REAP Renewable Energy Alaska Project

PRESENTS

THE FUTURE OF COOK INLET ENERGY

GAS SHORTAGES, RENEWABLE ENERGY SOLUTIONS & DEVELOPMENT ROADBLOCKS

A FORUM MODERATED BY ELIZABETH ARNOLD

APRIL 13, 2023
ANCHORAGE MUSEUM AUDITORIUM

AGENDA

APRIL 13, 2023
ANCHORAGE MUSEUM AUDITORIUM

6:30PM	Introduction by Ms. Arnold
6:35PM	First Panel Discussion
7:15 PM	15-minute Intermission
7:30 PM	Second Panel Discussion
8:10 PM	Closing Remarks
8:15 PM	Forum Concludes

MODERATOR

Elizabeth Arnold is a former National Public Radio Political Correspondent and current Professor of Journalism at the University of Alaska. For twenty plus years she was a familiar voice on NPR's *Morning Edition* and *All Things Considered* and a regular presence on PBS Washington Week, covering Congress, the White House, and the American West. Arnold has received numerous awards, including a duPont Columbia Silver Baton and the Dirksen Award for Distinguished Reporting of Congress. Over the last decade, she has reported on the ecological and human impacts of global warming from some of the most remote areas of the Arctic. A recent Fellow at Harvard's Shorenstein Center on Media, Politics and Public Policy, Arnold authored the paper "Gloom and Doom: The Role of the Media in the Public's Disengagement on Climate Change." https://shorensteincenter.org/media-disengagement-climate-change/

PANELISTS

Suzanne Settle is the Vice President of Energy, Land and Resources for Cook Inlet Region, Inc. (CIRI). Suzanne is responsible for expanding investments in U.S. power infrastructure as well as in natural resources by promoting responsible development on CIRI's vast portfolio of Cook Inlet land holdings. She joined CIRI in 2009, leading a team that built an energy portfolio consisting of wind power, gas storage, natural gas combined-cycle power, biomass and infrastructure assets located in Alaska, the lower 48 states, and Europe. Settle previously served as the Director, Energy Resources for Chugach Electric Association, a Partner at Enchanted Rock Capital LLC and Enchanted Rock Holdings LLP, worked as a Financial Trader with Kinder Morgan and an Asset Manager with Dynegy. Settle also serves as the Vice Chair of the Railbelt Reliability Council and as a Director of the Resource Development Council and the Alaska Independent Power Producers Association.

Mark Foster was born and raised in Fairbanks and attended Stanford University where his senior report was on the economics of the Devils Canyon/Watana Susitna Hydroelectric Project (1982). Mark returned to Fairbanks in the 1980s to work on refurbishing the power plant his grandfather helped build. He was appointed to the Alaska Public Utilities Commission (now RCA) in 1990 and served in the engineering seat. He has consulted in the energy, electric and telecom sectors in Alaska and internationally since 1994, including service as chair of audit committees of power and telephone companies, retiring from his board commitments in 2020 to create opportunities for a more diverse mix of board members. He recently conducted an analysis of the cost of decarbonizing the Alaska economy by 2050 and is hopeful that the next generation will take advantage of the emerging opportunities in clean energy project and technology development.

Larry Persily has vacillated between reporting on public policy, writing his opinions on public policy and trying to make policy during his 47 years in Alaska. During that time, Larry has focused on oil and gas issues, resource development, taxes, and the state's unsolved fiscal problems, with diversions into municipal issues and even CARES Act grants. His journalism degree from Purdue University in 1972 prepared him to think, but his time with the Alaska Department of Revenue (deputy commissioner), as a staffer to a House Finance Committee co-chair, and presidential appointee to run the federal office for Alaska North Slope gas pipeline projects taught him what to think about. When not in government, Larry has owned three different weekly newspapers in Alaska and reported for the Anchorage Times, Anchorage Daily News, Associated Press, Juneau Empire and Petroleum News.

Renewable energy has long been viewed by some as a more expensive option to generate electricity in Alaska compared to fossil fuels like natural gas. However, the cost of wind, solar, and battery technology has plummeted over the last decade. In contrast, the price of Cook Inlet natural gas has been increasing quickly over that same period. Today, variable wind and solar generation, when coupled with energy storage, promises lower costs for Alaskans compared to continuing the region's dangerous heavy dependence on natural gas.[1] Substantial and rapid diversification of the region's energy portfolio is needed now to reduce the risk of further energy price increases, and keep precious energy dollars circulating in the state's economy.

