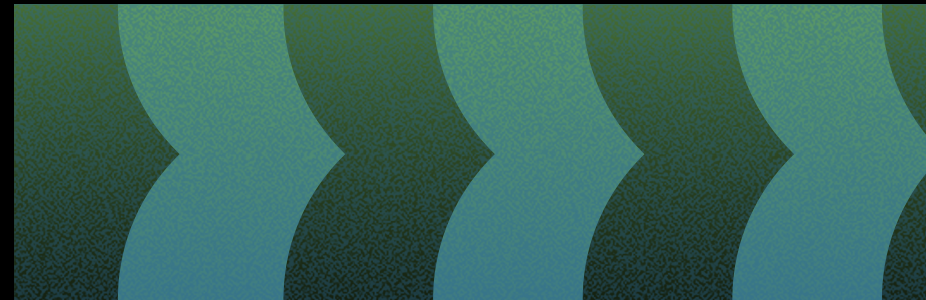
	Report Title	Scope	Objective
<b>Chugach</b>	Chugach's Integrated Resource Plan	Chugach	Provide long-term plan that meets Chugach's carbon reduction, reliability, and cost goals
<b>NREL</b>	Alaska 80% RPS Study	Railbelt	Identify costs and viability of renewable energy portfolio
<b>ACEP</b>	Railbelt Decarbonization Study	Railbelt	Identify pathways for zero net carbon emissions by 2050

Resource planning provides a roadmap for utilities to achieve identified goals.

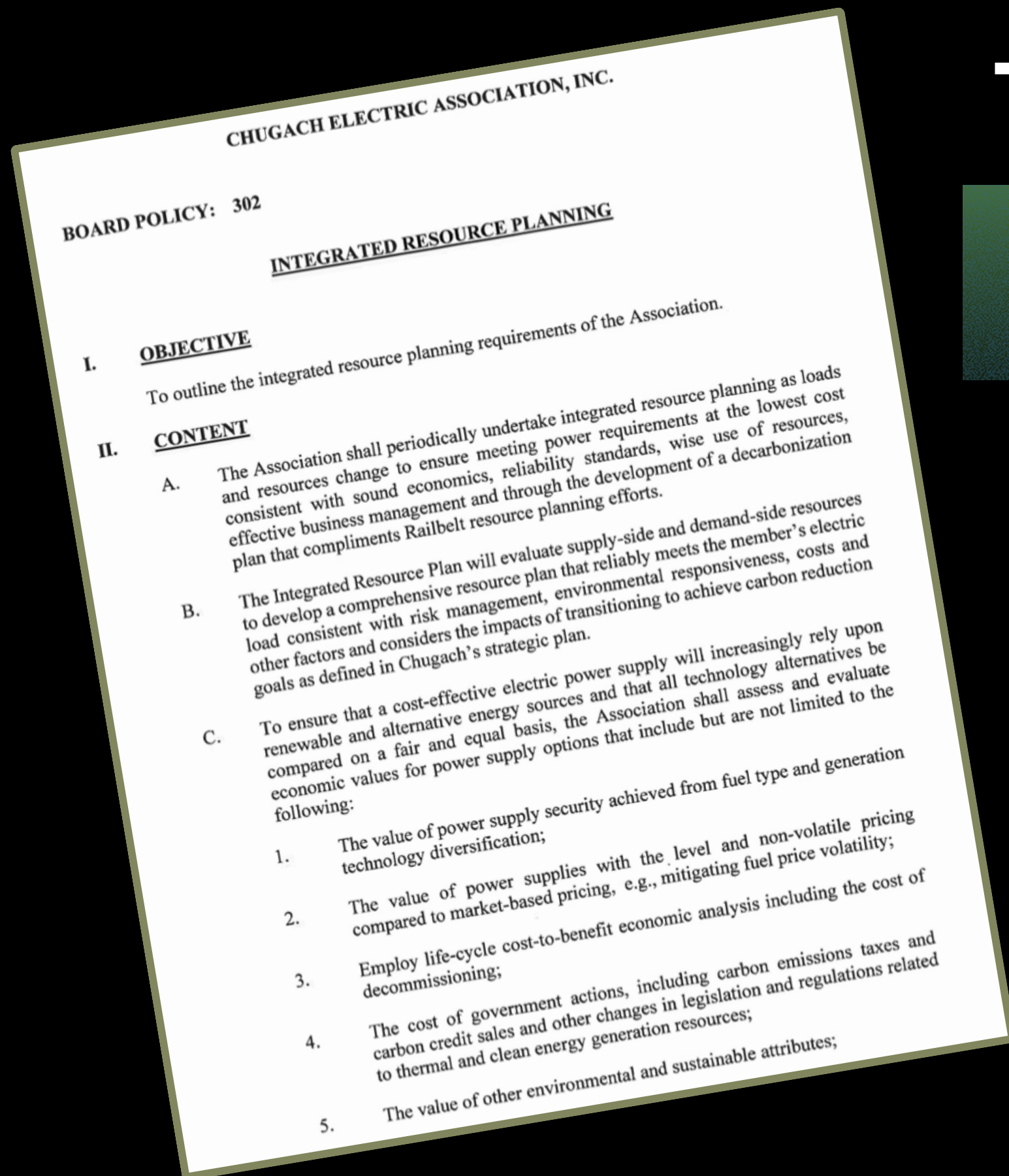


# IRPs at

# Chugach



- IRP Board Policy 302
- Last Chugach IRP was completed in 2010
- Changes since last report
  - Fire Island Wind
  - Southcentral Power Project
  - ML&P asset acquisition
  - Carbon reduction goals set
- IRP Process
  - Procurement
  - Awarded bidder
  - Completed IRP
  - Future modeling





