

**CHUGACH ELECTRIC ASSOCIATION, INC.
ANCHORAGE, ALASKA**

OPERATIONS COMMITTEE MEETING

AGENDA

Jim Nordlund, Chair
Dan Rogers, Vice Chair
Sisi Cooper, Director

Susanne Fleek-Green, Director
Mark Wiggan, Director

October 15, 2025

4:00 P.M.

Chugach Board Room

- 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* (4:10 p.m.)
 - A. August 13, 2025 (Mankel)
- IV. PERSONS TO BE HEARD (4:10 p.m.)
 - A. Member Comments
- V. NEW BUSINESS (4:25 p.m.)
 - A. Economic Dispatch (Rogers/Laughlin/M. Miller) (4:25 p.m.)
 - B. Girdwood to Indian Transmission Line Rebuild (Laughlin) (5:25 p.m.)
 - C. Rate Case Update (Clarkson) (5:35 p.m.)
 - D. Beluga Solar Project Approval** (D. Highers) (5:50 p.m.)
 - E. Gas Supply Update (Rudeck/Herrmann) (6:15 p.m.)
- VI. DIRECTOR COMMENTS (6:30 p.m.)
- VII. EXECUTIVE SESSION* (scheduled) (6:45 p.m.)
 - (Recess 15-minutes)
 - A. Gas Supply Update (Rudeck/Herrmann) (7:00 p.m.)
 - B. Cents of Community Update (Clarkson) (7:25 p.m.)
- VIII. NEW BUSINESS (none)
- IX. ADJOURNMENT* (7:45 p.m.)

* Denotes Action Items

** Denotes Possible Action Items

CHUGACH ELECTRIC ASSOCIATION, INC.
Anchorage, Alaska

August 13, 2025
Wednesday
4:00 p.m.

OPERATIONS COMMITTEE MEETING

Recording Secretary: Amanda Mankel

I. CALL TO ORDER

Acting Chair Wiggin called the Operations Committee meeting to order at 3:59 p.m. in the boardroom of Chugach Electric Association, Inc., 5601 Electron Drive, Anchorage, Alaska.

A. Roll Call

Committee Members Present:

Mark Wiggin, Acting Chair, Director
Jim Nordlund, Chair, *via teleconference*
Dan Rogers, Vice Chair – *via teleconference*
Sisi Cooper, Director – *via teleconference*
Susanne Fleek-Green, Director– *via teleconference and in-person*

Board Members Present:

Rachel Morse, Director
Katherine Jernstrom, Director

Guests and Staff Attendance Present:

Arthur Miller	Dusty Menefee	Taylor Asher
Sherri Highers	Dustin Highers	Bernie Smith, Member
Matthew Clarkson	Trish Baker	Kevin Carroll, Public
Andrew Laughlin	Randall Chicola	Alex Petkanas, AK Center
Allan Rudeck	Julie Hasquet	Matt Perkins, AK Renewables
Katie Millen	Kate Ayers	Natalie Kiley-Bergen
Nick Szymoniak	Sean Skaling	

Via Teleconference:

Stephanie Huddell	Heather Slocum	Brian Kassof, Member
Sandra Cacy	Buddi Richey	David Caye

II. APPROVAL OF THE AGENDA

Director Rogers moved, and Director Cooper seconded the motion to approve the agenda. The motion passed unanimously.

III. APPROVAL OF THE MINUTES

Director Nordlund moved, and Director Rogers seconded the motion to approve July 9, 2025, Operations Committee Meeting minutes. The motion passed unanimously.

IV. PERSONS TO BE HEARD

1. Bernie Smith member, commented on the solar plant agenda item, his attendance on the RCA meeting, and requested an update on the import of natural gas.
2. Alex Petkanas, Alaska Center, looking forward to today's agenda, expressed concerns on avoided cost information.
3. Matt Perkins, Alaska Renewables, addressed comment made by Bernie Smith.

V. NEW BUSINESS**

- A. *Beluga Solar Update (D. Highers)*
Dustin Highers, Vice President, Corporate Programs, presented the Beluga Solar Update and answered questions from the Committee.
- B. *Avoided Cost Comparison: Thermal Generation (imported LNG) vs. Alternative Renewable Generation (Chicola/Clarkson))*
Matt Clarkson, Chief Legal Officer, presented Avoided Cost Comparison: Thermal Generation (imported LNG) vs. Alternative Renewable Generation and answered questions from the Committee.
- C. *RRC Update (Rudeck/Baker)*
Allan Rudeck, Chief Strategic Officer, and Trish Baker, Sr. Manager, Government & Business Affairs, presented the RRC Update and answered questions from the Committee.

VI. DIRECTOR COMMENTS

Director comments were made at this time.

VII. EXECUTIVE SESSION*

- A. *RRC Update (Rudeck/Baker)*
- B. *Power Purchase Agreement with Independent Power Producer, Subject to NDA (Rudeck/Clarkson/Chicola)*
- C. *HR Matters (Millen/Menefee)*

At 5:30 p.m., Director Cooper moved, and Director Rogers seconded that pursuant to Alaska Statute 10.25.175(c)(1), (3) and (4), 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; 2) discuss with its attorneys matters the immediate knowledge of which could have an adverse effect on the legal position of the cooperative; and 3) discuss personnel matters. The motion passed unanimously.

The meeting reconvened in open session at 7:33 p.m.

VIII. NEW BUSINESS (NONE)

IX. ADJOURNMENT

At 7:34 p.m., Director Fleek-Green moved, and Director Nordlund seconded the motion to adjourn. The motion passed unanimously.

Economic Dispatch

Chugach Electric Association, Inc.
Operations Committee Meeting
October 15, 2025



Agenda

- Dispatch Background
- Dispatch Functions
- Economic Dispatch Background
- Economic Dispatch Definitions
- Unit Commitments
- Economic Dispatch Constraints
- Economic Dispatch Benefits
- Chugach's Economic Dispatch Process
- Economic Dispatch Applications & Power Pool
- Economic Dispatch: Example

Background

- Early control centers emerged alongside the first U.S. electrical systems.
- Control Centers were initially located in power plants and substations with operators who manually controlled equipment to maintain system parameters.
- Remotely controlled systems and communications infrastructure advancements, led to centralized control centers, creating the modern “Dispatch” “System Control”.



Functions



Electronic Switching and Tagging



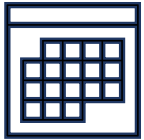
Fuel Scheduling



Coordination with outside entities



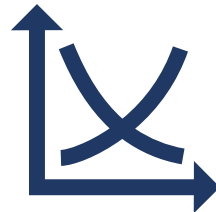
Trouble Calls



Maintenance Scheduling



Emergency Restoration

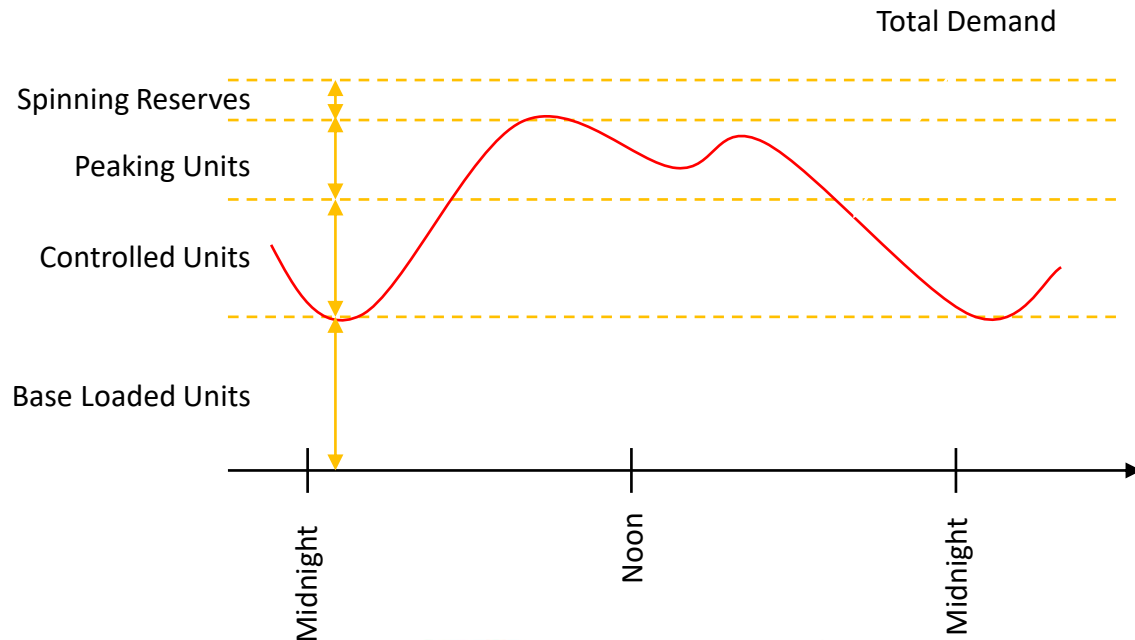


Economic Dispatch

Economic Dispatch

- Optimizes electricity generation to efficiently meet daily load cycle
- Aims to allocate power generation cost-effectively among various available units while maintaining grid reliability and adhering to operational constraints.

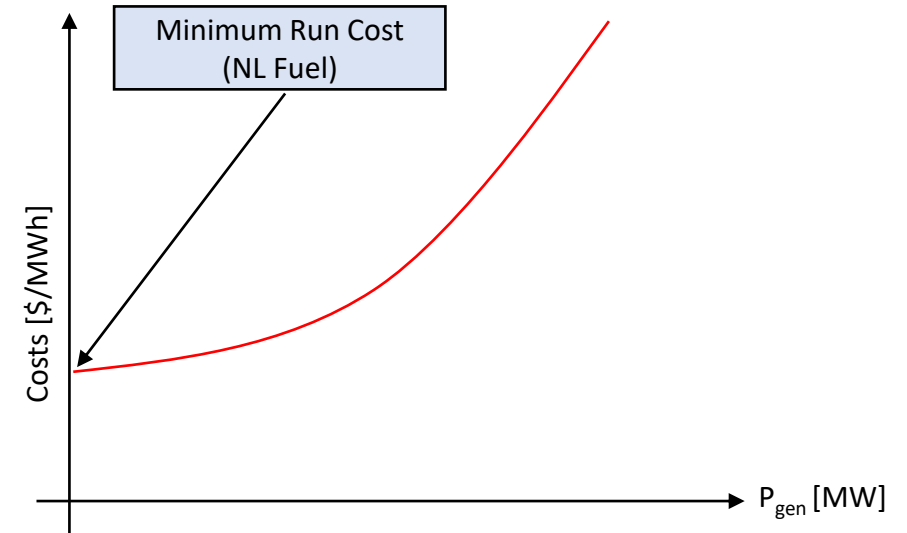
Daily Load Cycle Curve



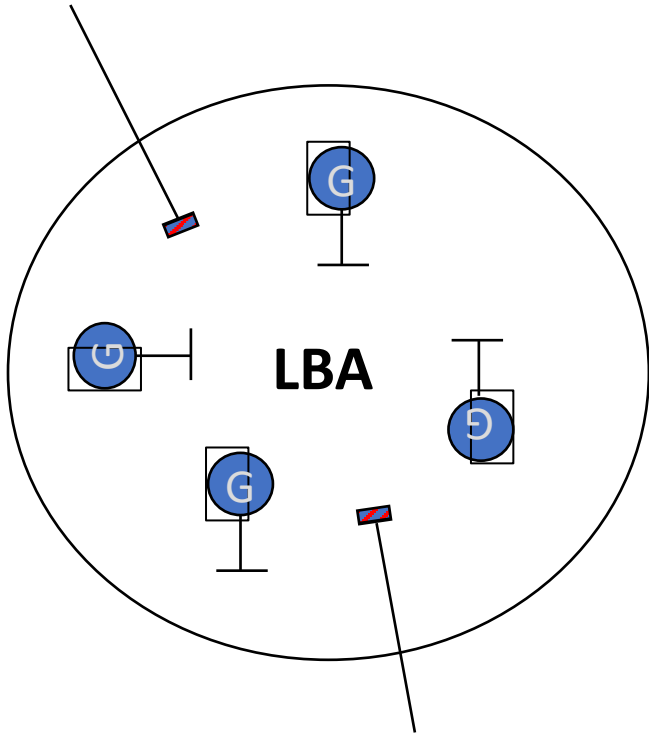
Chugach's Units

BESS
Hydro and Thermal
Peaking
Ramped Combined
Cycle and Hydro
Combined Cycle
Plants – SPP and P2A

