Intermountain Gas Company

IGRAC Invite and Meeting Materials

2023 – 2028

Exhibit No. 1

INTERMOUNTAIN® GAS COMPANY
A Subsidiary of MDU Resources Group, Inc.

INTEGRATED RESOURCE PLAN

MAY 2, 2023
INTERMOUNTAIN GAS RESOURCE ADVISORY COMMITTEE (IGRAC)

1

WELCOME

- Introductions
  - Name
  - Organization you are representing

2

BENEFITS OF AN IRP

- Blueprint to meet the Company's firm customer demands over a five-year forecast period based on various assumptions
- Provides frequent updates to the projected growth on the Company's system
- Considers all available resources to meet the needs of the Company's customers on a consistent and comparable basis
- Solicits input from Stakeholders during the modeling process
- Helps to ensure Intermountain Gas Company will continue to provide reliable energy service while minimizing costs

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INTERMOUNTAIN GAS COMPANY

- **Integrated Resource Plan Process**

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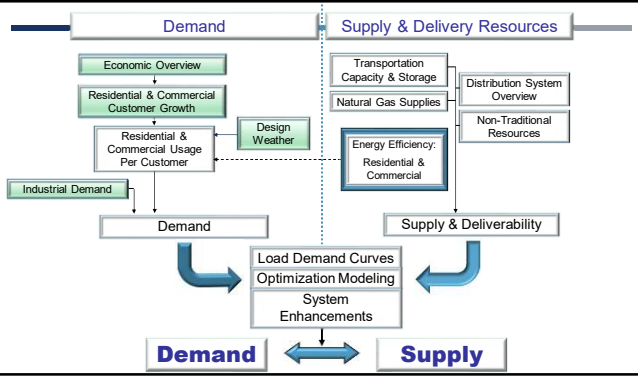

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AGENDA

- **Welcome & Introductions** – *Brian Robertson*
- **Safety Moment & Feedback Process** – *Brian Robertson*
- **IRP Recommendations** – *Brian Robertson*
- **System Overview –** *Brian Robertson*
- **Economic Forecast**– *Brian Robertson*
- **Residential & Commercial Customer Growth** – *Brian Robertson*
- **Design Heating Degree Days –** *Min Park*
- **Industrial Customer Forecasts** – Nicole Gyllenskog & *Dave Swenson*
- **Load Demand Curves** – *Brian Robertson*
- **Questions/Discussion**

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SAFETY MOMENT

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FEEDBACK SUBMISSIONS

- IRPComments@intgas.com
- Please provide comments and feedback within 10 days

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2021 IRP ACKNOWLEDGEMENT AND IRP RECOMMENDATIONS

- Final Order No. 35438 – Commission Acknowledged Intermountain's 2021 IRP Filing
- Commission Recommendations for Intermountain's IRP Process:
  - Staff recommends that the Company quantify the effects of new building codes and the Company's energy efficiency programs and incorporate estimates into its per customer usage models.
  - Staff recommends that the Company provide Staff capacity and cost information as enhancement projects are completed and brought online.
  - Staff recommends the Company vet future CPA results for accuracy to ensure the savings estimates and assumptions are reasonable and achievable.
  - Staff appreciates the Company incorporating model validation into this IRP and encourages the Company to continue to enhance this validation process as more AMI data becomes available.
  - Staff believes the Company can continue to enhance public participation by continuing to increase members of the IGRAC, providing materials to members prior to meetings, and making IRP information available on its website.

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SYSTEM OVERVIEW

BRIAN ROBERTSON
SUPERVISOR, RESOURCE PLANNING

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INTERMOUNTAIN GAS COMPANY

- Intermountain Gas Company is a natural gas local distribution company, founded in 1950 and served its first customer in 1956
- Provides service to 76 communities across southern Idaho
- 402,300+ customers

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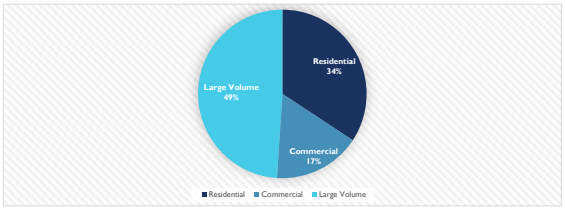
THROUGHPUT BY CUSTOMER CLASS



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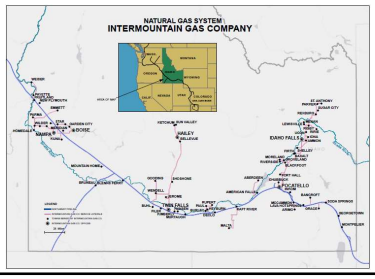
INTERMOUNTAIN GAS COMPANY DISTRIBUTION SYSTEM



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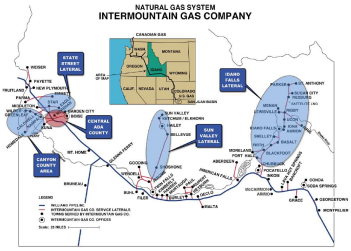
AREAS OF INTEREST (AOI)

- Distribution System Segments:
  - Canyon County
  - Central Ada County Lateral
  - North of State Street Lateral
  - Sun Valley Lateral
  - Idaho Falls Lateral
  - All Other Customers



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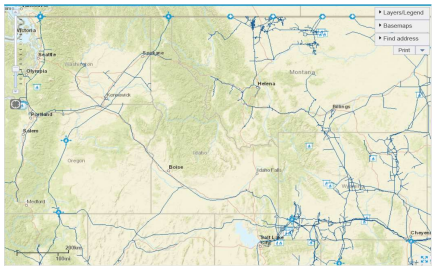
REGIONAL PIPELINES



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ECONOMIC FORECAST

BRIAN ROBERTSON

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WOODS & POOLE ECONOMICS, INC. Regional Projections

The methods used by Woods & Poole to generate the county projections proceed in four stages.

- First, forecasts to 2050 of total United States personal income, earnings by industry, employment by industry, population, inflation, and other variables are made.
- Second, the country is divided into 179 Economic Areas (EAs) as defined by the U.S. Department of Commerce, Bureau of Economic Analysis (BEA). The EAs are aggregates of contiguous counties that attempt to measure cohesive economic regions in the United States.
- The third stage is to project population by age, sex, and race for each EA on the basis of projected net migration rates. For stages two and three, the U.S. projection is the control total for the EA projections.
- The fourth stage replicates stages two and three except that it is performed at the county level, using the EAs as the control total for the county projections.

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Idaho Economic Forecast

for the State of Idaho and the Counties in Idaho

Future household growth, which is the key driver for future residential customer growth is modeled as a function of total population (less those individuals in group quarters), and general economic conditions in the state.

In brief: good or improving economic conditions will speed up the rate of household growth, however worsening or declining economic conditions will slow the rate of household formation and, in turn, slow the rate of household growth.

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Idaho Economic Forecast

The Great Recession of 2008 brought about a significant decline in Idaho's nonagricultural employment. From year-end 2007 through 2010 Idaho nonagricultural employment decreased by 7.9%, a loss of 51,500 jobs. The effects of 2008 – 2010 recession were relatively long lasting. Total nonagricultural employment in the state attained an annual average of 654,700 in 2007. It took 7 years, until the year 2014, for nonagricultural employment in the state reach prerecession levels.

Since 2014 Idaho's economy has regained its economic footing. Total nonagricultural employment in the state surged upward gaining nearly 105,000 jobs in five years – an annual average pace of 3.0% per year. During those five years Idaho was consistently ranked among the 5 fastest growing states in the nation.

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Idaho Economic Forecast

The COVID-19 Pandemic & Idaho's Economic & Population Growth:

In 2020 the COVID-19 pandemic brought Idaho's economic growth to a halt. From February 2020 to April 2020 nonagricultural in Idaho declined by 9.8% - a decrease of 74,300 jobs in a period of two months. This was a much sharper and steeper economic decline than that experienced in the 2008 Great Recession.

Initial expectations were that an economic recovery could be a long and tedious process. However, the latest economic statistics seem to indicate that that may not be the case in Idaho. The growth in Idaho's population was a driving force in Idaho's economic growth prior to the pandemic and continues today. Population growth in the state has brought new jobs to the state and spurred on construction and trade employment in the state.

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Idaho Economic Forecast

The COVID-19 Pandemic & Idaho's Economic & Population Growth:

Some statistics:

While Idaho's non-ag employment declined by nearly 74,000 in two months, construction employment in the state continued to grow – up 5.2% (about 1,800 jobs) at year-end 2020 when compared to year-earlier levels. Non-ag employment has since rebounded to expected levels beginning mid-2021.

Total population in Idaho has increased at a robust pace since 2010. Through 2019 the US Census Bureau estimates that Idaho's population increased by 219,500 (14.0% - a annual average increase of 2.0% per year over the 2010 to 2019 period). These increases are overwhelmingly due to a robust in-migration to Idaho. A 2.0% annual average rate of population growth, minus a natural population growth rate of 0.42% per year, leaves an annual average population increase of 1.58% per year (about 28,000 persons per year) due to in-migration.

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Idaho Economics Winter 2020 Economic Forecast

The COVID-19 Pandemic & Idaho's Economic & Population Growth:

The COVID – 19 pandemic has not yet slowed Idaho's population growth. Per the US Census Bureau, Idaho was ranked as the fastest growing state in the nation during 2020. This has only continued into 2021 and 2022, as Idaho's population grew 2.98% and 1.82%, respectively. Idaho was the fastest growing state in 2020 and 2021, and the second fastest growing state in 2022.

What is origin of Idaho's population in-migration? Statistics indicate that California is the major source of Idaho's current population growth. The pandemic has accelerated that pace of out-migration. The latest US Census Bureau estimates California's 2022 population decreased nearly 114,000 last year. Over the last 2 years the Census Bureau has estimated that approximately 236,000 persons per year have left California.

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And Then There is Idaho's Population Growth

The Base Case Economic Forecast assumes a normal amount of economic fluctuation and normal business cycles it is the "best estimate" of future economic activity in the State and it's forty four counties.

The High Growth Scenario assumes a more rapidly growing economy -- similar to the growth that Idaho experienced in the 1990s.

The Low Growth Scenario assumes a period of slower economic growth for the State of Idaho with fewer employment opportunities in the future. In turn, slower economic growth will slow the rate of population growth in the state by decreasing population in-migration (or causing a population out-migration) and slowing the rate of future household growth in the state.

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The Economic Forecast

In the 2023 - 2030 Forecast Period Idaho's Economy will experience:

An annual average increase in Nonagricultural employment of 2.5% per year, adding nearly 709,500 jobs to the State's payrolls.

Population growth averaging 1.13% per year over the 2023 - 2030 forecast period with, by the year 2030, the State's population nearing 2,020,700. Ada and Canyon counties are projected to attain a total population of 844,000 in the year 2030.

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The Economic Forecast

Nonagricultural employment in Idaho is expected to increase by nearly 120,000 over the 2023 to 2030 forecast period. But some industries will fare better than others:

Agriculture is projected to remain steady with only gaining a modest 600 additional statewide jobs by 2030.

Similarly, the Mining industry is expected to gain only an 300 jobs statewide by the year 2030.

Manufacturing employment in Idaho is predicted to increase at an annual average rate of 0.53%per year over the 2023 - 2030 period for an absolute gain of nearly 3,000 jobs from the 2022 employment levels.

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The Economic Forecast

The Transportation, Wholesale and Retail Trade, and the Utilities industries are expected to post annual average employment gains of 0.94% per year over the 2023 to 2030 period producing an absolute gain of close to 12,700 new jobs in the State.

Employment in the Finance, Insurance, and Real Estate Industries is expected to increase by 19,000 over the 2023 - 2030 period -- an annual average increase of 2.3% per year.

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The Economic Forecast

The Service Industries in Idaho are expected to be the fastest growing in terms of employment growth over the 2023 to 2030 period –

Employment in the Professional and Technical Services category is forecasted to increase by 10,600 over the 2023 - 2030 period -- an annual average increase of 1.9% per year.

Education and Health Services employment in the State is forecasted to increase by 31,360 over the 2023 - 2030 period -- an annual average increase of 2.8% per year.

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The Economic Forecast

Idaho employment in the Leisure and Hospitality Industries is forecasted to increase by nearly 16,700 over the 2023 - 2030 period -- an annual average increase of 2.0% per year. Lastly, employment in the category of Other Services is projected to increase by 6,200 over the 2023 - 2030 period -- an annual average increase of 1.5% per year.

In total, Idaho Service Industry Employment is projected to increase by 22,900 over the 2023 to 2030 period – 60.6% of the overall increase in Non-Ag employment in the State over the forecast period.

Government employment is predicted to increase at an annual average rate of 0.8% per year over the 2023 - 2030 period with a net gain of nearly 7,000 jobs statewide.

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The Economic Forecast

QUESTIONS ?

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RESIDENTIAL & COMMERCIAL CUSTOMER GROWTH

BRIAN ROBERTSON
SUPERVISOR, RESOURCE PLANNING

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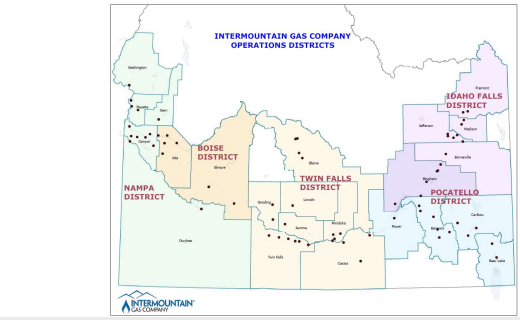

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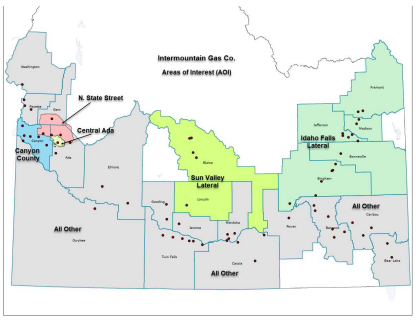

AOI GROWTH RATE

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FORECAST INPUTS

Year	County	Population	Employment
2023	ADA	511.806	375.903
2023	BANNOCK	89.713	50.571
2023	BEAR LAKE	6.093	3.545
2023	BINGHAM	47.651	23.78
2023	BLAINE	23.738	22.917

← Woods and Poole Data

Historic Actual Customer Counts →

Residential	2015	2015	2015	2015	2015	2016	2016
	8	9	10	11	12	1	2
Ada	135420	135729	136271	136864	137502	137814	138092
Bannock	20637	20660	20767	20911	21057	21112	21148
Bear Lake	1157	1160	1159	1165	1170	1171	1170
Bingham	7160	7169	7206	7251	7330	7349	7364
Blaine	9783	9793	9805	9851	9876	9885	9898

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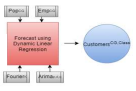
FORECASTING COMPONENTS

- Economic Forecast – State of Idaho
- $C^{CG,Class} = \alpha_0 + \alpha_1 Pop^{CG} + \alpha_2 Emp^{CG} + Fourier(k) + ARIMA\epsilon(p,d,q)$
- Model Notes:
  - C = Customers; CG = County; Class = Residential, Commercial, Industrial, or Interruptible; ARIMAϵ(p,d,q) = Indicates that the model has p autoregressive terms, d difference terms, and q moving average terms; Pop = Population; Emp = Employment; Fourier(k) = Captures seasonality of k number of seasons.
- Start with Linear Model
- Some are Naïve models
- Tests for any collinearity
- 'Boots-on-the-Ground' Observations/Feedback



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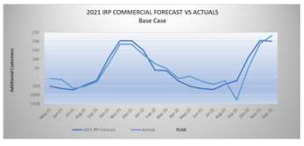
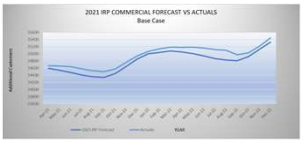
2021 IRP COMMERCIAL FORECAST VS ACTUALS