# Chugach IRP Goals

1

Achieve Chugach carbon reduction goals as identified in the Strategic Plan

2

Identify cost impacts of future power supply alternatives

3

Identify financial requirements and timing

4

Prioritize carbon reduction technologies

5

Identify potential generation asset utilization



# Input

# *Assumptions*

Decarbonization Plan

Existing Resources

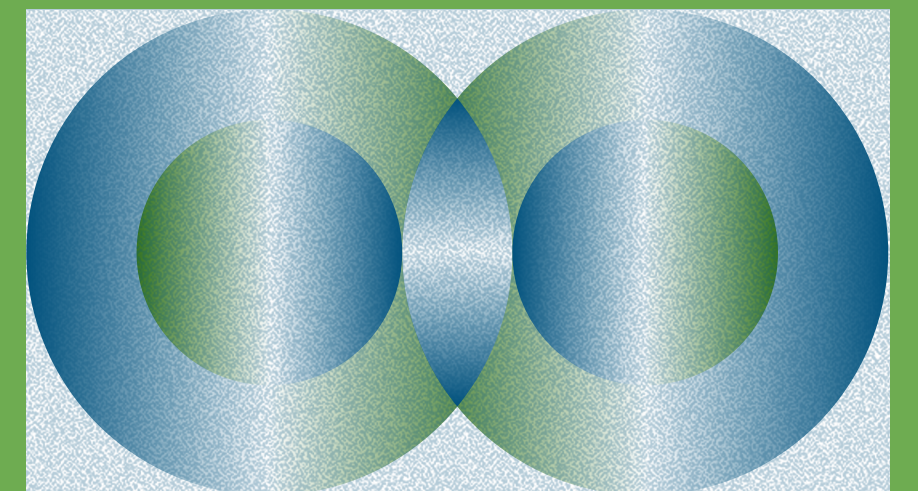
Demand Forecast

Natural Gas

Costs and volumes for Beluga River Unit, Hilcorp contract and future imported LNG

New Resources Considered

- Wind
- Solar
- Hydro
- Small modular nuclear reactor (SMR)
- Battery energy storage system (BESS)



# Expansion *Planning* with sensitivities



## Hydro “Swimlanes”

1. Existing Resources
  2. Existing Resources with Dixon Diversion
- 

## Load Forecast

1. Status Quo Load, 0.5% decline annually
  2. Low Load, 0.0% growth annually
  3. Base (Mid) Load, 0.2% growth annually
  4. High Load, 0.6% growth annually
- 