Renewables Keep Getting Cheaper

The last 15 years have seen dramatic decreases in the cost of utility-scale wind and solar due to technological improvements, economies-of-scale, enhanced operational efficiencies and stronger supply chains. In the United States, improvements in manufacturing and energy-conversion efficiency have decreased the price of utility-scale wind and solar by 72% and 90%, respectively, since 2009.[2] The International Energy Agency (IEA) reports that lithium batteries, which are rapidly being installed by utilities to manage the intermittent nature of renewable generation, are experiencing similar cost declines.

Both the present and the future for renewables are bright. The US Energy Information Agency (EIA) projects that the cost of both solar and wind will continue to decline for decades.[3] And the Inflation Reduction Act's passage in 2022 has extended, and even enlarged some, federal tax credits for renewable energy, effectively ensuring that the federal government will pay for at least 30% of the capital costs for renewable energy projects for the next 10 years.

Figure 1: Cost of Wind and Solar Power Purchase Agreements

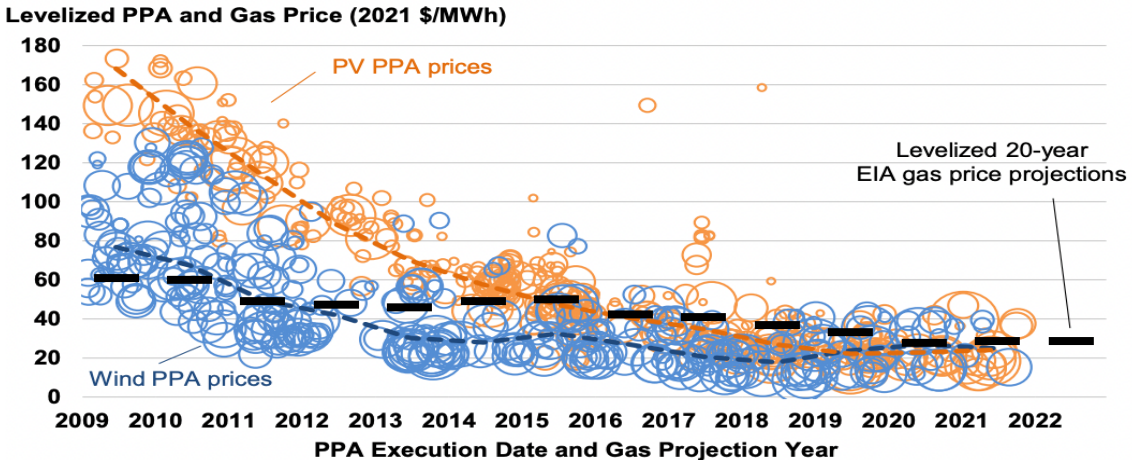

Figure 1 shows wind and solar power purchase agreement (PPA) prices in the U.S. compared to both projected and actual gas prices

[1] *"Railbelt Renewable Portfolio Standard: Economic Analysis." Analysis North (2022) at https://www.analysisnorth.com/rps-econ.html*
[2] "Lazard's Levelized Cost of Energy Analysis – Version 15.0," Lazard, 2021. https://www.lazard.com/perspective/levelized-cost-of-energy-levelized-cost-of-storage-and-levelized-cost-of-hydrogen/
[3] "Levelized Costs of New Generation Resources, Annual Energy Outlook 2022". US Energy Information Administration. 2022. p. 14, Figure 3. https://www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf

Cook Inlet Consumers Face Rising Energy Costs and a Dwindling Gas Supply

Approximately 85% of the Cook Inlet region's electricity relies on gas produced in Cook Inlet. This dependence explains a substantial portion of the rise in electric utility costs that the region has experienced over the last 15 years. The local market price of natural gas has increased by more than 50% since 2010. Today, Chugach Electric Association customers pay almost double what the average American pays for electricity.