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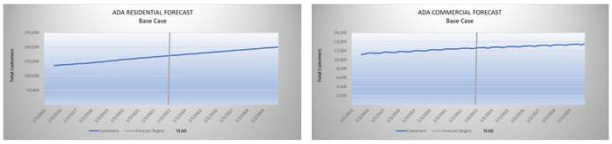
ADA COUNTY CUSTOMER FORECAST



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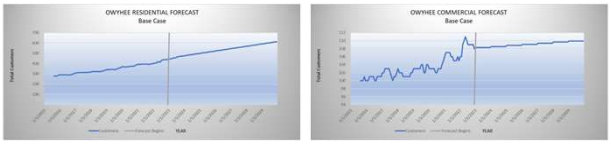
OWYHEE COUNTY CUSTOMER FORECAST



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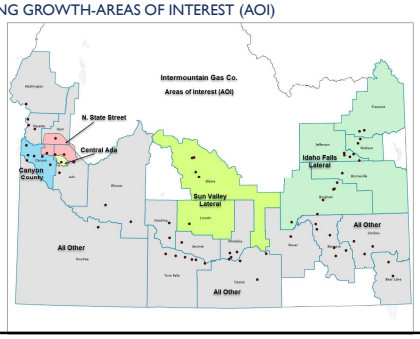
FORECASTING GROWTH-AREAS OF INTEREST (AOI)



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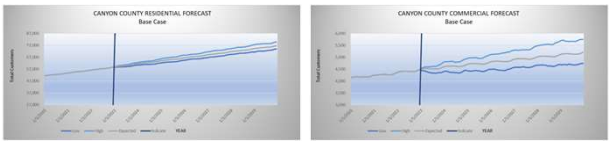
CANYON COUNTY CUSTOMER FORECAST



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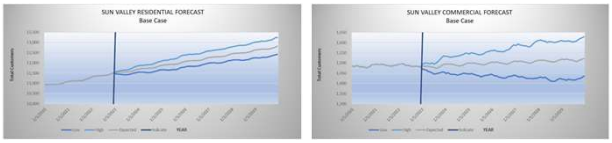
SUN VALLEY CUSTOMER FORECAST



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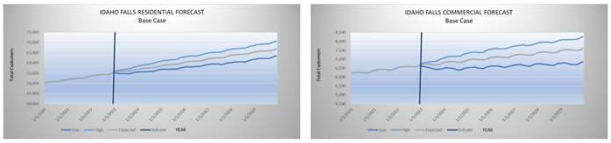
IDAHO FALLS CUSTOMER FORECAST



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N. OF STATE & CENTRAL ADA AREAS OF INTEREST

GIS Shape File of AOI's

N of State Street & Central Ada

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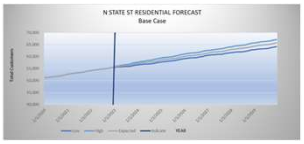
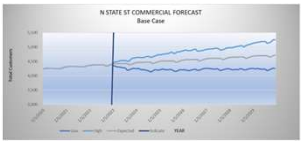
N STATE ST CUSTOMER FORECAST





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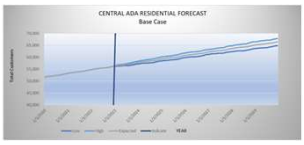
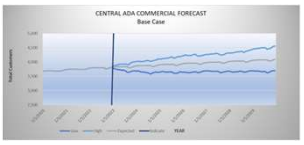
CENTRAL ADA CUSTOMER FORECAST





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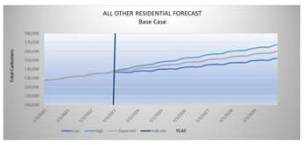
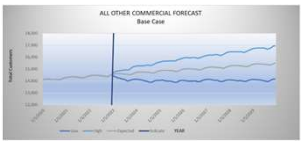
ALL OTHER CUSTOMER FORECAST





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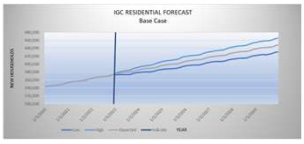
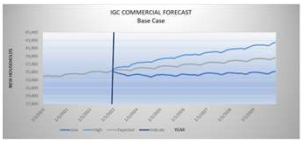
TOTAL SYSTEM CUSTOMER FORECAST





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QUESTIONS?

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HEATING DEGREE DAYS & DESIGN WEATHER

MIN PARK
REGULATORY ANALYST

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WEATHER

- Weather is a Key Residential & Commercial Demand Driver
- Heating Degree Days are Used to Capture Weather Effects
- Two Primary Weather Scenarios are Used in the IRP:
  - Normal HDD
  - Design HDD

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HEATING DEGREE DAY (HDD)

- What is a Heating Degree Day?
- Industry-Wide Standard Measuring Degrees Below a Set Base Temperature
- Base of 65 Degrees is Most Common

March 2nd, 2023 - Boise Example:

Daily High: 39 Degrees °F
Daily Low: 23 Degrees °F
Mean: 31 Degrees °F
65 Degrees – 31 Degrees = 34 HDD

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NORMAL HEATING DEGREE DAYS

- Benchmark for the IRP
- Used for Routine Planning and Represent the Typical or "Normal" Weather Expected on a Given Day
- 30-Year Rolling Average of Daily Mean Temperatures
- Normal for the IRP is the 30-Years Ended December 2022

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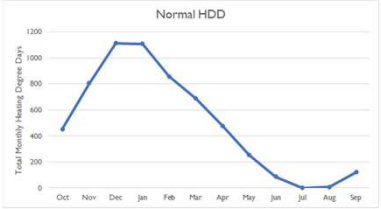
NORMAL HEATING DEGREE DAYS



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DESIGN DEGREE DAYS

- Design Degree Days Model the Coldest Temperatures that Could Feasibly Occur on Intermountain's System
- Created by Modeling Design Peak Day, then Modeling the Surrounding Week, Month, and Year

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DESIGN PEAK DAY

- Design Peak Day is the Absolute Coldest Day Planned for in the Design Year
- Engaged Idaho State Climatologist, Dr. Russell Qualls, to Conduct a Peak Day Study
- Study Produced a Range of Peak Days for Various Probability Assumptions
- 50-Year Peak-Day Event was Selected (78 HDD)
- Peak Day is Modeled to Occur on Jan 15th of the Design Year

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PEAK 5-DAY DESIGN

- The Days Surrounding the Peak Day are Modeled After the Coldest Recorded Consecutive 5-Days in a 50 Year Period.
- Peak Day is Assumed to be the Second Day in the 5-Day Period.

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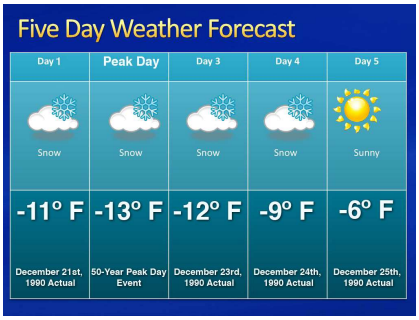

PEAK 5-DAY DESIGN

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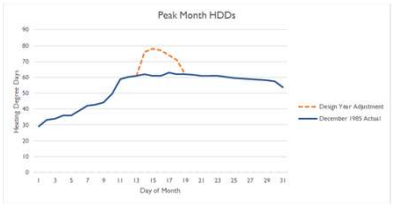
PEAK MONTH DESIGN

- The Days Surrounding the Peak 5-Day Period are Modeled After the Coldest Calendar Month in the last 50 Years
- The Current Peak Month is December 1985
- This Month Forms the Basis for January Design Weather



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DESIGNING THE REST OF THE YEAR

- The Rest of the Year is Modeled After the Coldest Heating Year in a 50 Year Record
- Oct 1984 – Sep 1985 Continues to be the Coldest
- This Period Also Included the Coldest Critical Three Month Heating Period (Dec-Feb)

Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep

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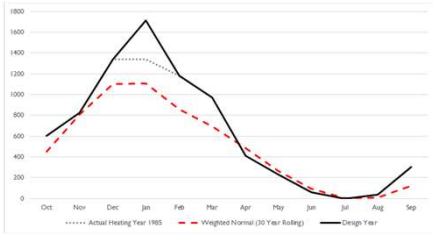
DEGREE DAY GRAPH



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AOI DEGREE DAYS

- Intermountain's service area is climatologically diverse
- Idaho Falls or Sun Valley vs. Boise
- Intermountain has developed unique Degree Days for each AOI
- Methods used to calculate AOI Degree Days mirror the Total Company approach

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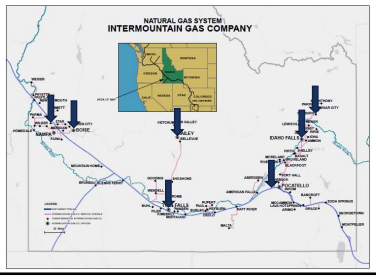
AOI DEGREE DAYS

Weather Stations West to East:
- KBOI
- KEUL
- KTWF
- KSUN
- KPIH
- KIDA
- KRXE



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QUESTIONS?

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2023 IRP
LARGE VOLUME CUSTOMER FORECAST

NICOLE GYLLENSKOG & DAVE SWENSON
MANAGERS, INDUSTRIAL SERVICES

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WHAT IS A LARGE VOLUME CUSTOMER?

- 149 largest customers; approximately 46% of 2022 sales
- Mix of "Industrial" and "Commercial" types
- As a group exhibit fairly high load factor
- Provide thousands of Idaho jobs; huge impact on economy

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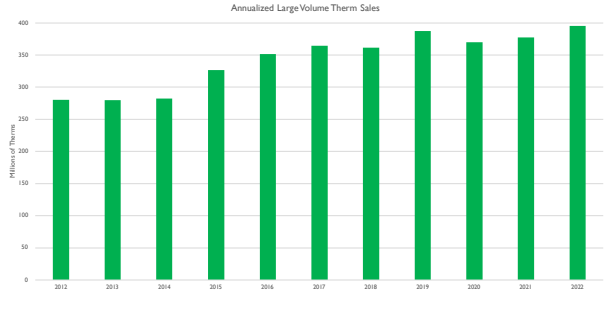

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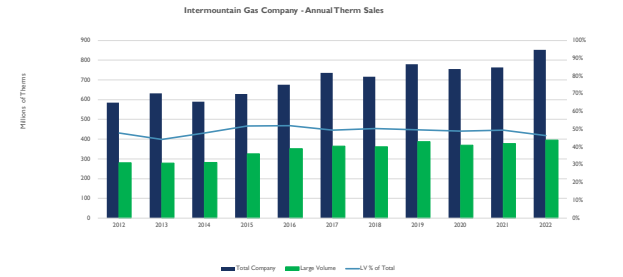

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REQUIREMENTS OF A LARGE VOLUME CUSTOMER

- Minimum 200,000 Therms per contract-year requirement
- Must elect 1 of 3 tariffs:
  - LV-1 bundled sales
  - T-3 interruptible transporation or T-4 firm transportation
- Minimum one-year contract; the contract sets the term and Maximum Daily Firm Quantity (MDFQ) for firm peak day use
- Contracts are site specific; can combine meters on contiguous property

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CLASSIFICATION OF CURRENT 149 LV CUSTOMERS

		Percent of Total	
By Rate Class:	# of	# of	Therms
LV-1 Sales –	36	24%	4%
T-3 Interruptible Transport –	9	6%	11%
T-4 Firm Transport –	104	70%	85%
Total –	149	100%	100%

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SEGMENTATION OF 149 LARGE VOLUME CUSTOMERS

By Market "Segment"	#	%	Therms%
Potato Processors –	18	12%	27%
Other Food Processors –	18	12%	32%
Meat & Dairy –	23	15%	13%
Ag & Feed –	8	5%	1%
Chemical/Fertilizer –	3	3%	9%
Manufacturing –	33	22%	7%
Institutional –	33	22%	6%
Other –	13	9%	5%
Total –	149	100%	100%

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LOCATION OF 149 LARGE VOLUME CUSTOMERS (BC)

By AOI:	#	%	Therms%
IFL –	28	19%	18%
SVL –	4	3%	1%
Central Ada –	2	1%	1%
State Street –	3	2%	1%
Canyon County –	21	14%	14%
All Other –	91	61%	65%
Total –	149	100%	100%

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OVERVIEW OF FORECAST TECHNIQUE

- Most not as weather sensitive as the Core Market
- Small population (not as many customers)
- Not as homogenous as Core (size, weather sensitivity)
- Don't use statistics/regression techniques
- Use an "adjusted" historical usage approach
- Forecast both Therm use and CD (MDFQ/MDQ)

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APPLICATION OF FORECAST TECHNIQUE

- Adjusted historical data with customer information and other data (e.g. EDO's) to develop three forecasts
  - Base Case
  - High Growth
  - Low Growth
- Assumed growth by specific customers
- Used recent trends to validate results

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SENDOUT STATISTICS

Core		Non Core	
Month to Date Plan	6,997,507	Month to Date Plan	3,948,149
Month to Date Actual	7,794,090	Month to Date Actual	4,099,699
MTD Over(Under) Plan	796,583	MTD Over(Under) Plan	151,550
MTD Over(Under) Plan %	11.38%	MTD Over(Under) Plan %	3.84%
Quarter to Date Plan	15,444,317	Quarter to Date Plan	11,111,058
Quarter to Date Actual	16,427,254	Quarter to Date Actual	11,758,323
QTD Over(Under) Plan	982,937	QTD Over(Under) Plan	647,265
QTD Over(Under) Plan %	6.36%	QTD Over(Under) Plan %	5.83%
Year to Date Plan	41,829,020	Year to Date Plan	38,494,499
Year to Date Actual	44,881,626	Year to Date Actual	39,518,831
YTD Over(Under) Plan	3,052,606	YTD Over(Under) Plan	1,024,332
YTD Over(Under) Plan %	7.30%	YTD Over(Under) Plan %	2.66%

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BASE CASE SCENARIO ASSUMPTIONS

- Starts with historical actuals
- Adjust for customer information and trends
- Natural gas prices competitive with other energy sources
- Economy dealing with inflation and supply chain issues
- Includes 5 new customers
- Mix of segments; 4 T-4 and1 LV-1; 3 are "All Other" in Magic Valley and 2 are in Canyon.
- Compounded annual growth rate of 1.01%

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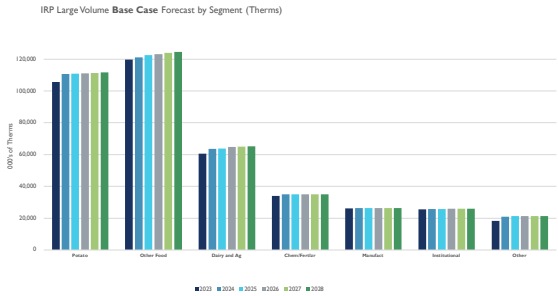

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HIGH GROWTH SCENARIO ASSUMPTIONS

- Starts with Base Case Forecast
- Natural gas prices remain comparatively low
- Economy comes out of the inflation with continued growth
- Assumes 10 new customers totaling 5.5 million Therms by 2028
- Additions mostly T-4 (9); 4 Meat & Dairy and 5 various segments; most growth in All Other
- Compounded annual growth rate of 2.37%

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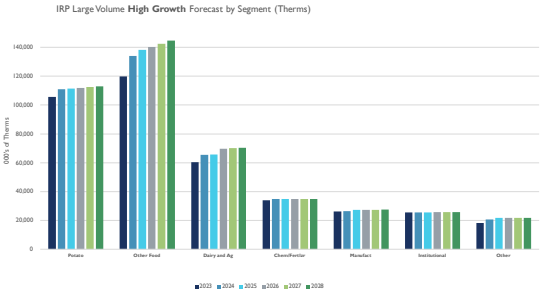

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LOW GROWTH SCENARIO ASSUMPTIONS

- Starts with Base Case Forecast
- Assume gas prices are less competitive
- Economy slows; recession or inflation causes slowing in growth
- Removed any customer having difficulty staying above the 200,000 Therm annual minimum
- Two new T-4 customers; 2 in the "Other," segment
- Compounded annual growth rate of -.07%