Thermal Unit Cost Curve



Definitions



Automatic Generation Control (AGC)

Automatic regulation of the mechanical power input to the synchronous generators within a Load Balancing area for: (1) load frequency control, and (2) economic dispatch

Load Balancing Area (LBA) or Control Area

A predefined control area consisting of electrical load, generation assets, and interconnections to other Load Balancing Areas

Area Control Error (ACE)

Measures the balance of generation with respect to demand

Security Constrained Economic Dispatch (SCED)

This model assumes a system with thermal generating units and aims to minimize the total generation cost based on demand (Load), generator limitations, system security constraints, such as transmission line limitations

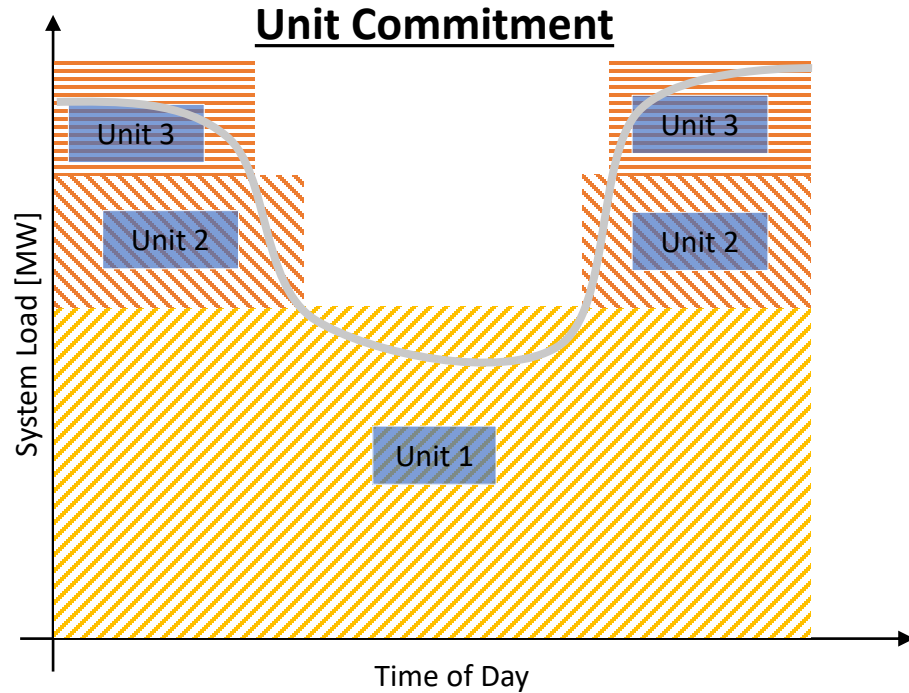
Fixed Costs

Costs that continue irrespective of plant load: capital investments, taxes, labor, insurance, interest, etc.

Variable Costs

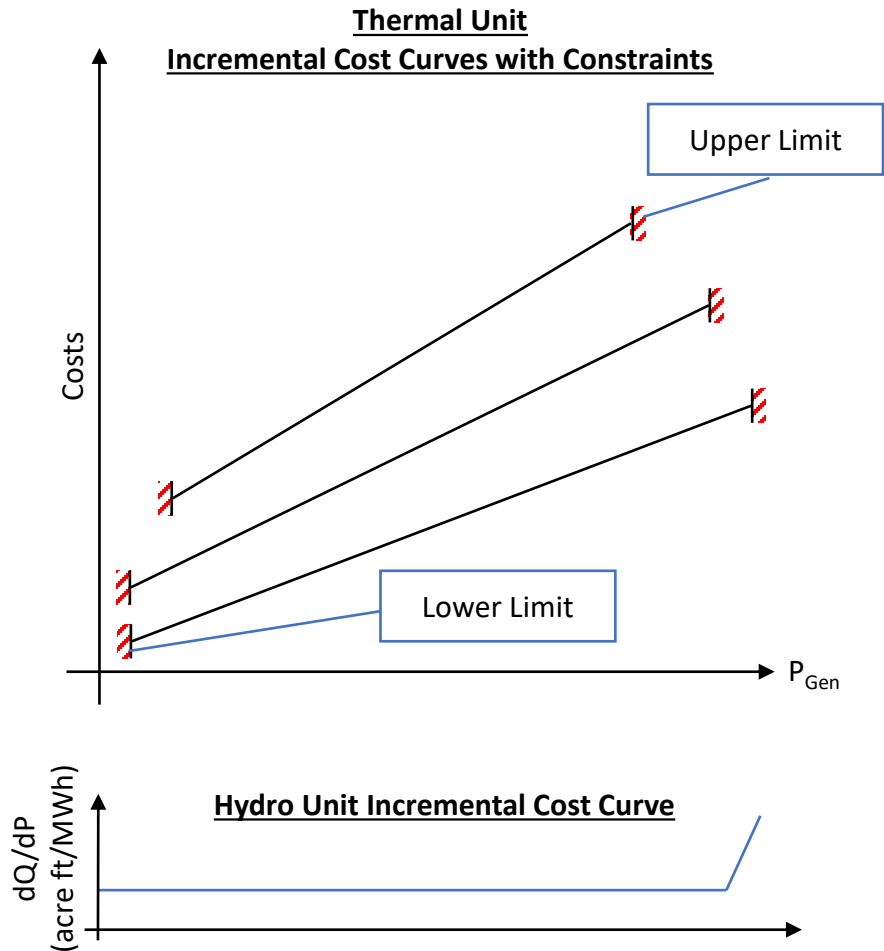
Costs that change based on output of the generating units such as fuel and some operation and maintenance costs

Unit Commitments



- Determine the number of units required to meet system load while considering:
 - Unit constraints
 - Minimum and maximum output
 - Minimum uptime
 - Minimum downtime
 - Deration of units
 - Manpower
 - Ramp rates
 - Exclusions
 - Spinning reserves
 - System requirements
 - Fuel constraints

Constraints

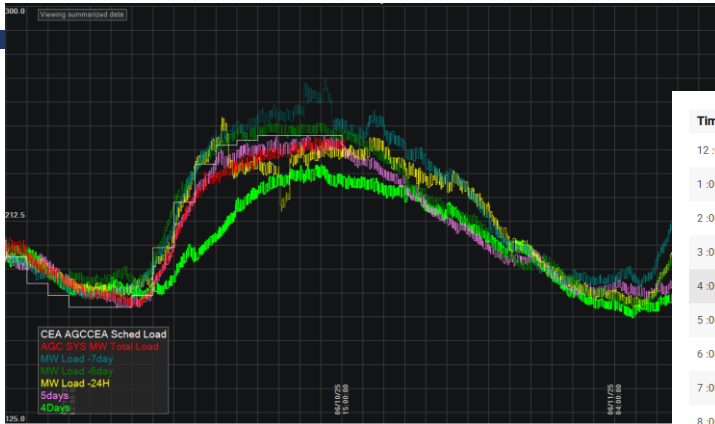


- **Power balance constraint:** Total generation must equal the total demand (load) plus transmission losses
- **Generator limits:** Each generator operates within defined minimum and maximum power output limits to ensure safe and efficient performance
- **Transmission line limits:** Operational restrictions placed on the amount of power transmitted through each line to prevent overloading, and ensure grid stability
- **Ramp rate constraints:** The limits on how quickly a power generator can increase or decrease their output over a given period of time
- **Reserve requirements:** The minimum amount of reserve capacity that must be maintained to respond to unexpected outages or demand surges

Benefits

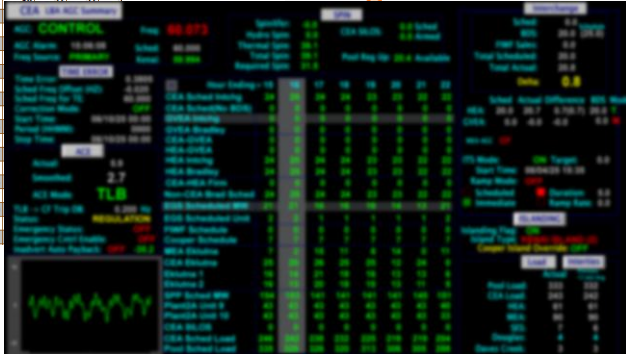
- **Lower electricity costs:** Prioritizes the most cost-effective generation sources, reducing overall consumer expenses
- **Enhanced grid reliability and efficiency:** Optimizes generation resource usage, supporting a stable and efficient power grid
- **Environmental and fuel benefits:** Running more efficient generators first reduces fuel consumption, lowers greenhouse gas emissions, and conserves fuel for future use

Chugach's Economic Dispatch Process



CEA Generation Schedule Thursday 06/12/2025										
06/12/2025 HourEnding	1	2	3	4	5	6	7	8	9	10
Total Sched Load	184	179	174	174	174	179	199	218	234	242
Kenai Load	11	11	11	11	11	11	12	12	13	13
SPP Temp	50	50	50	50	49	48	49	50	50	51
All Sales to CVEA										
All Sales to HEA										
All Sales to MEA										
SPP CC Mode	3C	3C	3C	3C	3C	3C	3C	3C	3C	3
SPP CEA Base	143	145	147	149	149	145	156	149	152	153
SPP CEA Duct										
SPP Total	143	145	147	149	149	145	156	149	152	153
Plant 2A CC Mode	1C	1C	1C	1C	1C	1C	1C	1C	1C	2C
Plant 2A Unit 9	43	43	43	43	43	43	40	43	43	4
Plant 2A Unit 10							18	43	43	4
Plant 2A Unit 11	14	14	14	14	14	14	14			
Plant 1 Unit 3										
Plant 1 Unit 4										
Plant 2 Unit 7										
Plant 2 Unit 8										
Beluga 1										
Beluga 2										
Beluga 3										
Beluga 5										
EGS CC Units	1	1	1	1	1	1	1	3		
EGS Plant	16	16	16	16	16	16	16	30		
Cooper Lake 1	7	7	7	7	7	7	7	7		
Cooper Lake 2										
CEA Eklutna	15	18	10			8	20	13		
MEA Eklutna	14				8					
Total Eklutna	29	18	10		8	8	20	20		
CEA Eklutna Loss Payback										
FIWF	1	1	1							