Figure 2: Railbelt Residential Electric Rates ($/kWh)[4]

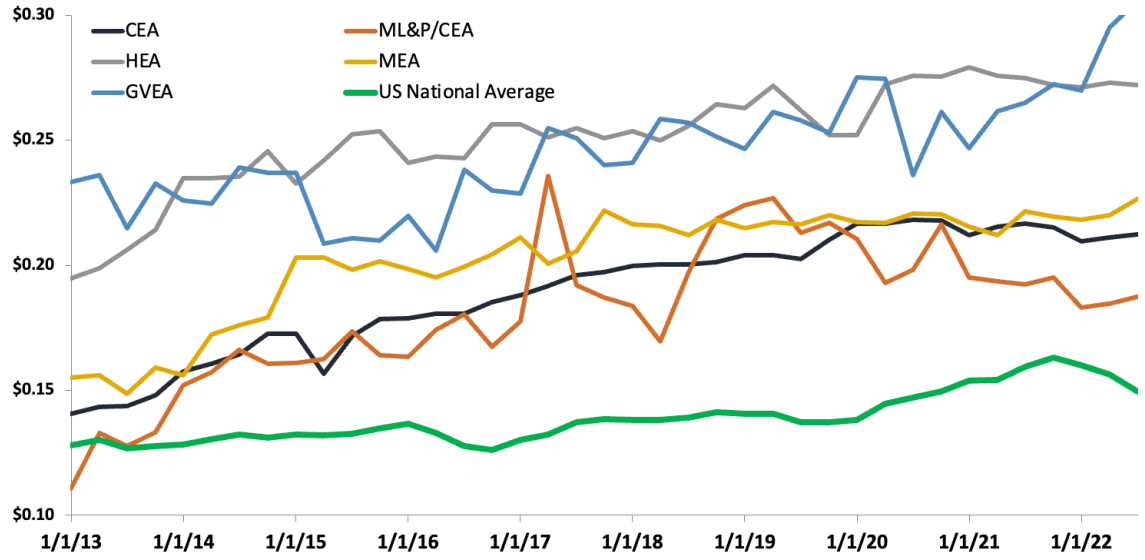

Figure 2 shows electricity rates from each Railbelt Utility compared to the national average

Figure 3: Cook Inlet Natural Gas Prices Continue to Rise[5]

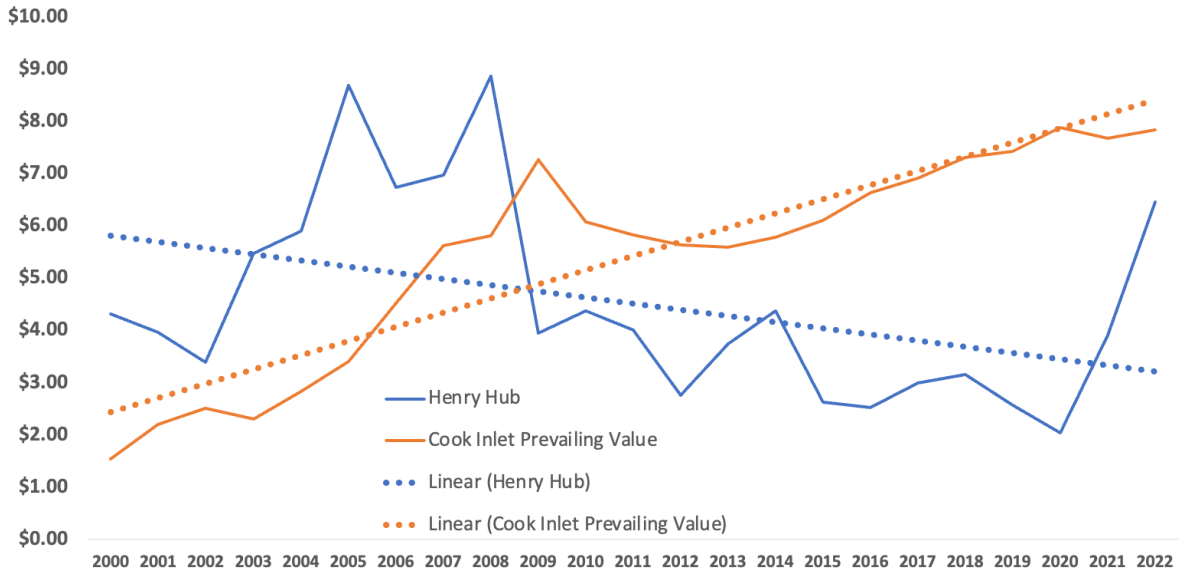

Figure 3 shows the increasing trend of Cook Inlet natural gas prices compared the US (Henry Hub) price

[4] "Residential Electricity Rates" Regulatory Commission of Alaska (2022)., US Energy Information Agency

[5] "Cook Inlet Prevailing Values." Alaska Department of Revenue - Tax Division. State of Alaska, (2022), a t www.tax.alaska.gov/programs/oil/prevailing/cook.aspx.