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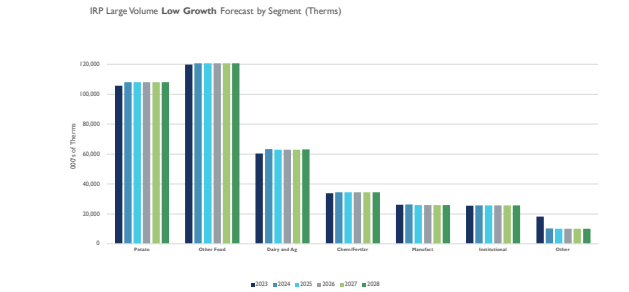

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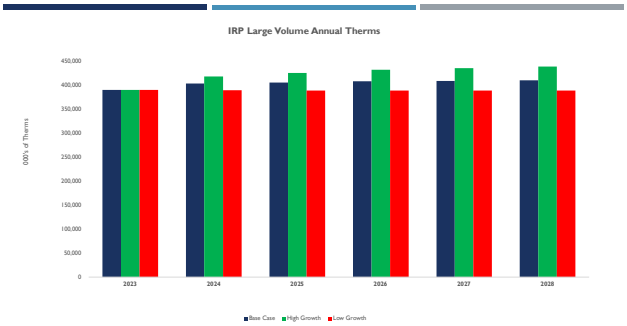

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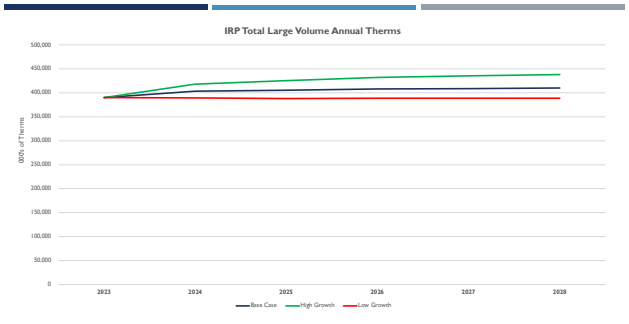

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OPTIMIZATION MODELING - MDFQ VS THERM FORECAST

- Use MDFQ not therm forecast in optimization model
- Contract includes Maximum Daily Firm Quantity (MDFQ)
- Intermountain provides MDFQ 365 day/year; gas supply
- MDFQ trends therm projections
- Only firm customers in design peak; no interruptible
- Includes new customer additions
- Compounded annual growth rate of .08%

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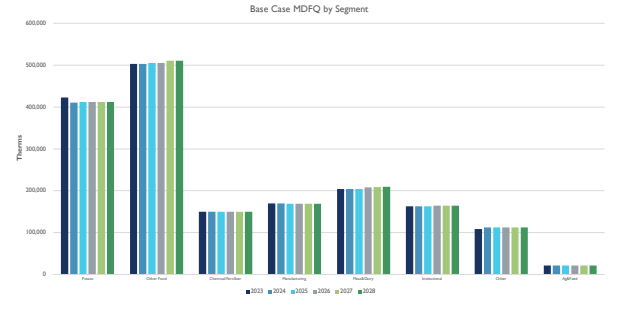

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QUESTIONS?

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LOAD DEMAND CURVES

- Incorporates several inputs
  - Res & Com Customer Forecast, Normal and Design Weather, Use Per Customer, Demand Side Management, and Large Volume Forecast.
  - LDC = (Customer Forecast * HDD * User Per Customer) – DSM + LV Forecast
- Load Demand Curve Utilization
  - Identifies potential upstream pipeline and distribution system constraints
  - Resource Optimization
  - Storage Management
- Remedies for Any Constraints Will be Identified Later
- Note: Load Demand Curves for upstream pipeline modeling will differ from distribution system modeling

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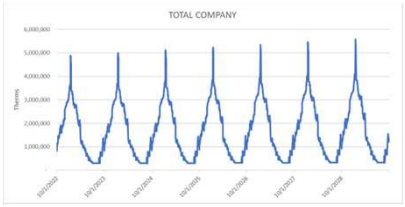

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AREAS OF INTEREST

- Idaho Falls Lateral
- Sun Valley Lateral
- Canyon County Lateral
- North of State Street Lateral
- Central Ada County

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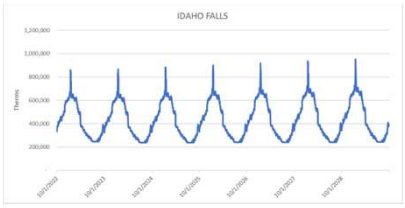

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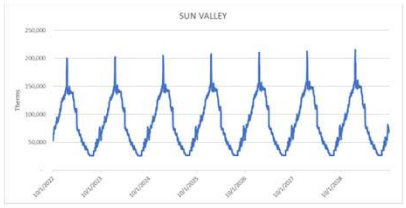

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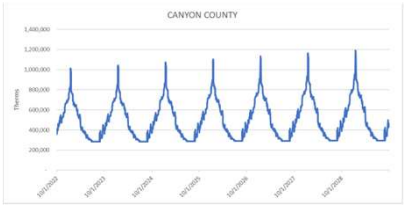

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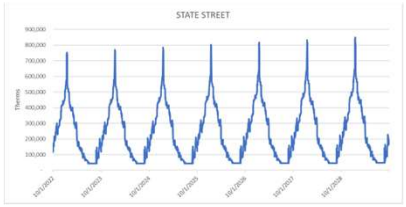

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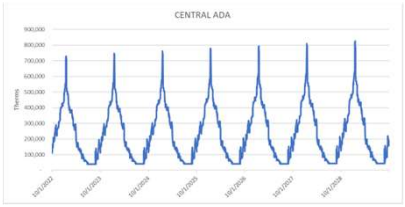

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QUESTIONS?

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ADDITIONAL MEETINGS

- **Thursday, June 8, 2023 via Microsoft Teams**
  - Usage Per Customer
  - Energy Efficiency
  - Supply Side Resources
  - Distribution System Modeling
- **Wednesday, August 2, 2023 via Microsoft Teams**
  - Potential Capacity Enhancements
  - Resource Optimization
  - Planning Results

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FEEDBACK SUBMISSIONS

- IRP.Comments@intgas.com
- Please provide comments and feedback within 10 days

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IGRAC #1

Date & time: 5/2/2023, 9:00 AM to 11:00 PM MT

Location: Microsoft Teams Meeting

Presenters: Brian Robertson, Min Park, Nicole Gyllenskog,

In attendance: Bruce Folsom, Kevin Keyt, Brian Robertson, Kathleen Campbell, Nicole Gyllenskog, Mark Sellers-Vaughn, Lori Blattner, Brenna Garro, Matthew Hunter, Min Park, Michael Parvinen, Teresa McKnight, Eric Wood, Susan Davidson, Zachary Sowards, Russ Nishikawa, Dave Swenson, Jennifer DeBoer, Robyn Sellers

Introduction

Brian Robertson, Supervisor of Resource Planning, opened the meeting by welcoming and thanking stakeholders for participating in Intermountain's IRP Process. Brian then proceeded with introductions, the agenda, a safety moment, and a reminder of the stakeholder engagement goals.

Presentation #1 – 2021 IRP Acknowledgement and IRP Recommendations (Brian Robertson)

- Recommendations
    - Quantify effects of new building code changes
    - Provide capacity and cost information
    - Ensure accuracy of savings estimates and assumptions from CPA
    - Enhance validation as more AMI data becomes available
    - Make IRP info available on website

Comment: Kathleen Campbell ensures they have more AMI data and will be using it

Presentation #2 – System Overview (Brian Robertson)

- Large Volume 47% Residential 34% Commercial 17%
- Areas of Interest
    - Canyon County
    - Central Ada County Lateral
    - North of State Street Lateral
    - Sun Valley Lateral
    - Idaho Falls Lateral
    - All Other Customers

Question: "Are there multiple lines from Pocatello to Idaho Falls?"
Answer: "The Idaho Falls lateral runs from Pocatello to St. Anthony. Along the lateral there is a couple sections that have looped to reinforce the lateral. The Idaho Falls lateral has seen significant growth over the last couple of IRP's" – Kathleen Campbell

Presentation #3 – Economic Forecast (Brian Robertson)

- Nonagricultural employment decreased by 7.9% in Recession of '08
- April 2020 saw 9.8% decline due to pandemic
- Since 2010 Idaho's population increased 14%

- Fastest growing state in 2020, 2021, and second fastest in 2022
- 1.13% population growth/year projected 2023-2030

Presentation #4 – Residential & Commercial Growth (Brian Robertson)

- Forecast inputs
    - Woods and Poole population and employment
    - Historical customer count
- ARIMA model with Fourier term

Question: "How are you defining customer?"
Answer: "Based on meter count and unique ID" – Lori Blattner, Kathleen Campbell, Brian Robertson

Question: "Does Sun Valley account for snow melt in customer count seasonality?"
Answer: "No we don't include snow melt because those are interruptible customers" – Kathleen Campbell

Presentation #5 – Heating Degree Days & Design Weather (Min Park)

- Heating Degree Day based off 65 degrees
- 30-day rolling average of daily mean temperatures
- Design Degree Days model coldest temperature from Design Peak Day
- Peak Day modeled to occur Jan 15

Presentation #6 – Large Volume Customer Forecast (Nicole Gyllenskog)

- 149 large volume customers make up 47% of sales
- Minimum of 200,000 therms per contract year to be LVC
- Start with historic trends and add customer trends

Question: "At what point are you restrained by capacity on NWP?"
Answer: "We will have a discussion about this IGRAC 3" – Brian Robertson
Answer: "For T3, T4 contracts (most LVCs) the gas supply purchasing, and transportation is the customer or gas marketers' responsibility" – Dave Swenson
Answer: "NWP is Bi-directional and has fewer constraints in Intermountain territory than over in Cascade territories" – Kathleen Campbell
Answer: "Gas storage has increased to serve Intermountain customers and pipeline constraints in Intermountain's service territory has not been a concern yet." – Mark Sellers-Vaughn

Presentation #7 – Load Demand Curves (Brian Robertson)

- Load Demand Curve = (Customer Forecast * HDD *Use Per Customer) – DSM + LV Forecast

Comment: "Analyst to analyst questions and discussion is important, and should be done frequently" – Bruce Folsom

The Meeting was Adjourned – IGRAC #2 will be held on June 8, 2023 @ 9 AM MT

INTERMOUNTAIN® GAS COMPANY

A Subsidiary of MDU Resources Group, Inc.

INTEGRATED RESOURCE PLAN

JUNE 8, 2023

INTERMOUNTAIN GAS RESOURCE ADVISORY COMMITTEE (IGRAC)

1

WELCOME

- Introductions
- Feedback Process
- Agenda

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FEEDBACK SUBMISSIONS

- IRP.Comments@intgas.com
- Please provide comments and feedback within 10 days

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AGENDA

- **Welcome & Introductions** – Mark Sellers-Vaughn *(Manager, Supply Resource Planning)*
- **Safety Moment** – Jenny De Boer *(Resource Planning Economist I)*
- **Distribution System Modeling** – Kathleen Campbell *(Senior Engineer)*
- **Avoided Cost Methodology –** Min Park *(Regulatory Analyst I)*
- **Energy Efficiency** – Kathy Wold *(Manager, Energy Efficiency)*
- **Supply Resources and Transportation & Storage Resources** – *Eric Wood (Supervisor, Gas Supply), Devin McGreal (Sr. Resource Planning Economist)*
- **Questions/Discussion**

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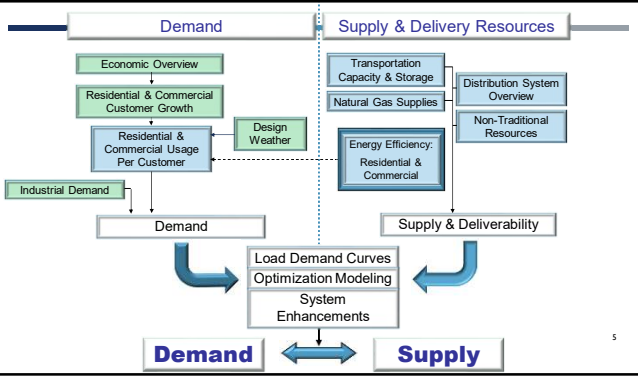

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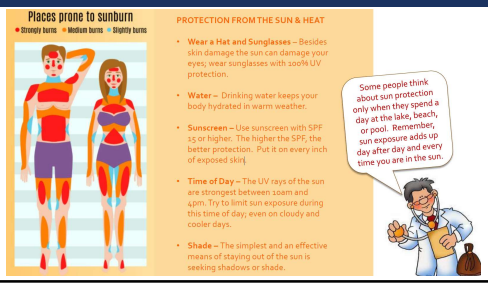
SAFETY MOMENT



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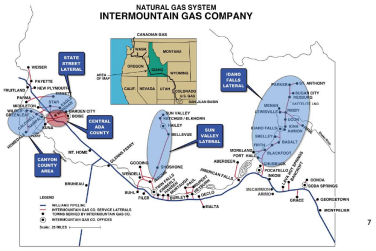
AREAS OF INTEREST (AOI)

- Distribution System Segments:
  - Canyon County
  - Central Ada County Lateral
  - "North of State Street" Lateral
  - Sun Valley Lateral
  - Idaho Falls Lateral
  - All Other Customers



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DISTRIBUTION SYSTEM PLANNING

KATHLEEN CAMPBELL, PE – SENIOR ENGINEER
ZACHARY SOWARDS – ENGINEER III

IDAHO
JUNE 8TH, 2023

8

SYSTEM DYNAMICS:

- Piping:
  - Diameter – ½" to 16"
  - Material – Polyethylene and Steel
  - Operating Pressure – 60 psi to 850 psi
  - Idaho – approx. 7,155 miles of distribution & 284 miles of transmission

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SYSTEM DYNAMIC'S CONT.

- Facilities:
  - Regulator stations – Over 600
  - Other equipment such as LNG, odorizer and compressors



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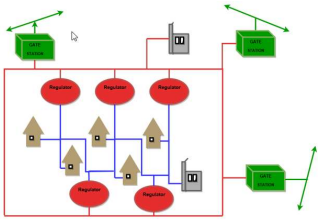
SYSTEM DESIGN



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SYNERGI GAS MODELING

- To evaluate our systems for growth and potential future deficits we use our gas modeling software, Synergi Gas
- Distributed and supported by DNV
- Models incorporates:
  - Total customer loads
  - Existing pipe and system configurations
- Hydraulic modeling software that allows us to predict flows and pressures on our system based on gas demands predicted during a peak weather event.
- Models are updated every three years and maintained between rebuilds

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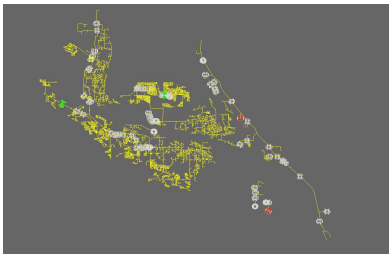
SYNERGI MODEL EXAMPLE



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MODEL BUILDING PROCESS

- Synergi models are completely rebuilt every three years and maintained/updated between rebuilds
- When models are rebuilt
  - We export current GIS data to build spatial model
  - We export 5 years of CC&B billing data to CMM to create an updated demands file
  - We validation and calibrate each district model to a recent low-pressure event using existing data (ERXs/pressure charts/SCADA/metertek/LV usage)
  - We create a design day model based on the updated heating degree day determined by gas supply (determined by trending historical weather events)
- IGC models were rebuilt in Fall of 2021

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DATA GATHERING

- CC&B (Customer Billing Data)

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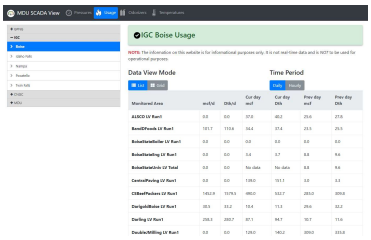
DATA GATHERING



- SCADA Data
- Real time and historical flow characteristics at specific locations in the system

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DATA GATHERING

Town	HDD	Avg Daily Temperature (°F)
Boise	75	-10
Nampa	68	-3
Pocatello	82	-17
Idaho Falls	88	-23
Twin Falls	77	-12
Ketchum	82	-17

- Peak Heating Degree Day (HDD) modeled by IGC based on historical weather data

Peak HDD = 65 – Average Daily Temp

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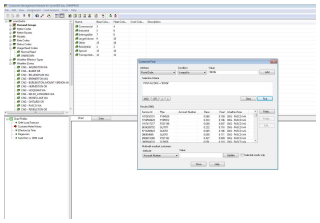
CUSTOMER MANAGEMENT MODULE (CMM)



- Brings CC&B customer data into Synergi as demands file
- Demand file applies load spatially in the model.