Time	Conditions	Temp.	Feels Like	Precip
12:00 am	Clear	57 °F	57 °F	2%
1:00 am	Clear	56 °F	55 °F	2%
2:00 am	Clear	54 °F	53 °F	3%
3:00 am	Clear	52 °F	51 °F	4%
4:00 am	Clear	51 °F	50 °F	5%
5:00 am	Sunny	50 °F	50 °F	5%
6:00 am	Sunny	51 °F	51 °F	5%
7:00 am	Sunny	52 °F	52 °F	4%
8:00 am	Sunny	54 °F	54 °F	3%
9:00 am	Sunny	56 °F	56 °F	2%
10:00 am	Sunny	58 °F	58 °F	1%
11:00 am	Sunny	60 °F	60 °F	1%
12:00 pm	Sunny	61 °F	61 °F	1%
1:00 pm	Sunny	63 °F	63 °F	0%
2:00 pm	Sunny	64 °F	64 °F	0%
3:00 pm	Sunny	65 °F	65 °F	0%



- **Assess Generation Availability:** Identify which generation assets will be operational for the day ahead
- **Analyze Weather and Temperature Profiles:** Consider forecasted conditions that may impact load and generation efficiency
- **Review Historical Load Trends:** Examine recent consumption patterns (previous 24 hours, prior week, etc.) and corresponding weather data
- **Develop Day-Ahead Load Profile:** Project anticipated demand based on weather forecasts and historical trends
- **Input Data into Scheduling Software:** Include generator availability, ambient temperatures, and the projected load profile
- **Run Iterative Economic Dispatch Solution:** Use software to determine the most cost-effective allocation of generation resources
- **Evaluate Proposed Schedule:** Ensure it meets reliability standards and economic objectives
- **Implement Schedule in SCADA:** Import the validated schedule for day-ahead operation

Applications & Power Pool

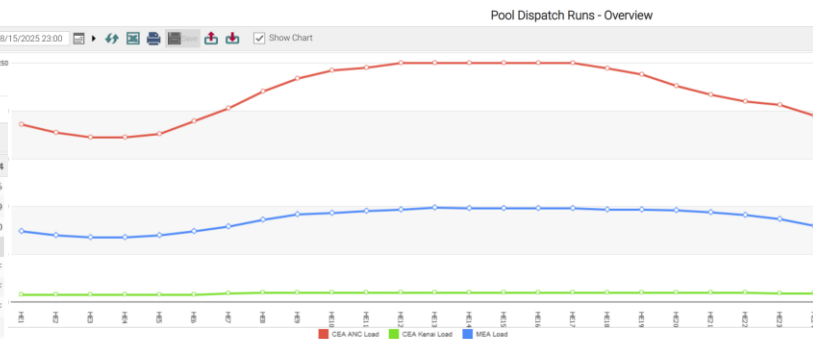
- Overall dispatch process is the same
- CEA supplies inputs to MEA for GenTrader economic dispatch calculations
- CEA operates real-time generation resources according to the day-ahead schedule produced by MEA Central Scheduling Service

CEA Generation Summary										SYSTEM									
Time: 08:57:02										TLB CONTROL									
Inland Type: NO ISLAND (1)										ACC Alarms: 08:57:02									
Plant	Unit	Gen	Name	Loc/Rem	Base Point	Oper Mode	Regulation Mode	Actual Gen	BA R/L	Des Gen	Base Point	Ramp Target							
SPP(OFF)	Line				STANDBY	Normal	OFF	-0.0	0.0	0.0	0.0	0.0							
Plant 2A	9	Run	FIXED	Normal	ASSIST			42.7	8%	42.7	43.0	40.0							
Plant 2A	10	Run	FIXED	Normal	ASSIST			38.9		38.9	39.0	39.2							
Plant 2A	11	Line	MANUAL	Normal	OFF			27.6											
EGS	Run	AUTO	Normal	REG				97.7		97.7	97.7	102.0							
Bradley 1	Run	COMPLEX	Normal	ASSIST				55.7		54.8	54.8	15.0							
Bradley 2	Run	FIXED	Normal	ASSIST				30.6		30.0	30.0	15.0							
Cooper 1	Run	FIXED	Normal	ASSIST				9.1		9.1	9.1	9.0							
Cooper 2	Line	OFFLINE	Normal	OFF				0.0		0.0	0.0	0.0							
Eklutna 1	Run	RAMP	Normal	ASSIST				18.6		18.0	18.0	14.0							
Eklutna 2	Run	RAMP	Normal	ASSIST				17.7		17.2	17.2	14.0							
FWF	Line	MANUAL	Normal	OFF				13.6											
Plant 1 3	Line	STANDBY	Normal	OFF				0.0		0.0	0.0	0.0							
Plant 1 4	Line	STANDBY	Normal	OFF				0.0		0.0	0.0	10.0							

Preliminary Pool Plan Report - Pool Dispatch No Sales

Start Date: 08/15/2025 00:00		End Date: 08/15/2025 23:00																									
Name	Total	HE1	HE2	HE3	HE4	HE5	HE6	HE7	HE8	HE9	HE10	HE11	HE12	HE13	HE14	HE15	HE16	HE17	HE18	HE19	HE20	HE21	HE22	HE23	HE24		
CEA ANC Load	5252	186	177	172	172	176	189	203	220	234	242	245	250	250	250	250	250	250	244	238	226	217	210	206	195		
CEA Kernal Load	225	8	8	8	8	8	8	9	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9		
MEA Load	2099	74	70	68	68	70	74	79	86	92	93	95	97	99	98	98	98	98	97	97	96	94	91	87	80		
SPP																											
SPP Availability		OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF		
SPP Status		OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF		
SPP CC Mode		OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF		
SPP Total Lo Limit																											
SPP Total Hi Limit																											
SPP RFS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
SPP Spin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
SPP RegUp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
SPP RegDn	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
SPP Total Output	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
SPP Total Fuel Usage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

<input type="checkbox"/> RFS Requirement	816.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0
<input type="checkbox"/> CEA RFS Requirement	624.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
<input type="checkbox"/> MEA RFS Requirement	192.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
<input type="checkbox"/> RegUp Requirement	300.0	18.0	12.0	9.0	7.0	10.0	14.0	18.0	19.0	14.0	14.0	12.0	13.0	7.0	7.0	11.0	12.0	12.0	14.0	14.0	14.0	14.0	14.0	17.0	
<input type="checkbox"/> CEA RegUp Requirement	221.0	9.0	8.0	6.0	4.0	6.0	10.0	13.0	14.0	12.0	11.0	9.0	10.0	5.0	5.0	5.0	9.0	9.0	10.0	10.0	12.0	11.0	10.0	12.0	



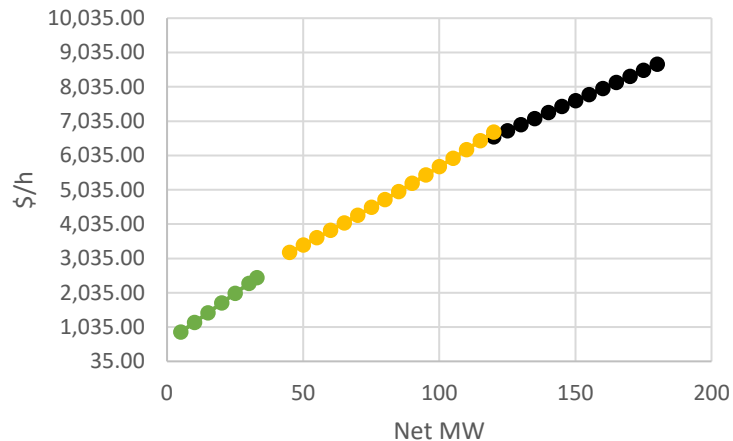
	HE1	HE2	HE3	HE4	HE5	HE6	HE7	HE8	HE9	HE10	HE11	HE12	HE13	HE14	HE15	HE16	HE17	HE18	HE19	HE20	HE21	HE22	HE23	HE24
268	255	248	248	254	271	291	316	336	345	350	357	359	358	358	358	358	358	351	345	332	321	311	302	284
186	177	172	172	176	189	203	220	234	242	245	250	250	250	250	250	250	244	238	226	217	210	206	195	
8	8	8	8	8	8	9	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	
74	70	68	68	70	74	79	86	92	93	95	97	99	98	98	98	98	97	96	94	91	87	80		
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Selected Cost Curves

Cost curves are shown for: Nikkels (one combustion turbine No. 3); Sullivan Plant 2A (two combustion turbines and one steam turbine); Southcentral Power Project (three combustion turbines and one steam turbine)

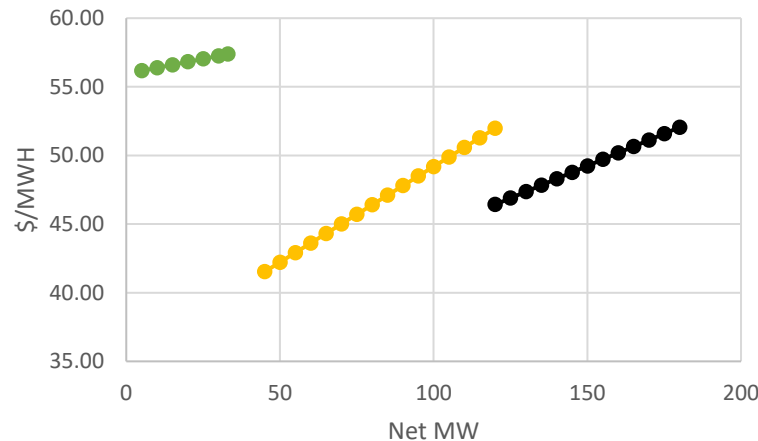
Total costs curves include all fixed and variable costs to operate the units throughout their range

