Colorado Springs Utilities

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Electric and Gas Integrated Resource Plans

Utilities Board Special Meeting for Approval

June 26, 2020

Agenda

- Welcome and Introduction
- Summary of UPAC Recommendations
- Portfolios 16 and 17 Comparison
- Customer Comment
- Board Discussion and Decision

Public Process Update

Public Engagement Summary

Public Comment Summary

Emails to energyvision@csu.org

- 38 received 5/29-6/15
- 37 received 6/15-6/17

Public Meetings Speakers

28 people spoke at the Utilities Board June 17 meeting

- 6 Stakeholder Groups
- 22 Citizens/Customers

Summary of UPAC Recommendations

EIRP Recommendation

Pathway	Portfolio	Carbon targets	2022	2023	2025	2026	2030	2035	2040	2050
Pathway E	Portfolio 16	2030 80% 2050 90%		Drake retire Small, mobile, natural gas generator			Nixon 1 retire Gas/renewable/ storage/DSM	Birdsall retire Gas/renewable/ Storage/DSM		
Gas	G-E16		LDC IT with oil backup		Expand/new pipeline capacity with NNT		Expand/new pipeline capacity with NNT			

Reasons for UPAC's recommendation of Portfolio 16:

- High Attribute ranking
- Meets state regulatory carbon reduction
- Solid financial results
- Reasonable risk profile
- Uses proven innovative technology
- Earliest Drake decommissioning
- Provides flexibility on Nixon 1 replacement

EIRP PORTFOLIO 16

Overview

- Carbon reduction goals: 80% by 2030, 90% by 2050
- Coal retirement: Drake Power Plant no later than 2023, Nixon Power Plant no later than 2030
- Other retirement: Birdsall Power Plant no later than 2035
- Replacement: Small, mobile natural gas generators, renewable energy, storage and other natural gas generation plus energy efficiency initiatives

Pathway	Portfolio	Carbon targets	2022	2023	2025	2026	2030	2035	2040	2050
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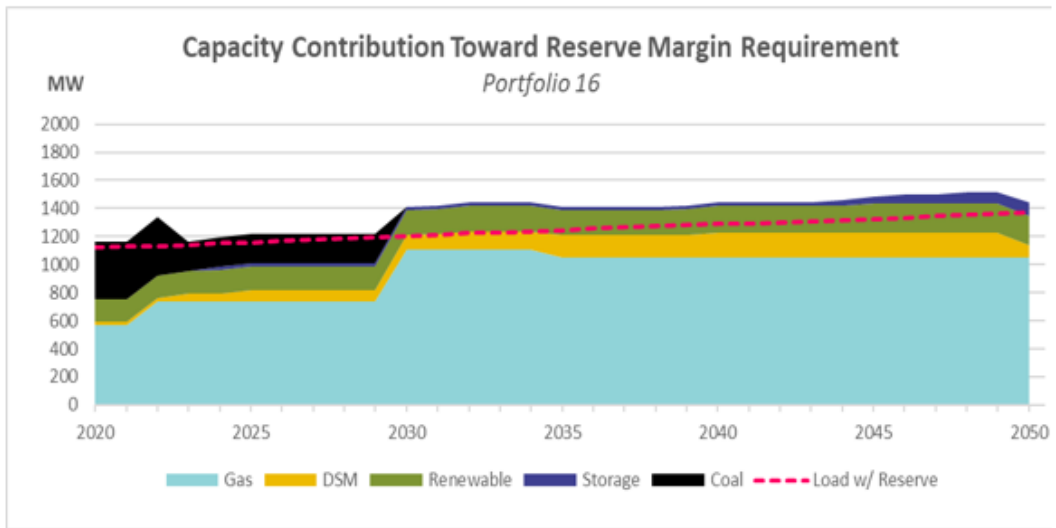


Resource Change 2021-2050 (MW)	
Drake (2023)	-208
Nixon 1 (2030)	-207
Nixon 2-3	0
Birdsall (2035)	-54
Front Range	0
New Gas	523
DSM	52
Storage	75
Solar	150
Wind	100
Hydro	0
Geothermal	10
Biomass/ Biogas	10
Carbon Capture	0
Nuclear	0

Financial Metrics	
30 Year Revenue Requirement	$36.27B
Average Annual Revenue Requirement	$1.21B
Average Adjusted Debt Service Coverage	2.09
Average Adjusted Days Cash on Hand	179
30 Year Electric Revenue	$18.0B

Attribute Score	
Reliability	93
Cost/ Implementation	63
Environment/ Stewardship	72
Flexibility/ Diversity	75
Innovation	50
Total score (normalized)	98.7

Sensitivities ($ incremental)	
Social Cost	$1.05B
High Load	$308M
Low Load	($238)M
High Gas	$535M
Low Gas	($482)M
90x30	$217M
100x50	$193M
Drake 2022	($13)M

Risks

- Tight on capacity with early Drake decommissioning
- Electrification will provide a challenge in serving increased load while reducing GHG emissions
- Future regulatory risk (ex. 100% renewables)
- Transmission import limitations for wind generation

Attribute rank

Financial rank

GIRP Recommendation

Portfolio	2022	2025	2030	2032	2034	2035	2040	2043	2050
G-6		DR + EE		Propane Air Expansion			Propane Air New		

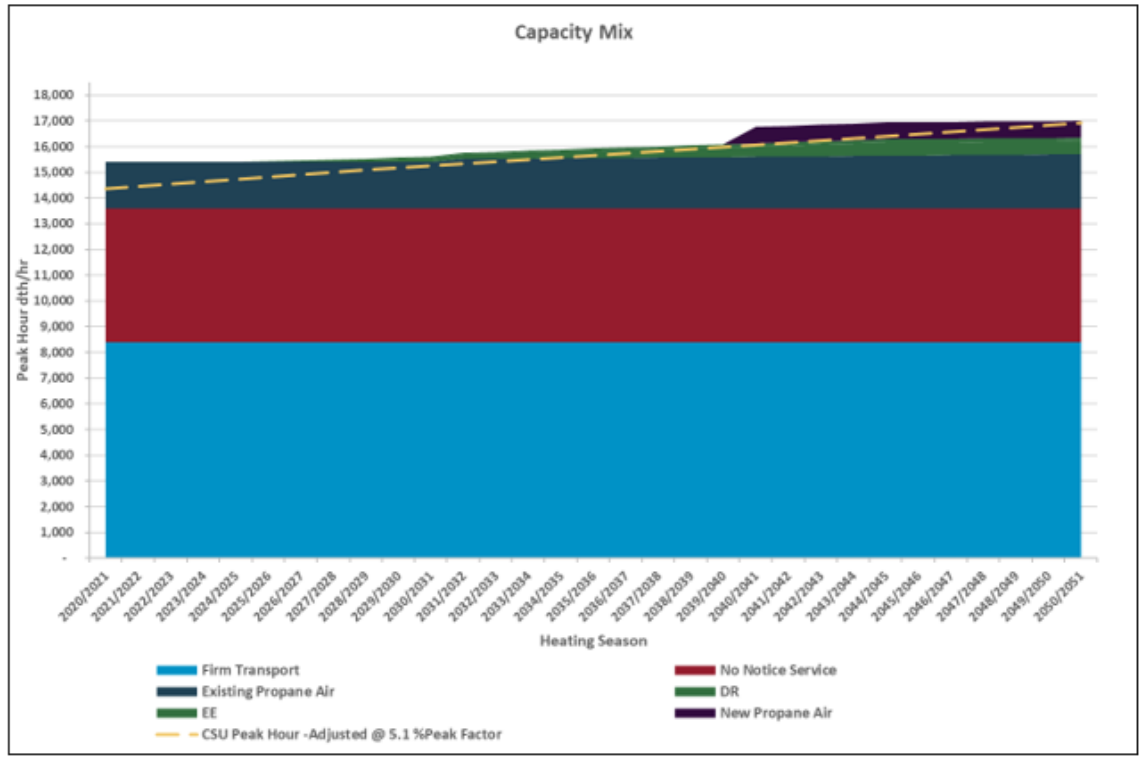
Reasons for UPAC's recommendation of Portfolio 6:

- Best attribute score
- Lowest revenue requirement
- Contains both DR and EE features
- Controllable risk profile
- Defers new infrastructure requirements

GIRP PORTFOLIO 6

Overview
Addition: Demand response, energy efficiency, new propane air, existing propane air expansion

	Portfolio	2022	2025	2030	2032	2034	2035	2040	2043	2050
Pathway C DSM + new peak shaving capacity	G-6		Demand response and energy efficiency		Propane air expansion			Propane air new		



Resource Change 2021-2050 (Dth/hr)	
Existing PA	300
New PA	650
New Pipeline Capacity	0
New LNG	0
Demand Response	500
Energy Efficiency	150

Financial Metrics	
30 Year Revenue Requirement	$35.71B
Average Annual Revenue Requirement	$1.190B
30 Year Gas Revenue	$5.73B

Attribute Score	
Reliability	83.5
Cost/ Implementation	100.0
Environment/ Stewardship	100.0
Flexibility/ Diversity	86.8
Innovation	72.7
Total score (normalized)	100.0

Sensitivities ($ incremental)	
High Growth	$7.79M
Low Growth	($12.54M)
Renewable Natural Gas (voluntary)	$64.10M
Non-firm Options	Included in EIRP Portfolios
Peaking Capacity Options	Requires Study
High DR	NA
High EE	NA
High DSM	($1.70M)
Distributed Generation on LDC System	Increases EIRP New Fixed Gas Costs by 86%

Risks

- High growth advances capital plan by 5 years, increases fixed gas costs
- Potential public push back on new PA Plant
- Electrification reduces load growth/revenue
- Regulatory risk mandating RNG
- Non-firm options require oil backup for DG
- DSM needs proof of concept, program development

1
Attribute rank

C

Portfolios 16 and 17 Comparison

Why Consider Portfolio 17

- Community input
- Board interest
- CEO/ Leadership/ Employee Recommendation

EIRP PORTFOLIO 17

Pathway	Portfolio	Carbon targets	2022	2023	2025	2026	2030	2035	2040	2050
Pathway E	Portfolio 17	2030 80% 2050 90%		Drake retire Small, mobile, natural gas generator			Nixon 1 retire Non-carbon, storage & DSM	Birdsall retire Non-carbon, storage & DSM		
Gas	G-E17		LDC IT with oil backup		Expand/new pipeline capacity with NNT					

EIRP PORTFOLIO 17

Overview

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- Coal retirement: Drake Power Plant no later than 2023, Nixon Power Plant no later than 2030
- Other retirement: Birdsall Power Plant no later than 2035
- Replacement: Small, mobile natural gas generators, non-carbon generation and storage plus energy efficiency initiatives

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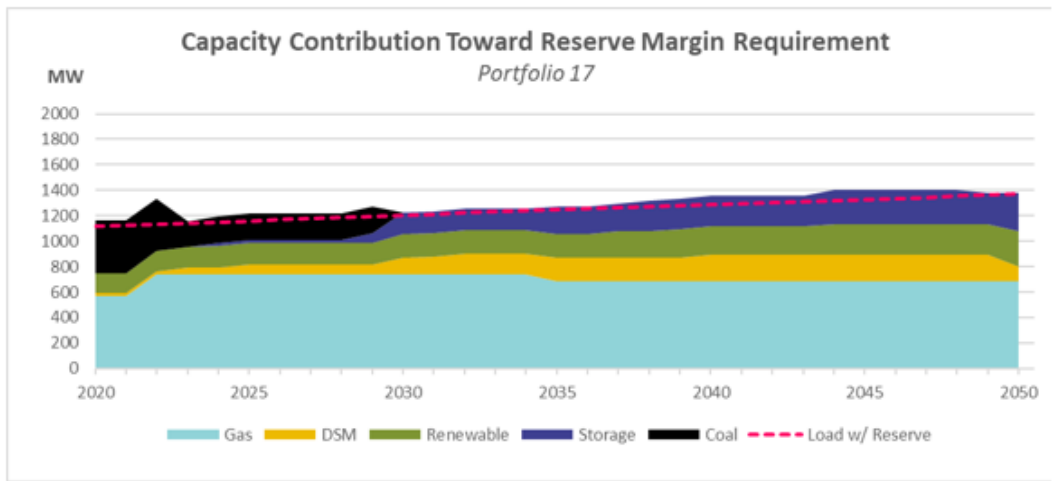

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Front Range	0
New Gas	156
DSM	76
Storage	417
Solar	150
Wind	500
Hydro	0
Geothermal	10
Biomass/ Biogas	10
Carbon Capture	0
Nuclear	0

Financial Metrics	
30 Year Revenue Requirement	$36.47B
Average Annual Revenue Requirement	$1.22B
Average Adjusted Debt Service Coverage	1.85
Average Adjusted Days Cash on Hand	154
30 Year Electric Revenue	$18.21B

Attribute Score	
Reliability	100
Cost/ Implementation	46
Environment/ Stewardship	69
Flexibility/ Diversity	88
Innovation	70
Total score (normalized)	100

Sensitivities ($ incremental)	
Social Cost	$0.97B
High Load	$330M
Low Load	($317)M
High Gas	$458M
Low Gas	($491)M
90x30	$98M
100x50	$100M
Drake 2022	($55)M

Risks

- Tight on capacity with early Drake decommissioning
- Electrification will provide a challenge in serving increased load while reducing GHG emissions
- Future regulatory risk (ex. 100% renewables)
- Transmission import limitations for wind generation