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IDAHO FIXED NETWORK UPDATE

- IGC has a goal of reading 90% of customer meters though Fixed Network Devices
- Device installation has been ongoing with 61% coverage completed though Q1 2023
- 90% coverage expected by end of year 2023

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FIXED NETWORK TO MODELING COMPARISON

Fixed Network VS CMM	2021	2023
Number of Data Points Compared	100	892
% Difference	12%	2%

- 2021 Data was collected from a single service territory
- 2023 Data was collected from all IGC service territories containing fixed network devices

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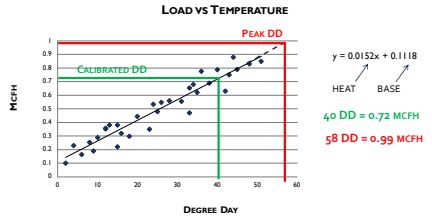
CALIBRATED VS PEAK DEGREE DAY



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IDENTIFICATION OF SYSTEM DEFICITS/CONSTRAINTS

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SYNERGI MODELING CAPABILITIES:

- Review Large Volume Customer requests
- Model RNG
- Supports design/sizing of pipe and pipeline components (regulator stations, compressors)
- Future planning
- Model IRP predicted growth
- Identify deficiencies
- Determine system reliability
- Optimize distribution enhancement options
- Cold Weather Action Plans and Modeling Curtailments/Interruptible Customers

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WHAT IS A CAPACITY DEFICIT?

- A deficit is defined as a critical system that is at or limiting capacity.
- Critical system examples include:
  - Pipeline bottlenecks
  - Minimum inlet pressure to a regulator station or HP system
  - Minimum inlet pressure to compressor (suction)
  - Component limiting capacity

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DISTRIBUTION SYSTEM MODELING PROCESS TO ENSURE WE CAN MEET IRP GROWTH PREDICTIONS

- As part of the IRP process, we complete a comprehensive review of all of our distribution system models every two years to ensure that we can maintain reliable service to our customers during peak low temperature events.
- With our capital budget cycle, we also complete system reviews on an annual basis.
- If a deficit is predicted the system is evaluated and a reinforcement/enhancement is proposed and selected based on alternative analysis considerations and placed into the capital budget based on timing needs of the predicted deficit.

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DISTRIBUTION ENHANCEMENT/REINFORCEMENT OPTIONS TO ADDRESS DEFICITS

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ENHANCEMENT OPTIONS

- Pipeline:
  - Replacements
  - Reinforcements
  - Loops & Back feeds
  - Pressure Increases
  - Uprates
- Facility Upgrades
- Additional Regulator Stations feeding the distribution system
- New Strategically placed Gate Stations
- Compressor Stations

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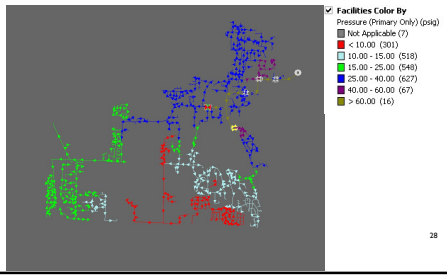
DISTRIBUTION ENHANCEMENT EXAMPLE

- Theoretical low-pressure scenario



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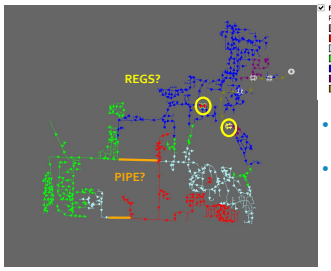
DISTRIBUTION ENHANCEMENT OPTIONS

- Low pressure scenario



- Compressor station infeasible
- Other Solutions?

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DISTRIBUTION ENHANCEMENT OPTIONS

- Reinforcement option #1

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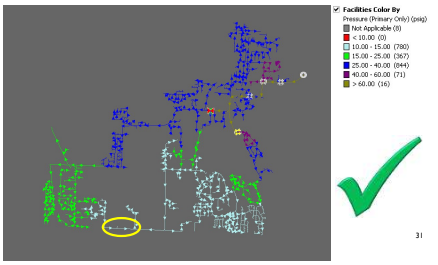
DISTRIBUTION ENHANCEMENT OPTIONS

- Reinforcement option #2



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ENHANCEMENTS CONSIDERATIONS

- Scope
- Cost
- Capacity Increase
- Timing
- System Benefits
- Alternative Analysis
- Feasibility

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ENHANCEMENT REVIEW AND SELECTION PROCESS TO CAPITAL BUDGET

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ENHANCEMENT SELECTION GUIDELINES:

- Shortest segment of pipe that addresses deficiency
- Segment of pipe with the most favorable construction conditions
- Segment of pipe that minimizes environmental concerns and impacts to the community
- Segment of pipe that provides opportunity to add additional customers
- Total construction cost including restoration

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ENHANCEMENT SELECTION PROCESS:

Info & Data

↓

Project & Schedules

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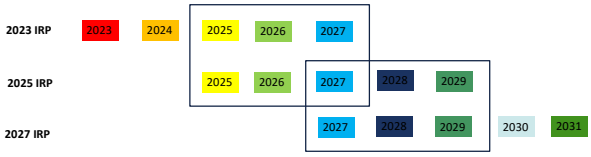
ITERATIVE PROCESS OF IRP



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QUESTIONS?

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AVOIDED COST METHODOLOGY

MIN PARK
REGULATORY ANALYST

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A BRIEF HISTORY

- INT-G-19-04, Order No. 34536 directed the Company to review its avoided cost calculations.
- In early 2020, Intermountain invited interested members of the Energy Efficiency Stakeholder Committee (EESC) to join an Avoided Cost Subcommittee.
  - Met three times between February and June 2020
  - The Subcommittee came to an understanding on the general Avoided Cost methodology
  - Avoided cost subcommittee met in March of 2022
  - Could not agree on distribution cost (still set at 0)

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AVOIDED COST OVERVIEW

"A Penny Saved is a Penny Earned."

- The *Avoided Cost* is used to put a dollar value to energy savings.
- This allows utilities to spot opportunities where energy efficiency is more cost effective than a supply-side option.

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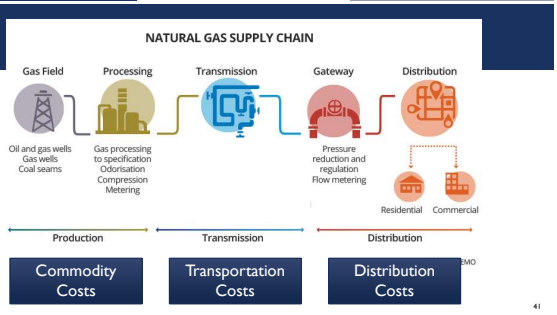

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FORMULA

$$AC_{Nominal} = CC + TC + VDC$$

- $AC_{Nominal}$ = Nominal Avoided Cost Per Therm
- CC = Commodity Cost
- TC = Transportation Cost
- VDC = Variable Distribution Cost

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COMMODITY COST CALCULATION

- The price of a molecule of gas depends on the basin, the time of year, and even the day of the week.
- Calculation starts with internal 30-year price forecasts for three primary basins.
  - Basins prices are weighted based on company Day Gas purchase data.
  - Normal Heating Degree Days (HDD65) are used to shape monthly prices.

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TRANSPORTATION COST CALCULATION

- Includes the cost of reserving additional capacity on the Northwest Pipeline.
  - Based on costs & volumes listed in latest tariffs for RS and GS-1 customers.
- Also contains variable costs associated with transporting gas to city gate.

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DISTRIBUTION COST CALCULATION

- Energy efficiency can lead to delaying or even avoiding costly pipeline capacity expansions.
- Large expansions occur irregularly, making it difficult to quantify this type of saving.
- Currently, the calculation contains a placeholder value of $0.00 for this cost component.
- As part of this IRP Process, Intermountain will work with stakeholders to try to develop a distribution system cost.

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2023 IRP UPDATES

- Updated Basin price forecast.
- Updated HDD Shaping to use 2022 Normal weather.
- Added new year of Day Gas purchase data.
- Updated transportation cost with latest PGA tariff.
- Inflation Rate updated from 2% to 3.15 %.

Levelized Avoided Cost by Year
Discounted 2022 $ Therm

YEAR	UPDATED COST	PREVIOUS COST
2022	$0.87	0.50
2023	$1.27	0.50
2024	$1.15	0.50
2025	$1.05	0.50
2026	$0.99	0.50
2027	$0.93	0.51
2028	$0.89	0.51
2029	$0.85	0.51
2030	$0.82	0.51
2031	$0.80	0.51
2032	$0.78	0.52

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QUESTIONS?

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Energy Efficiency

KATHY WOLD
MANAGER, ENERGY EFFICIENCY

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Energy Efficiency

Demand Side Management (DSM) refers to resources acquired through the reduction of natural gas consumption due to increases in efficiency of energy use.

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DSM: Resources acquired through the reduction of consumption due to energy efficiency

Option A:
Purchase MMBtu from Supplier A
$$$$

Option B:
Energy Efficiency Program
Therm savings (MMbtu)
$$

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INTERMOUNTAIN® GAS COMPANY

Energy Efficiency

Rebate	Minimum Efficiency	Incentive Amount
Combination Boiler for Space and Water Heat	95% AFUE	$800
Furnace	95% AFUE	$350
Boiler	95% AFUE	$800
Storage Water Heater	.68 UEF	$115
Tankless Water Heater Tier I	.91 UEF	$325
Tankless Water Heater Tier II	.87 UEF	$300
Smart Thermostat Use the ENERGY STAR Smart Thermostat Finder.	ENERGY STAR® Certified	$100

www.intgas.com/saveenergy

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INTERMOUNTAIN® GAS COMPANY

Energy Efficiency

WHOLE HOME TIER I – $900

- HERS rated
- Air sealing at or below 3 ACH at 50 Pa
- Ceiling insulation at or above R-49
- Ducts and air handler located inside conditioned space or duct leakage to outside of less than 4 CFM25/100 ft2 CFA
- Furnace efficiency at or above 97% AFUE

WHOLE HOME TIER II – $700

- HERS rated
- Air sealing at or below 4 ACH at 50 Pa
- Ducts and air handler located inside conditioned space or duct leakage to outside of less than 4 CFM25/100 ft2 CFA
- Furnace efficiency at or above 95% AFUE

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INTERMOUNTAIN® GAS COMPANY

Energy Efficiency

WHOLE HOME TIER I – $900

- HERS rated
- Air sealing at or below 3 ACH at 50 Pa
- Ceiling insulation at or above R-49
- Ducts and air handler located inside conditioned space or duct leakage to outside of less than 4 CFM25/100 ft2 CFA
- Furnace efficiency at or above 97% AFUE

WHOLE HOME TIER II – $700

- HERS rated
- Air sealing at or below 4 ACH at 50 Pa
- Ducts and air handler located inside conditioned space or duct leakage to outside of less than 4 CFM25/100 ft2 CFA
- Furnace efficiency at or above 95% AFUE

NEW OPTION: Stack the savings and stack the cash in your pocket! Layer water heating and/or smart thermostat rebates on top of the Whole Home Tier I or Tier II rebate.

Example 1:

Whole Home Tier I	$900
Tier I Tankless Water Heater	$325
Smart Thermostat	$100
Total Potential Rebate	**$1,325**

Example 2:

Whole Home Tier II	$700
Smart Thermostat	$100
Total Potential Rebate	**$800**

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INTERMOUNTAIN® GAS COMPANY

Energy Efficiency

Commercial Energy Efficiency

HEATING INCENTIVES

Eligible Appliance	Efficiency Rating	Rebate
Condensing Unit Heater	90% AFUE or Greater Efficiency	$1,500
Boiler Reset Control	N/A	$350
High-Efficiency Condensing Boiler	90% or Greater Thermal Efficiency and ≥300 kBTUh	$4.50/kBTUh

KITCHEN EQUIPMENT INCENTIVES

Eligible Appliance	Efficiency Rating	Rebate
Fryer	ENERGY STAR® Certified	$800
Steamer	ENERGY STAR® Certified (≥38% cooking eff/≤2,038 BTU/hr/pan Idle Rate)	$1,100
Griddle	ENERGY STAR® Certified (≥38% cooking eff/≤2,650 BTU/hr/pan Idle Rate)	$200

ENERGY STAR® Commercial Food Service Product Finder

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Guidehouse
Outwit Complexity

INTERMOUNTAIN GAS COMPANY 2023 CONSERVATION POTENTIAL ASSESSMENT

EESC PRESENTATION
FINAL RESULTS

May 25, 2023

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GUIDEHOUSE TEAM


Robin Maslowski
Project Director
Guidehouse


Jon Starr
Professional Director
Guidehouse


Neil Podkowsky
Project Manager
Guidehouse


Aneesha Aggarwal
Deputy Project Manager
Guidehouse


Brian Chang
Measure Lead
Guidehouse


Raniel Chan
Modeling Lead
Guidehouse

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WHAT ARE THE OBJECTIVES FOR THIS CONSERVATION POTENTIAL ASSESSMENT (CPA)?

Assess Achievable Energy Savings Potential	• Rationally and transparently estimate achievable natural gas energy efficiency (EE) potential within IGC service territory • Forecast net impacts from 2024-2044
Apply Results	• Inform IGC's EE goals, portfolio planning, and budget setting • Contribute to IGC's Integrated Resource Planning process (IRP) • Identify new EE savings opportunities

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2023 CPA METHODOLOGY

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WHAT IS A CONSERVATION POTENTIAL ASSESSMENT?