## Resource Scenarios

1. Unconstrained
  2. Large Solar & Large Wind required
  3. SMR required
  4. Large Hydro required
- 

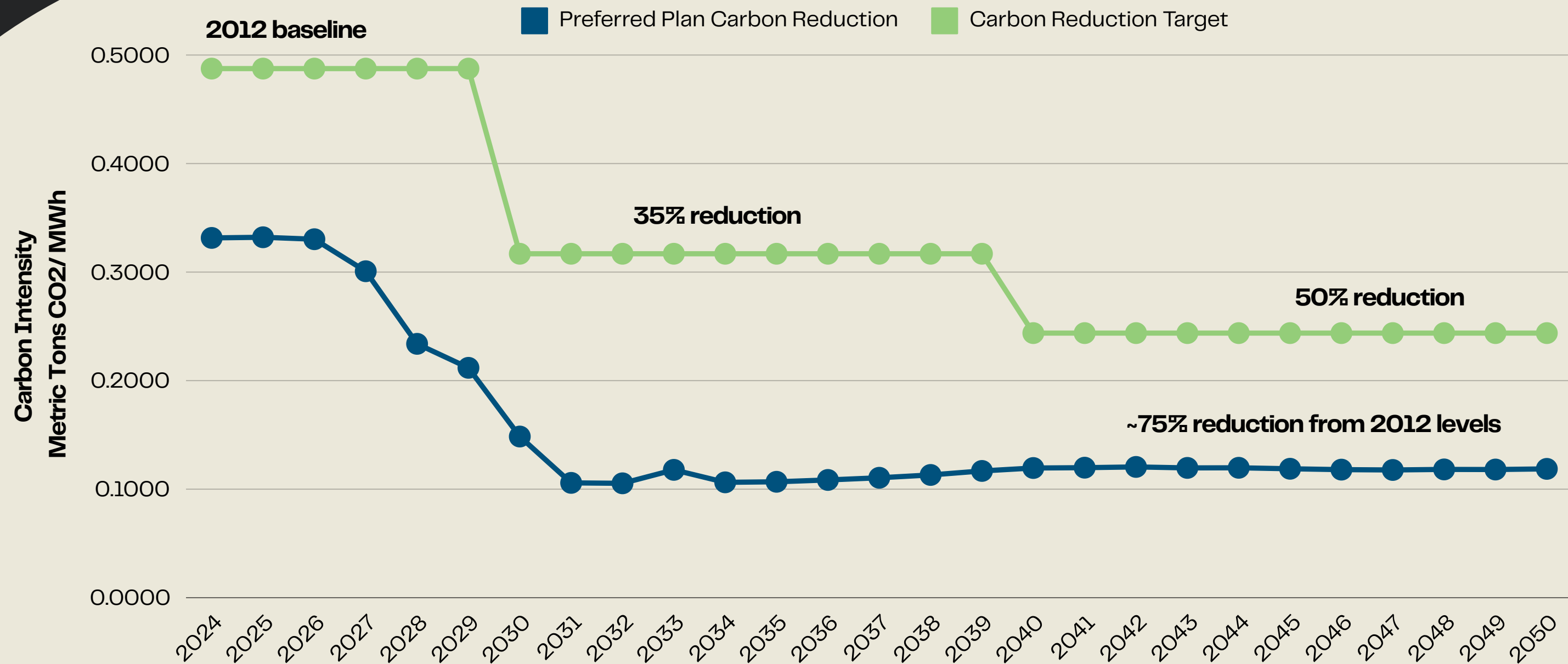
## Carbon Reduction

1. Unconstrained
2. Chugach’s carbon reduction goals

# Preferred Plan

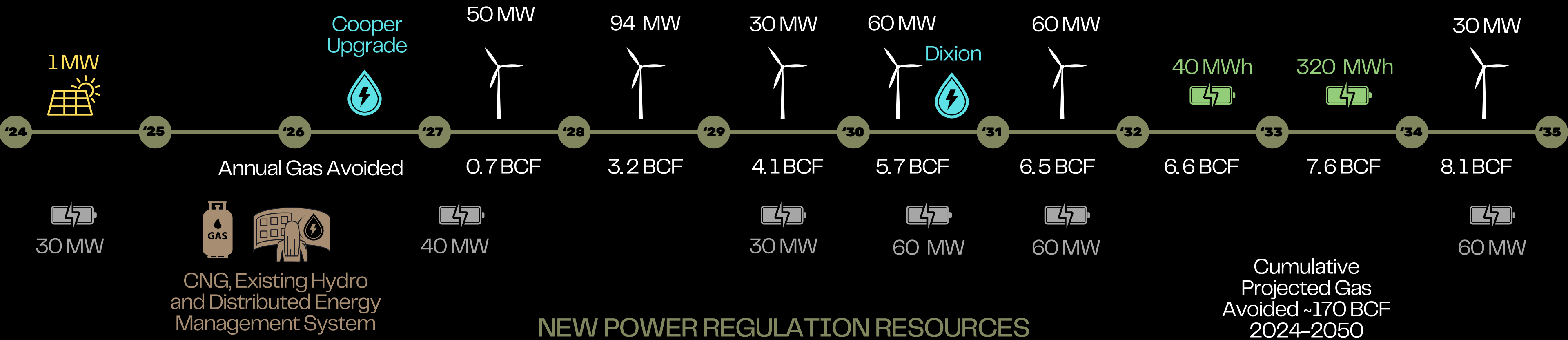
## *Carbon goals met*

without material negative impacts to rates or reliability

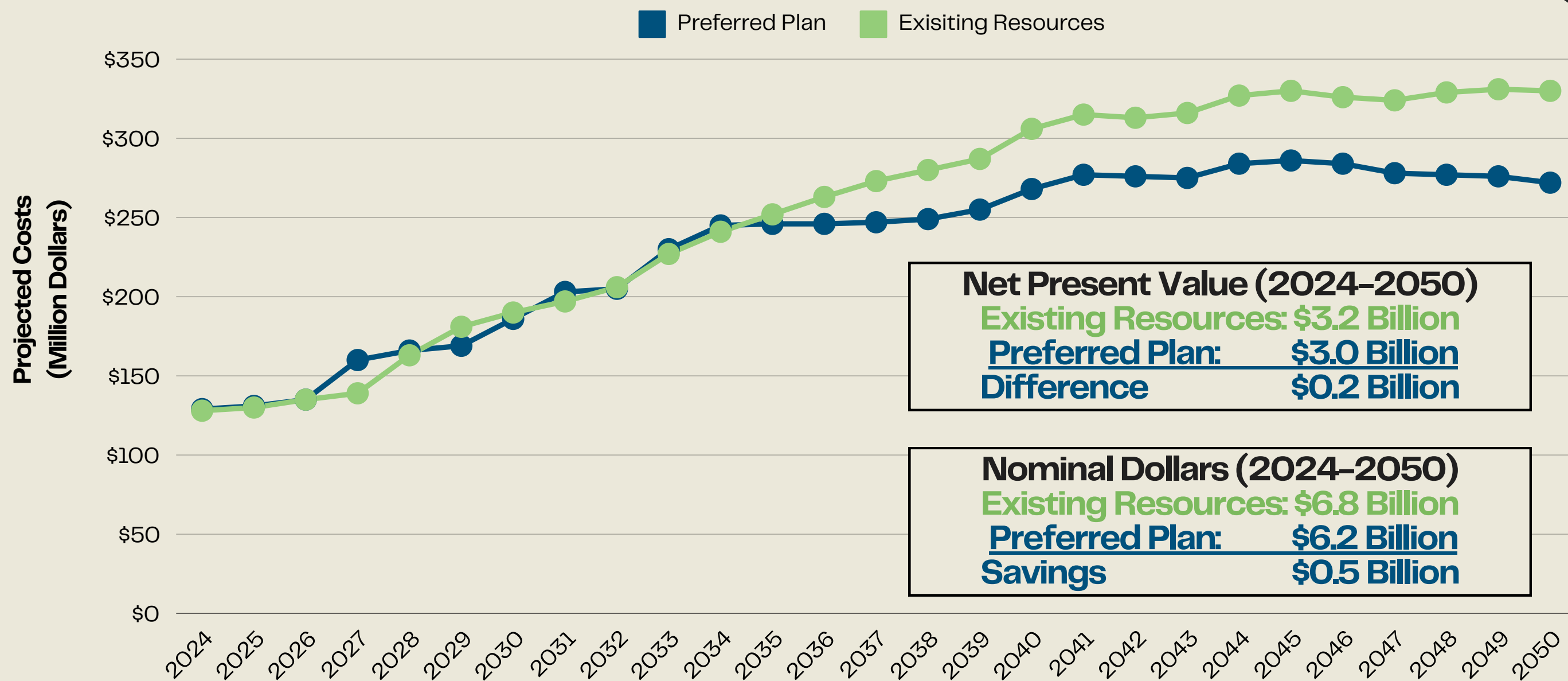


# Preferred *Portfolio*

## NEW ENERGY, ENERGY STORAGE & CAPACITY RESOURCES



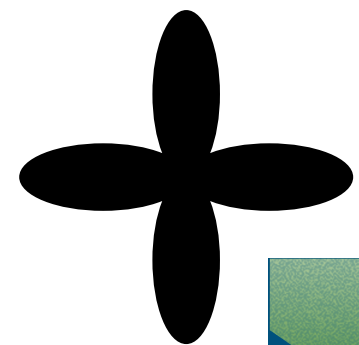
# Economic Goals met



Preferred plan has a 6% savings compared to existing resource portfolio



# Key *Insights*



Preferred plan provides least cost power supply and aligns with carbon reduction goals

01

## Carbon Reduction

Chugach carbon reduction goals are met economically

- No new thermal generation
- Adds renewable energy generation

02

## Resources Themes

- Dixon Diversion
- Utility Scale Wind
- Battery Energy Storage Systems

03

## Load

Forecasted load from low to high does not have a significant impact on selected generation

04

## Regulation Resources

Further design and engineering for regulation required

05

## Economics

Preferred plan is sensitive to cost changes of gas, new resources, and regulation



# Next Steps

1

Insource  
IRP model

2

Railbelt  
Reliability  
Council IRP  
participation

3

Financial  
planning

4

Power  
regulation  
analysis

5

Implement  
projects

6

Continuous  
improvement

Chugach will continuously develop long range plans in order to be nimble as technology changes and member preferences evolve.

# *Appendix*

- Initial Modeling
- Requirements
  - Identify Model Options