Attribute rank

Financial rank

EIRP PORTFOLIO 16

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EIRP PORTFOLIO 17

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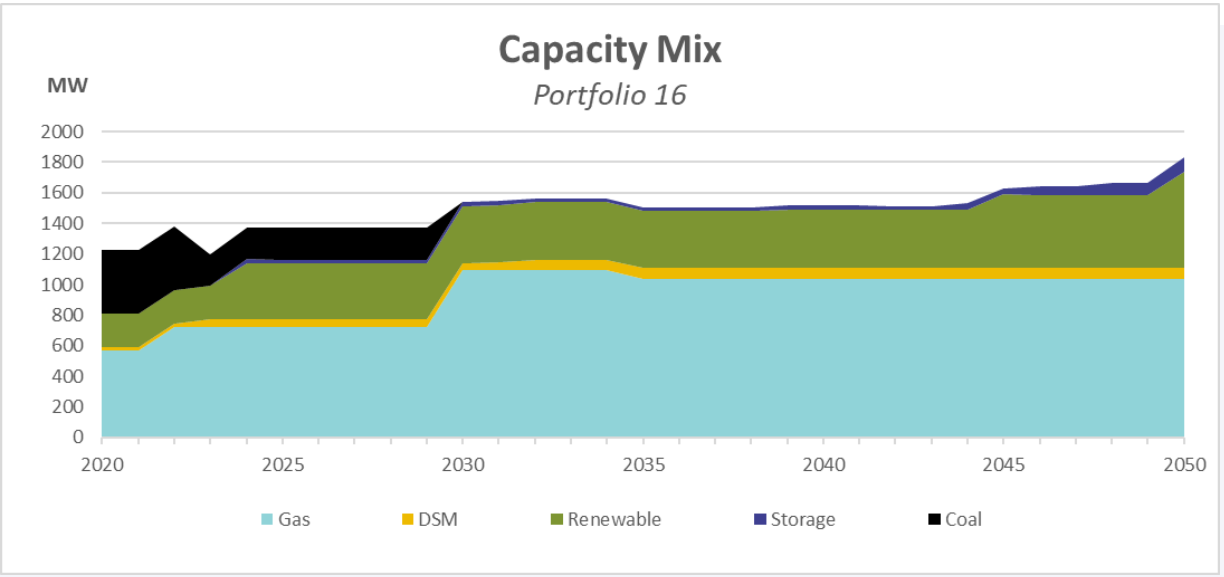
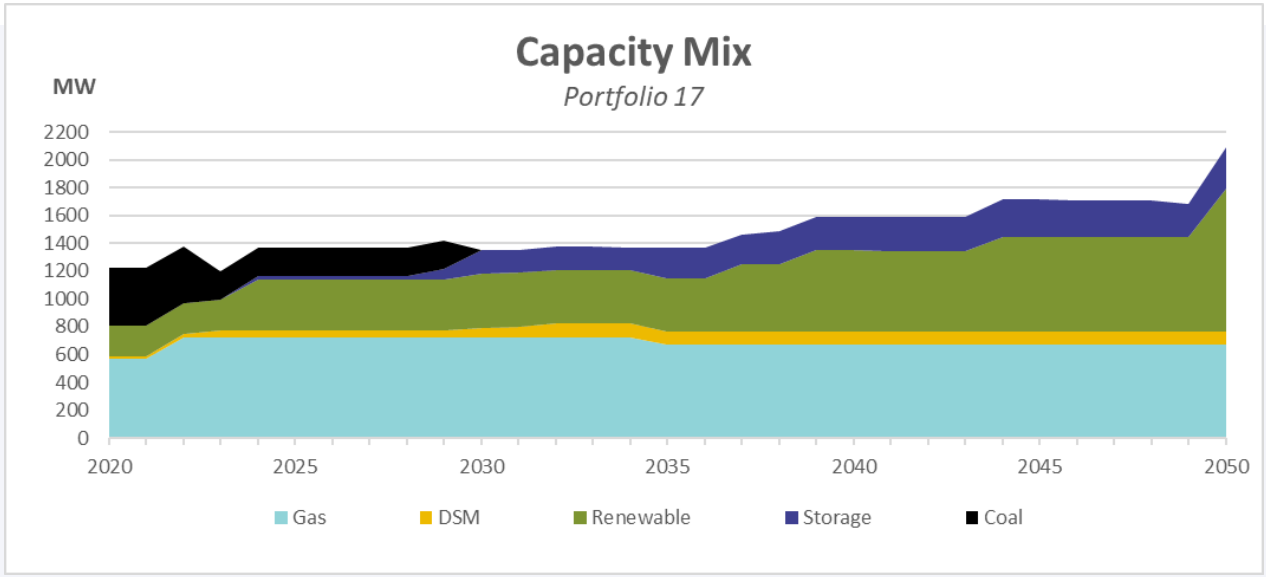
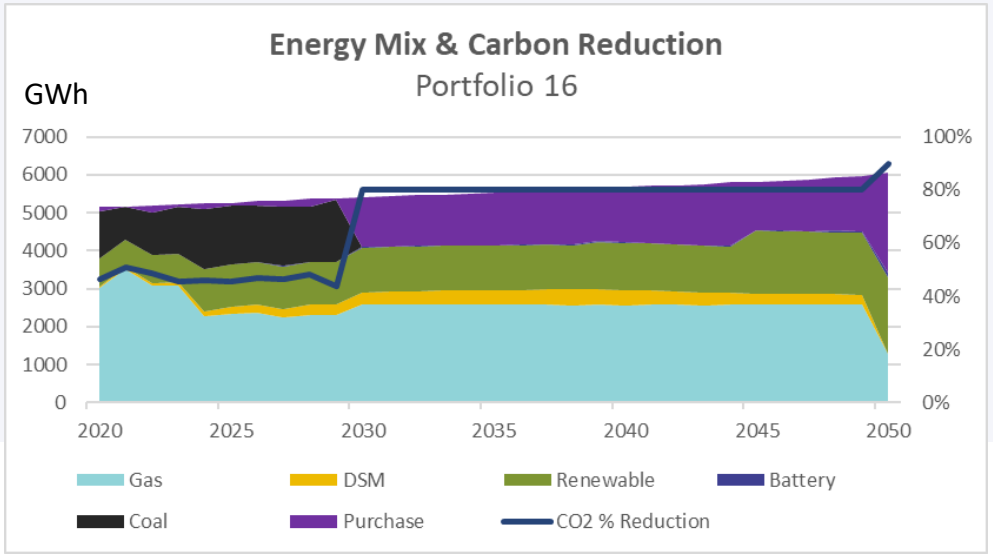
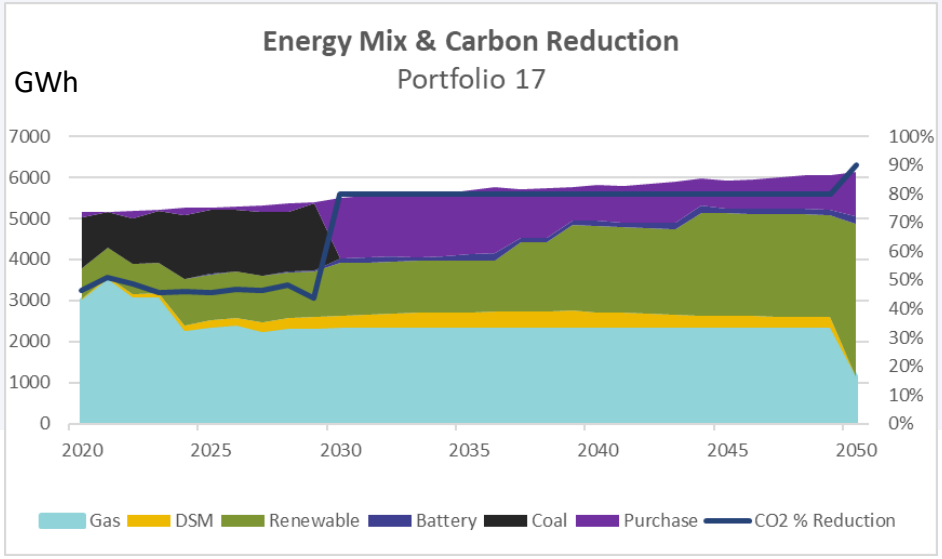
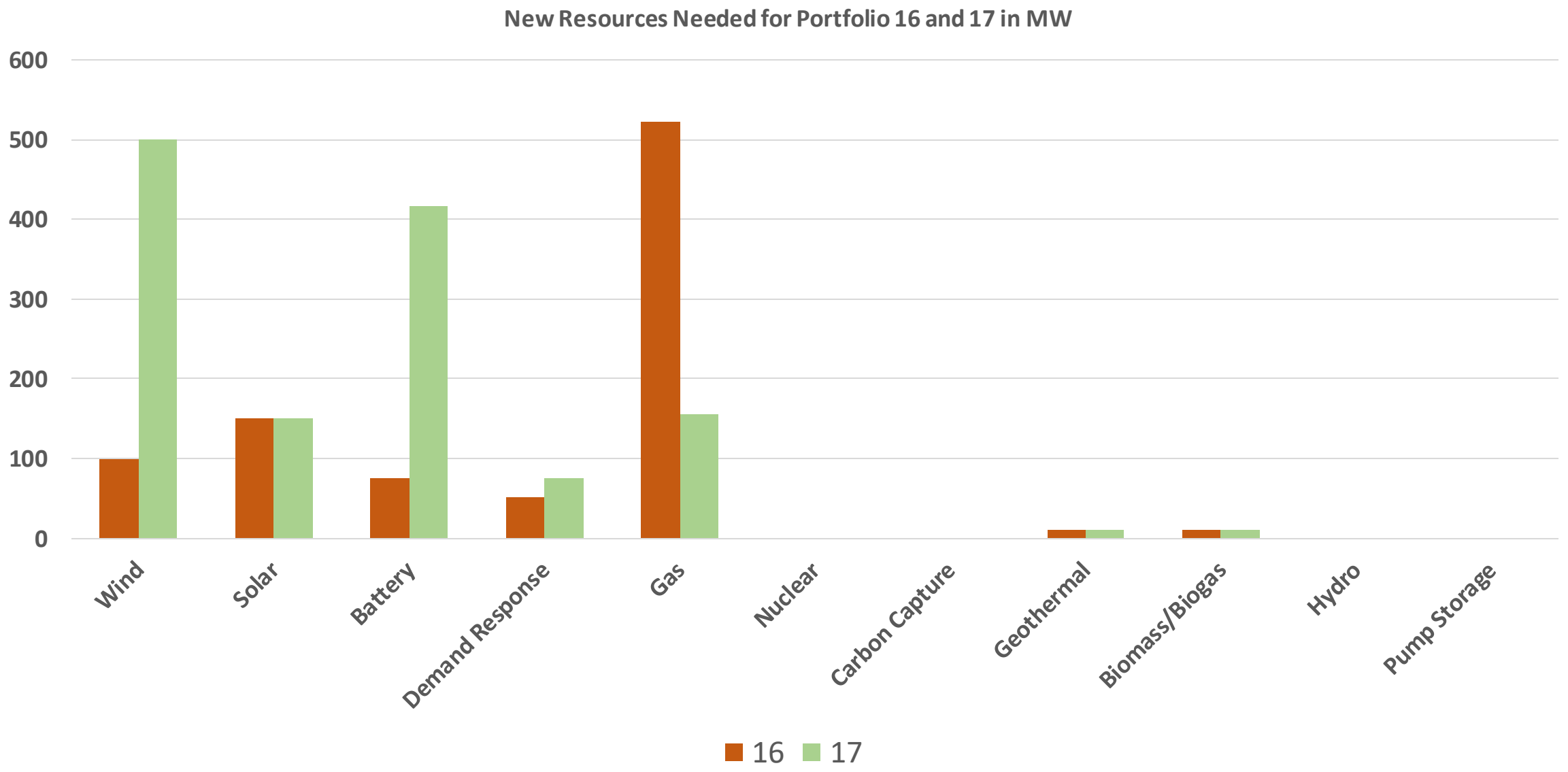
Portfolios 16 and 17 Capacity and Energy










New Resources Needed for Portfolio 16 and 17 in MW
600
500
400
300
200
100
0
Wind
Solar
Battery
Demand Response
Gas
Nuclear
Carbon Capture
Geothermal
Biomass/Biogas
Hydro
Pump Storage
16
17

IRP Goals (Phase 1)

Resilient and reliable

- Industry leading reliability and resiliency while avoiding potential stranded assets
- Support economic growth of the region

Cost-effective energy

- Maintain competitive and affordable rates
- Further advance energy efficiency and demand response

Environmentally sustainable

- Grow renewable portfolio
- Establish timelines for decommissioning of assets

Reduces our carbon footprint

- Meet all environmental regulations with specific metrics that include reducing our carbon footprint
- Reduce reliance on fossil fuels

Uses proven state-of-the-art technologies

- Proactively and responsibly integrate new technologies

to enhance our quality of life for generations to come

Attribute Scoring (Phase 2)

	Reliability	Cost / Implementation	Environment / Stewardship	Flexibility / Diversity	Innovation	Total
Weighting	32%	22%	22%	14%	10%	
Criteria	1. Quick Ramp 2. Quick Start 3. Market Purchases 4. Availability	1. NPVRR 2. Decommission timeframe	1. GHG Reduction 2. Land Use 3. Water Use	1. Average Capacity 2. Generation Sources	1. Demand Reduction 2. State of the Art Technology use	
Portfolio 16 - Score	1.12	0.66	0.70	0.42	0.25	**3.15**
Portfolio 17 - Score	1.20	0.49	0.66	0.49	0.35	**3.19**