- Measure Energy Savings
- Measure Life
- Technology Density and Saturation

- Avoided Costs
- Measure Costs

- Historical Program Achievements
- Program Budget
- Customer Adoption Characteristics

Technical Potential
Total energy savings available by end-use and sector, relevant to current population forecast

Economic Potential
Utility Cost Test (UCT) cost-effectiveness screen

Achievable Potential
EE expected to be adopted by programs

Establishes Goals & Scenarios for Forecast

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ACHIEVABLE POTENTIAL FOR REBATE PROGRAMS

- The EE savings that could be expected in response to specific levels of program incentives and assumptions about existing policies, market influences, and barriers.
- Estimated by:
  - Calculating the market share, or penetration of measures based on customer awareness of the measure and customer willingness to adopt the measure
  - Willingness is determined by comparing payback time associated with efficient measure against competing measures
  - Calibrating forecast using historic program data

Technical Potential
Total energy savings available by end-use and sector, relevant to current population forecast

Economic Potential
Cost-effectiveness Screen

Achievable Potential
EE expected to be adopted by programs

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DETAILED RESULTS

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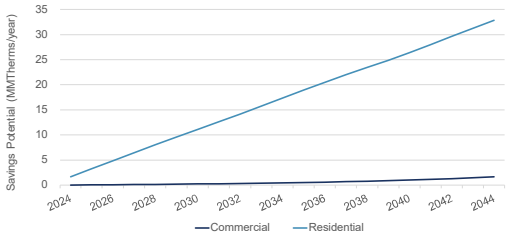
NATURAL GAS ENERGY (MMTHERMS/YEAR) CUMULATIVE NET ACHIEVABLE POTENTIAL BY SECTOR



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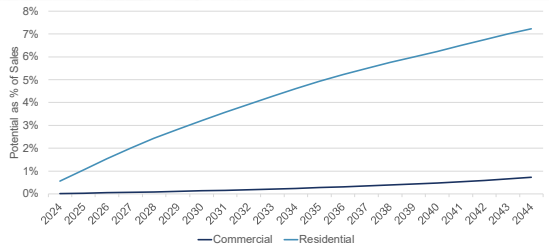
TOTAL NATURAL GAS CUMULATIVE NET ACHIEVABLE POTENTIAL AS A % OF FORECAST NATURAL GAS SALES



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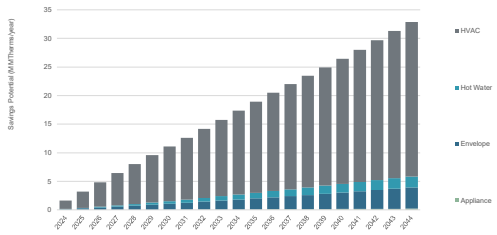
CUMULATIVE NET NATURAL GAS ACHIEVABLE POTENTIAL BY RESIDENTIAL SECTOR END USE (MMTHERMS/YEAR) (BUSINESS AS USUAL)



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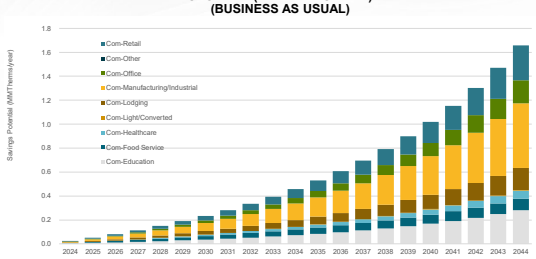
CUMULATIVE NET NATURAL GAS ACHIEVABLE POTENTIAL BY COMMERCIAL CUSTOMER SEGMENT (MMTHERMS/YEAR) (BUSINESS AS USUAL)



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SCENARIOS

Unconstrained Historical Budget	Medium Adoption	High Adoption, High Incentive
• Assumes a **ramp up** of customer adoption **through 2029** driven by increased IGC program activity • **Without constraining program spending to historical levels**. • Incentives at **50%** incremental cost.	• **Increase** in adoption parameters for **customer awareness and willingness to adopt** EE technologies. • Incentives at **50%** incremental cost.	• **Further increased** adoption parameters for **customer awareness and willingness to adopt** to highest levels based on Guidehouse's experience and rules of thumb. • Incentives at **65%** incremental cost.

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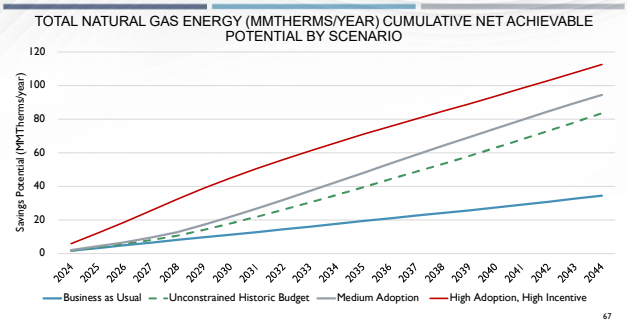

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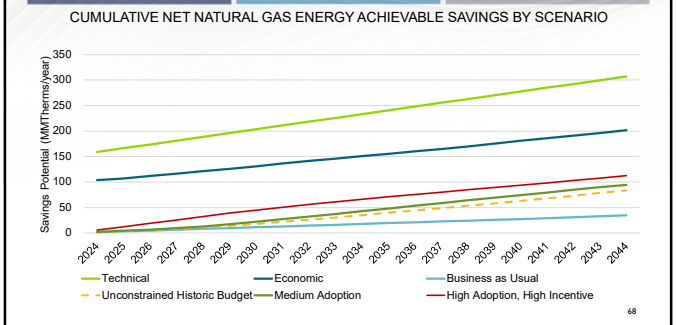

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QUESTIONS?

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BREAK

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SUPPLY & DELIVERY RESOURCES

ERIC WOOD
SUPERVISOR, GAS SUPPLY

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GAS SUPPLY PLANNING

- What's the goal? To meet the energy needs and expectations of our customers:
  - Reliability (365 days per year)
  - Security (delivery on the coldest day)
  - Competitive and stable prices through a mix is fixed priced hedges
  - Efficiently meet future growth
  - Frequently evaluate the portfolio

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NATURAL GAS SUPPLIES

What are Traditional Supply Resources?

- Natural gas supply; the molecules or "commodity"
- Interstate pipeline capacity
- Storage facility capacity
- Energy Efficiency

What are Non-Traditional Supply Resources?

- Renewable Natural Gas
- Hydrogen

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NATURAL GAS SUPPLIES

Where Does "Our" Gas Come From?

- Canadian gas supply (~90%)
  - British Columbia
  - Alberta
- Rockies' gas supply (~10%)
  - Wyoming, Colorado, Utah etc.
- Access to supply somewhat dependent upon available transport capacity

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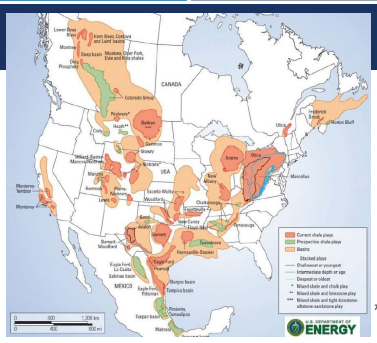
- North American gas plays



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NATURAL GAS SUPPLIES

Gas Supply Forecast - Observations

- Robust increase in shale gas production
- Mature basins (WCSB, gulf on & offshore)
- Today: ample supply vs demand

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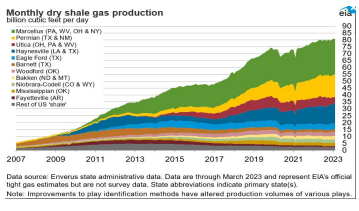
NATURAL GAS PRODUCTION BY PLAY 2007-2023



Source: EIA

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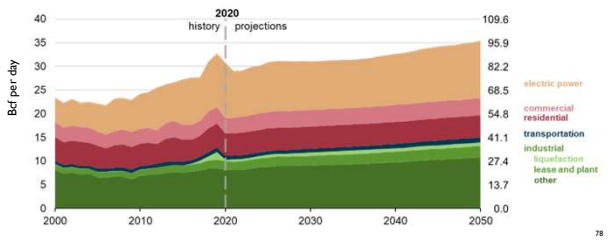
U.S. NATURAL GAS CONSUMPTION BY SECTOR



Source: EIA AEO2021

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NATURAL GAS SUPPLIES

Gas Supply - Pricing

- Natural gas is a commodity and market is liquid
- Price follows supply and demand fundamentals
- Price history & forecast

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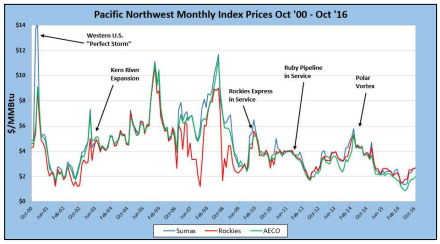
HISTORIC GAS PRICES



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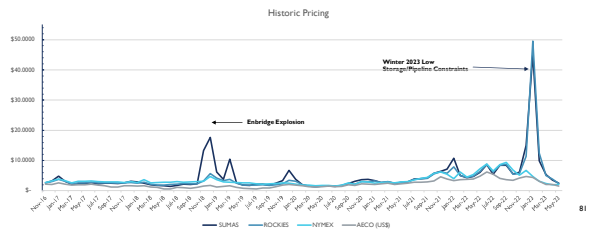
RECENT HISTORIC GAS PRICES



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NATURAL GAS PRICE FORECAST

Intermountain's IRP Price Forecast

- Intermountain's long-term planning price forecast is based on a blend of current market pricing along with long-term fundamental price forecasts.
  - The fundamental forecasts include sources such as Wood Mackenzie, EIA, the Northwest Power and Conservation Council (NWPCC), Bentek and the Financial Forecast Center's long-term price forecasts.
  - Used weighted prices from the sources based on historical performance, beginning in year two of the forecast.
  - While not a guarantee of where the market will ultimately finish, Henry Hub NYMEX is 100% of the forecast for the first year as it is the most current information that provides some direction as to future market prices.
- Intermountain is gathering Renewable Natural Gas information and plans to model RNG as a potential resource in the upstream optimization process.

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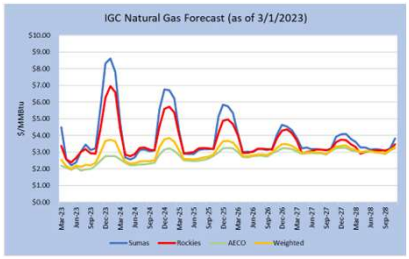
INTERMOUNTAIN'S IRP PRICE FORECAST



Preliminary Weights:
Sumas – 10%
Rockies – 10%
AECO – 80%

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INTERMOUNTAIN GAS COMPANY
2023-28 INTEGRATED RESOURCE PLAN

INTERSTATE TRANSPORTATION AND STORAGE RESOURCES

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INTERSTATE TRANSPORTATION AND STORAGE RESOURCES

- Intermountain holds firm, long-term contracts for interstate capacity on four (4) pipelines - two U.S. and two Canadian
- All gas directly delivered to Intermountain comes through the Williams Northwest system
- Firm capacity on Northwest is determined at both receipt and delivery points

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INTERSTATE TRANSPORTATION AND STORAGE RESOURCES

Interstate Transportation Capacity – cont.

- Delivery to Intermountain Service Territory
  - Firm Capacity Held Directly by Intermountain
  - City Gate Delivery Direct from Suppliers
- Capacity Segmentation
- Capacity Release and Mitigation for Intermountain
- Market forces drive new capacity projects

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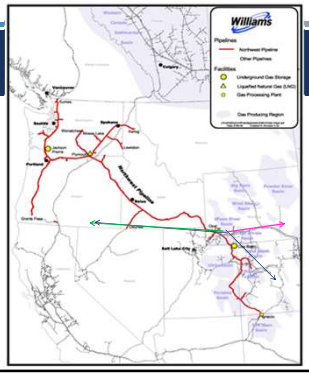
NORTHWEST PIPELINE, GTN, NOVA AND FOOTHILLS



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CAPACITY RESOURCES

Northwest Daily Maximum Transportation Capacity (MMBtu)

	2021	2022	2023	2024	2025	2026
Sumas (3k is winter only)	0	0	0	0	0	0
Stanfield	221,565	221,565	221,565	221,565	221,565	221,565
Rockies	106,478	106,478	106,478	59,328	59,328	59,328
Citygate	10,000	10,000	10,000	-	-	-
Total Capacity	338,043	338,043	338,043	280,893	280,893	280,893
Storage Withdrawals with Bundled Capacity	185,512	185,512	185,512	155,175	155,175	155,175
Maximum Deliverability	523,555	523,555	523,555	436,068	436,068	436,068

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STORAGE RESOURCES

- What is storage?
  - Natural or man-made structures where natural gas can be injected and stored for later retrieval
  - Gas is normally injected during periods of lower demand and lower prices
  - Gas is usually withdrawn during periods of higher demand and higher prices

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STORAGE RESOURCES

- Why do we need storage?
  - Demand curve is *not* linear
  - Annual supply curve somewhat linear
  - Transport capacity is very linear
  - Not feasible to meet peak demand with only interstate capacity and must-take gas purchases alone
  - Storage enhances winter/peak delivery capability and minimizes costs by balancing flat supply with seasonal demands

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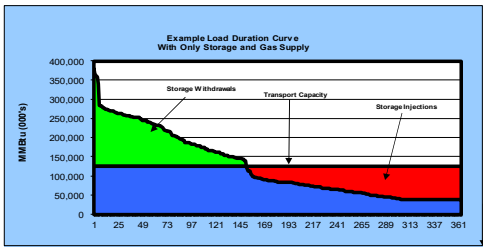

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STORAGE RESOURCES

- Uses
  - "Needle" peaking
  - Winter baseload
  - Day-to-day load balancing
  - Natural gas price hedge
  - System integrity/emergency issues
- Types
  - Liquefied Storage (LNG)
  - Underground

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STORAGE RESOURCES

Liquefied Storage Characteristics

- Natural gas is liquefied @ minus 260° F
- Liquid occupies 1/600 volume of vapor
- Nearly pure methane, non-corrosive, non-toxic and yes, SAFE
- High regasification/withdrawal capability
- Ideal for needle peaking, system balancing and system integrity issues

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STORAGE RESOURCES

Liquefied Storage Characteristics

- Liquefaction is slow which limits ability to cycle inventory
- Liquefaction is energy intensive → high cycling and inventory cost
- Generally stored in above-ground tanks
- No methane is released into the atmosphere

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PLYMOUTH LNG FACILITY

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STORAGE RESOURCES

Underground Storage Characteristics

- Gas is injected under pressure into developed salt domes, depleted well structures, underground aquifers or other porous geological formations
- Maximum daily withdrawal less than liquid storage; operating capability is dependent upon inventory level and pressure
- Injections comparatively faster and cycling costs are lower than liquid storage; multiple inventory cycles can enhance cost effectiveness

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STORAGE RESOURCES

Location & Type of Storage used by Intermountain

- Nampa, ID LNG – liquid (Intermountain)
- Plymouth, WA LNG – (Northwest Pipeline)
- Rexburg, ID Satellite LNG (Intermountain)
- Jackson Prairie - underground aquifer in western WA (Northwest Pipeline)
- Clay Basin - underground depleted well reservoir in NE Utah (Questar Pipeline)

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STORAGE RESOURCES - LOCATIONS

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STORAGE RESOURCES

Intermountain's 2023/24 Storage Statistics (MMBtu)

Facility	Seasonal Capacity	% of Nov-Mar	Daily Withdrawal Maximum	Daily Withdrawal % of Peak	Daily Injection Max Vol	Daily Injection # of Days	Redelivery Capacity
Nampa	600,000	1%	60,000	16%	3,500	166	*None*
Plymouth*	1,475,135	4%	155,175	43%	12,500	213	TF-2
Jackson Prairie	1,092,099	3%	30,337	8%	30,337	36	TF-2
Clay Basin	8,413,500	20%	70,114	19%	70,114	120	TF-1
Grand Total	11,580,734	28%	315,626	86%	116,451		

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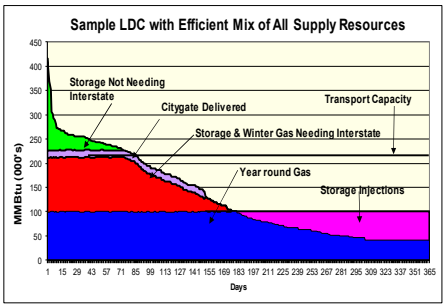

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QUESTIONS?

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FEEDBACK SUBMISSIONS

- IRP.Comments@intgas.com
- Please provide comments and feedback within 10 days

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THIRD MEETING

August 2, 2023, 9:00 a.m. - Noon

- Potential Capacity Enhancements
- Resource Optimization
- Planning Results
- Remaining IRP Process

IGRAC #2

Date & time: 6/8/2023, 9:00 AM to 12:00 PM MT

Location: Microsoft Teams Meeting

Presenters: Mark Sellers-Vaughn, Jenny De Boer, Kathleen Campbell, Zachary Sowards, Min Park, Kathy Wold, Eric Wood

In attendance: Mark Sellers-Vaughn, Jenny De Boer, Kathleen Campbell, Zachary Sowards, Min Park, Kathy Wold, Eric Wood, Bruce Folsom, Kevin Connell, Mathew Hunter, Michael Parvinen, Nicole Gyllenskog, Rick Keller, Kevin Keyt, Teresa McKnight, Jason Barnes, Jason Talford, Taylor Thomas, Jett Hawk, Kristen Sreda, Devin McGreal

Introduction

Mark Sellers-Vaughn opened the meeting by welcoming and thanking stakeholders for participating in Intermountain's IRP Process. Mark then proceeded with introductions, the agenda, and a reminder of the stakeholder engagement goals. Jenny De Boer presented a safety moment.