Total Cost Curves



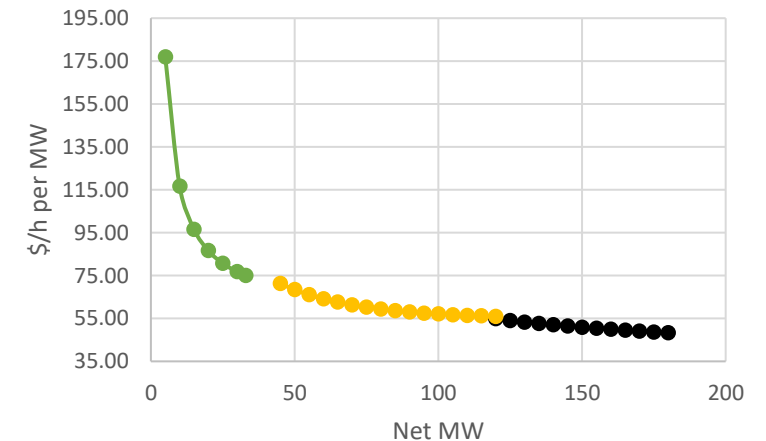
The cost for the next MWh produced

Incremental Cost Curves



Cost of all MWhs. Demonstrates economies of scale

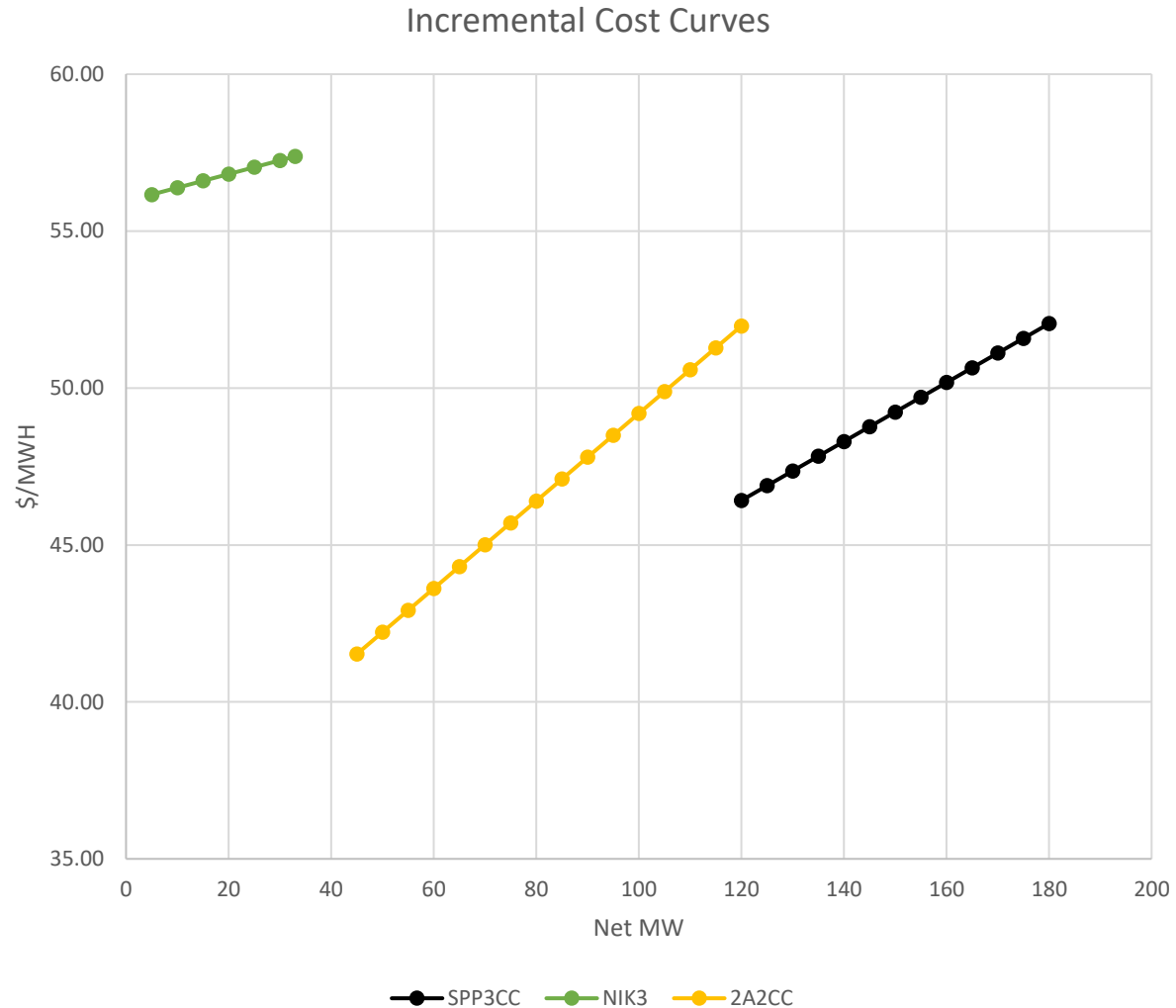
Average Cost Curves



Economic Dispatch: Example

In this example, Chugach is operating Nikkels Unit 3, Plant 2A, and SPP

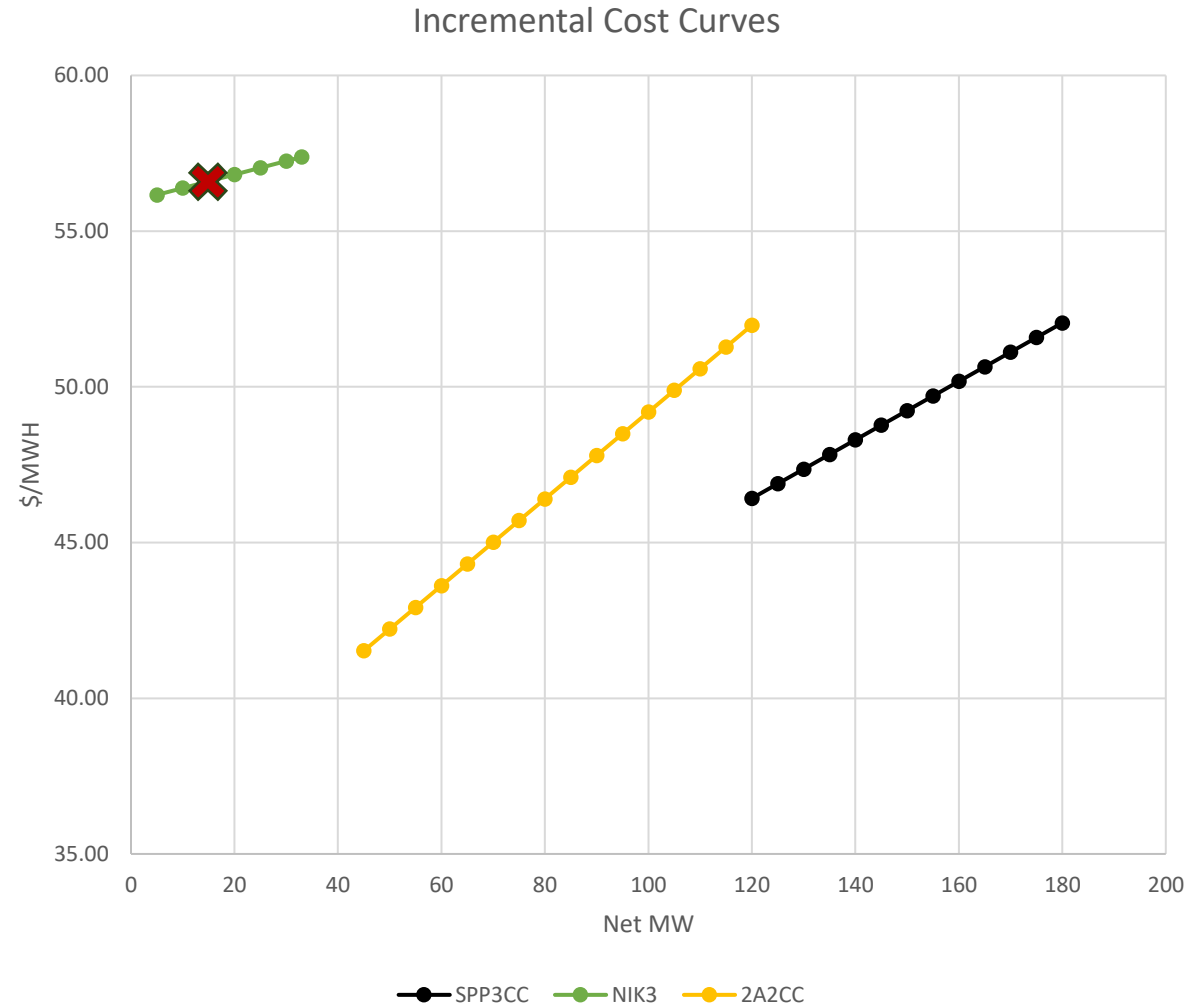
We will examine how incremental cost can guide the selection of the next MW of generation should be generated to meet load requirements



Economic Dispatch: Example

Current plant outputs are as follows:

Nikkels 3: 15MW

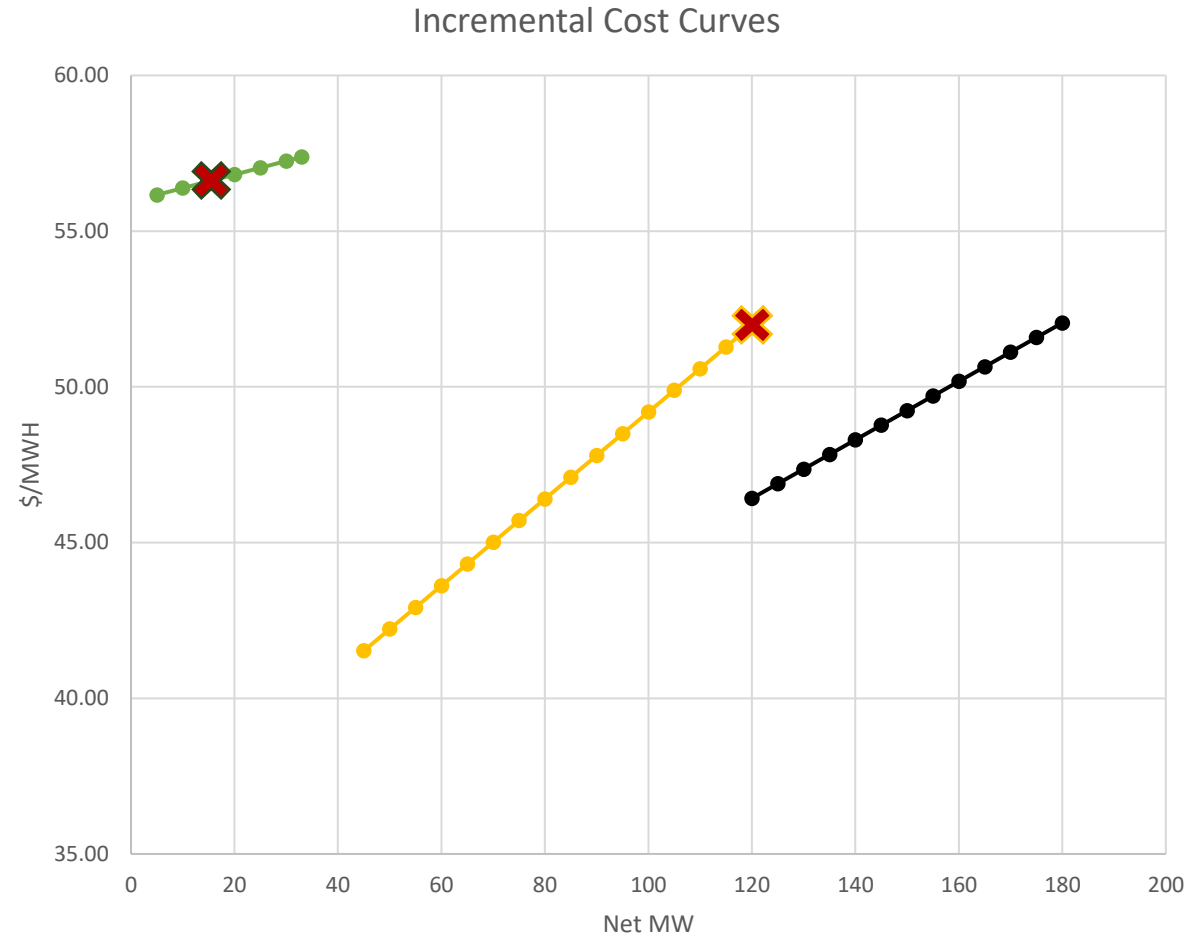


Economic Dispatch: Example

Current plant outputs are as follows:

Nikkels 3: 15MW

2A: 120MW



Economic Dispatch: Example

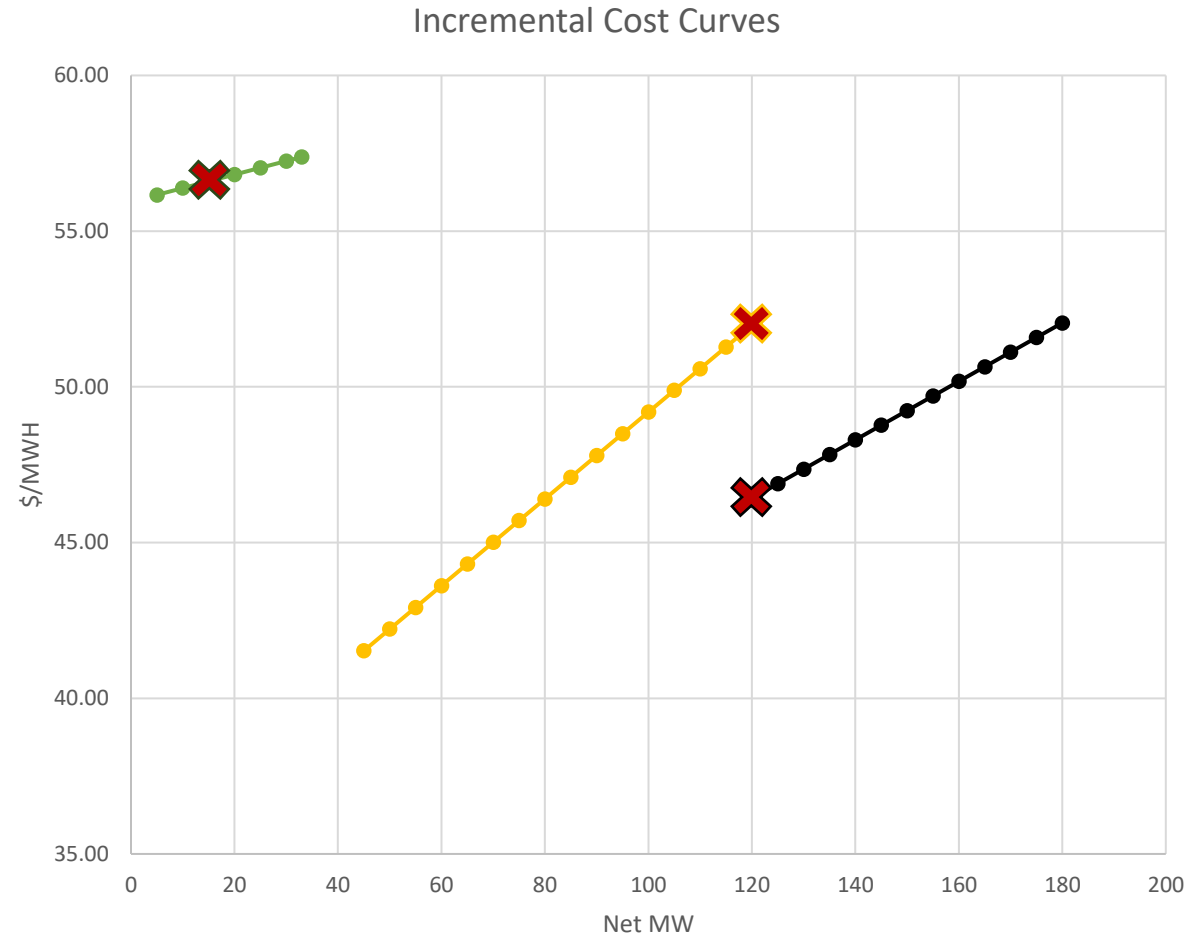
Current plant outputs are as follows:

Nikkels 3: 15 MW

2A: 120 MW

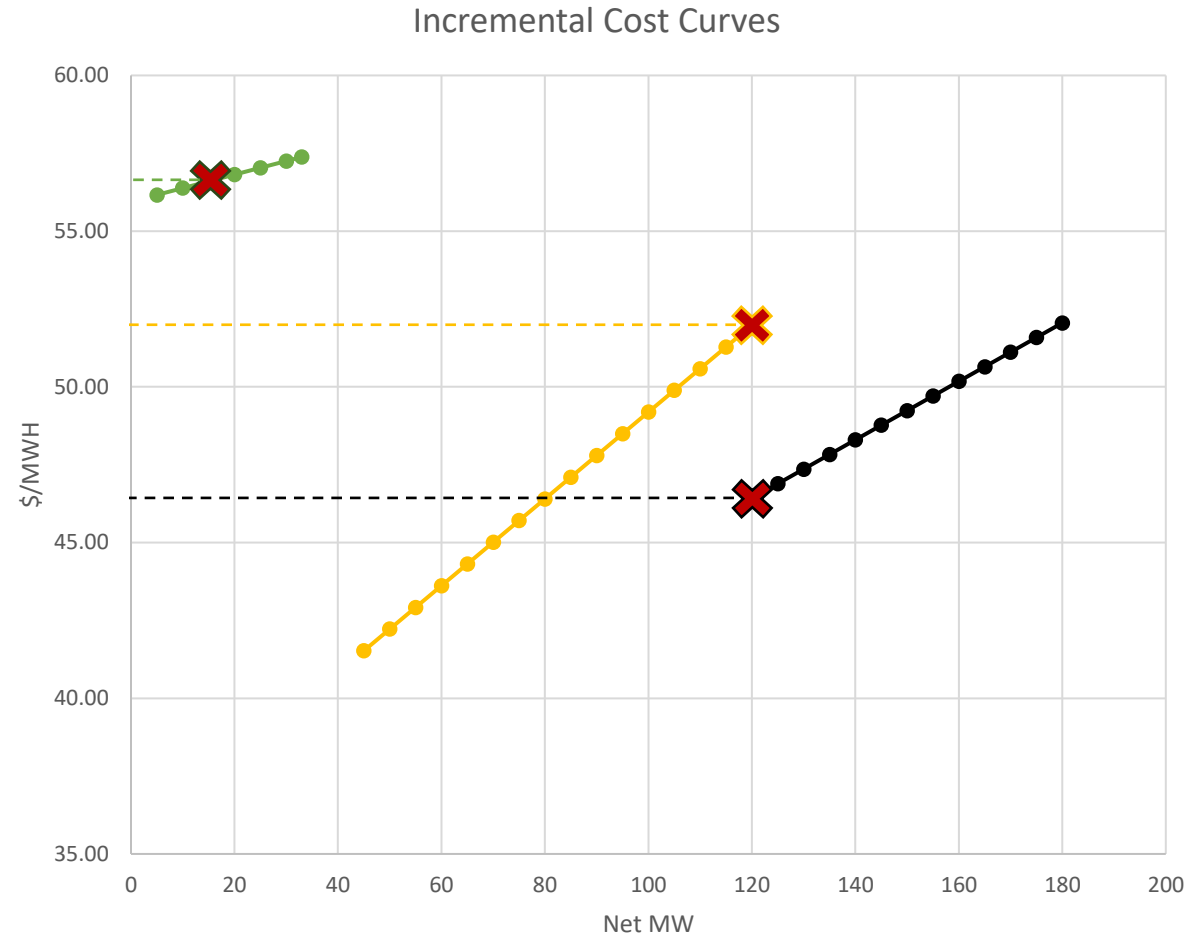
SPP: 120 MW

Total: 255 MW

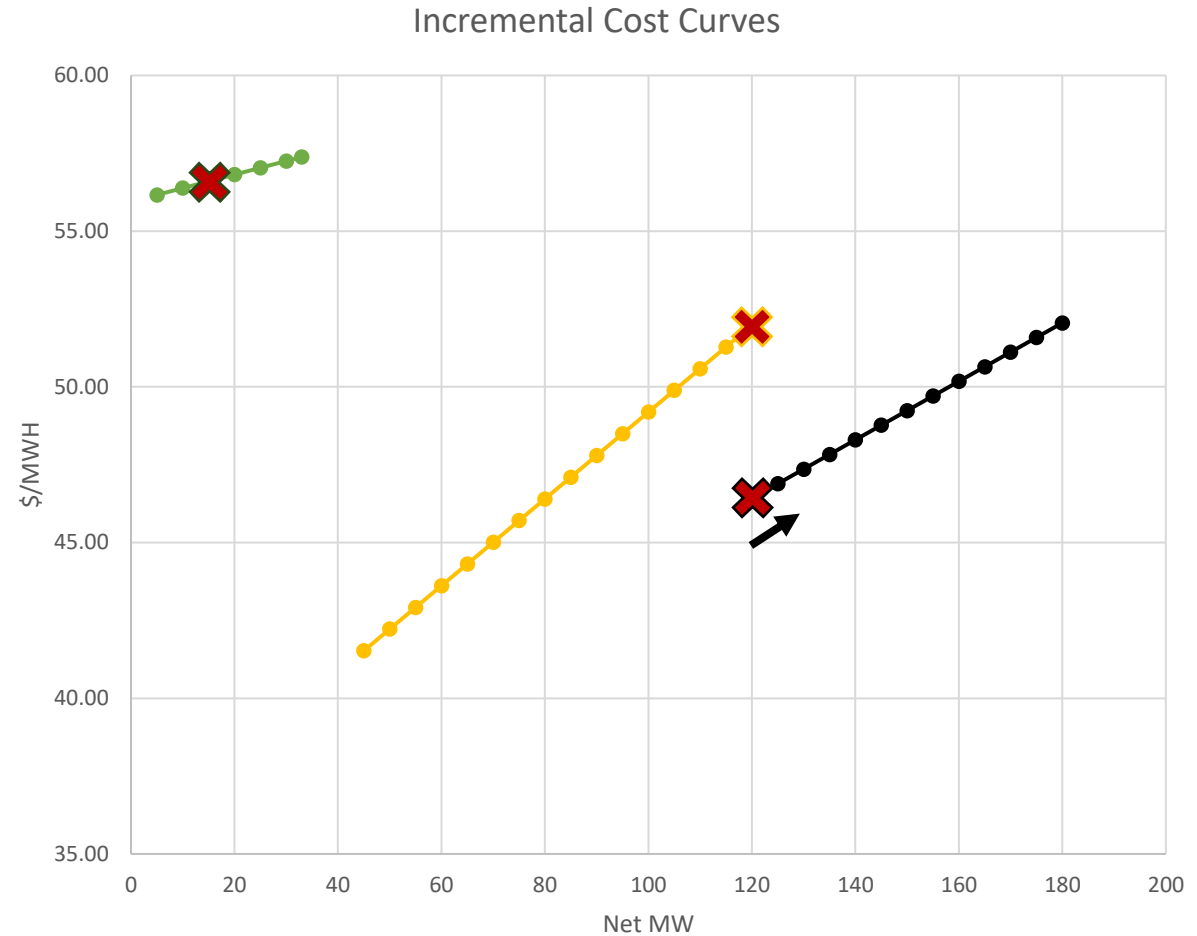


Economic Dispatch: Example

When comparing incremental costs at the current outputs for each generation resource, SPP has the lowest cost for generating additional power.