The Railbelt electric utilities currently pay Hilcorp about $7.50/Mcf for gas.[6] This is roughly three times more than today's Henry Hub price for gas in the Lower 48.[7] The primary reason for this price differential is that the Railbelt is a small market. Our small population simply does not incentivize large capital investments in new exploration and development.

For over ten years the State of Alaska's Department of Natural Resources (DNR) has accurately characterized the future trajectory of Cook Inlet natural gas prices by assessing the cost of development of future resources. In 2011, amid concern that Cook Inlet gas supply would fail to meet local utility needs, a DNR assessment projected that gas supplies would be sufficient to meet the region's needs through 2021, but prices would need to rise substantially to incentivize the necessary investment.[8]

Figure 4: DNR's 2011 Assessment of Gas Price Rise Needed to Incentivize Investment[9]

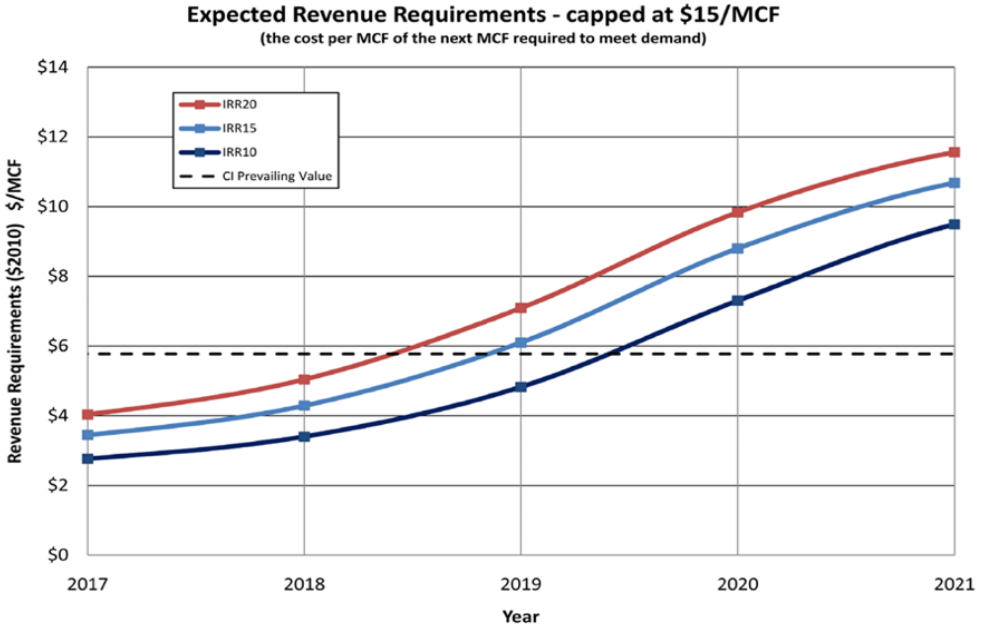

Figure 4 shows DNR's 2011 projections for the price rises necessary to incentivize the investment sufficient to meet local needs over time under different assumptions of company-required internal rates of return (IRR)

In 2018, DNR revisited its assessment of future Cook Inlet natural gas supplies. That analysis suggested that prices would continue to slowly rise through 2026 but would then need to rise sharply – probably exceeding $13-$16 per mcf – to be able to continue to meet local utility demand until the end of the decade.[10] However, even at these higher prices, the gas resources identified by DNR would not be sufficient to continue to meet local utility demand much past 2030. [11]

---

[6] See utility tariff filings TA540-18, TA530-8, and TA448-32 at https://rca.alaska.gov/RCAWeb/ViewFile.aspx?id=22E11B1F-C942-497B-A0CA-1FFFD86530ED, https://rca.alaska.gov/RCAWeb/ViewFile.aspx?id=5F6FDD69-90D8-4F15-92EC-663AE9285809, and https://rca.alaska.gov/RCAWeb/ViewFile.aspx?id=22E11B1F-C942-497B-A0CA-1FFFD86530ED, respectively.