Presentation #1 – Distribution System Modeling (Kathleen Campbell, Zachary Sowards)

- System Dynamics
  - Pipeline diameter ½" to 16"
  - Operating pressure 60psi to 850psi
- Model System in Synergi
- Peak Heating Degree Day
  - Peak HDD = 65 – Average Daily Temp
- Fixed Network
  - Can read meters on ongoing basis rather than manual monthly reads
  - IGC has a goal of reading 90% of meters through Fixed Network by the end of 2023
  - Currently 61% of meters are read through Fixed Network
- System Deficits
  - Pipeline bottleneck
  - Minimum inlet pressure to compressor
  - Component limiting capacity

Question: "What is the compressor station for?"
Answer: "Compressors will boost pressure on a lateral. Instead of running another pipeline, a compressor can be used to solve pressure issues for long laterals such as the Sun Valley Lateral." -Kathleen Campbell
Question: "What level of granularity is used in the model?"
Answer: "They run at a higher level as to not inundate the model with too much data, I will get into this later on in the presentation" -Kathleen Campbell
Question: "Do you look at gas quality and BTU to make sure you are getting what you are paying for?"
Answer: "We check Williams and have our own BTU zones to ensure proper billing." – Kathleen Campbell
Question: "Are you able to increase pressure on 60psi pipes?"
Answer: "Every pipeline has an MAOP (max allowable operating pressure) and anything over that would be subject to an upgrade." – Kathleen Campbell
Question: "How do you determine which pipeline size you upgrade to on expansions?"

Answer: "We look at a 5-year snapshot to make sure we don't over-project the need. There are certain areas with exceptions such as Boise and Nampa which have had incredibly high growth in the last couple years." – Kathleen Campbell

Presentation #2 – Avoided Cost Methodology (Min Park)

- Nominal Avoided Cost per Therm = Commodity Cost + Transportation Cost + Variable Distribution Cost
    - Commodity Cost Calc
        - Calc starts with internal 30-year price forecasts for three primary basins (weighted on day gas purchase data)
        - Heating Degree Day used to shape monthly prices, based off 65 degrees
    - Transportation Cost Calc
        - Cost of reserving additional capacity on Northwest Pipeline
    - Distribution Cost Calc
        - Energy efficiency can lead to delaying or even avoiding costly pipeline expansions

Question: "Is the inflation rate commonly used in the calculation?" Was it used in years past?"
Answer: "In previous years, we also used inflation rate but it increased this year as it is based on a five-year average." – Min Park
Question: "Previous years' costs all seem relatively even but for updated costs there is a lot of variability, can you explain what is driving this change?"
Answer: "The numbers are based off gas prices by year, they are weighted based off HDD shaping. Inflation caused a change in gas prices." – Min Park
Question: "Gas prices are always up and down and previous years don't reflect this volatility, is there a change in HDD shaping methodology?"
Answer: "I don't think there was a big difference in shaping I think it was due to the pricing we saw earlier this year and inflation." – Min Park
Answer: "We can look into this and provide more explanation as to why we saw this in the current IRP, but the pricing volatility from this winter certainly has had an effect." – Mark Sellers-Vaughn
Question: "What stakeholders are you working with?"
Answer: "I am not sure, I was just told stakeholders." – Min Park
Answer: "I think it would be Intermountain walking through the methodology and soliciting feedback through the process." – Mark Sellers-Vaughn
Question: "Specifically what committee would the distribution costs be discussed in of the four stakeholder meetings?"
Answer: "I believe it would be the Avoided Cost Sub-Committee." – Kathy Wold
Comment: "Please cover how the inflation rate has been included in this calculation in the past during the sub-committee meeting. Also please address it in the next IGRAC."

Presentation #3 – Energy Efficiency (Kathy Wold)

- Demand Side Management
    - Option A: purchase MMbtu from supplier
    - Option B: purchase energy efficiency programs through customers
- Incentives can stack on top of each other
- Conservation Potential Assessment
    - Assess achievable energy savings potential
    - Apply results
- What is CPA?
    - Technical Potential
        - Total energy savings available relevant to population

- Economic Potential
    - Cost effectiveness
- Achievable Potential
    - EE expected to be adopted by programs

Question: "What is a HERS rating?"
Answer: "Home Energy Rating System is a third party who rates new builds by energy efficiency. They perform tests and give an energy efficiency score. This measures items that are important to energy savings." – Kathy Wold
Question: "The whole home incentives stacked with the smart thermostat incentives may have some overlap, do you have any insight on how these can be disentangled?"
Answer: "I am unsure about the specifics of that, but I will check and follow up." – Kathy Wold
Question: "For the modeling in the Base case of the IRP which model are you looking to use?"
Answer: "The conservative scenario would be using business as usual, but we will be working with the IRP team to decide which scenario to use." – Kathy Wold
Question: "What is considered a lot versus a little therm savings when looking at DSM commercial savings?"
Answer: "All savings are good savings; in terms of our commercial program it is new in development and small in comparison to the residential program." – Kathy Wold
Question: "What avoided cost are we using, the one from the previous slides?"
Answer: "We are using the avoided cost calculation that comes from the Resource Planning Team which Min was referencing in the previous slides." – Kathy Wold

Presentation #4 – Supply Resources and Transportation & Storage Resources (Eric Wood, Jenny De Boer)

- Gas Supply Planning
    - Reliability
    - Security
    - Competitive and stable prices
    - Efficiently meet future growth
    - Frequently evaluate portfolio
- Traditional Supply Resources
    - Natural Gas Supply
    - Pipeline Capacity
    - Storage Capacity
    - Energy Efficiency
- Non-Traditional Supply Resources
    - Renewable Natural Gas
    - Hydrogen
- Storage Resources
    - Use
        - Needle peaking
        - Winter baseload
        - Day-to-day load balancing
        - Gas price hedge
        - Emergency issues
    - Types
        - Liquefied Storage
        - Underground

Question: "What is "lease and plant other" on the graph?"
Answer: "I am unsure, this is from EIA so I will have to look into that." – Eric Wood

Question: "What is the arrangement pertaining to ownership of JP and Clay Basin storage facilities?"

Answer: "We don't own capacity, we lease it from them." – Eric Wood

Question: "How does needle peaking work with capacity on the pipeline?"

Answer: "Usually we use LNG for needle peaking because we can draw greater amounts more quickly, it is a little different than normal capacity on the pipeline. We use a separate contract only for storage to get the gas to the distribution system. Nampa and Rexburg are located behind the citygate so don't require excess upstream pipeline capacity." – Eric Wood

Question: "In the past when market price was more predictable, after the end of the heating season gas was cheap and we used that to fill storage. Now that doesn't seem to be the case. It seems as if storage doesn't seem to work as a hedge anymore, is that accurate?"

Answer: "Last summer we had delayed summer injections due to higher prices, but we still found times to buy cheaper fill gas. This continues into the current year as hydropower kicks up in May and June and allows us to capitalize on cheaper gas than we tend to see in late summer." – Eric Wood

Question: "Can you explain your hedging portfolio a bit?"

Answer: "The hedging portfolio is mostly handled by our marketer IGI. It is a three-year portfolio under constant evaluation. We provide them with a forecast for the year, the front of every month, and the daily forecast so IGI can plan to buy for storage or day gas for demand." – Eric Wood

Quesiton: "Was Intermountain exposed to volatile pricing this winter? How much was hedging able to help?"

Answer: "Intermountain was shielded a bit, as they buy less from sumas. Intermountain was positioned well this last winter, they were exposed to some day gas pricing but tried to rely more on long term contracts and gas from storage." – Eric Wood

The Meeting was Adjourned

Action Items:

1. Look in the work papers to see how inflation has been included in Avoided Cost calculations in this past IRP cycle and previous cycles to determine how the methodology has changed.
2. Follow up on how the overlap of stacking entire-system and smart thermostat energy efficiency programs contributes to double counting or how it is disentangled.

INTERMOUNTAIN® GAS COMPANY
A Subsidiary of MDU Resources Group, Inc.

INTEGRATED RESOURCE PLAN

AUGUST 2, 2023
INTERMOUNTAIN GAS RESOURCE ADVISORY COMMITTEE (IGRAC)

1

WELCOME

- Introductions
- Feedback Process
- Agenda

2

FEEDBACK SUBMISSIONS

- IRP.Comments@intgas.com
- Please provide comments and feedback within 10 days

3

AGENDA

- **Welcome & Introductions** – Brian Robertson (Supervisor, *Resource Planning)*
- **Safety Moment** – Devin McGreal (Sr, Resource Planning Economist)
- **Load Demand Curves –** *Brian Robertson (Supervisor, Resource Planning)*
- **Potential Capacity Enhancements** – Kathleen Campbell *(Engineer III, Engineering Services)*
- **Resource Optimization –** *Jenny De Boer (Resource Planning Economist I), Brian Robertson (Supervisor, Resource Planning)*
- **Questions/Discussion**

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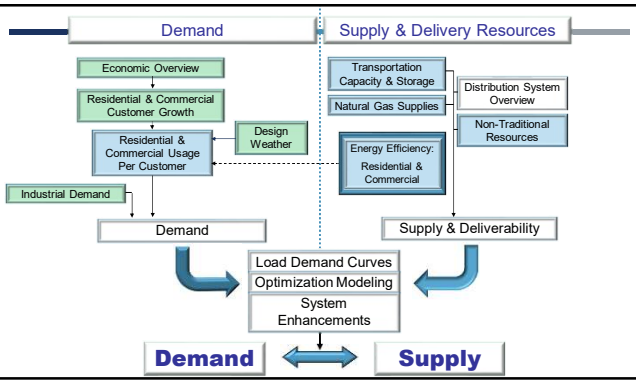

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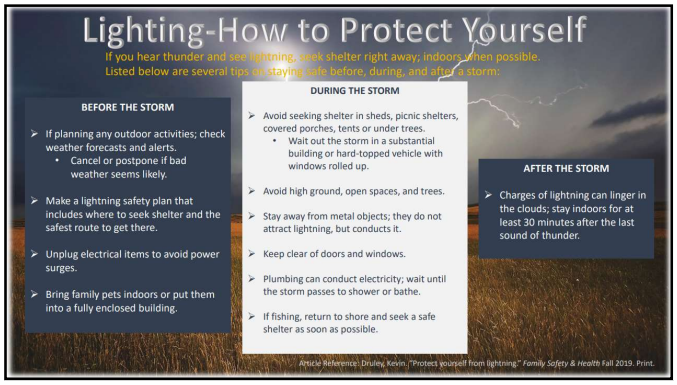
SAFETY MOMENT

DEVIN MCGREAL
SR. RESOURCE PLANNING ECONOMIST

6



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LOAD DEMAND CURVES

BRIAN ROBERTSON
SUPERVISOR, RESOURCE PLANNING

8

LOAD DEMAND CURVE KEY VARIABLES

- Based on Design Weather Conditions
- Low, Base and High Growth Core Market Customer Projections
- Customer Usage Per Degree Day
- MDFQ for Large Volume Customers

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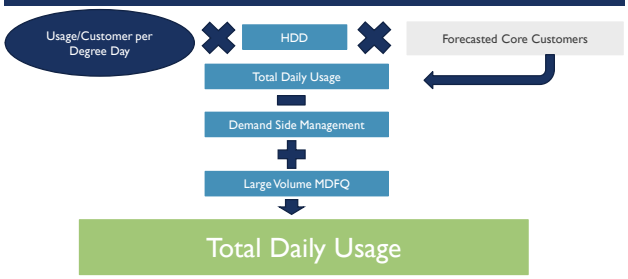
PEAK SEASON CORE MARKET LOAD DEMAND CURVE METHODOLOGY



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LOAD DEMAND CURVE

- Load Demand Curve: A forecast of Daily Gas Demand Using 'Design' Temperatures, and Predetermined 'Usage Per Customer'
- Designed to Measure Distribution Capacity at Our 5 Areas of Interest (AOIs)
- To Measure Total Company for Upstream Capacity
- Based on Current Resources or Resources Scheduled to be Available During the IRP Period
- Remedies for Any Constraints Will be Identified Later
- Storage Management

11

CAPACITY RESOURCES

Northwest Daily Maximum Transportation Capacity (MMBtu)

	2023	2024	2025	2026	2027	2028
Sumas (3k is winter only)	3,000	0	0	0	0	0
Stanfield	221,565	221,565	221,565	221,565	221,565	221,565
Rockies	106,478	106,478	106,478	59,328	59,328	59,328
Citygate	10,000	10,000	10,000	-	-	-
Total Capacity	341,043	338,043	338,043	280,893	280,893	280,893
Storage Withdrawals with Bundled Capacity	185,512	185,512	185,512	155,175	155,175	155,175
Maximum Deliverability	526,555	523,555	523,555	436,068	436,068	436,068

- Intermountain has segmented capacity from Sumas to IGC at Stanfield. Intermountain owns Stanfield to IGC.
- Stanfield Capacity is dependent on GTN, including GTN Xpress which is expected to be online in 2023.
- Intermountain is receiving approximately 21,000 dth/day capacity on NOVA, Foothills, and GTN on April 1, 2024.
- On-System Storage is 65,000 dth/day.

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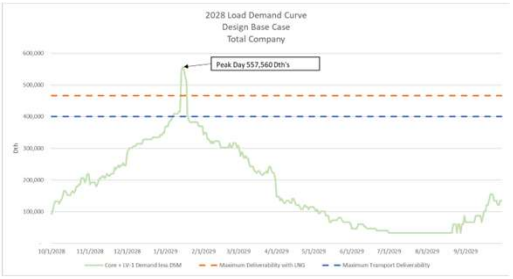

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DESIGN CAPACITY OF DISTRIBUTION SYSTEM

- Idaho Falls Lateral
- Sun Valley Lateral
- Canyon County Lateral
- State Street Lateral
- Central Ada County

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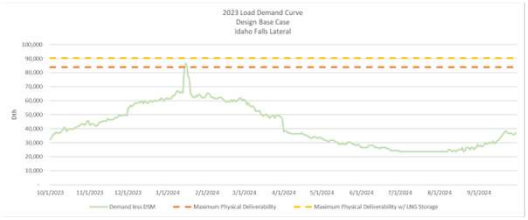

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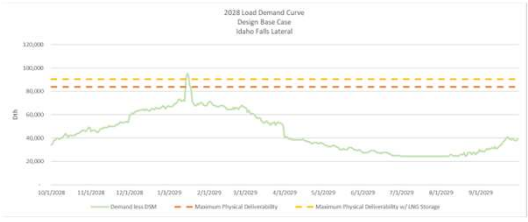

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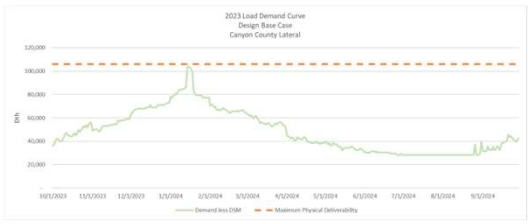

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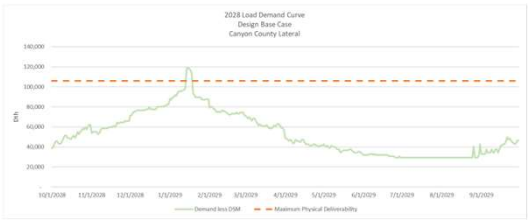

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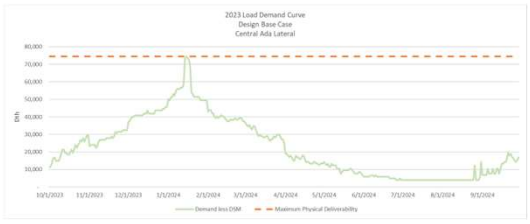

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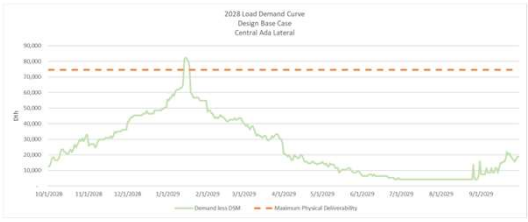

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QUESTIONS?