**Define IRP Goals**

**Develop assumptions and key inputs**

**Expansion planning analysis**

**Resource adequacy**

**Portfolio design**

**Portfolio comparison**

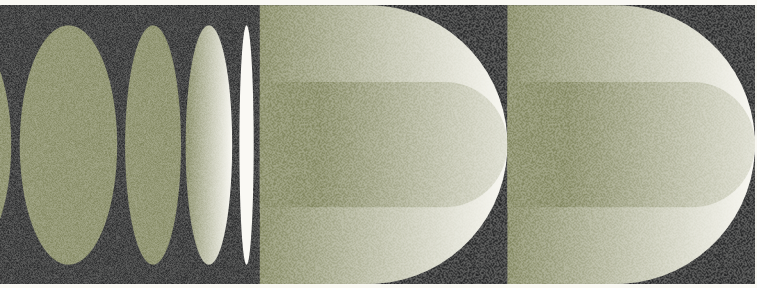
**Reliability**

**Preferred Plan**

- Base Case Development
- Develop model sensitivities
  - Select Resources

- Sensitivity Analysis
- Identify Model Compare Base to Alternate Portfolios
  - Identify least cost option

# *IRP* Analysis



# Portfolio *Stress Testing*

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01 Low Load

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02 High Load

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03 Low LNG Forecast

---

04 High LNG Forecast

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05 Low Hydro Output on all units  
(-20% every year)

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06 High Hydro Output on all units  
(+20% every year)

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07 Low Wind Output on all new  
units (-5% capacity factor)

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08 Full New ERA Program Funding

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09 High Capital Cost (+30%)

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# Decarbonization Program Projects Report

*Operations Committee Report  
April 10, 2024*

# Project Charters

## Project Charter

- *Project Description & Type*
- *Scope*
- *Schedule*
- *Cost*
- *Major Risks*
- *Assumptions*
- *Constraints*
- *Exclusions*

*Chief Executive Officer*

## What is a Charter?

A document that  
“...formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities...”

from  
A Guide to the Project Management Body of Knowledge  
(PMBOK Guide) - Fifth Edition