[7] "Natural Gas Electric Power Price", EIA (2022), at https://www.eia.gov/dnav/ng/ng_pri_sum_a_EPG0_PEU_DMcf_a.htm

[8] Gibson et al, "Cook Inlet Natural Gas Production Cost Study." Alaska Department of Natural Resources, Division of Oil & Gas. (2011), at https://dog.dnr.alaska.gov/Documents/ResourceEvaluation/Cook_Inlet_Natural_Gas_Production_Cost_Study.pdf

[9] *Ibid*

[10] Redlinger et al, "Cook Inlet Natural Gas Availability." Alaska Department of Natural Resources, Division of Oil & Gas. (2018), at https://dog.dnr.alaska.gov/Documents/ResourceEvaluation/CI_Natural_Gas_Availability_Study_2018.pdf

[11] *Ibid*

In DNR's most recent study, the *2022 Cook Inlet Gas Forecast,* the agency projects that gas supply in Cook Inlet could fail to meet local demand as soon as 2027.[12] These DNR projections are in line with DNR's previous findings and show that gas shortages in Cook Inlet are imminent. DNR's most recent study also shows that to even meet demand through 2027, new well development (for "proved undeveloped" gas) will be necessary.

Figure 5: Cook Inlet Proved Developed & Proved Undeveloped Gas Supply [13]

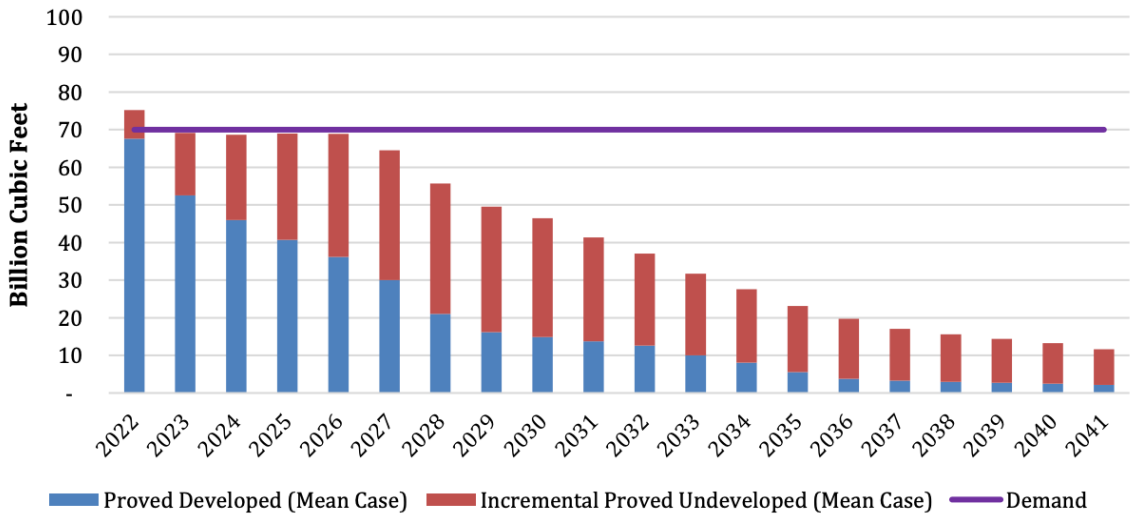

Figure 5 shows annualized gas volumes of proved developed and proved undeveloped with the demand profile for Cook Inlet gas of 70 Bcf per year

DNR's general characterization of future Cook Inlet production is consistent with Hilcorp's announcement last spring that it no longer has confidence it will be able to continue to meet Cook Inlet demand as the region's current utility contracts for gas expire.[14] Homer Electric Association has the first gas supply contract to expire, in 2024. ENSTAR's is the last, in 2031.

LNG Imports

In response to DNR's findings, Railbelt electric utilities have recently testified to Alaska's Senate Resources Committee that if an in-state natural gas pipeline does not materialize, they believe the answer to making up gas supply shortfalls is importing liquified natural gas (LNG).[15] When discussing proposals to import LNG, those utilities did not inform legislators of the effect LNG imports would have on electricity and home heating rates. However, *importing LNG will dramatically increase cost of natural gas in Cook Inlet* from the current average of $7.50/Mcf to somewhere between $12 and $25/Mcf, nearly doubling or even tripling gas costs.