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DISTRIBUTION SYSTEM ENHANCEMENTS

KATHLEEN CAMPBELL, P.E. - SENIOR ENGINEER - ENGINEERING SERVICES
ZACHARY SOWARDS - ENGINEER III – ENGINEERING SERVICES

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IGRAC #2 COVERED:

- System dynamics
- Synergi model process
- Identification of system deficits/constraints
- Distribution enhancement/reinforcement options to address deficit
- Enhancement considerations and selection process into 5-year budget

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THIS PRESENTATION WILL COVER:

- Project needs to support core growth for each AOI
- Alternative Analysis to resolve deficit (if it has not already been covered in a previous IRP)
- Timing, Cost and capacity gained for each project/alternative.

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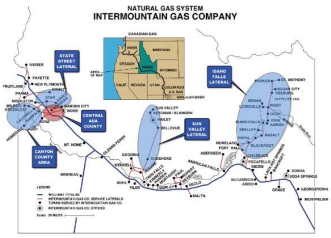
AREAS OF INTEREST (AOI)

- Distribution System Segments:
  - Canyon County
  - Central Ada County Lateral
  - "North of State Street" Lateral
  - Sun Valley Lateral
  - Idaho Falls Lateral
  - All Other Customers



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OTHER AOI

- Reinforcements required to meet 2028 growth predictions
  - Payette Gate Upgrade
    - 2024 - $3.49M
  - New Plymouth Gate Upgrade
    - 2024 - $2.67M

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CANYON COUNTY AOI

- Requires reinforcements by 2023 to meet IRP growth predictions
- AOI capacity limiter: 6-inch, 8-inch and 10-inch HP bottleneck on Ustick Rd
- Alternatives considered were discussed in 2021 IRP
- Ustick Phase III was selected in 2021 IRP
- Ustick Phase III has been designed and permitted and will begin construction in August 2023
- Ustick Phase III is estimated to cost $12.8M

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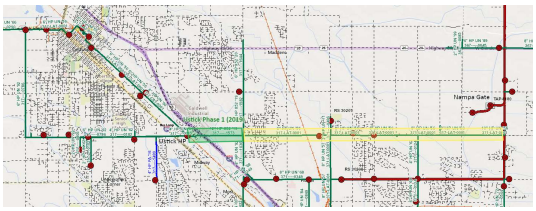
CANYON COUNTY - BOTTLENECK



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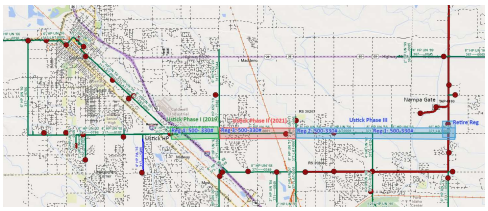
CANYON COUNTY : USTICK PHASE III



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STATE STREET LATERAL AOI

- Requires reinforcements by 2025 & 2026 to meet IRP growth predictions
- AOI Capacity Limiter: 12-inch HP bottleneck on State Street and 4 in HP bottleneck on Linder Rd & State Penn (Boise #2) Gate Capacity
- Alternatives considered for 12-inch HP & 4- HP bottleneck were discussed in 2021 IRP
- State Street Phase II Uprate was selected in 2021 IRP
- State Street Phase II is budgeted for 2024
- State Street Phase II is estimated to cost $902K
- State Penn Gate Upgrade is budgeted for 2025 Design and 2026 Construction
- State Penn Gate Upgrade is estimated to cost $2.73M

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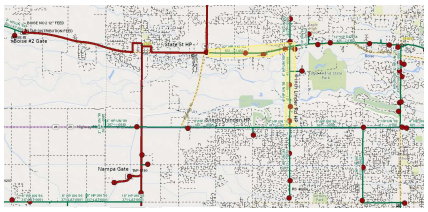
STATE STREET AOI - BOTTLENECK



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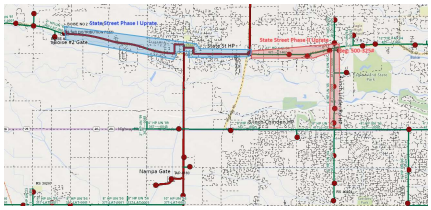
STATE STREET PHASE II UPRATE



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CENTRAL ADA COUNTY AOI

- Requires reinforcements by 2023 to meet IRP growth predictions
- AOI Capacity Limiter: 10-inch and 8-inch HP bottleneck on Meridian Rd and Victory Rd
- Alternatives considered were discussed in 2021 IRP
- 12-inch South Boise Loop was selected in 2021 IRP
- 12-inch South Boise Loop will be online in Fall of 2023
- 12-inch South Boise Loop is estimated to cost $17.9M

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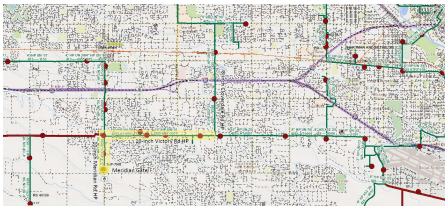
CENTRAL ADA COUNTY AOI - BOTTLENECK



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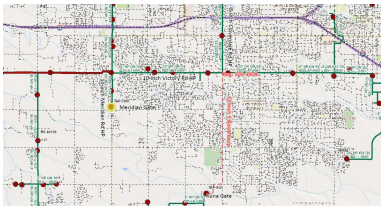
12-INCH SOUTH BOISE LOOP



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SUN VALLEY LATERAL AOI

- Requires reinforcements by 2023 to meet IRP growth predictions.
- AOI Capacity Limiter: End of line pressure to Ketchum area
- Alternatives considered were discussed in the 2019 IRP
- Shoshone Compressor Station was selected in 2019 IRP
- Shoshone Compressor Station is scheduled for commissioning in August
- Shoshone Compressor Station is estimated to cost $6.7M

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SUN VALLEY LATERAL AOI - BOTTLENECK

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SHOSHONE COMPRESSOR STATION

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IDAHO FALLS LATERAL AOI

- Requires reinforcements by 2024 to meet IRP growth predictions.
- AOI Capacity Limiter: End of line pressure to St. Anthony's
- Alternatives considered were discussed in the 2021 IRP
- Blackfoot Compressor Station was selected in 2021 IRP
- Blackfoot Compressor Station has been ordered and will be installed in 2024
- Blackfoot Compressor Station is estimated to cost $20M

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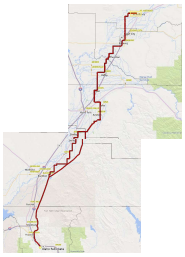
IDAHO FALLS AOI - BOTTLENECK



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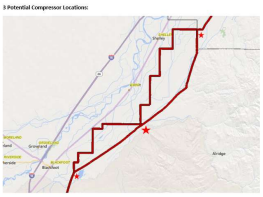
BLACKFOOT COMPRESSOR STATION



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AOI CAPACITY SUMMARY AND TIMING NEEDS:

Year	Ada County AOI Capacity (lh/day)	Ada County AOI Reinforcement Required	State Street Lateral AOI Capacity (lh/day)	State Street Lateral AOI Reinforcement Required	Canyon County AOI Capacity (lh/day)	Canyon County AOI Reinforcement Required	Sun Valley Lateral AOI Capacity (lh/day)	Sun Valley AOI Reinforcement Required	Idaho Falls Lateral AOI Capacity (lh/day)	Idaho Falls AOI Reinforcement Required
2023	870,000	12-inch S Boise Loop	820,000	None	1,390,000.00	12-inch Untick Phase III	247,500	Shoshone Compressor Station	904,000.00	None
2024	870,000	None	820,000	None	1,390,000.00	None	247,500	None	1,093,000.00	IFL Compressor Station
2025	870,000	None	950,000	State Street Uprate	1,390,000.00	None	247,500	None	1,093,000.00	None
2026	870,000	None	950,000	State Penn Gate Upgrade	1,390,000.00	None	247,500	None	1,093,000.00	None
2027	870,000	None	950,000	None	1,390,000.00	None	247,500	None	1,093,000.00	None
2028	870,000	None	950,000	None	1,390,000.00	None	247,500	None	1,093,000.00	None

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QUESTIONS?

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IRP OPTIMIZATION MODEL

Draft Design Base Results

JENNY DE BOER; RESOURCE PLANNING ECONOMIST I
BRIAN ROBERTSON; SUPERVISOR, RESOURCE PLANNING

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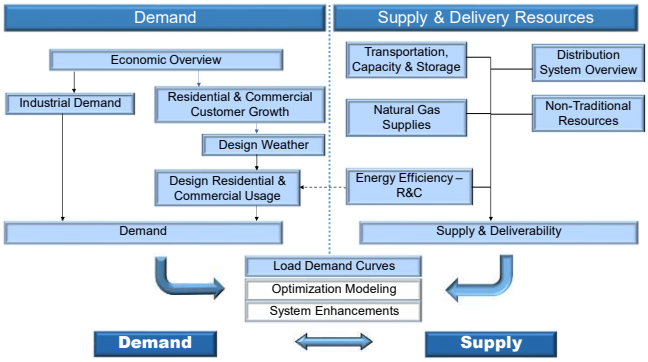

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IRP OPTIMIZATION MODELING

- **IGC IRP Model "Integrates"/Coordinates all the main functional elements of IGC operation:**
  - Gas Demand/Load, how much & where is gas consumed, "Load Duration Curve" (LDC) by area of interest.
  - Gas Supply, from where, how much, and what price is gas supplied to meet demand (LDC).
  - Gas Transport, how does gas move from supply to demand area given pipeline size and prices.
  - Demand Side Management (DSM), cost effective energy efficiency is used to reduce demand
  - Local Gas Distribution, local lateral sizing is explicitly modeled to meet demand & ensure reliability
  - The IRP model utilizes PLEXOS®, a linear optimization model, to determine the least cost manner to have loads served by supply, transport, DSM & laterals.

All results presented here are draft subject to further IGC review.

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WHAT IS OPTIMIZATION?

- Utilizes a ***standard*** mathematical technique called "linear programming" …to optimize over all possible combinations.
- The model knows the exact load and price for every day of the planning period based on the analyst's input and can therefore minimize costs in a way that would not be possible in the real world.
- Therefore, it is important to recognize that linear programming analysis provides helpful but not perfect information to guide decisions.
- Selects from a mix of resources over planning horizon to meet forecasted loads.

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MODEL ELEMENTS

- Functional components:
  - Demand forecast (Area's of Interest)
  - Traditional supply resources
    - Existing and potential gas supplies by basin
    - Storage resources
    - Transportation capacity resources
  - Price forecast
  - Non-traditional supply e.g., new distribution capacity, RNG, DSM etc.

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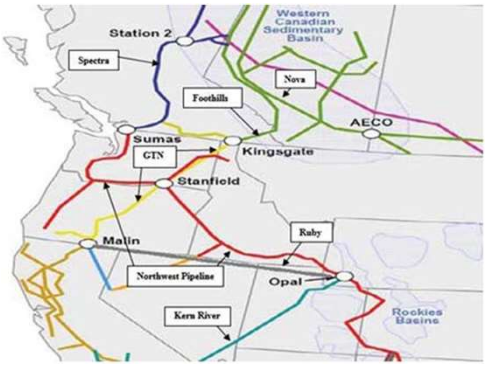

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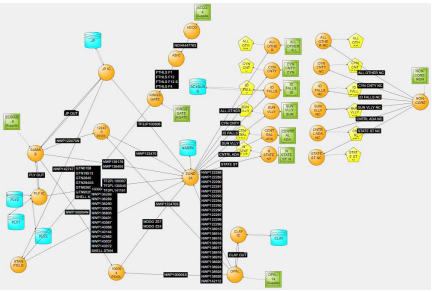
MODEL STRUCTURE

Transport, Storage, Supply, & Demand Areas to Idaho (IGC))



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MODEL STRUCTURE

Transport

- Transportation contracts are the means of how Intermountain gets the gas from the supplier to the end user.
- Transportation has an MDQ, a Reservation Charge (D1 rate), a Flow Charge (transportation rate), and a fuel loss percentage.
- A maximum delivery quantity (MDQ) which is the maximum amount of gas Intermountain can move on the pipeline on a single day.
- A D1 rate which is the reservation rate to have the ability to move the MDQ amount on the pipeline.
- A transportation rate which is the rate per dekatherm that is actually moved on the pipeline.
- The fuel loss percentage is the statutory percent of gas based on the tariff from the pipeline that is lost and unaccounted for from the point of where the gas was purchased to the citygate.

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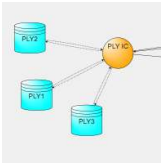
MODEL STRUCTURE

Storage

- Intermountain has storage at 5 locations: Jackson Prairie (JP), Plymouth (Ply), Clay Basin, Nampa, and Rexburg.
- Storage injections targets are set at 35% by the end of June, 80% by the end of August, and 100% by the end of September to emulate cycling storage for non-needle peaking storage.
- Intermountain can withdrawal approximately 30,377 dth per day from JP, 155,175 dth per day from Plymouth, and 70,144 dth per day from Clay Basin for a total of approximately 255,626 dth per day of off-system storage.
- Intermountain can withdrawal approximately 60,000 dth per day from Nampa and 5,500 dth per day from Rexburg for a total of approximately 65,500 dth per day of on-system storage.



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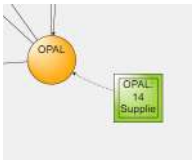
MODEL STRUCTURE

Supply

- Intermountain can purchase gas at three markets; AECO, SUMAS, and OPAL.
- At each market Intermountain can purchase gas at different locations along the pipeline.
- For each year, Intermountain uses Base, Winter base, Summer and Winter day gas, and Peak day incremental supplies as inputs.
- Over the planning horizon, the contracts are renewed in November and April.



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MODEL STRUCTURE

Supply

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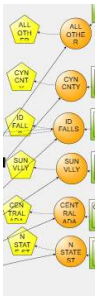
MODEL STRUCTURE

Demand Area

- Demand is forecasted at the five areas of interest, as well as all other customers.
- Demand is determined by the load demand curves.
- Each area of interest has DSM, which decrements demand at the avoided cost price.