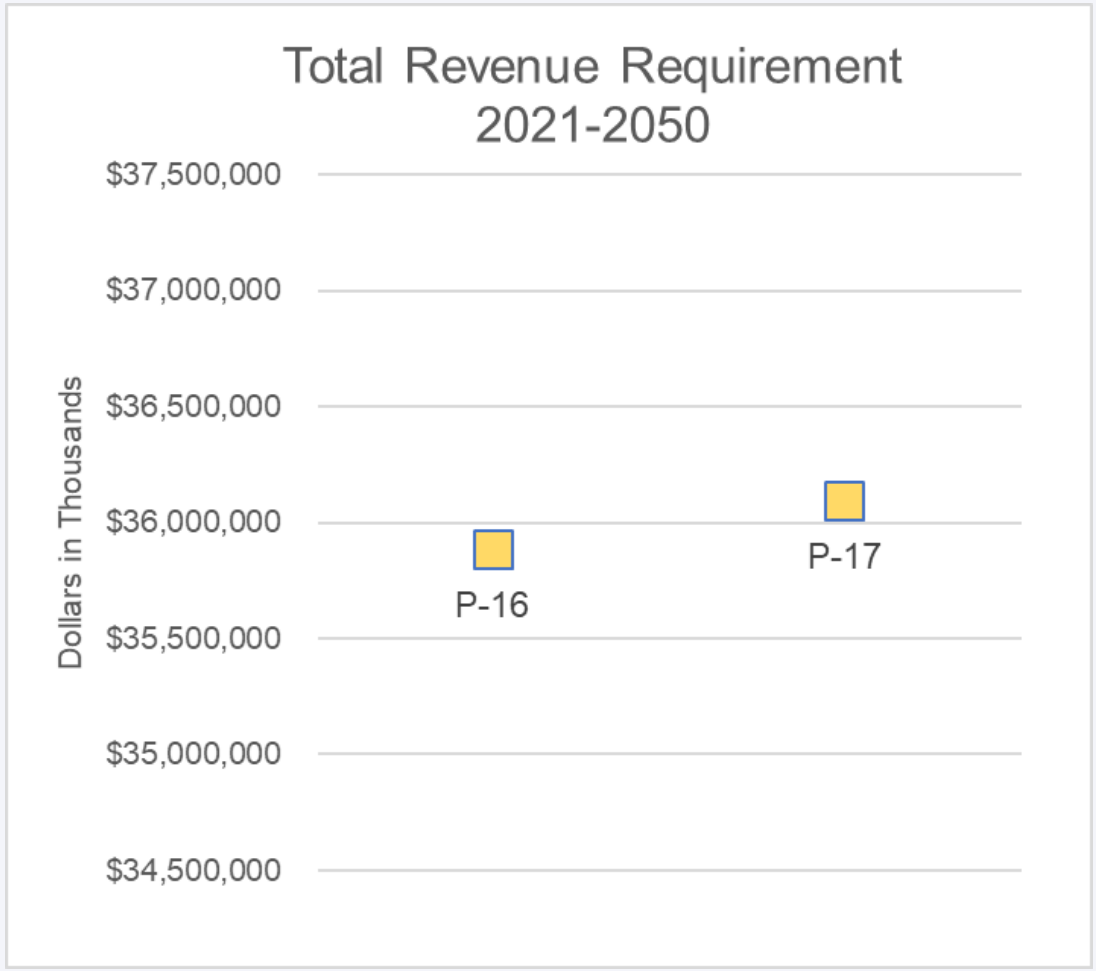
Note: Final Score is normalized against score of all other portfolios on 100 point scale.

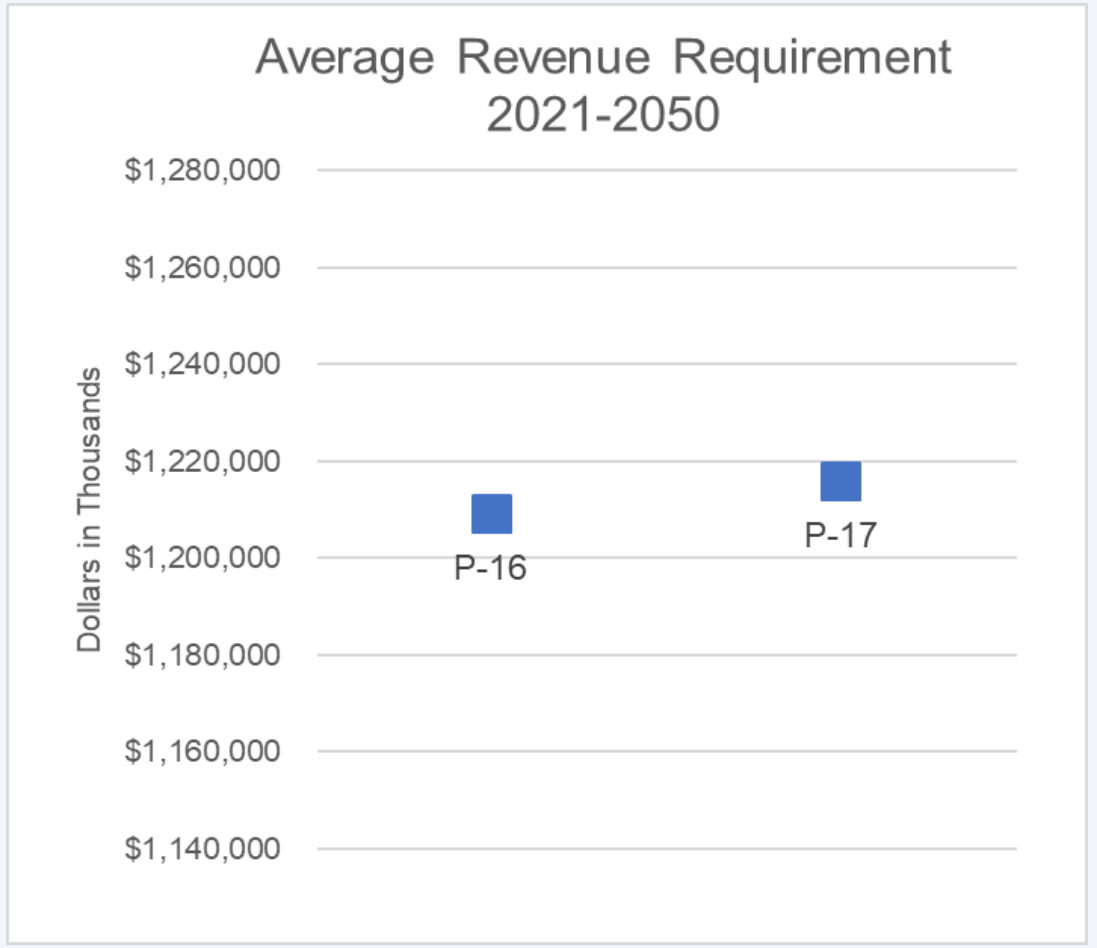
Portfolio 16 and 17 Scoring Slide

Portfolio	Pathway	CO2 Target	Retirements	New Resources	Attribute Ranking	Total Score Normalized	Financial Ranking	Total RR	% Increase to Portfolio R	% Increase to Portfolio 1
17	E	80% by 2030 90% by 2050	Drake 2023 Nixon 1 2030	Aeroderivative/Non-Carbon/Storage/DSM	1	100	4	$36.47B	2.10%	-0.21%
16	E	80% by 2030 90% by 2050	Drake 2023 Nixon 1 2030	Aeroderivative/Gas/Renewable/Storage/DSM	2	98.7	1	$36.27B	1.53%	-0.76%

Note: Total RR is total revenue requirement for all 4 services for 30 years in billions of dollars. It represents total cost to run Colorado Springs Utilities.

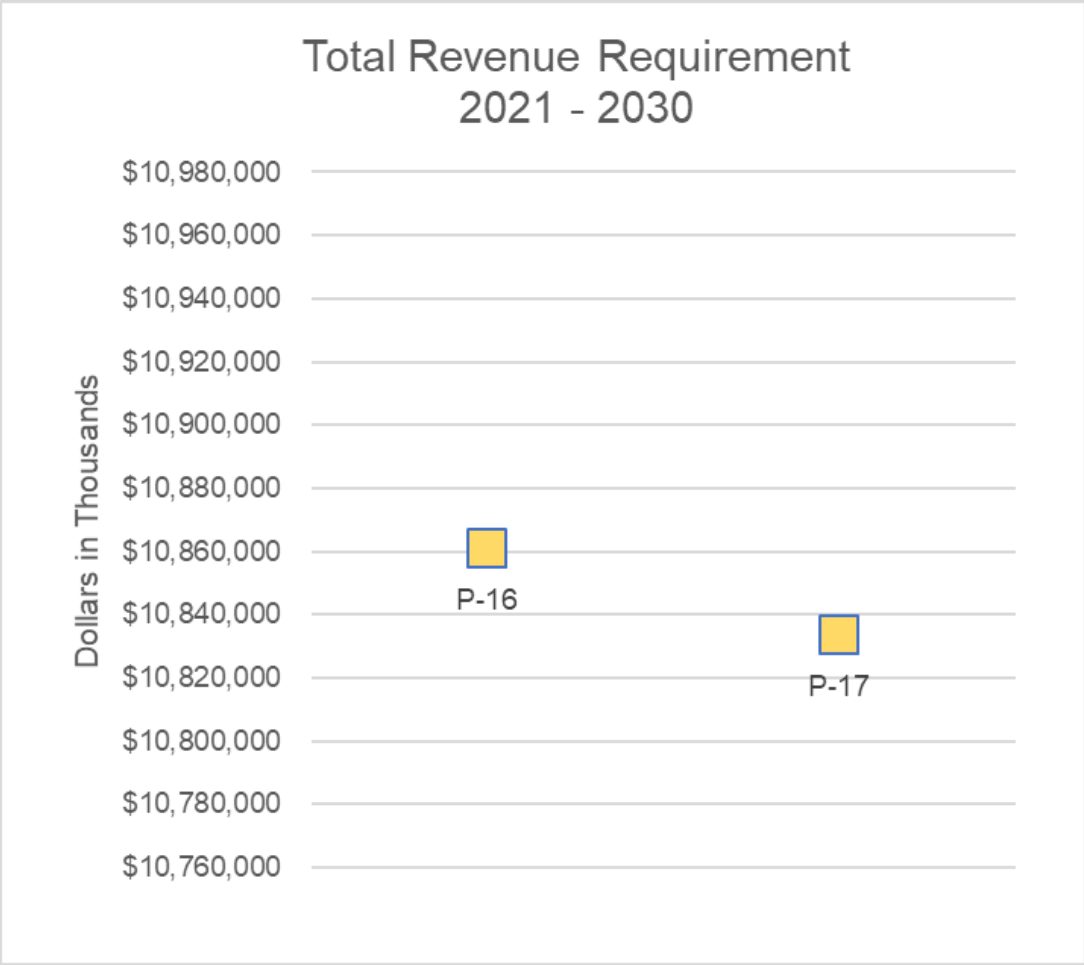
Portfolio 16 & 17 Financial Results (30 year)

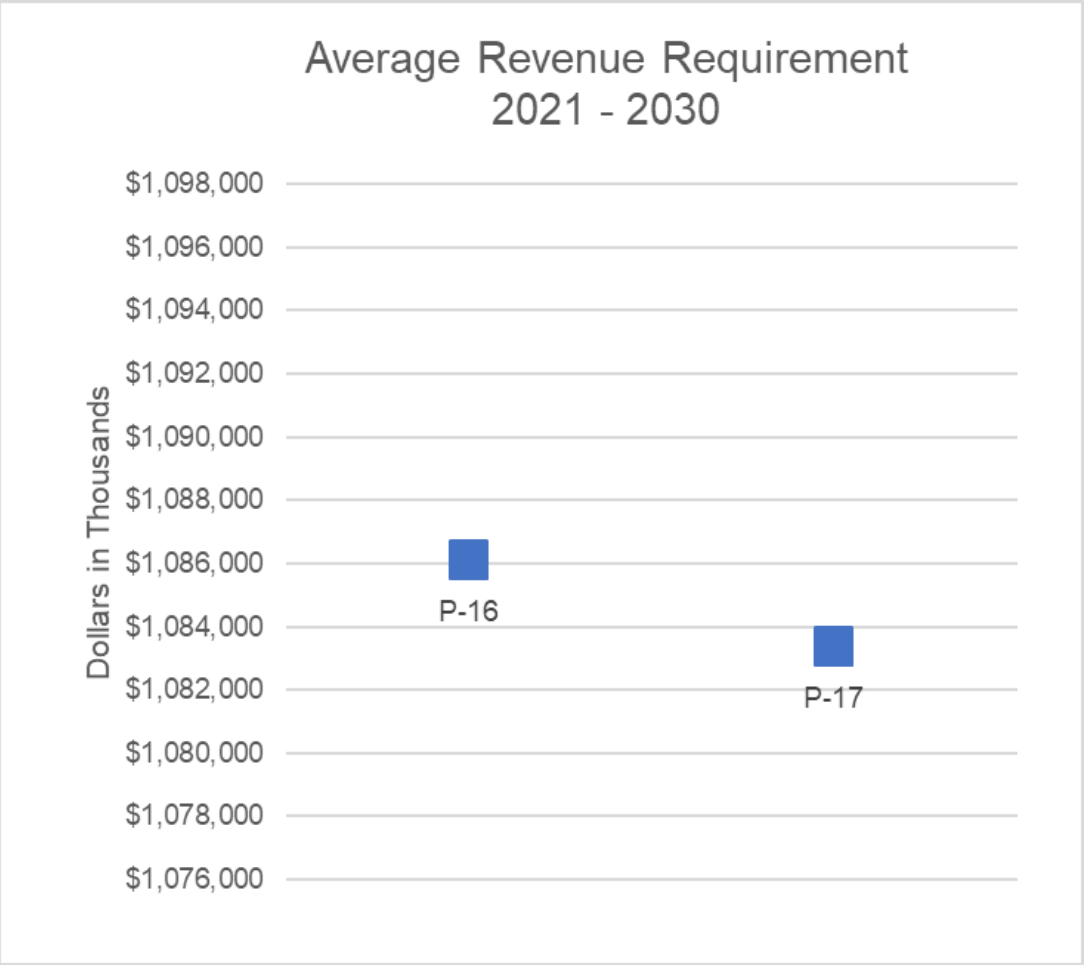




Revenue numbers are for 30 years.

Portfolio 16 & 17 Financial Results (10 year)





Revenue numbers are for 10 years.