Economic Dispatch Background



Economic Dispatch Background

New plant outputs are as follows:

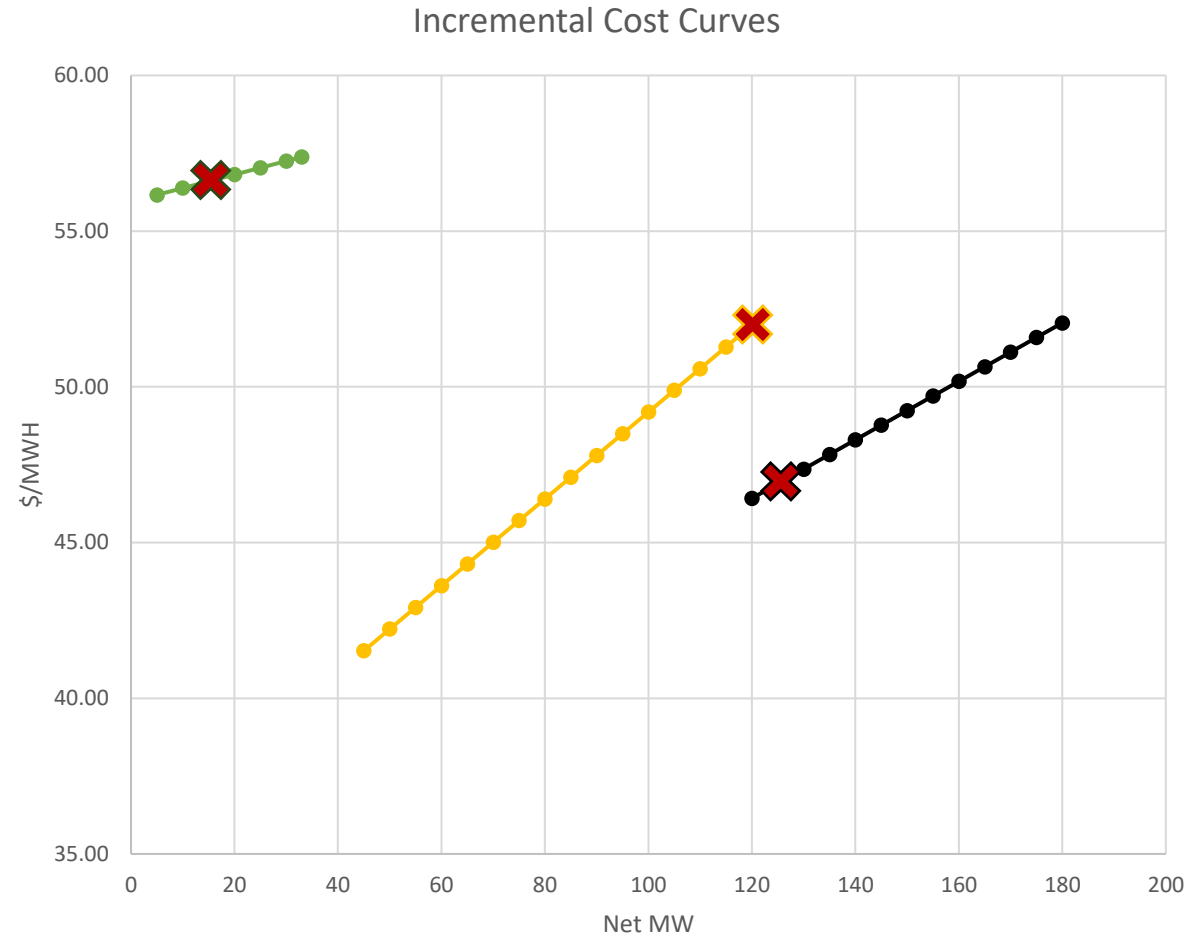
Nikkels 3: 15 MW

2A: 120 MW

SPP: 125 MW

Total: 260 MW

Choosing to increase SPP output to meet load requirements results in the most economical real time unit commitment



Questions?

Quartz Creek 115 kV T-Line Rebuild Girdwood to Indian

**Operations Committee Meeting
October 15, 2025**

Quartz Creek Rebuild Girdwood - Indian

Project Description:

- Programmatic rebuild of the 115 kV transmission line between University and Quartz Creek Substations
 - Original Project Scope:
 - Retire approximately 12.51 miles of transmission line
 - Install new: conductor, fiber optic cable, structures, guys, anchors and foundations
 - Completed Project Scope – Retired and Installed 9.54 miles
 - Remaining Project Scope – 2.97 miles
 - Girdwood Tap – 0.73 miles
 - Structure 23-9 to 25-6 – Section between bike path and mountain base north of Bird Point – 2.24 miles



Quartz Creek Rebuild Girdwood - Indian

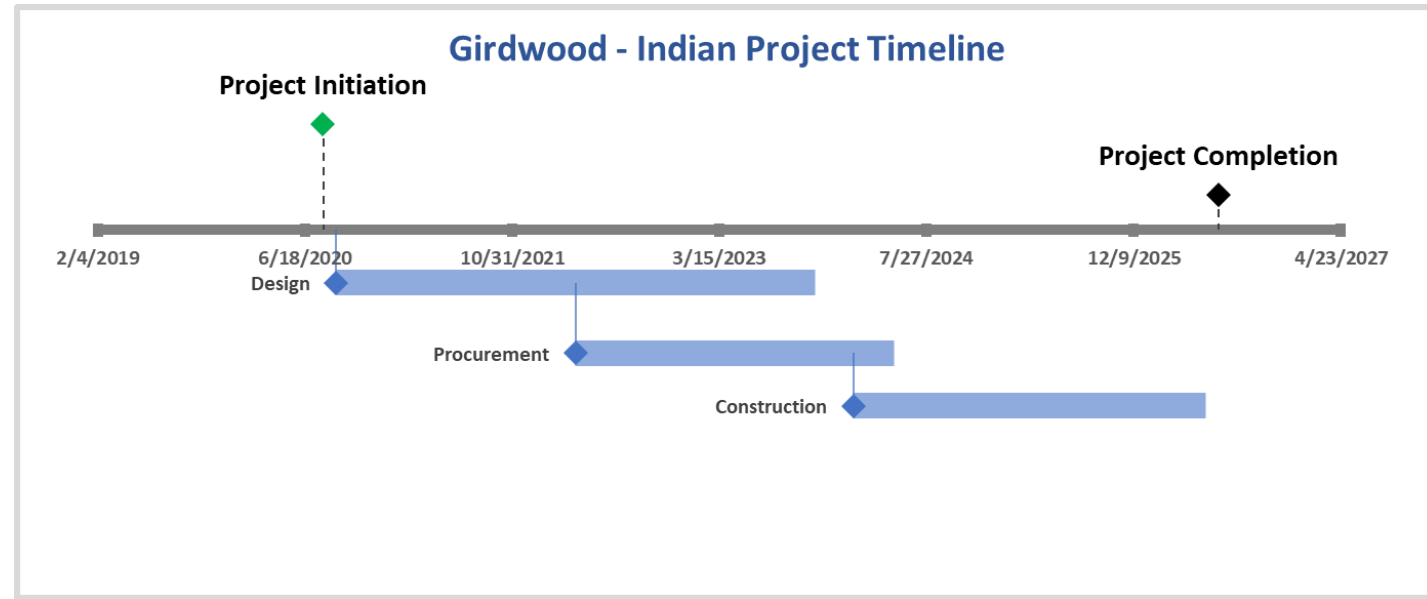
Remaining Project Scope Timeline

- January 2025 – Notified by Contractor that the work was unable to be completed as originally planned due to the lack of snow and warm weather
- January – March 2025 – Chugach actively negotiated with the Contractor to identify options to complete remaining scope
- April 2025 – September 2025 – Once a path forward with the existing Contractor could not be agreed upon, Chugach worked towards termination of existing construction contract and packaging of remaining work for new construction bid process

Quartz Creek Rebuild Girdwood - Indian

Project Update

- Cost forecasted to remain on budget
- Schedule has been extended one year





Beluga Solar Project

Request for Project Approval

*Operations Committee Meeting
October 15, 2025*



About Us

Chugach Electric has been tasked with achieving carbon reduction in terms of an intensity value, which is the metric tons of carbon produced for the total energy (in megawatt-hours) served to our members. This project is a tangible step toward the first target.

AT LEAST

35%

reduction by 2030

50%

reduction by 2040

FROM A 2012 BASELINE

*Assuming no negative material impact on
rates or reliability*



Our Project Development Team

DEERSTONE CONSULTING

Anchorage-based DeerStone Consulting specializes in renewable energy and infrastructure development. Led by Brian Hirsch, the firm has supported 65+ projects across Alaska, securing \$550M in funding while delivering solar, wind, hydro, and battery storage solutions with strong community engagement and regulatory expertise .

PRC WIND & PRC SOLAR

PRC Wind brings 25+ years of experience in utility-scale wind and solar development. The firm advises on project structuring, financing, and execution, with a proven track record guiding large-scale renewable projects from concept to completion .

MERDIAN MANAGEMENT

Meridian Management is a Service-Disabled Veteran-Owned Small Business with 25 years in project management and construction oversight. Based in Anchorage, the firm has delivered \$300M+ in energy and infrastructure projects, excelling in permitting, cost control, and constructability .

Project Selection Method



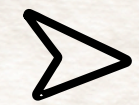
ADVANCE ENGINEERING TO 10~30%

Projects must advance past a pre-feasibility stage in order to justify engineering for a full feasibility analysis taking the project up to 30% design.



PREPARE CAPEX / OPEX ESTIMATES

Cost estimates will improve as engineering advances; the level at which the project will be presented for approval depends on the complexity, size, and characteristics of the project.



COMPARE LCOE & NPV VALUES

With CapEx and OpEx estimates, a standard set of assumptions is applied to create a pro forma cash flow allowing the calculation of a levelized cost of energy (LCOE) and net present value (NPV) based on a comparison to avoided cost which is related to expected future LNG costs.



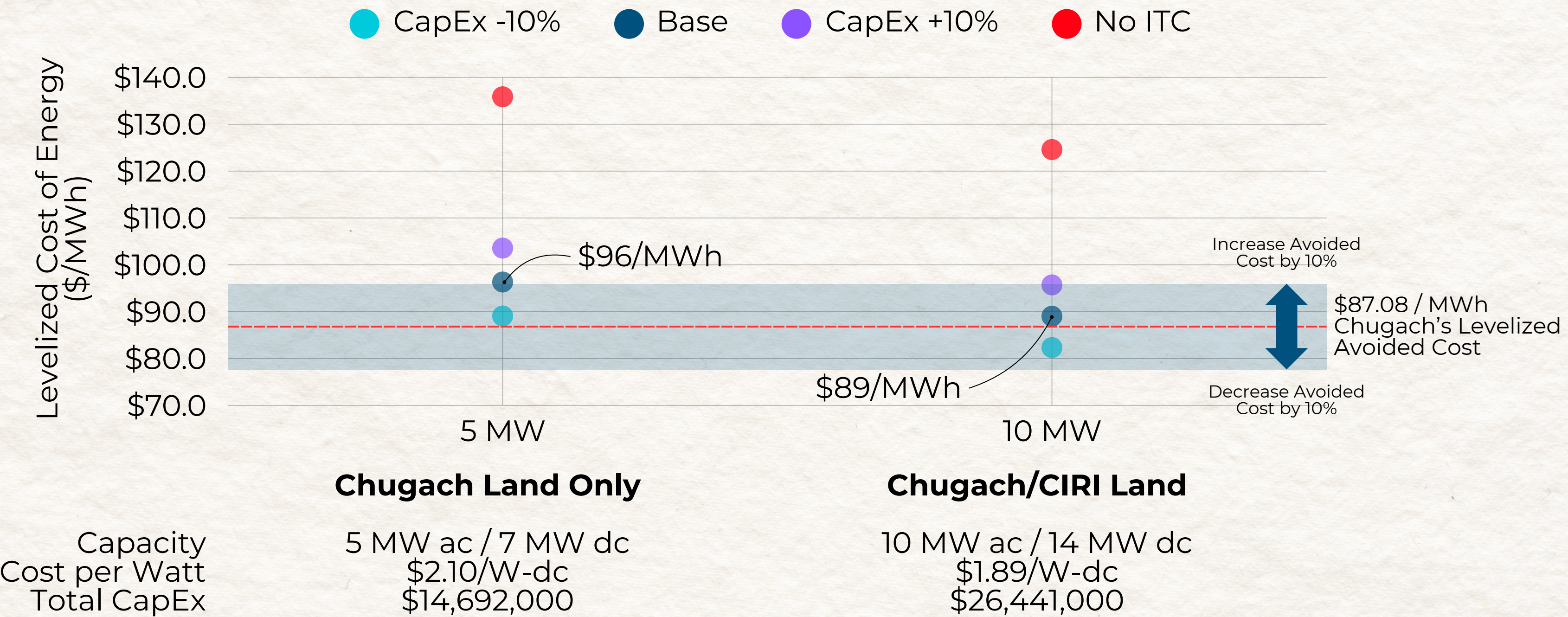


Operations & Maintenance

- **Performance monitoring**
- **Quarterly site inspections**
- **Inverter replacement**
 - Scheduled at year 13
- **Vegetation management**
 - Brush mowing twice per year; hand cut tree saplings
- **Snow management**
 - Designed to 4' above grade to allow snow-shedding
 - Typical to not clear snow from panels, instead clear below panels
- **Staff training**
- **Fencing repairs**