# Moving to Planning Phase

*All Projects Subject to Final Technical and Economic Analyses*

## Base Case Projects

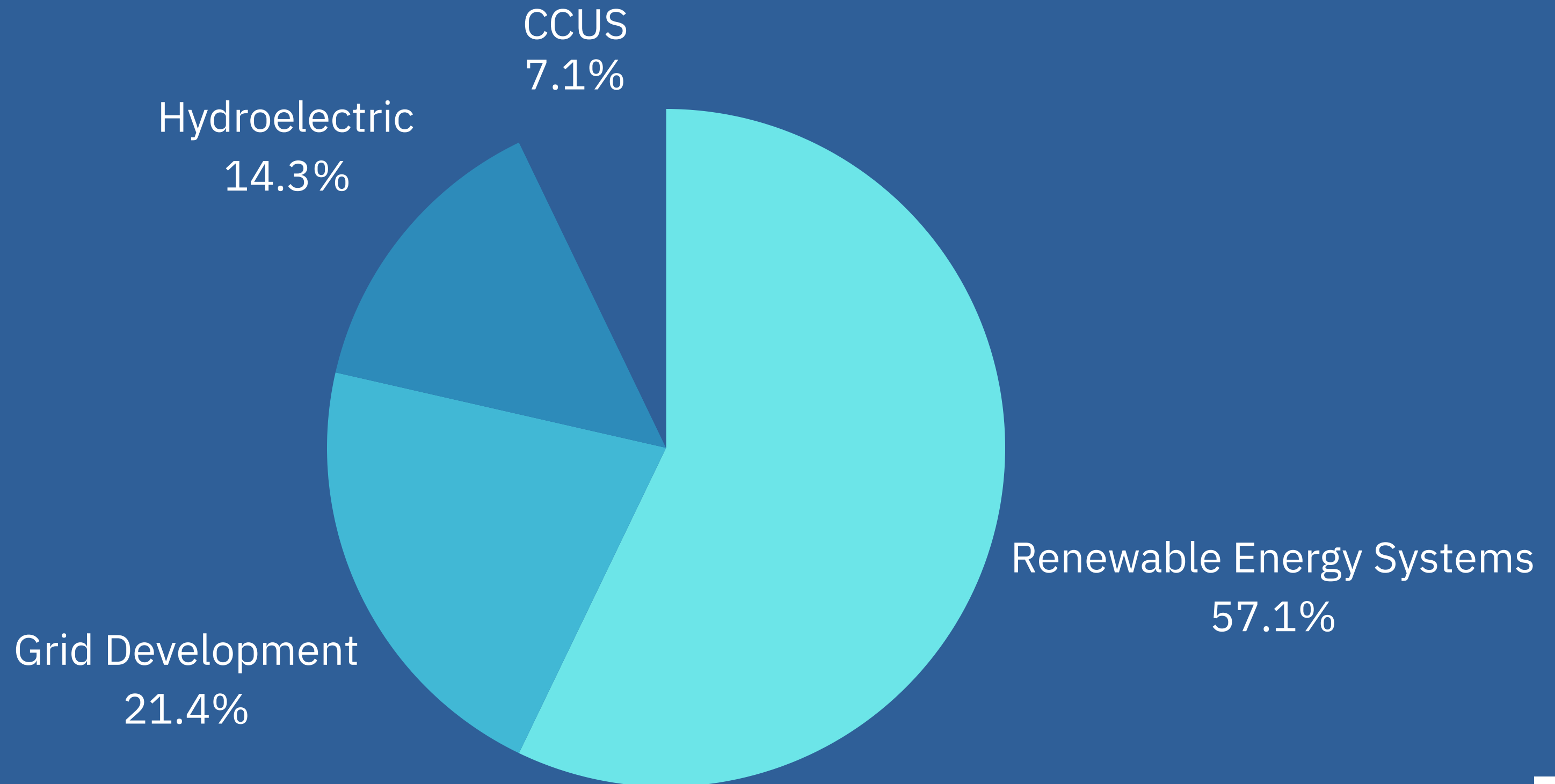
- Little Mount Susitna Wind
- Renewables Grid Integration
- Government Hill BESS
- Sullivan Gas Storage
- Cooper Lake Runner Replacement
- Sullivan / SPP / Retherford Solar\*

## Augmentation Projects

- Midnight Solar
- Port Microgrid
- Godwin Creek Hydroelectric
- Dixon Diversion
- Long-Duration Energy Storage Demo
- SPP-AirGas CO2 Utilization