Summary Comparison - Similarities

Portfolio 16:

- 2nd highest Attribute ranking (Phase 2)
- Meets state regulatory carbon reduction
- Solid financial results (within margin of error)
- Reasonable risk profile
- Earliest Drake decommissioning (NLT 2023) with gas aeroderivative replacement
- Provides flexibility on Nixon 1 replacement
- Aligned with community input (early decommissioning)
- Aligned with IRP Goals
- Aligned with GIRP Portfolio 6

Portfolio 17:

- Highest scoring portfolio on attributes (Phase 2)
- Meets state regulatory carbon reduction
- Solid financial results (within margin of error)
- Reasonable risk profile
- Earliest Drake decommissioning (NLT 2023) with gas aeroderivative replacement
- Provides flexibility on Nixon 1 replacement
- Aligned with community input (early decommissioning)
- Aligned with IRP Goals
- Aligned with GIRP Portfolio 6

Summary Comparison - Differences

Portfolio 16:

- Relies on gas resources and demand side management to replace Nixon 1 capacity

Portfolio 17:

- Relies on wind, energy storage and demand side management to replace Nixon 1 capacity
- Less dependence on spot market purchases to serve load and reduce carbon footprint

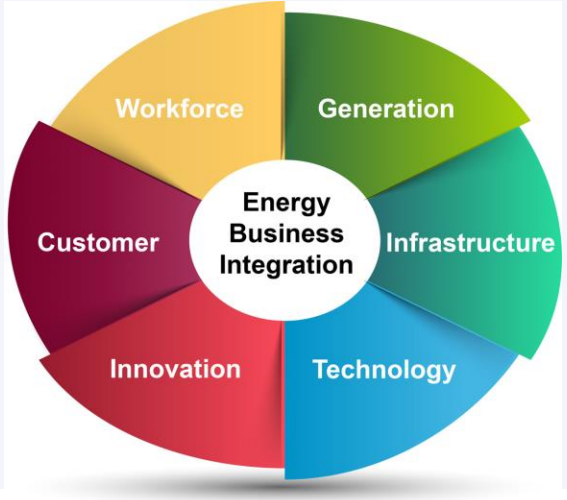
Utilities' Recommendation- Portfolio 17

EIRP PORTFOLIO 17

Pathway	Portfolio	Carbon targets	2022	2023	2025	2026	2030	2035	2040	2050
Pathway E	Portfolio 17	2030 80% 2050 90%		Drake retire Small, mobile, natural gas generator			Nixon 1 retire Non-carbon, storage & DSM	Birdsall retire Non-carbon, storage & DSM		
Gas	G-E17		LDC IT with oil backup		Expand/new pipeline capacity with NNT					

Reasons for Utilities' recommendation of Portfolio 17:

- Enhanced reliability and resilience
- Investment in infrastructure to support renewables and advanced technologies
- Supports vision of advancing renewable energy and future technologies (e.g. microgrids, storage, electric vehicles, AMI, distributed resources, etc.)
- Will promote innovation, utility transformation and agility
- Use gas resources for Nixon replacement only as a contingency/back up plan



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Customer Comment

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Board Discussion and Decision


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Supplemental Information

Public Comment Summary – June 17

Ft. Carson and Army Office of Energy Initiatives

- Resiliency is the most important aspect of their energy service.
- Colorado Springs Utilities has involved them in the IRP process and provides resilient power at Fort Carson.
- Army installations must have access to energy to assure readiness.
- Energy infrastructure is a key facet of resilience importance and the Army is willing to partner with Colorado Springs Utilities in siting key energy infrastructure that establish longer duration and larger scale backup resources.

Sierra Club Beyond Coal

- Applauds early coal retirement and the promise that no Utilities employees will lose their job.
- Sees the need to invest in new energy sources, but prefers renewable resources to fossil fuel due to environmental impacts.
- New natural gas plants will cost more money with significant regulatory risk.
- Supports Portfolio 17.

Public Comment Summary – June 17

Penrose/St. Francis

- Penrose/St. Francis partners with Colorado Springs Utilities at both campuses.
- They rely on resilience and enhanced power at St. Francis, and look forward to planning programs with Interquest campus, and the possibility of a solar farm there.
- Appreciative of rebate programs.

Downtown Partnership

- Downtown Partnership were engaged and participated in the IRP, and appreciates strong business community involvement.
- Pleased with both portfolios and supporting portfolio 17, as it gives an edge with wind and battery for a clean energy future, new investment to downtown, and opportunity to have a bold clean energy commitment.
- Supports swift plan for decommissioning Drake Power Plant, which will attract businesses looking for this commitment.

Public Comment Summary – June 17

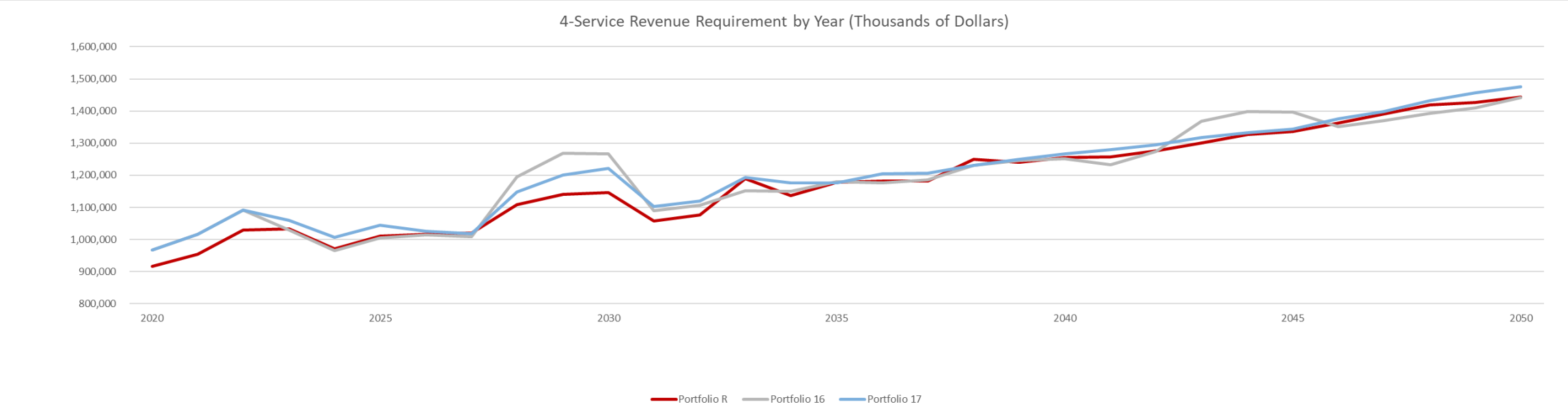
Chamber of Commerce & EDC

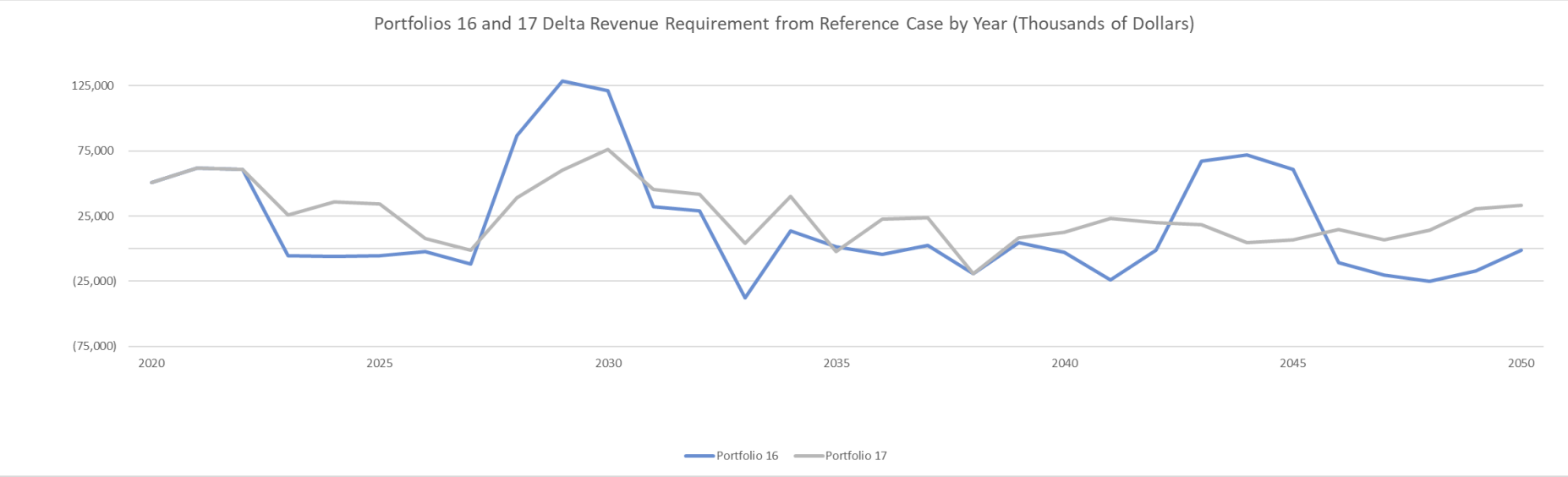
- Agrees with the five attributes used to evaluate portfolios.
- The Chamber & EDC has participated, and presented to UPAC, appreciate adjustments made, and endorsed the process conducted with robust public outreach.
- Sees Drake redevelopment and future of the plant as a gateway and opportunity for revitalization downtown.

Public Comments

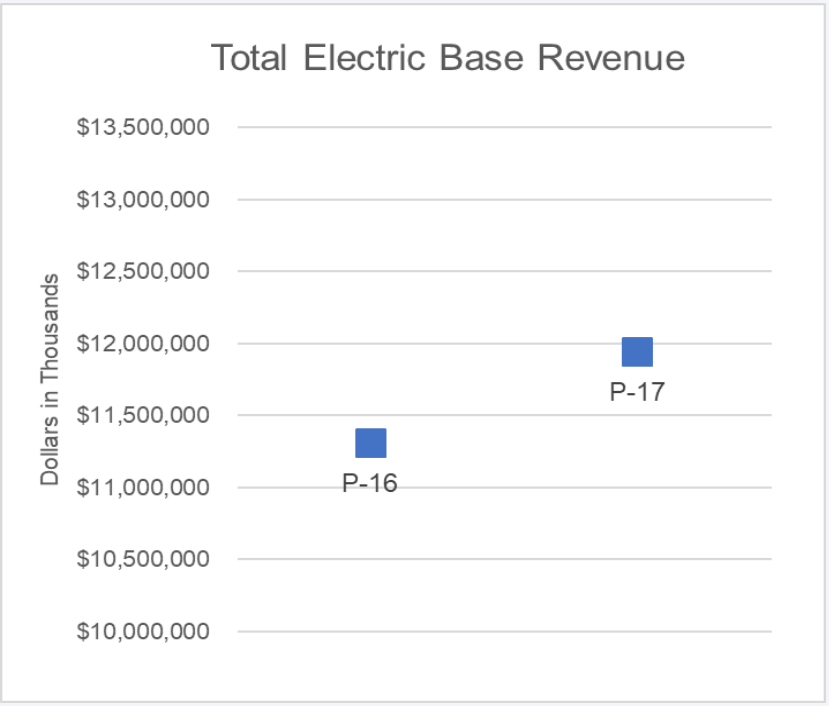
- Nineteen Speakers supported Portfolio 17 over Portfolio 16.
- Two speakers supported Portfolio 10, one speaker supported Portfolio 16.
- Preference for renewable resources vs. fossil fuels as replacement for Drake and Nixon.