NOTE: Investigating options for union contract

Project Financial Sensitivities



\$115/MWh presented to Board August 13

- Stable and conservative CapEx estimate
- Preliminary and conservative O&M estimate

Refined production estimate (5% savings)

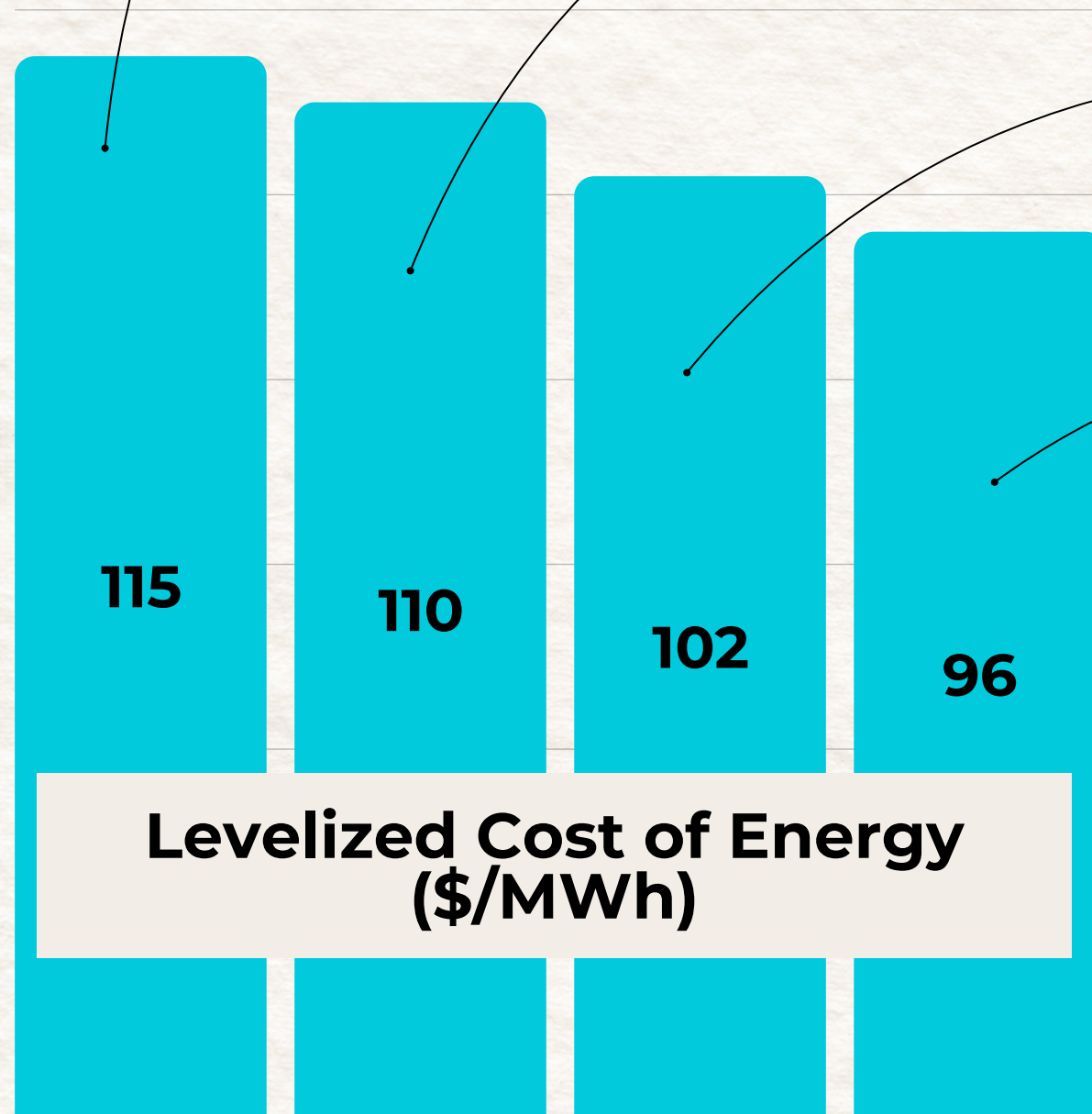
- Refined production estimates leveraged Solar Anywhere data

Decreased insurance costs by 60% (8% savings)

- Refined total cost basis of insurance
- Reduced insurance rate based on market information

Decrease O&M costs by 30% (6% savings)

- Refined based on additional vendor quotes



Levelized Cost of Energy
(\$/MWh)

5 MW on Chugach Land

Project Financial Refinements

Financial Analysis

		2025	2026	2027	2028	2029	2030	2031	...	2039	2040	2041	...	2057	2058
Benefits / Revenue															
Energy Production, MWh	-	-	524	6,781	6,747	6,714	6,680			6,417	6,385	6,353		4,386	-
Avoided Generation Cost	\$ -	\$ -	\$30	\$555	\$630	\$660	\$675			\$803	\$821	\$842		\$869	\$ -
Renewable Energy Certificates	\$ -	\$ -	\$2	\$22	\$22	\$23	\$23			\$27	\$28	\$28		\$21	\$ -
Total Benefits / Revenue	\$ -	\$ -	\$31	\$577	\$653	\$683	\$698			\$830	\$849	\$870		\$891	\$ -
Costs															
Capital Costs	\$1,100	\$9,548	\$4,044	\$ -	\$ -	\$ -	\$ -			\$ -	\$ -	\$ -		\$ -	\$ -
Investment Tax Credit Offset	\$ -	\$ -	\$ -	\$ (5,583)	\$ -	\$ -	\$ -			\$ -	\$ -	\$ -		\$ -	\$ -
Land Lease Costs	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -			\$ -	\$ -	\$ -		\$ -	\$ -
Operating Costs	\$ -	\$ -	\$42	\$172	\$176	\$181	\$185			\$225	\$231	\$236		\$261	\$ -
Inverter Replacement	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -			\$ -	\$ -	\$525		\$ -	\$ -
Total Costs	\$1,100	\$9,548	\$4,086	\$ (5,411)	\$176	\$181	\$185			\$225	\$231	\$761		\$261	\$ -
Net Cash Flow	\$ (1,100)	\$ (9,548)	\$ (4,055)	\$5,988	\$476	\$502	\$513			\$605	\$618	\$109		\$629	\$ -

5 MW Base Case

Financial Analysis

		2025	2026	2027	2028	2029	2030	2031	...	2039	2040	2041	...	2057	2058
Benefits / Revenue															
Energy Production, MWh		-	-	1,047	13,563	13,495	13,427	13,360		12,835	12,771	12,707		8,772	-
Avoided Generation Cost		\$ -	\$ -	\$59	\$1,111	\$1,260	\$1,320	\$1,349		\$1,606	\$1,642	\$1,683		\$1,738	\$ -
Renewable Energy Certificates		\$ -	\$ -	\$3	\$44	\$45	\$46	\$46		\$54	\$55	\$56		\$43	\$ -
Total Benefits / Revenue		\$ -	\$ -	\$63	\$1,155	\$1,305	\$1,366	\$1,396		\$1,661	\$1,697	\$1,740		\$1,781	\$ -
Costs															
Capital Costs		\$1,588	\$19,169	\$5,683	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -		\$ -	\$ -
Investment Tax Credit Offset		\$ -	\$ -	\$ -	\$(10,047)	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -		\$ -	\$ -
Land Lease Costs		\$ -	\$15	\$15	\$16	\$16	\$17	\$17		\$22	\$23	\$23		\$28	\$ -
Operating Costs		\$ -	\$ -	\$75	\$304	\$311	\$319	\$327		\$397	\$407	\$417		\$461	\$ -
Inverter Replacement		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	\$1,028		\$ -	\$ -
Total Costs		\$1,588	\$19,184	\$5,773	\$ (9,728)	\$328	\$336	\$344		\$419	\$430	\$1,469		\$489	\$ -
Net Cash Flow		\$ (1,588)	\$ (19,184)	\$ (5,711)	\$10,882	\$977	\$1,030	\$1,051		\$1,241	\$1,267	\$271		\$1,292	\$ -

10 MW Chugach/CIRI Case

Financial Summary


Project:	5 MW Base Case	10 MW Chugach/CIRI Case
NPV:	(\$1,083,000)	(\$456,000)
Capital Cost:	\$14,692,000	\$26,441,000
Capacity Factor:	15.5%	15.5%
Energy Production (MWh):	188,400	376,800
Avoided Natural Gas (MCF):	1,412,999	2,825,999
Rate Impact: <i>(with ITC applied for average household)</i>	\$20.09 over 30 yrs	\$29.34 over 30 yrs
Rate Impact: <i>(without ITC applied for average household)</i>	\$46.41 over 30 yrs	\$76.72 over 30 yrs

	Utility	Developer	EPC	Owner	Size (MW AC)	Size (MW DC)	Years in Service	Inflation Adjusted CapEx (\$/Watt-DC)	PPA (\$/MWh) (Escalating %)	LCOE w/ITC (\$/MWh)
Lower 48 Baseline*								\$1.33		
Willow Pilot	MEA	RIPP	RIPP	RIPP	0.1	0.1	2018	\$1.56	Avoided Cost	
Willow Expansion	MEA	RIPP	RIPP	RIPP	0.9	1.2	2019	\$1.60	Avoided Cost (\$83 in 2024)	
Houston Solar	MEA	RIPP	RIPP	Clean Capital	6	8.5	2023	Confidential	\$67	
Beluga Solar (10 MW)	Chugach	Chugach	TBD	Chugach	10	14	2027	\$1.89		\$89
Beluga Solar (5 MW)	Chugach	Chugach	TBD	Chugach	5	7	2027	\$2.10		\$96
GVEA	GVEA	GVEA			0.6	0.6	2018	\$2.44		Unknown
Badger Road	GVEA	TCC	Tapraq Rock		1	1.2	2025	\$3.20	Unknown	
Retherford (Community) Solar	Chugach	Chugach	Alaska Solar	Chugach	0.5	0.5	2025	\$4.49 In Construction		\$181
Puppy Dog Lake (Proposed)	HEA	RIPP			30	45	Stalled	Confidential	\$74	

Projects Comparison

Recommended Project Information

➤ Solar PV Capacity (AC)	10 MW	➤ Solar PV Capacity DC	14 MW
➤ CapEx Cost (Overnight)	\$26.4M	➤ DC:AC Ratio / Cap Factor	1.4 / 15.5%
➤ CapEx Cost (per Watt)	\$1.89/Watt-DC	➤ Type	Bifacial
➤ O&M Cost	\$22.86/kW-DC/Yr	➤ Land (Acres)	40 Chugach, 40 CIRI
➤ Solar Production (Total)	376,800 MWh	➤ Row Spacing	40 feet
➤ Avoided Natural Gas	2,825,999 MCF	➤ Tilt, Azimuth	35°, 180°