This high cost of LNG is reflective of Alaska's location, and our proximity to the Japan-Korea-Marker (JKM) LNG market, the closest LNG market to the Railbelt. Japan's Ministry of Finance and Trade Statistics reports that spot LNG traded for more than $30/Mcf in December

[12] Burdick et al, 2022 Cook Inlet Gas Forecast. Alaska Department of Natural Resources, Division of Oil & Gas. (2022), https://dog.dnr.alaska.gov/Documents/ResourceEvaluation/Cook_Inlet_Gas_Forecast_Report_2022.pdf
[13] *Ibid.*
[14] DeMarban, Alex. "Hilcorp warns Alaska utilities about uncertain Cook Inlet natural gas supplies" Alaska Daily News (2022, May 17)
[15] Railbelt Utilities before Alaska State Senate Resources Committee (2022), https://www.akleg.gov/basis/Meeting/Detail?Meeting=SRES%202023-02-01%2015:30:00

2022. Since April 2021, spot LNG has averaged more than $25/Mcf – more than triple today's average Cook Inlet price.[16] Since natural gas makes up about 30% of the cost of our electricity, such an increase would have an outsized impact on both electricity and heating rates in Southcentral Alaska. Our continued over-reliance on natural gas for electricity generation means that, in a high import, spot-price scenario, electricity prices could rise by 50%.

Alternatively, the utilities are considering the possibility of negotiating lower prices for imported LNG by locking the region into long-term contracts. Not only would this scenario still increase the cost of gas to the region's consumers, but it would also effectively take Alaska out of the rapid clean energy transition that is now underway in the rest of the world. If we continue to depend heavily on gas, Alaska will miss out on the next 10 years of federal tax credits for renewables and instead, export billions of our energy dollars to a gas supplier somewhere else.

Importing LNG would be another blow to Alaska's struggling economy. Alaska's overall economic performance is already among the worst in the nation, with the state currently ranking as the worst in which to do business.[17] Importing LNG will only make this problem worse by increasing the price of both heat and electricity – and thus the cost of doing business.

Renewable Energy in the Cook Inlet Region

The cost of most everything in Alaska is higher than in the Lower-48 due to limited markets, difficult logistics and reduced economies-of-scale. Nevertheless, today renewable energy successfully competes in the Alaska marketplace. In March 2022, the RCA approved, without controversy, an electricity supply contract for the output of a relatively small 6 MW solar farm between Matanuska Electric Association (as purchaser) and an independent solar power, Energy 49, LLC (as provider). The RCA staff recommendation that supported the Commission's approval noted that the solar contract price would be less than the variable cost of MEA's gas supply by 2029, was just and reasonable, and, should be approved. The Commission concurred with the RCA staff.[18] The fact that Cook Inlet gas prices are now likely to be significantly higher than what the RCA contemplated over a year ago underscores the degree to which renewables can already favorably compete in the Railbelt.

There has never been a better time for the state's most populous region to transition to more local, stably priced renewable energy. Prices of renewables have dropped precipitously, and for the next 10 years the federal government will cover 30% of the investment cost. There are many ways for the region to take advantage of these generous federal tax credits. For example, REAP estimates that new rooftop solar on 25% of Anchorage's buildings could quickly generate about 10% of the city's residential electricity. This would boost local employment without relying on the same supply and financial resources that utility-scale solar installations require. In addition, large wind and solar projects, supplemented with battery storage, can be

[16] "Natural Gas", JOGMEC (2023): See https://oilgas-info.jogmec.go.jp/nglng_en/1009209.html.
[17] "Americas Top States for Business" (2022): https://www.cnbc.com/2022/07/13/americas-top-states-for-business-2022-the-full-rankings.html
[18] "Tariff Action Memorandum" for TA535-18, 3/10/2022. https://rca.alaska.gov/RCAWeb/ViewFile.aspx?id=179D912B-C930-4049-A108-E68764F19F9F

developed relatively quickly. The more the Railbelt can rapidly reduce its dependence on Cook Inlet natural gas in the short run, the less LNG the region will need to import. However, Railbelt utilities are showing no inclination to invest in renewable energy at the scale needed to limit LNG imports. Legislative action seems to be the only way to ensure the region's energy future.