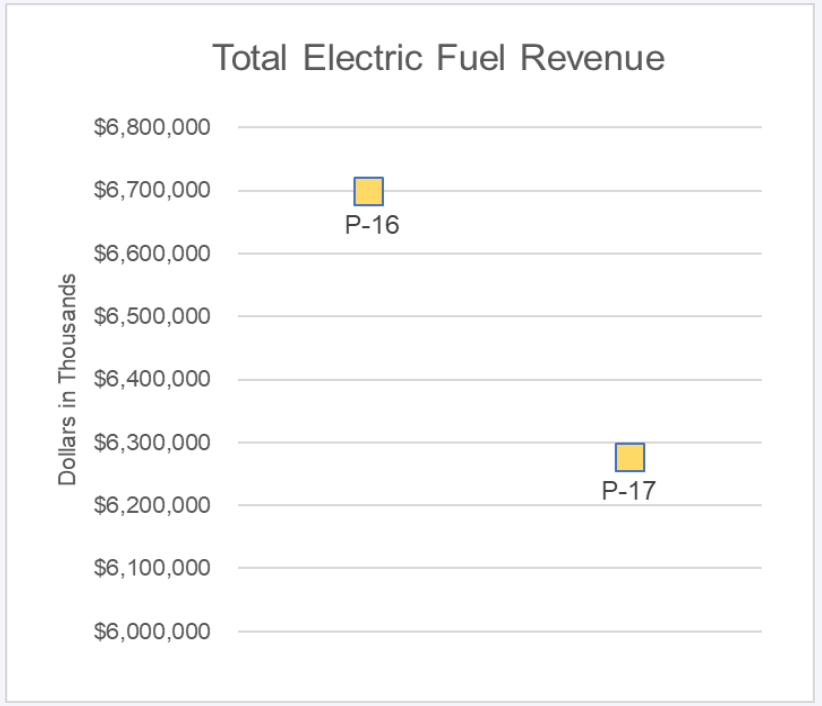
Revenue Requirement Comparison

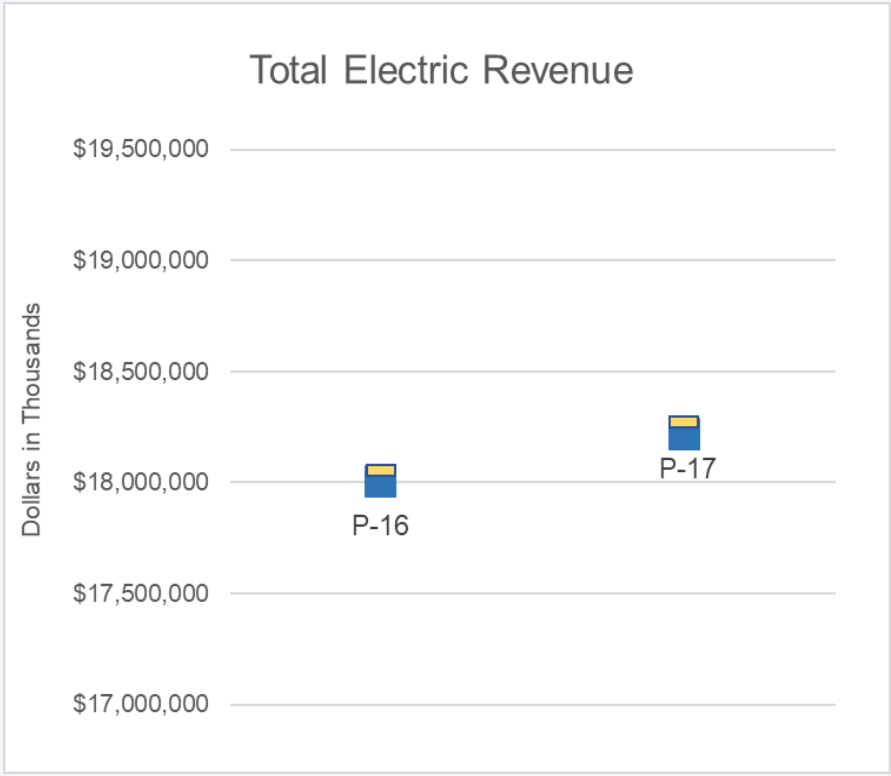




Electric Revenue – Base and Fuel



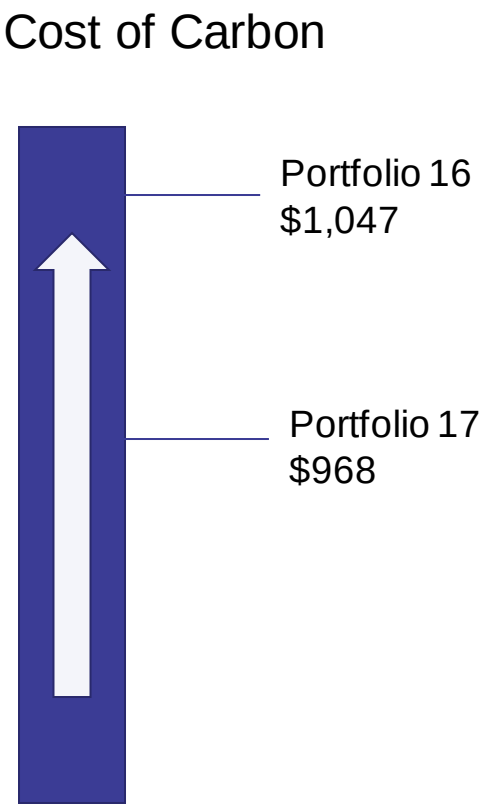




Revenue numbers are for 30 years.

EIRP Sensitivity
Social Cost of Carbon

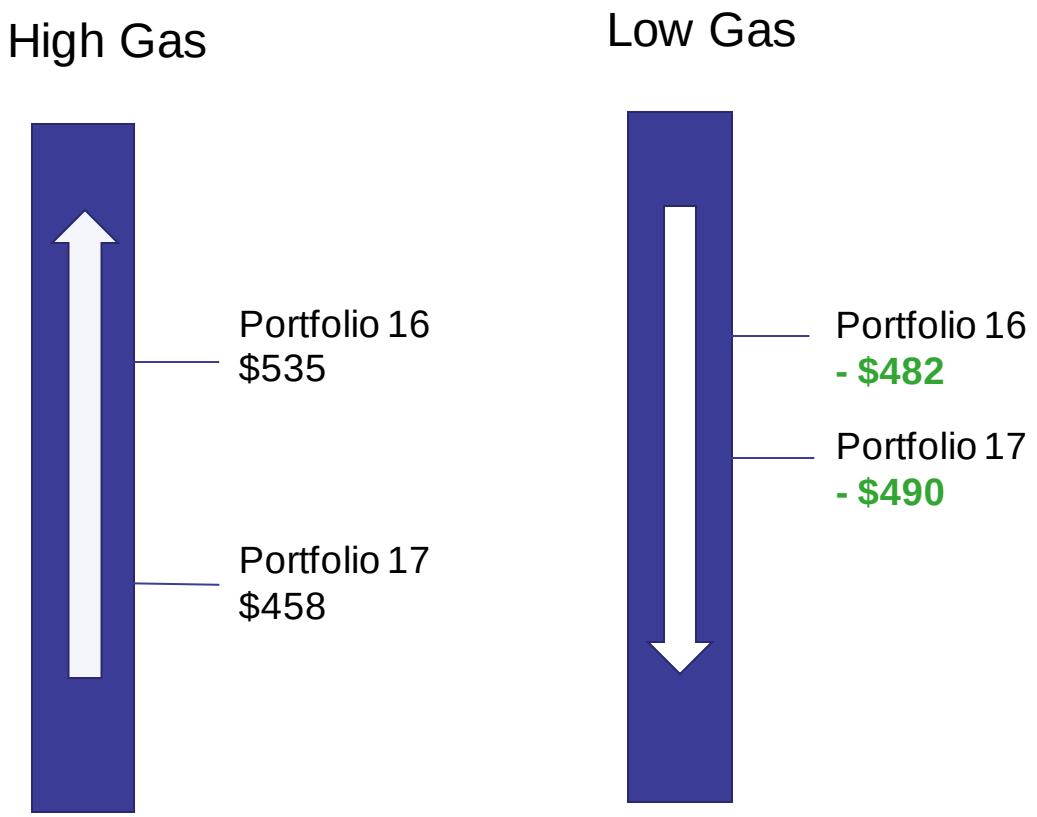
- All portfolios are more costly
- Accelerates CO2 reduction by backing down coal and gas generation
- Requires substantial increase in carbon free or renewable energy
- Gas resources built to meet capacity requirements but do not run much



Incremental net present value revenue requirement over 30 years.
Numbers are in millions of dollars.
Black numbers indicate increase.

EIRP Sensitivity
Gas Price

- Both gas and renewable portfolios are impacted due to cost of market purchases
- Low gas prices help all portfolios
- High gas prices hurt all portfolios

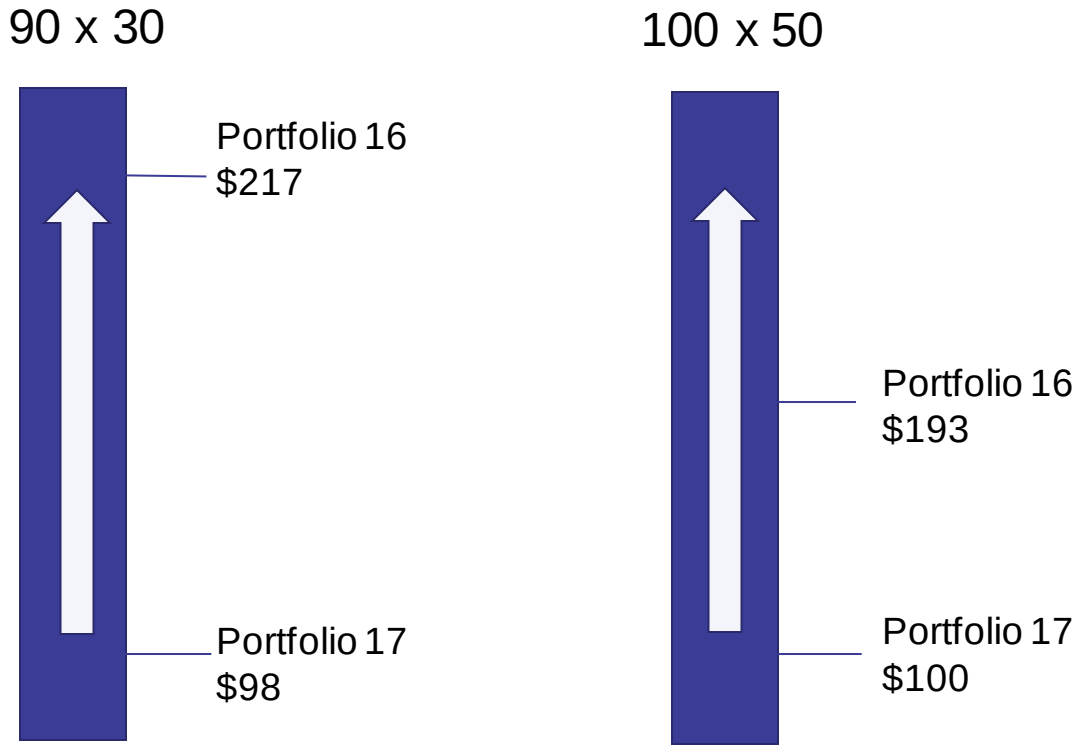


Incremental net present value revenue requirement over 30 years. Numbers are in millions of dollars. Green numbers indicate decrease in revenue requirement. Black numbers indicate increase.

EIRP Sensitivity

Carbon reduction

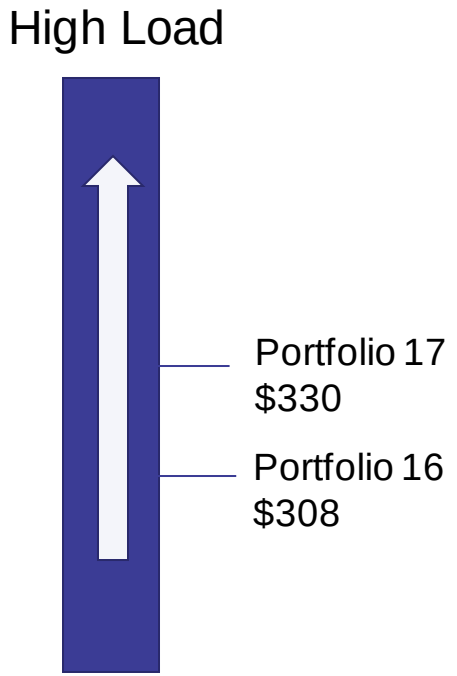
- All portfolios are more costly
- Increased reliance on energy market
- Model still builds gas generation as bridge allowing for cost of renewables to continue to decline
- Current transmission infrastructure not sufficient to achieve 100% renewable energy
- A lot of excess energy and hours of curtailment, and a significant amount of energy storage and DSM needed
- Portfolios 10 and 11 already meet 100% by 2050 target

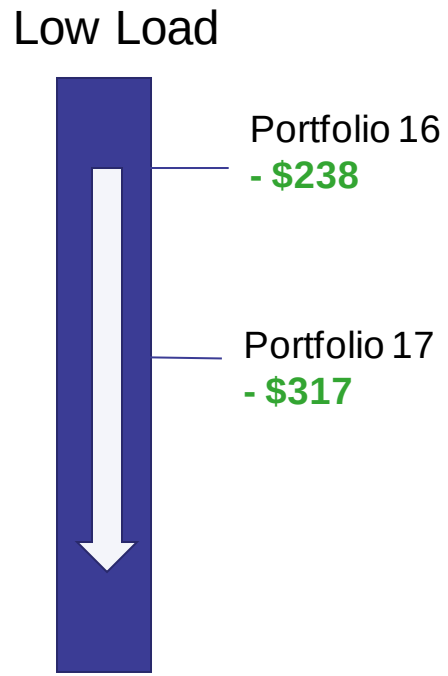


Incremental net present value revenue requirement over 30 years.
Numbers are in millions of dollars. Black numbers indicate increase.

EIRP Sensitivity
Load Forecast

- High load represents potential annexation and electrification scenarios
- Electrification will increase electric revenue requirement but decrease gas revenue requirement
- High load increases total revenue requirement
- Low load decreases total revenue requirement





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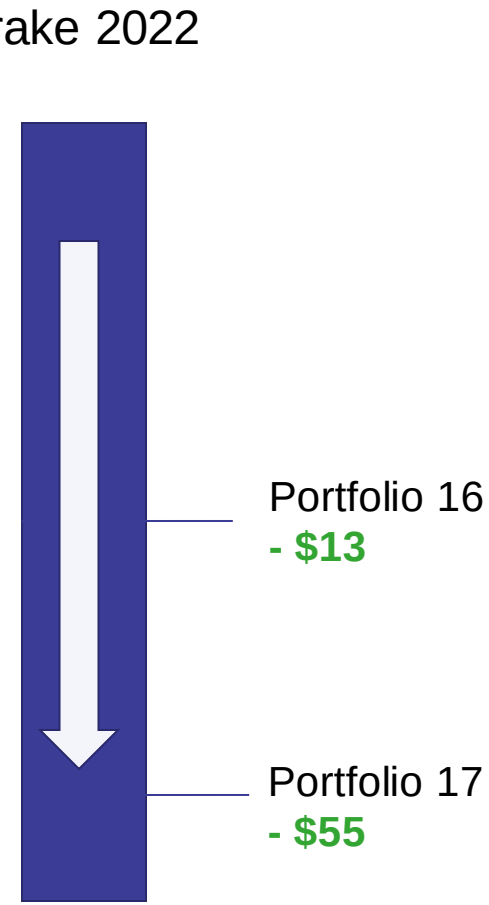
EIRP Sensitivity