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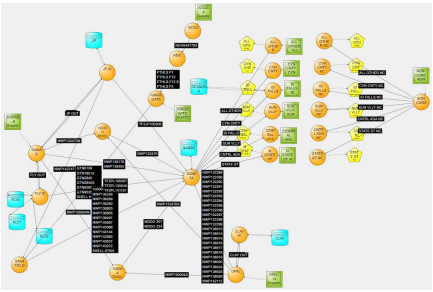
MODEL STRUCTURE

Transport, Storage, Supply, & Demand Areas to Idaho (IGC))



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Lateral Capacity Summary By Year

2023 Base Year (Dth)

Area of Interest	Core Peak Day	Deliverability	% of Deliverability	Total Peak Day	Capacity	% of Capacity
IDAHO FALLS	66,430	65,434	102%	86,121	90,400	95%
SUN VALLEY	18,074	17,803	102%	19,784	20,000	99%
CANYON COUNTY	77,739	76,572	102%	101,399	103,200	98%
STATE STREET	74,536	73,418	102%	75,346	82,000	92%
CENTRAL ADA	72,896	71,803	102%	72,996	74,500	98%
ALL OTHER	179,722	177,025	102%	276,942		

2024 Year 2 (Dth)

Area of Interest	Core Peak Day	Transport	% of Transport	Total Peak Day	Capacity	% of Capacity
IDAHO FALLS	68,118	68,022	100%	86,609	90,400	96%
SUN VALLEY	18,330	18,304	100%	20,040	20,000	100%
CANYON COUNTY	80,650	80,536	100%	104,310	103,200	101%
STATE STREET	76,141	76,034	100%	76,951	82,000	94%
CENTRAL ADA	74,488	74,383	100%	74,588	74,500	100%
ALL OTHER	183,036	182,777	100%	280,656		

2025 Year 3 (Dth)

Area of Interest	Core Peak Day	Transport	% of Transport	Total Peak Day	Capacity	% of Capacity
IDAHO FALLS	69,832	68,195	102%	88,423	90,400	98%
SUN VALLEY	18,586	18,150	102%	20,296	20,000	101%
CANYON COUNTY	83,549	81,591	102%	107,409	103,200	104%
STATE STREET	77,743	75,920	102%	78,553	82,000	96%
CENTRAL ADA	76,077	74,294	102%	76,177	74,500	102%
ALL OTHER	186,272	181,905	102%	283,892		

DRAFT MODEL RESULTS - LATERALS

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2026 Year 4 (Dth)

Area of Interest	Core Peak Day	Transport	% of Transport	Total Peak Day	Capacity	% of Capacity
IDAHO FALLS	71,533	57,738	124%	90,124	90,400	100%
SUN VALLEY	18,838	15,205	124%	20,548	20,000	103%
CANYON COUNTY	86,620	69,916	124%	110,480	103,200	107%
STATE STREET	79,343	64,042	124%	80,153	82,000	98%
CENTRAL ADA	77,664	62,687	124%	77,764	74,500	104%
ALL OTHER	189,530	152,980	124%	287,570		

2027 Year 5 (Dth)

Area of Interest	Core Peak Day	Transport	% of Transport	Total Peak Day	Capacity	% of Capacity
IDAHO FALLS	73,239	57,862	127%	91,870	90,400	102%
SUN VALLEY	19,093	15,084	127%	20,803	20,000	104%
CANYON COUNTY	89,520	70,725	127%	113,380	103,200	110%
STATE STREET	80,942	63,948	127%	81,752	82,000	100%
CENTRAL ADA	79,251	62,612	127%	79,351	74,500	107%
ALL OTHER	192,821	152,337	127%	291,461		

2028 Year 6 (Dth)

Area of Interest	Core Peak Day	Transport	% of Transport	Total Peak Day	Capacity	% of Capacity
IDAHO FALLS	74,943	57,977	129%	93,574	90,400	104%
SUN VALLEY	19,348	14,968	129%	21,058	20,000	105%
CANYON COUNTY	92,441	71,513	129%	116,301	103,200	113%
STATE STREET	82,542	63,856	129%	83,352	82,000	102%
CENTRAL ADA	80,838	62,537	129%	80,938	74,500	109%
ALL OTHER	196,116	151,718	129%	294,806		

DRAFT MODEL RESULTS - LATERALS

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DISTRIBUTION SYSTEM SHORTFALL SOLVES

- ADA County – Bend 12-inch S Boise Loop
- State Street – State Street Uprate and State Penn Gate Upgrade
- Canyon County – 12-inch Ustick Phase III
- Sun Valley Lateral – Shoshone Compressor Station
- Idaho Falls – IFL Compressor Station

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TRANSPORTATION SHORTFALL SOLVES

- Contract Renewals
- GTN Xpress
- Alternative Transportation Uptake
- Renewable Natural Gas
- Others?

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Lateral Capacity Summary By Year

2023 Base Year (Dth)

Area of Interest	Core Peak Day	Deliverability	% of Deliverability	Total Peak Day	Capacity	% of Capacity
IDAHO FALLS	66,430	76,156	87%	86,120	90,400	95%
SUN VALLEY	18,070	20,716	87%	19,780	24,750	80%
CANYON COUNTY	77,740	89,122	87%	101,400	139,000	73%
STATE STREET	74,540	85,454	87%	75,350	82,000	92%
CENTRAL ADA	72,900	83,574	87%	73,000	87,000	84%
ALL OTHER	179,720	206,034	87%	276,940		

2024 Year 2 (Dth)

Area of Interest	Core Peak Day	Transport	% of Transport	Total Peak Day	Capacity	% of Capacity
IDAHO FALLS	68,060	78,775	86%	86,550	109,300	79%
SUN VALLEY	18,320	21,204	86%	20,030	24,750	81%
CANYON COUNTY	80,560	93,243	86%	104,220	139,000	75%
STATE STREET	76,040	88,012	86%	76,850	82,000	94%
CENTRAL ADA	74,390	86,102	86%	74,490	87,000	86%
ALL OTHER	182,920	211,719	86%	280,540		

2025 Year 3 (Dth)

Area of Interest	Core Peak Day	Transport	% of Transport	Total Peak Day	Capacity	% of Capacity
IDAHO FALLS	69,720	78,982	88%	88,310	109,300	81%
SUN VALLEY	18,570	21,037	88%	20,280	24,750	82%
CANYON COUNTY	83,380	94,457	88%	107,240	139,000	77%
STATE STREET	77,550	87,852	88%	78,360	95,000	82%
CENTRAL ADA	75,880	85,960	88%	75,980	87,000	87%
ALL OTHER	186,050	210,766	88%	283,670		

DRAFT MODEL RESULTS - LATERALS

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DRAFT MODEL RESULTS - LATERALS

2026 Year 4 (Dth)

Area of Interest	Core Peak Day	Transport	% of Transport	Total Peak Day	Capacity	% of Capacity
IDAHO FALLS	71,350	75,440	95%	89,940	109,300	82%
SUN VALLEY	18,810	19,888	95%	20,520	24,750	83%
CANYON COUNTY	86,380	91,332	95%	110,240	139,000	79%
STATE STREET	79,060	83,592	95%	79,870	95,000	84%
CENTRAL ADA	77,380	81,816	95%	77,480	87,000	89%
ALL OTHER	189,200	200,046	95%	287,240		

2027 Year 5 (Dth)

Area of Interest	Core Peak Day	Transport	% of Transport	Total Peak Day	Capacity	% of Capacity
IDAHO FALLS	72,980	75,587	97%	91,610	109,300	84%
SUN VALLEY	19,060	19,731	97%	20,760	24,750	84%
CANYON COUNTY	89,210	92,397	97%	113,070	139,000	81%
STATE STREET	80,570	83,449	97%	81,380	95,000	86%
CENTRAL ADA	78,870	81,688	97%	78,970	87,000	91%
ALL OTHER	192,390	199,264	97%	291,030		

2028 Year 6 (Dth)

Area of Interest	Core Peak Day	Transport	% of Transport	Total Peak Day	Capacity	% of Capacity
IDAHO FALLS	74,600	75,714	99%	93,230	109,300	85%
SUN VALLEY	19,290	19,578	99%	21,000	24,750	85%
CANYON COUNTY	92,070	93,445	99%	115,930	139,000	83%
STATE STREET	82,080	83,306	99%	82,890	95,000	87%
CENTRAL ADA	80,370	81,570	99%	80,470	87,000	92%
ALL OTHER	195,580	198,501	99%	294,270		

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DRAFT MODEL RESULT GENERAL SUPPLY BALANCE SUMMARY

Supply Area	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24
AECO	4,574,030	5,911,230	7,178,870	7,178,870	6,715,720	6,641,870	3,437,110	2,328,330	1,331,320	1,266,320	1,402,300	2,804,780
Sumas	310,000	-	-	-	-	90,000	300,000	744,440	300,000	310,000	310,000	300,000
Rockies	310,000	-	-	-	-	-	300,000	310,000	300,000	310,000	310,000	300,000
ALL OTHER	3,540	3,430	3,540	3,540	3,320	3,540	3,430	3,540	3,430	3,540	3,540	3,430
CENTRAL ADA	3,070	2,970	3,070	3,070	2,870	3,070	2,970	3,070	2,970	3,070	3,070	2,970
CYN CNTY	2,750	2,660	2,750	2,750	2,570	2,750	2,660	2,750	2,660	2,750	2,750	2,660
ID FALLS	1,660	1,600	1,660	1,660	1,550	1,660	1,600	1,660	1,600	1,660	1,660	1,600
N STATE ST	3,040	2,940	3,040	3,040	2,840	3,040	2,940	3,040	2,940	3,040	3,040	2,940
SUN VLLY	180	180	180	180	170	180	180	180	180	180	180	180
Storage	0	-	1,874,520	4,408,850	1,610,840	121,550	0	0	0	0	0	0

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DRAFT MODEL RESULT GENERAL SUPPLY BALANCE SUMMARY

Year 6

Supply Area	Oct-27	Nov-27	Dec-27	Jan-28	Feb-28	Mar-28	Apr-28	May-28	Jun-28	Jul-28	Aug-28	Sep-28
AECO	2,556,690	3,104,670	6,277,900	6,160,670	5,843,340	4,014,720	1,544,050	1,423,950	1,233,110	1,274,210	1,284,210	1,508,470
Sumas	1,224,890	887,000	916,570	916,570	857,440	916,570	1,187,000	1,026,270	887,000	916,570	919,940	1,057,150
Rockies	1,232,980	1,193,210	1,232,980	1,232,980	1,153,430	1,232,980	1,493,210	1,232,980	1,193,210	1,232,980	1,232,980	1,193,210
ALL OTHER	16,640	16,100	16,640	16,640	15,570	16,640	16,100	16,640	16,100	16,640	16,640	16,100
CENTRAL ADA	14,430	13,960	14,430	14,430	13,500	14,430	13,960	14,430	13,960	14,430	14,430	13,960
CYN CNTY	11,630	11,250	11,630	11,630	10,880	11,630	11,250	11,630	11,250	11,630	11,630	11,250
ID FALLS	10,640	10,300	10,640	10,640	9,960	10,640	10,300	10,640	10,300	10,640	10,640	10,300
N STATE ST	14,260	13,800	14,260	14,260	13,340	14,260	13,800	14,260	13,800	14,260	14,260	13,800
SUN VLLY	1,830	1,770	1,830	1,830	1,710	1,830	1,770	1,830	1,770	1,830	1,830	1,770
Storage	0	1,199,150	1,385,180	4,270,210	1,164,770	1,239,120	0	0	0	0	0	0

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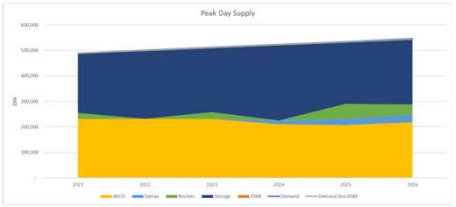
DRAFT MODEL RESULT GENERAL SUPPLY BALANCE SUMMARY



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SUMMARY

- Employs Utility Standard Practice Method To Optimize System
- Models DSM & Storage
- Handles storage withdrawal and injection across seasons
- Provides a check on need for lateral expansion.
- Provides a check on transport and supply capacity

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QUESTIONS?

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FEEDBACK SUBMISSIONS

- IRPComments@intgas.com
- Please provide comments and feedback within 10 days

IGRAC #3

Date & time: 8/2/2023, 9:00 AM to 12:00 PM MT

Location: Microsoft Teams Meeting

Presenters: Brian Robertson, Devin McGreal, Kathleen Campbell, Zachary Sowards, Jenny De Boer

In attendance: Mark Sellers-Vaughn, Brian Robertson, Devin McGreal, Kathleen Campbell, Zachary Sowards, Jenny De Boer, Nicole Gyllenskog, Eric Wood, Kevin Keyt, Rick Keller, Michael Parvinen, Min Park, Susan Davidson, Bruce Folsom, Teresa McKnight

Introduction

Brian Robertson opened the meeting by welcoming and thanking stakeholders for participating in Intermountain's IRP Process. Brian then proceeded with introductions, the agenda, and a reminder of the stakeholder engagement goals. Devin McGreal presented a safety moment.

Presentation #1 – Load Demand Curves (Brian Robertson)

- Based on Design Weather Conditions
- Low, Base, and High Growth Core Market Customer Projections
- Customer usage per Degree Day
- MDFQ for Large Volume Customers
- Customer per Degree Day * HDD * Forecasted Core Customers = Total Daily Usage
- Total Daily Usage – Demand Side Management + Large Volume MDFQ = Total Daily Usage

Question: "When you look at the total daily usage does that include DSM? It looks like DSM is double counted."
Answer: "The first total daily usage in the equation is through historic use and then forecasted future DSM is added in as well" – Brian Robertson
Question: "Demand does not include interruptible, correct?
Answer: "This is purely firm contract demand, no interruptible." – Brian Robertson

Presentation #2 – Potential Capacity Enhancements (Kathleen Campbell, Zachary Sowards)

- Reinforcements required to meet 2028 growth predictions
  - Payette Gate Upgrade, 2024
  - New Plymouth Gate Upgrade, 2024
- Canyon County AOI
  - Requires enforcements by 2023 to meet IRP growth predictions
  - Bottleneck on Ustick road
- State Street Lateral AOI
  - Requires enforcements by 2025 & 2026 to meet IRP growth predictions
  - Bottleneck on State Street and on Linder Road
- Central Ada AOI
  - Requires reinforcements by 2023 to meet IRP growth predictions
  - Bottleneck on Meridian Road and Victory Road
- Sun Valley Lateral AOI
  - Requires enforcements by 2023 to meet IRP growth predictions

    - End of line pressure to Ketchum
- Idaho Falls Lateral AOI
    - Requires reinforcements by 2024 to meet IRP growth predictions

Question: "If projects were accepted in a previous IRP, are they looked at again for each IRP cycle?"
Answer: "Yes, they are looked over again to ensure they are necessary" – Kathleen Campbell
Question: "Doesn't Payette include its own direct natural gas connection?"
Answer: "I can check and follow up with that" – Kathleen Campbell
Answer: "I can address that, nothing out there currently is being added to the Intermountain system" – Eric Wood
Question: "Looking at phase III is that a reconstruction of an existing line?"
Answer: "We had already done phase I and phase II, and the cost was prohibitive to run a new line, so we continued with the planned upgrade." – Kathleen Campbell
Question: "Could you give some insight on what it takes to upgrade?"
Answer: "We have to go through pressure tests, apply for permits, physically do a leak survey, etc." – Kathleen Campbell
Question: "What type of compressors do you use are they natural gas fired or electric (Shoshone compressor)?"
Answer: "It is natural gas fired." – Zachary Sowards
Question: "What is the discharge vs suction pressure (Blackfoot compressor station)?"
Answer: "I will double check before writing the narrative, but discharge is 700 pounds and suction is 500 pounds." – Zachary Sowards
Comment: "It would be nice to see your upgrade summary include 2019/2021 IRP costs to see how much costs have increased."
Answer: "Yes, with inflation things have changed. I have provided current costs, but I can also provide previous costs. One of the cost drivers is the cost of land, especially in the Idaho Falls Lateral." – Kathleen Campbell
Question: "Do you do a full life cycle analysis of compressors when you evaluate type of compressors you use for these projects?
Answer: "We did include Net Present Value calculations for these upgrades." – Brian Robertson
Question: "Does that include NPV for all compressor options?"
Answer: "Yes, we did that for the compressor options including maintenance over a 20-year period." – Kathleen Campbell

Presentation #3 – Resource Optimization (Jenny De Boer, Brian Robertson)

- Transportation Shortfall Solves
    - Contract Renewals
    - GTN Xpress
    - Alternative Transportation Uptake
    - Renewable Natural Gas

Question: "When did you start using PLEXOS?"
Answer: "In the beginning of 2022" – Brian Robertson
Question: "What is your time intervals associated with your model? Is it daily?"
Answer: "Yes, it is daily." – Brian Robertson
Question: "Is PLEXOS used just for demand or is it also used for dispatch?"
Answer: "We have only used PLEXOS for planning purposes so far." – Brian Robertson
Question: "Is your load looking into system constraints to meet the load?"
Answer: "Yes, for our core customers" – Brian Robertson
Question: "What is the measurement being used, dekatherms?"
Answer: "Yes, dekatherms." – Brian Robertson

The Meeting was Adjourned

Action Items:

1. Consider adding in 2019/2021 costs of the upgrade summary into the IRP narrative for comparison with current price.