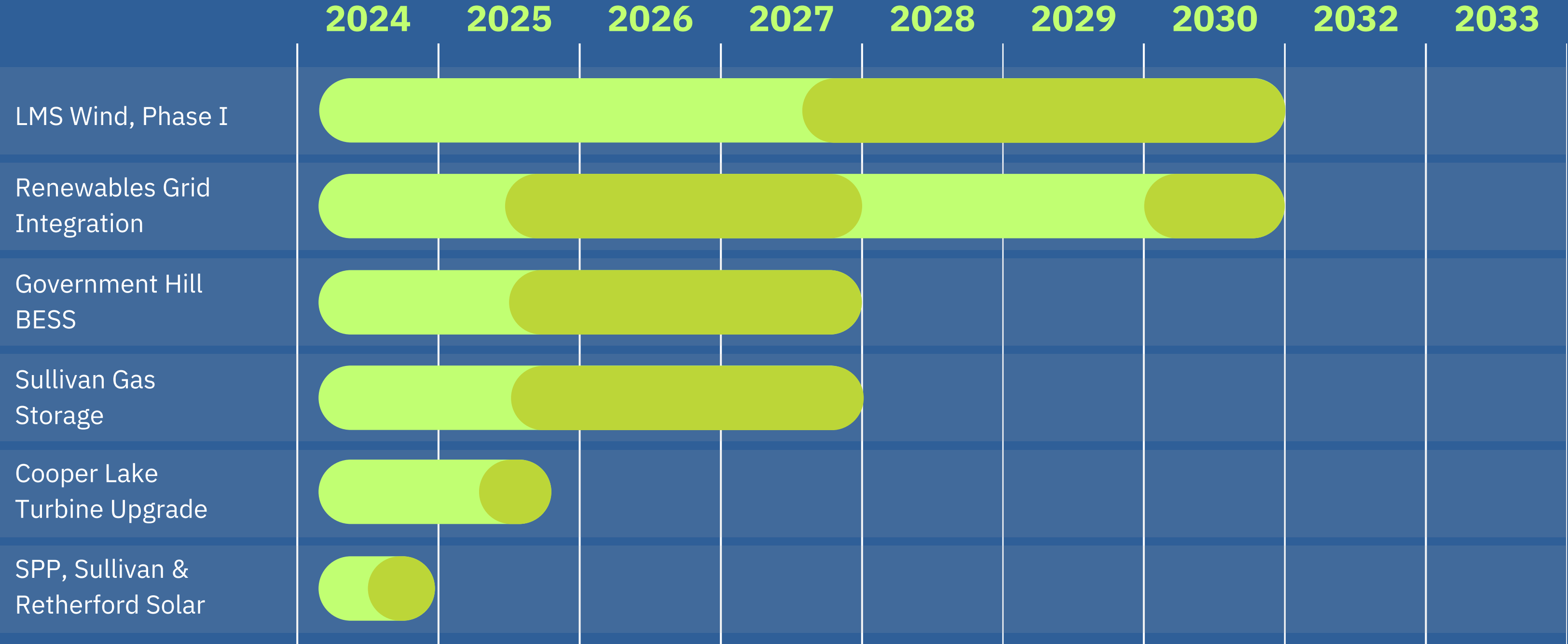
*\*Approved and Underway*

# Projects by Program





# Base Projects Timeline



# Preparation for Board Approval

- Project Scope Statement (Scope Baseline)
- Cost & Schedule Baseline
- Integrate Into CIP & Financial Forecast

# Questions?



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# Project Charters

Board Packet Materials

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# Little Mount Susitna Wind Project

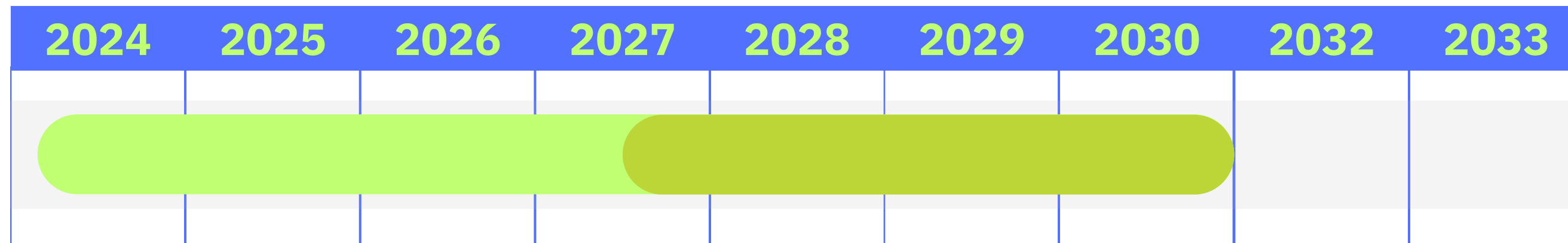
**COD**  
**2030**

## Project Description

*Power Purchase Agreement*

Wind energy project located on Little Mount Susitna in the West Cook Inlet area with power levels up to 154 MW and a capacity factor of about 40%

**COST**  
**TBD**



## Major Risks

Difficult Negotiations  
Supply Chain for Electrical Equipment  
Permitting Delays or Disapprovals  
Rough Terrain, Construction Delays

## Considerations

Up to Three Phases of Execution  
PPA Partnering Being Considered  
Dependent on Electrical Interconnection