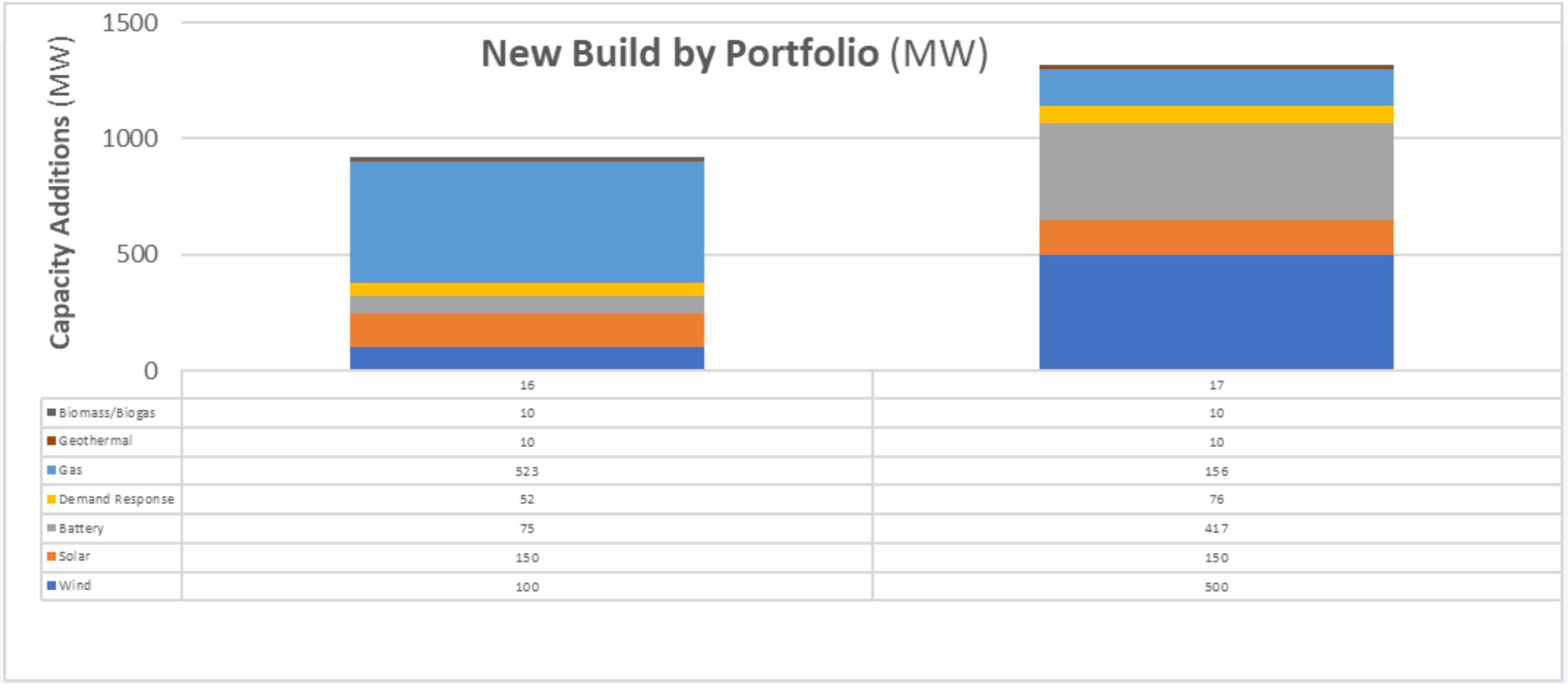
Drake retired no later than 2022

- Only possible in portfolios 12, 16 and 17
- Additional capacity is needed sooner
- Can lower costs even more depending on new capacity resource



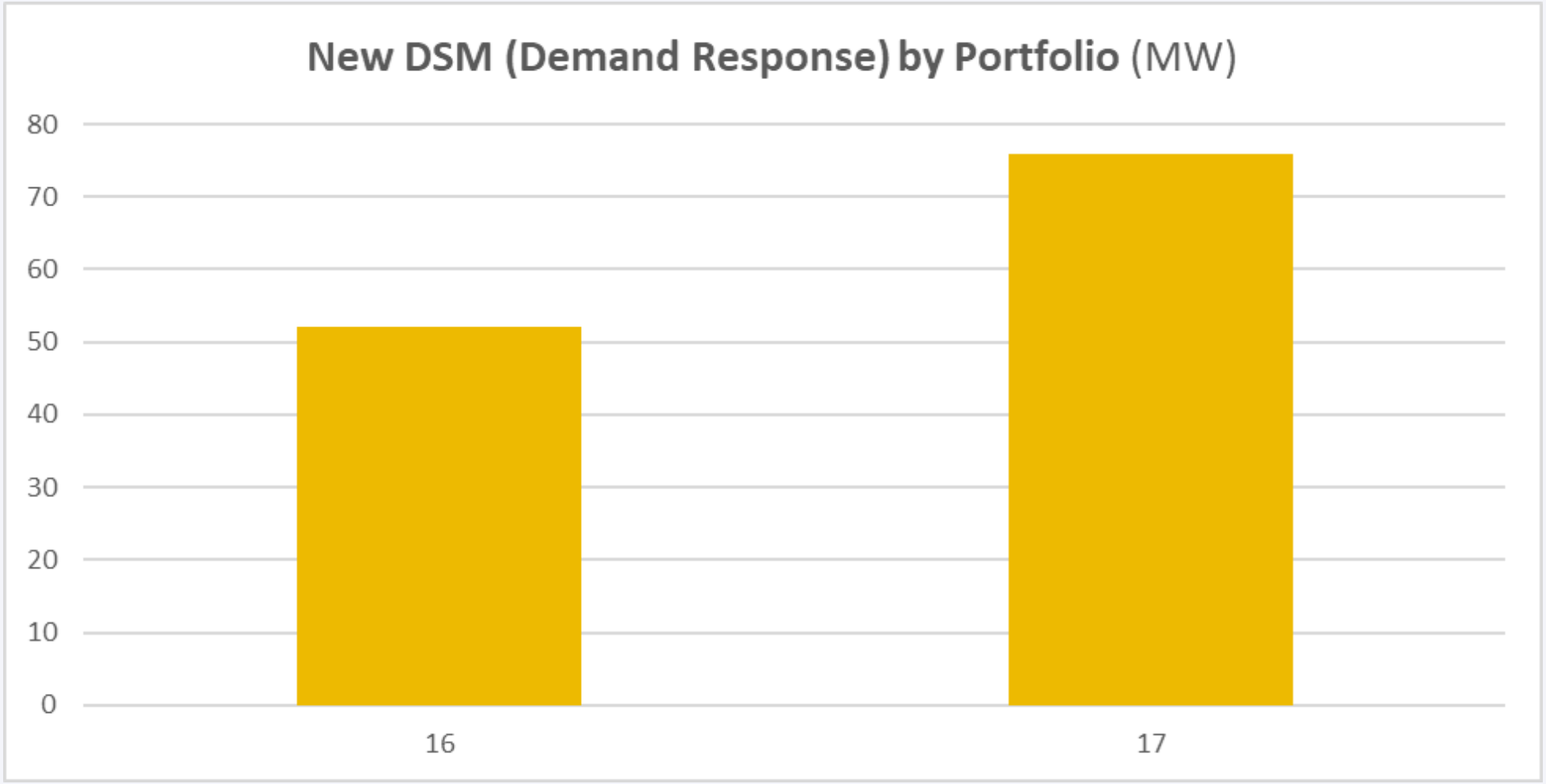
Incremental net present value revenue requirement over 30 years. Numbers are in millions of dollars. Green numbers indicate decrease in revenue requirement. Black numbers indicate increase.

Portfolios 16 and 17 New Resources

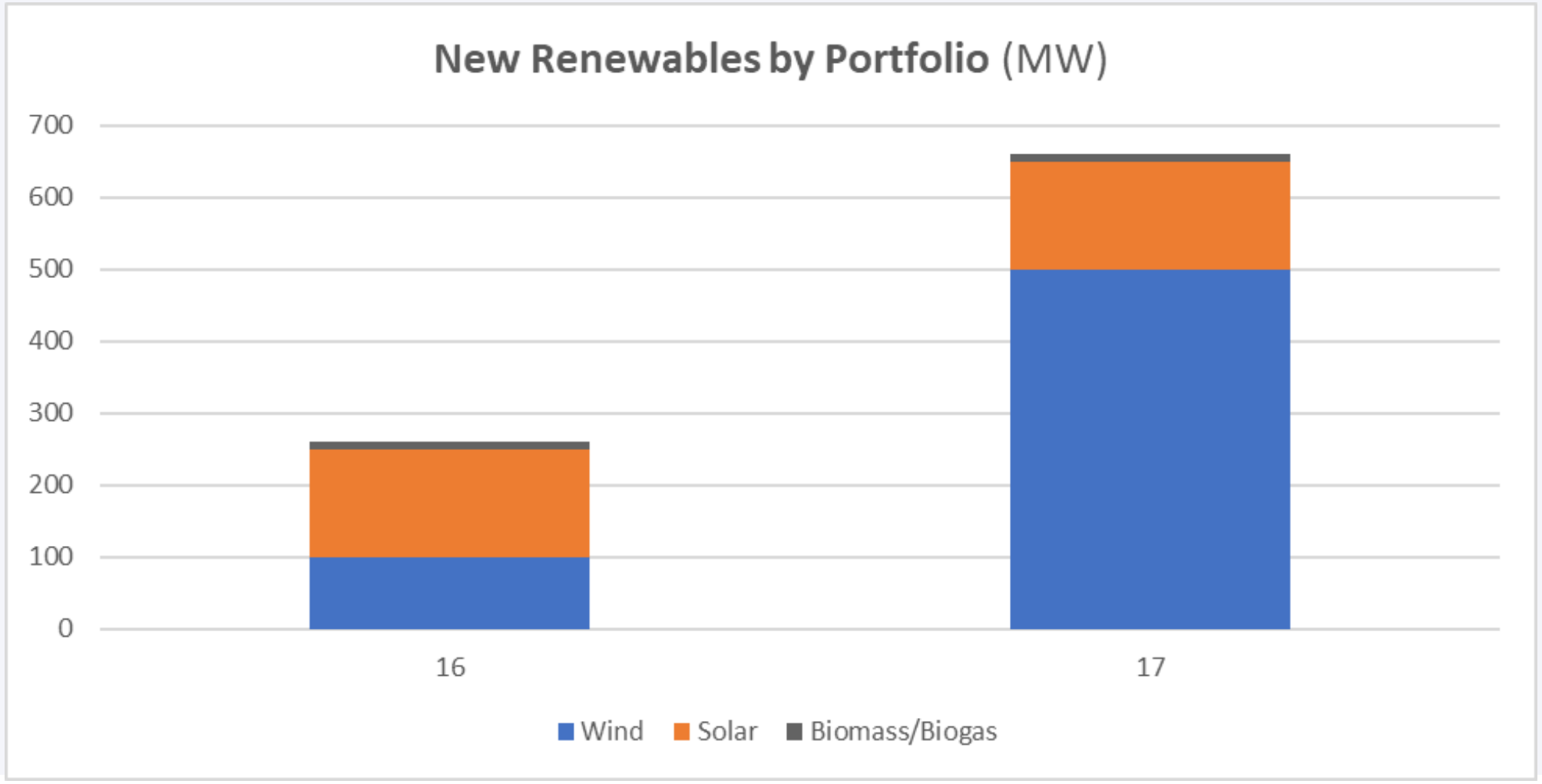


	16	17
Biomass/Biogas	10	10
Geothermal	10	10
Gas	523	156
Demand Response	52	76
Battery	75	417
Solar	150	150
Wind	100	500