Project Location



AREA

40 acres required for the layout of the solar PV facility on Chugach property and an additional 40 acres on CIRI land



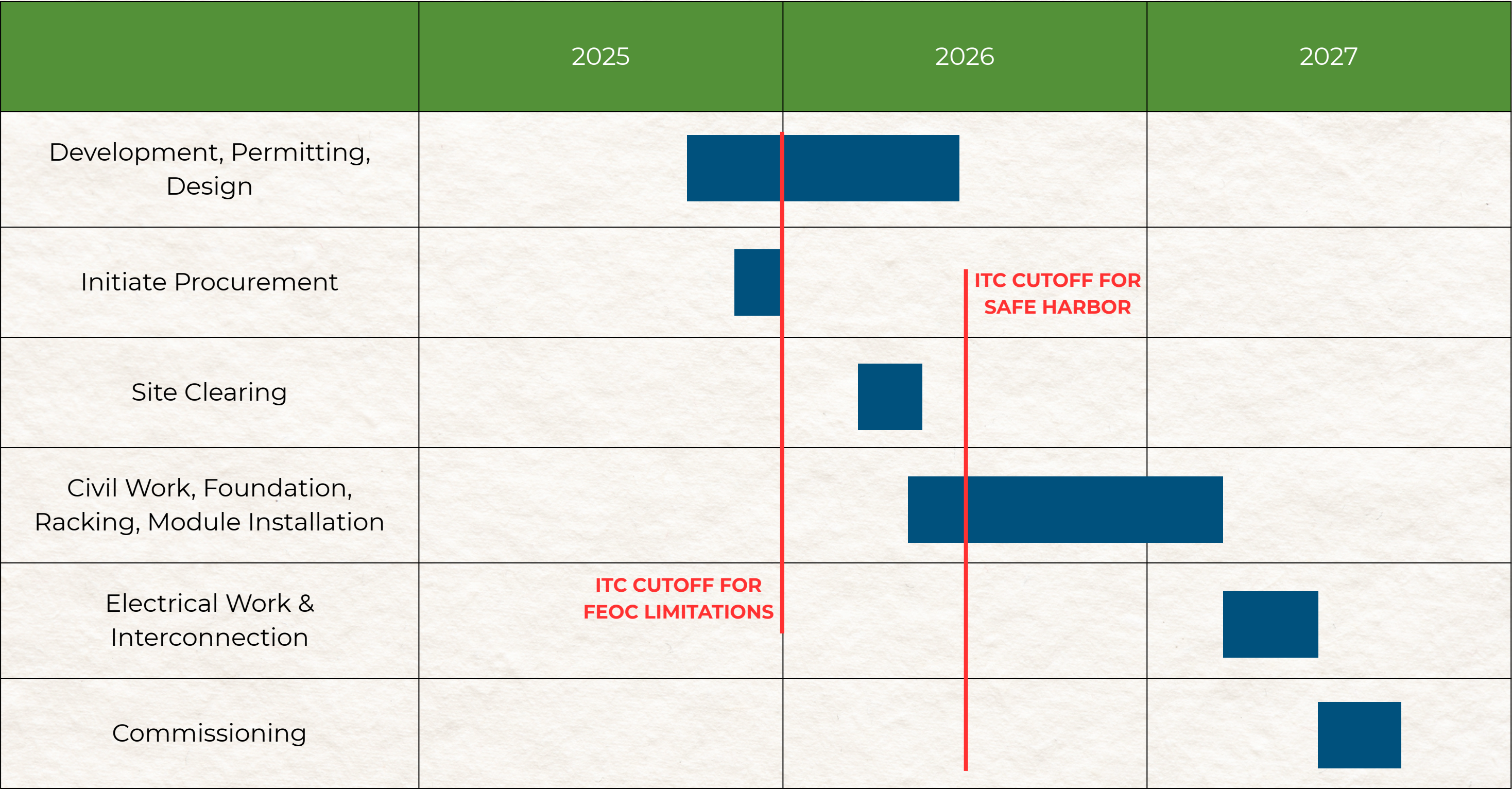
SITUATION

Located on the north side of the Beluga Power Plant; this property selection avoids land selected for a future DC converter station



ENVIRONMENT

Wet ground and existing stream will reduce area coverage although no special permits are expected to address wetlands



Project Schedule

10 MW

Project Risks & Opportunities

➤ ELIGIBILITY FOR TAX CREDITS

Largest risk to capture the full 40% ITC tax credit. Safe harbor and “physical work” requirements by July 4, 2026. “Foreign Entity of Concern” restrictions begin January 1, 2026.

➤ CAPITAL COST INCREASES

Increased CapEx may be driven by unfavorable ground conditions, remote location, and import tariff uncertainty. A 10% adder was applied to ground prep costs, and a separate 20% adder addresses remote location risks.

➤ SOLAR PRODUCTION

Solar production has been estimated using models and real production from comparable projects. This makes production risk relatively low.

➤ GRANT FUNDING

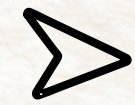
An application for the Renewable Energy Fund from AEA was submitted by the deadline of September 12, 2025. This is not included in the project cost estimate.

➤ ECONOMICS

Avoided Cost may change based on ongoing natural gas negotiations, which would impact project economics

CONTINGENCY BUDGET

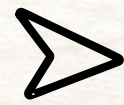
In addition to the specific cost adders described above, conservative cost estimates and another 15% adder has been applied to account for overall contingency and import tariff costs.



LEVELIZED COST OF ENERGY

\$89 / MWh

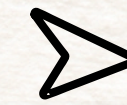
This LCOE is based on real, inflation adjusted costs. The largest single risk is not achieving ITC which could increase this to \$124 / MWh.



NET PRESENT VALUE

(\$456,000)

The NPV is sensitive to variations in avoided costs which will result from ongoing LNG negotiations. This equates to a rate impact of less than \$3/year for an average residence.



CARBON IMPACT

155,496 METRIC TONS

The project promises to offset approx. MCF of natural gas which equates to this amount in tons of CO₂.



PROJECT CAPEX

\$26,441,000

Includes 15% contingency and contractor overhead and profit



PROJECT SCHEDULE

Substantial Completion by October 31, 2027

This is a conservative estimate of the project energization date which could be shortened with higher cost winter work approval.



RISKS

ITC, CapEx, Production

These three categories cover the most significant risks which are being specifically mitigated and further addressed with a 15% project contingency.

Project Summary



Thank You.

Questions?

CHUGACH ELECTRIC ASSOCIATION, INC.
Anchorage, Alaska

OPERATIONS COMMITTEE MEETING
AGENDA ITEM SUMMARY

October 15, 2025

ACTION REQUIRED

AGENDA ITEM NO. V. D.

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

TOPIC

Beluga Solar Project – Authorization of Funding and Regulatory Filing

DISCUSSION

Chugach Electric Association has adopted sustainability, or the “triple bottom line,” as a core business philosophy, incorporating financial, environmental, and social measures into overall business performance. As part of this philosophy, Chugach has set decarbonization goals to reduce carbon intensity by at least 35% by 2030 and 50% by 2040, using 2012 as the baseline year, without negative material impact to member rates or system reliability.

To support these goals and diversify its generation portfolio, Chugach has developed the Beluga Solar Project. The project represents a significant step toward achieving Chugach’s decarbonization objectives and provides new renewable generation resources. The total estimated cost of the project is approximately \$26,441,000, or approximately \$16,393,000 net of federal Investment Tax Credit (ITC) benefits after commercial operation.

Approval of this resolution authorizes the Chief Executive Officer to proceed with execution and completion of the project, to seek approval from the Regulatory Commission of Alaska (RCA) for cost recovery, and to take all actions necessary to carry out the project.

MOTION

Move that the Operations Committee recommend that the Chugach Board of Directors approve the attached resolution authorizing the Chief Executive Officer to spend up to \$26,441,000 for the execution and completion of the Beluga Solar Project, to file the Project with the Regulatory Commission of Alaska for cost recovery in rates, and to take all actions necessary to carry out this resolution.



RESOLUTION

Beluga Solar Project

WHEREAS, Chugach Electric Association, Inc. (Chugach) has established a decarbonization goal to reduce its carbon intensity by at least 35% by 2030 and by at least 50% by 2040, using 2012 as the baseline year, without causing a negative material impact to member rates or system reliability;

WHEREAS, Chugach has identified new renewable energy resources as desirable for diversifying its generation portfolio and advancing its decarbonization goals;

WHEREAS, the Beluga Solar Project (Project) has been developed as a key component of Chugach's broader renewable energy portfolio, supporting Chugach's core business philosophy of sustainability and contributing to the achievement of its decarbonization goals;

WHEREAS, Chugach estimates that design and construction of a 5 MW-AC Project will cost approximately \$14,692,000 before application of the federal Investment Tax Credit (ITC), or approximately \$9,109,000 after application of the ITC following commercial operation;

WHEREAS, Chugach further estimates that design and construction of a 10 MW-AC Project will cost approximately \$26,441,000 before application of the federal ITC, or approximately \$16,393,000 after application of the ITC following commercial operation, contingent upon successful negotiations with Cook Inlet Region Inc. (CIRI) who would provide additional land necessary to achieve this project size; and,

WHEREAS, Chugach has determined that the anticipated benefits of the Project at a negligible rate impact to members support proceeding with its development and seeking approval from the Regulatory Commission of Alaska (Commission) for recovery of eligible costs in rates.

NOW THEREFORE BE IT RESOLVED, that the Chief Executive Officer be, and hereby is, authorized to expend up to \$26,441,000 for the execution and completion of the Beluga Solar Project;

BE IT FURTHER RESOLVED, that the Chief Executive Officer be, and hereby is, authorized and empowered to file the Project with the Commission for inclusion in Chugach's rates; and



BE IT FINALLY RESOLVED, that the Chief Executive Officer be, and hereby is, authorized and empowered to take all such further action and to execute and deliver all such further agreements, certificates, instruments, contracts, purchase orders, and other documents and agreements, in the name and on behalf of Chugach; to pay or cause to be paid all expenses; to take all such other actions as they shall deem necessary, desirable, advisable, or appropriate to consummate, effectuate, carry out, or further the foregoing resolutions.

CERTIFICATION

I, Susanne Fleek-Green do hereby certify that I am the Secretary of Chugach Electric Association, Inc., an electric not for profit cooperative membership corporation organized and existing under the laws of the State of Alaska: that the foregoing is a complete and correct copy of a resolution adopted at a meeting of the Board of Directors of this corporation, duly and properly called and held on the 22nd day of October 2025; that a quorum was present at the meeting; that the resolution is set forth in the minutes of the meeting and has not been rescinded or modified.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed the seal of this corporation on the 22nd day of October 2025.

Secretary

Chugach Electric Association, Inc.
Anchorage, Alaska

Summary of Executive Session Topics for
Operations Committee Meeting on October 15, 2025
Agenda Item VII.

- A. Discussion of confidential and sensitive information regarding an update of Chugach's gas supply, public disclosure of which could have an adverse effect on the finances and legal position of the Association. (AS 10.25.175(c)(1) and (3))
- B. Discussion of confidential and sensitive information regarding an update of Chugach's *Cents of Community* program, disclosure of which could have an adverse effect on the finances and legal position of the Association. (AS 10.25.175(c)(1) and (3))