# LMS Wind Interconnection Project

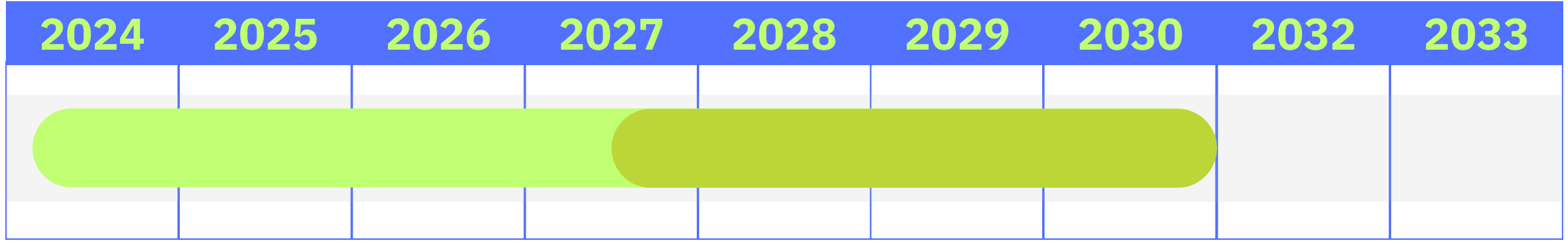
**COD**  
**2030**

## Project Description

*Deferred / Reimbursable*

Transmission connection between the LMS Wind Project and existing Chugach transmission line between Beluga and Pt. MacKenzie

**COST**  
**\$90M**



## Major Risks

- Permitting in State Game Refuge
- Rough Terrain, Construction Delays
- Aging Beluga-Pt MacKenzie Transmission

## Considerations

Three Year Permitting Window

# Renewables Grid Integration Project

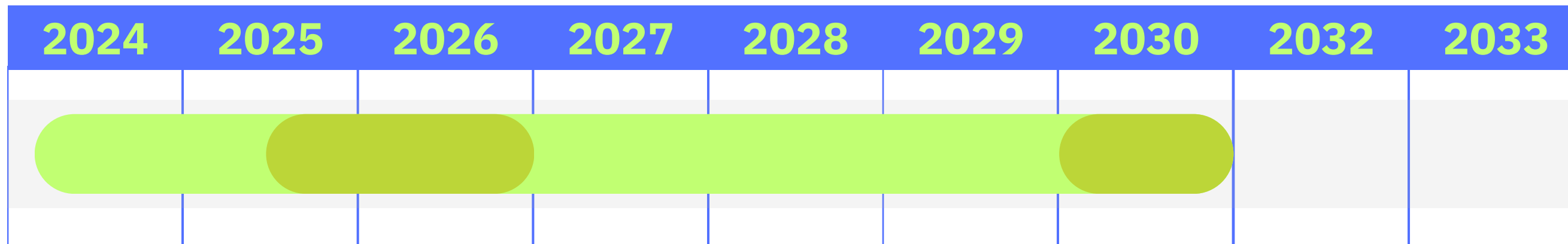
**COD**  
**2030**

## Project Description

*Capital*

Controls and communication to automatically manage the power output of renewable energy and power regulation resources

**COST**  
**\$6M**



## Major Risks

Equipment Selection May Impact Costs  
Innovative Application of DERMS Technology  
Management of Variable Power on Closed Grid is New

## Considerations

Excludes Comm Link to LMS Wind Project  
Significant Change to Dispatch / Operations

# Government Hill BESS Project

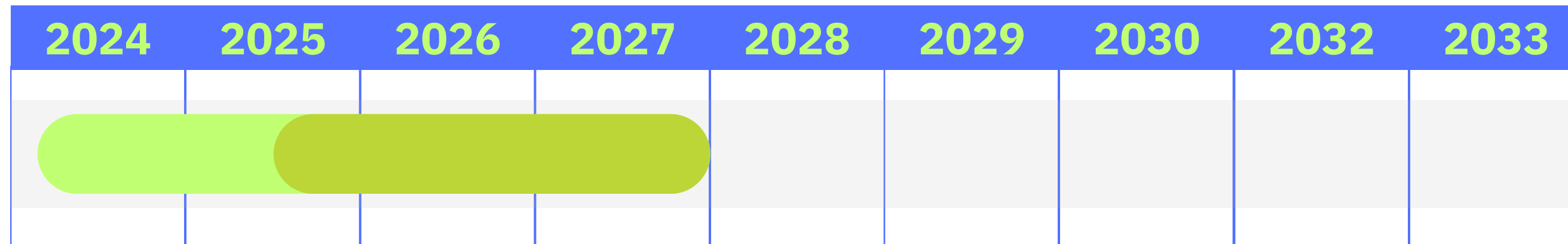
**COD**  
**2027**

## Project Description

*Capital*

Battery Energy Storage System (BESS) designed to respond to variable power from renewable energy resources on the Chugach system

**COST**  
**\$70M**



## Major Risks

Size May Need to Evolve to Meet Demand  
Electrical Equipment Procurement Delays  
Land Use Subject to Municipal Approval

## Considerations

Municipality & DOD May Contribute to Costs  
New Microgrids May Reduce Project Size  
Ancillary Services Contract Alternative