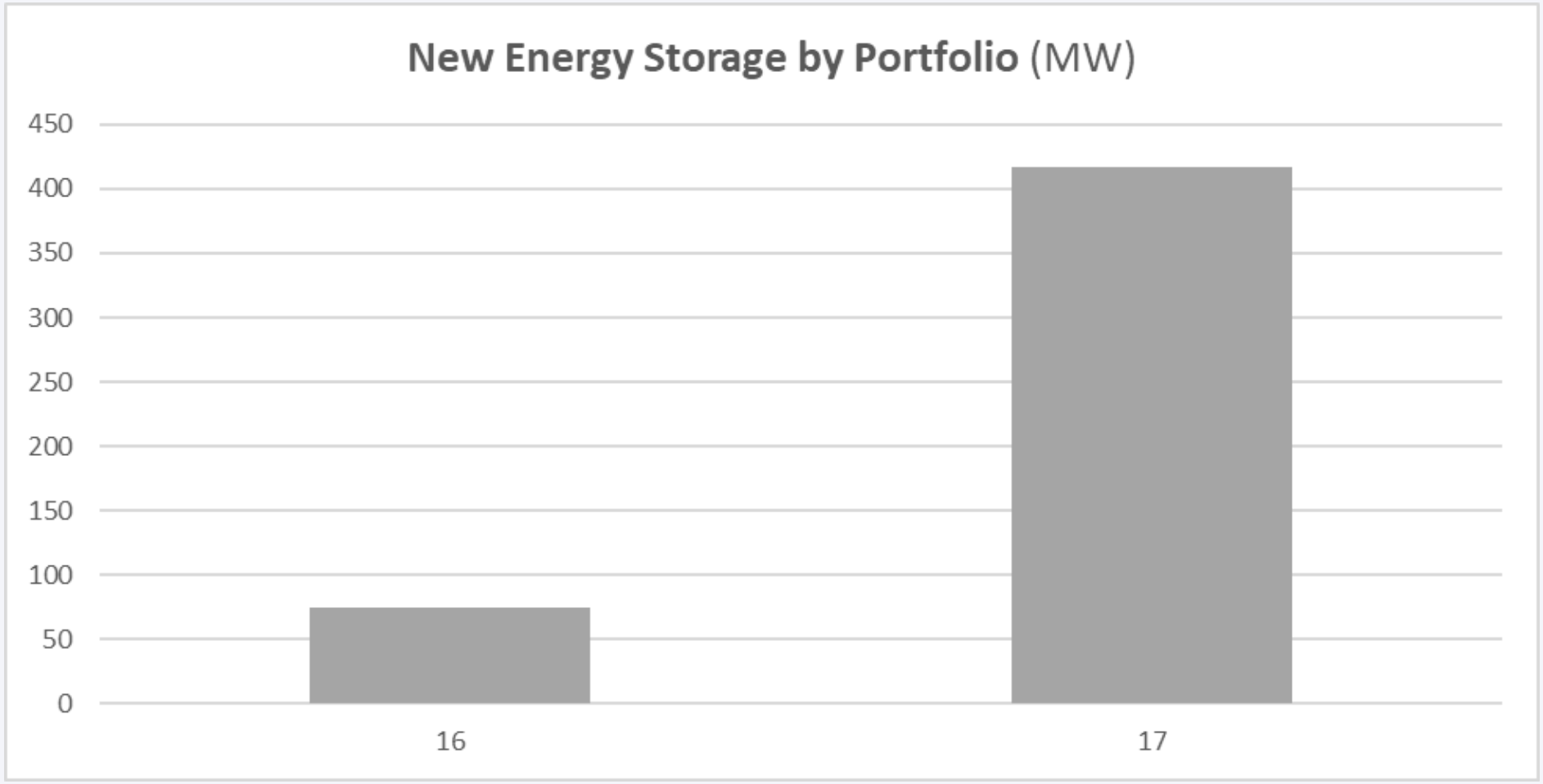
DSM Resources by Portfolio



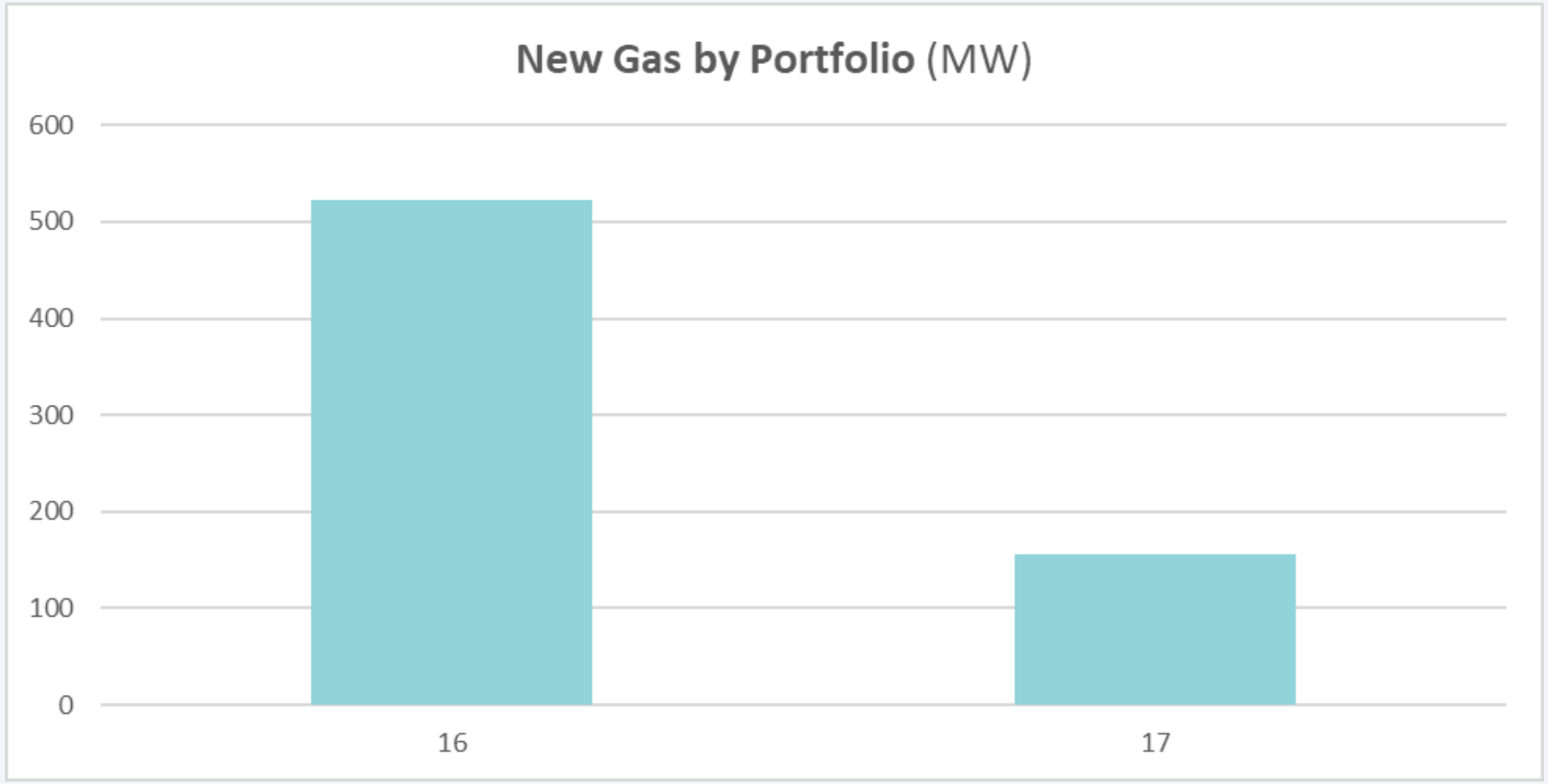
Renewable Resources by Portfolio

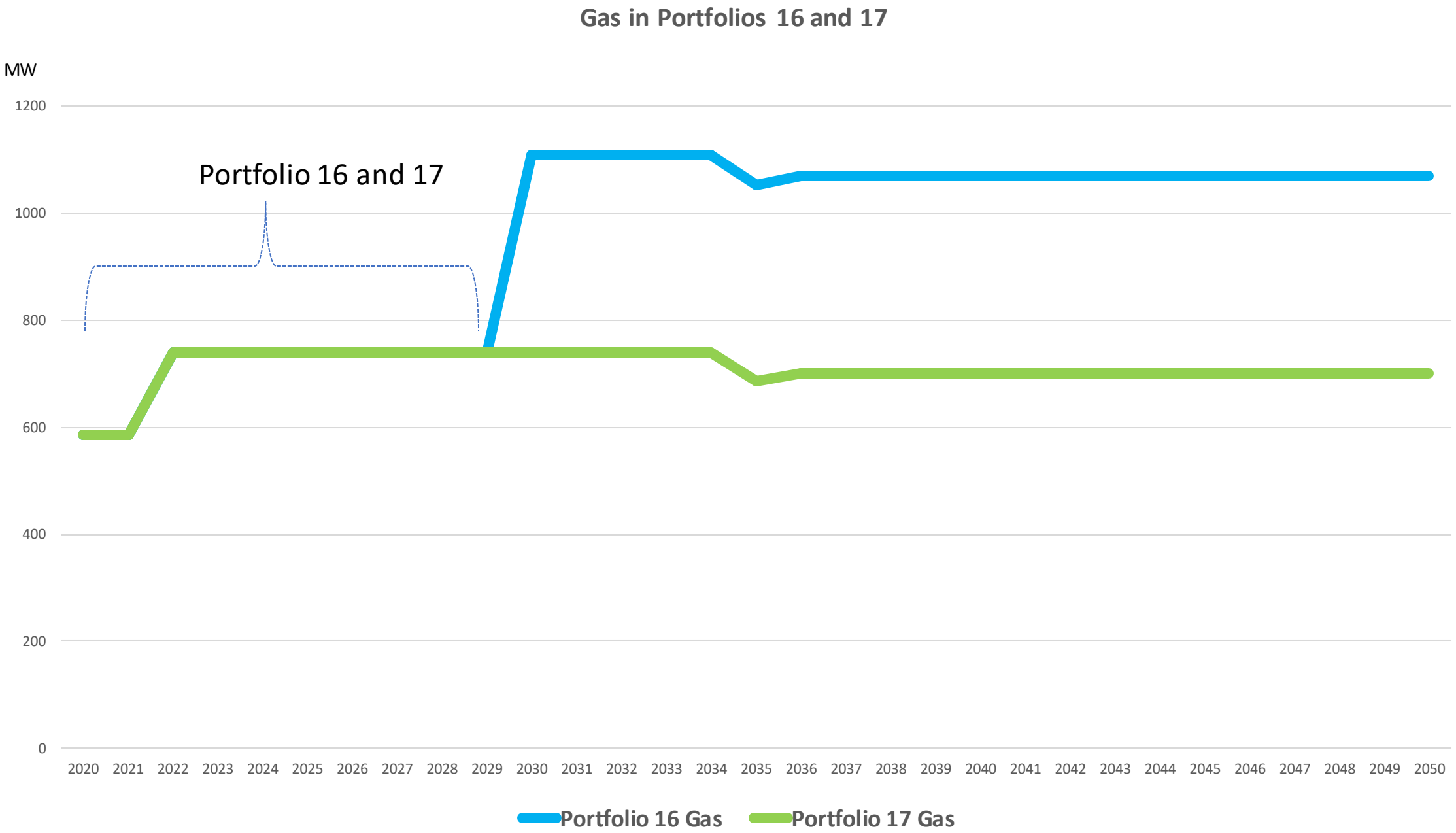


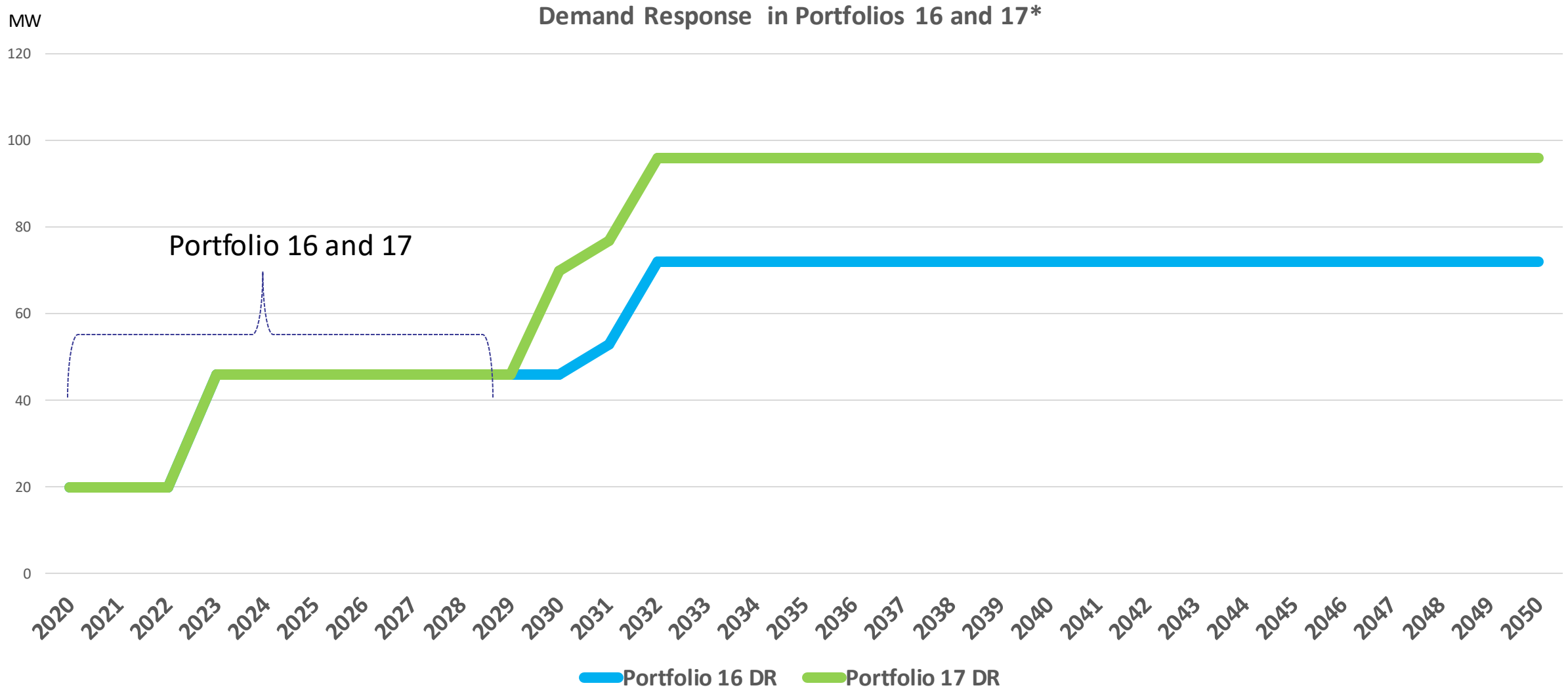
Energy Storage Resources by Portfolio



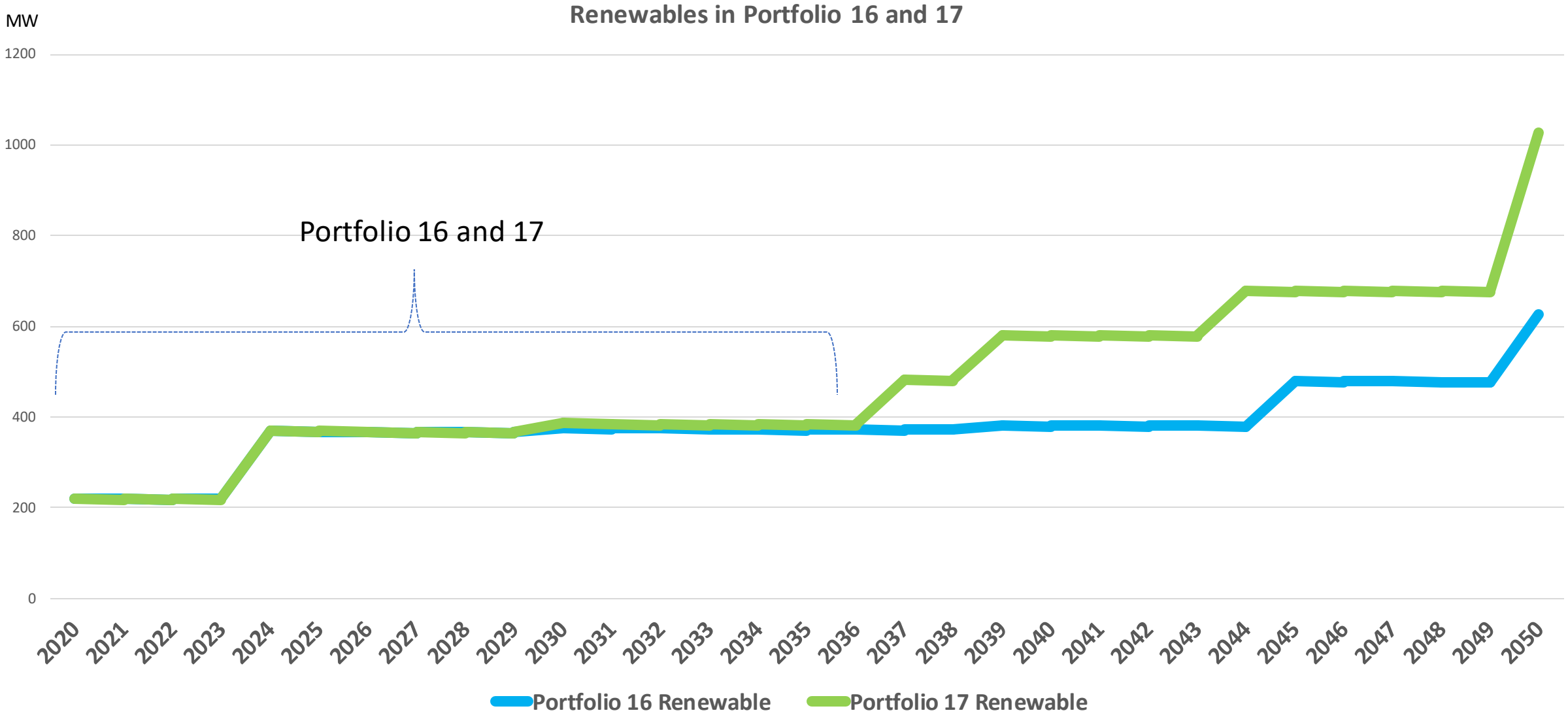
Gas Resources by Portfolio




Gas in Portfolios 16 and 17
MW
1200
1000
800
600
400
200
0
Portfolio 16 and 17
2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050
Portfolio 16 Gas
Portfolio 17 Gas



*Savings from energy efficiency is the same for each portfolio


Renewables in Portfolio 16 and 17
MW
1200
1000
800
600
400
200
0
Portfolio 16 and 17