Renewable Portfolio Standard (RPS)

Legislation was recently introduced in the Alaska House and Senate to establish a Renewable Portfolio Standard for the Railbelt region. An RPS is a simple and widely used policy tool that requires that electricity suppliers diversify their generation portfolios to include an increasing amount of electricity generated from local, stably-priced renewable energy sources. The proposed RPS would require the five electric utilities in the Railbelt to generate a specified percentage of their electricity from renewable sources according to the following timeline: 25% by the end of 2027, 55 percent by the end of 2035 and 80 percent by December 31, 2040. The region currently generates approximately 15 percent of its electricity from renewables.

Research recently conducted by the National Renewable Energy Laboratory (NREL) in Colorado and Analysis North in Anchorage both conclude that reaching the RPS goals outlined in the legislation is feasible. Analysis North found that achieving 80% renewable penetration in the Railbelt by 2040 would require $3.2 billion in new capital expenditures over the base case scenario NREL used in its analysis, which included new transmission upgrades that NREL assumed in all the scenarios it studied. Analysis North found that this $3.2 billion capital investment would save $6.7 billion in natural gas costs, producing a net benefit of $3.5 billion.[19]

Figure 6: Cost and Benefits of RPS Scenario 3[20]

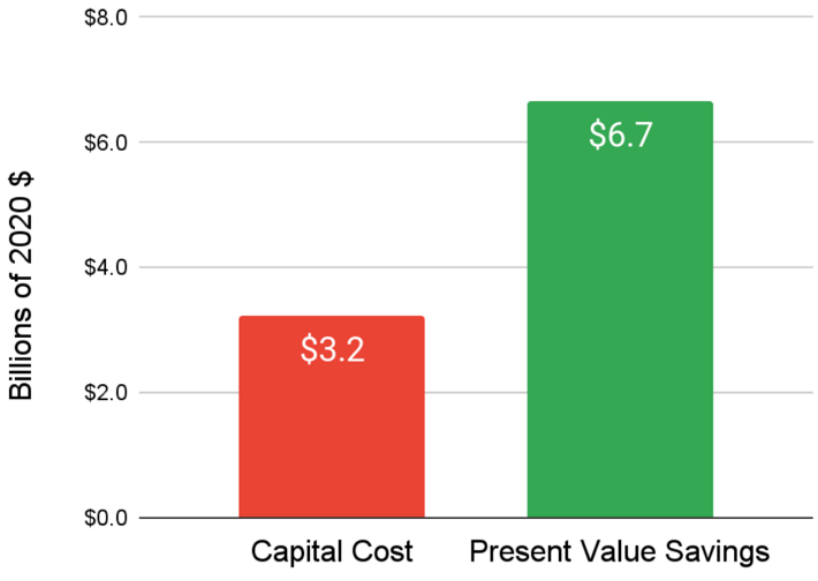

Figure 7 shows the present value of renewable energy capital cost investments, and the present value of natural gas

[19] *"Railbelt Renewable Portfolio Standard: Economic Analysis." Analysis North (2022) at https://www.analysisnorth.com/rps-econ.html*
[20] *Ibid*

Analysis North's net savings estimate is in many ways conservative. It assumed that federal investment tax credits would *not* be extended. However, the Inflation Reduction Act has now extended them until 2032. Analysis North also assumed that natural gas prices would no longer escalate after 2040 - a sharp break from the historical record. Finally, the analysis assumed that the cost of wind and solar installations would remain constant between 2022 and 2035, despite a decades-long trajectory that has steadily been bringing those prices down, a price trend that the US Energy Information Administration projects will continue.

A renewable portfolio standard would stabilize electricity costs and keep billions of energy dollars circulating in the state's economy. A standard would also help diversify the state's economy by attracting new companies that are seeking 100 percent renewable energy before they decide to invest in a new market. Developing the Railbelt's significant wind, solar and small hydropower resources would also create thousands of new local jobs, jobs that will not be created if the region decides to double down on natural gas generation by importing LNG.

The Railbelt region needs aggressive action now to install as much wind, solar and batteries as possible in the next five years, before major utility gas contracts with Hilcorp expire. Projects like an in-state gas line have been promised for decades but, even in the best case, will take far too long to develop to prevent the region from importing LNG. Meanwhile, wind, solar and batteries can all be installed on relatively short timeframes. Longer lead time renewables like small hydro, geothermal and tidal energy can follow. The Legislature should establish a Renewable Portfolio Standard that requires the Railbelt utilities to diversify the region's electricity portfolio. Such a standard would decrease the risk that the region imports LNG and accelerate a transition to local renewable energy that supports energy independence and a vibrant economy.