# Sullivan Gas Storage Project

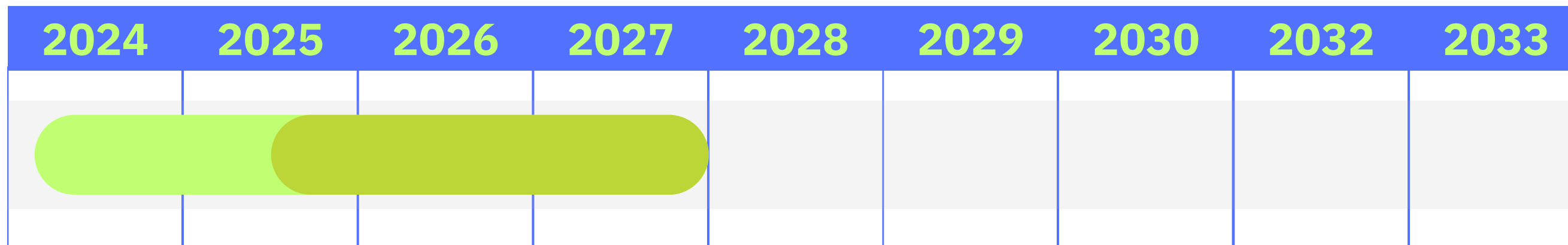
**COD**  
**2027**

## Project Description

*Capital*

Gas storage at the George M. Sullivan Plant to support continuous compliance with day-ahead gas scheduling requirements allowing thermal plant response to variable power from renewable energy sources

**COST**  
**\$25M**



## Major Risks

Size May Need to Evolve to Meet Demand  
Electrical Equipment Procurement Delays  
Few Suppliers of Storage Vessels

## Considerations

Not Eligible for ITC  
Site Selection for Chugach-Only Application  
ENSTAR Contract Alternative

# Cooper Lake Runner Replacement

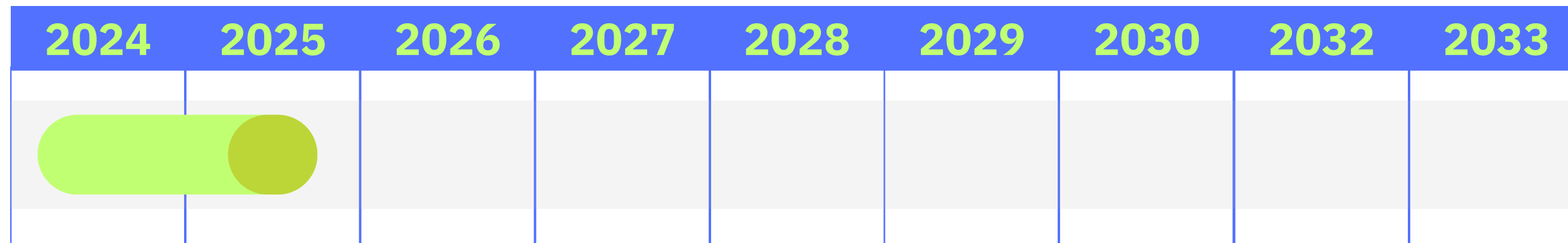
**COD**  
**2025**

## Project Description

*Capital*

Hydro turbine upgrade allowing wider range of power output for support of renewable power integration

**COST**  
**\$3.2M**



## Major Risks

Procurement Delays on New Turbine Runner  
Shipping of Critical Parts to/from OEM  
Unexpected Damage Found Upon Inspection

## Considerations

Grant Application for 30% In Progress  
Outage Timing Based on Normal Turbine Conditions



# Comments on NREL's Report “Achieving an 80% Renewable Portfolio in Alaska's Railbelt: Cost Analysis”

*Operations Committee Report  
April 2024*

# Nature of the Report

**The Report is Not  
Intended as a  
Definitive Work**

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**Significant  
Assumptions on  
Renewables  
Deployment**

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Regardless of recognized “significant uncertainties” around the scenarios, the basic concept is not challenged that fuel savings can be achieved through the introduction of renewables

# Assumed Limited Constraints

**\$2.9B Renewable &  
Other Purchases  
Required by 2040**

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**Cost of Renewables  
May Be  
Underestimated**

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Limits on the rate of capacity expansion and the associated cost may tend to impact the selected portfolio and timing of projects in an IRP. NREL's report provides a goal that motivates the utilities to diligently work toward significant savings, but it may not account for the heavy lift associated with such an extensive and expensive build-out of projects by 2040.

# Add, Don't Subtract

**Fossil Fuel Plants  
Still Needed in the  
Future**

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**Avoid Taking Units  
Out of Service**

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The report highlights that existing high efficiency thermal and hydroelectric plants should not be taken out of service, both of which support regional resiliency. The report justifies maintaining these plants in good working order into the future.

# Regional vs Railbelt Stability

**Regional Expansion  
First is OK**

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**Power Variability  
Issues Recognized**

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It was repeated in the report that each region should remain capable of operating independently to ensure grid stability and resiliency. This supports utility decisions to perform regional clean energy and power regulation projects first, but proactively seek opportunities to coordinate power exchange between the regions as transmission capacities are increased.



# Final Comments

## The Model is Imperfect, but the Direction is Good

- Report is consistent with Chugach's direction. Modeling is inherently difficult, especially when assumptions may be challenged. The essence of the report demonstrates where cost savings may be found, but NREL recognizes future technical and financial studies must also support it.

## No Major Changes to Existing Thermal & Hydro

- Confirmed that new renewable and power regulation projects must be supported by our existing fossil fuel and hydroelectric plants.

## Improve Regionally, Create Railbelt Opportunities

- System stability was recognized as a critical element. While regional independence is necessary and prudent, interregional collaboration will come with improved transmission capabilities.

# Questions?