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
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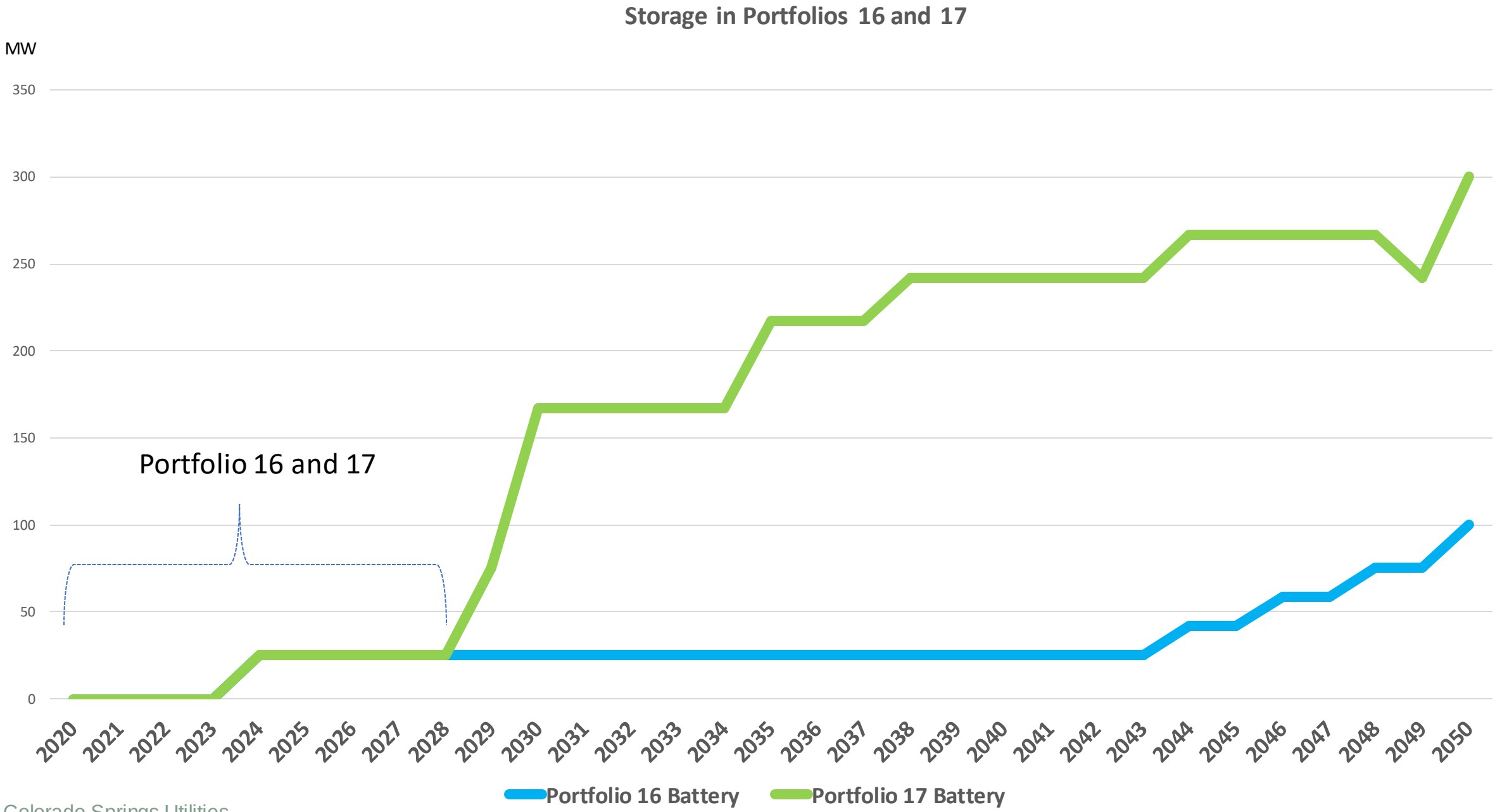
2041
2042
2043
2044
2045
2046
2047
2048
2049
2050
Portfolio 16 Renewable
Portfolio 17 Renewable


Storage in Portfolios 16 and 17
MW
350
300
250
200
150
100
50
0
Portfolio 16 and 17
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
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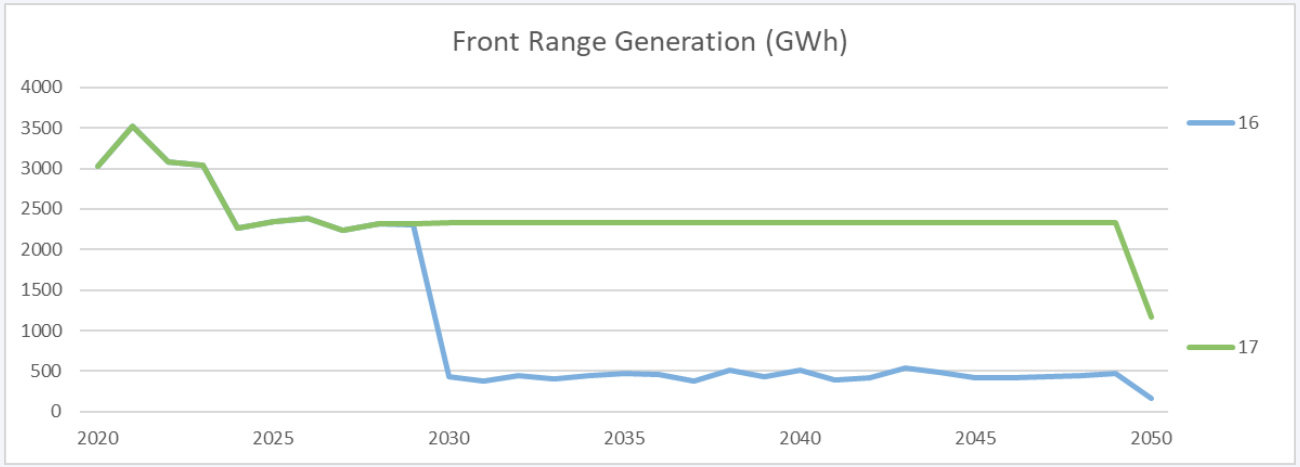
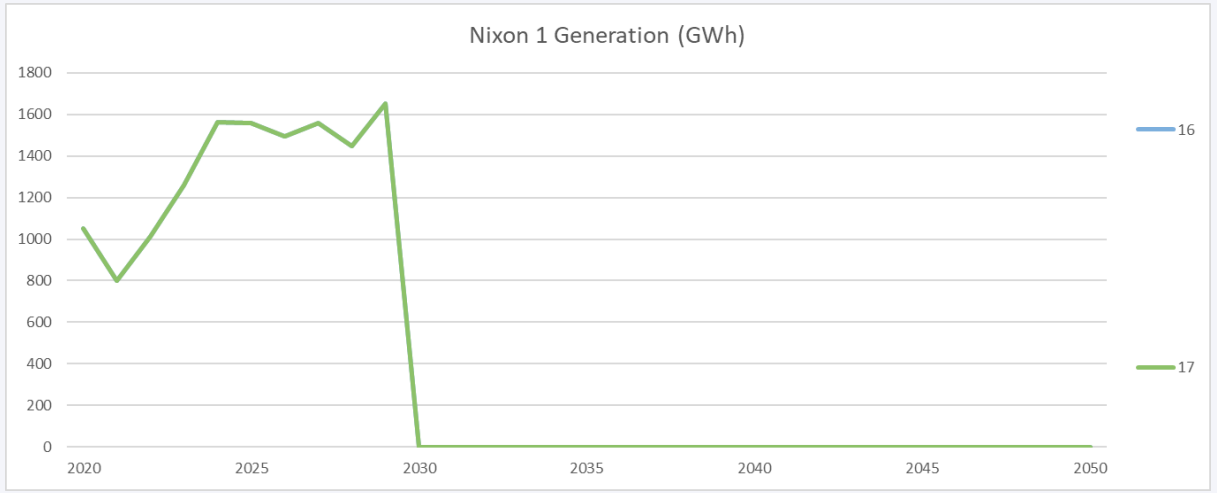
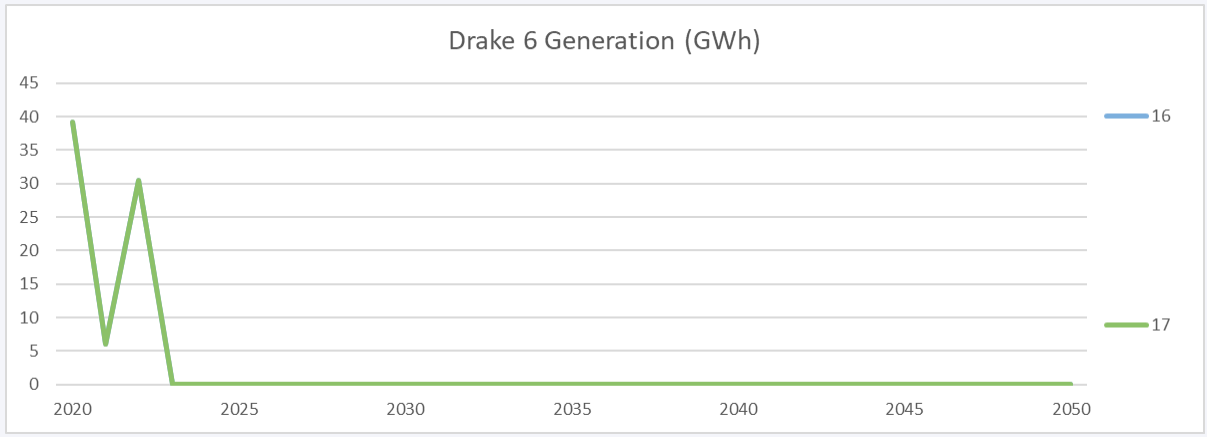
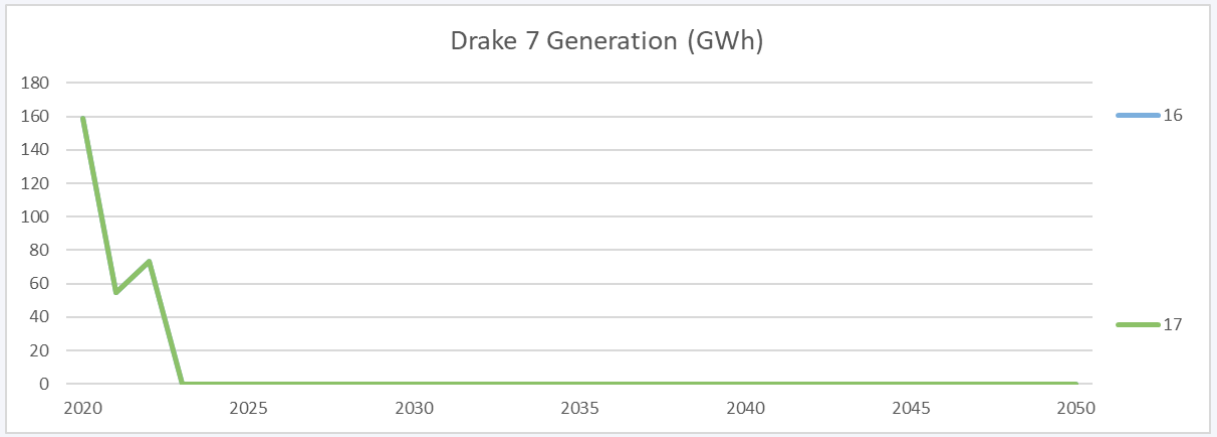
2040
2041
2042
2043
2044
2045
2046
2047
2048
2049
2050
Portfolio 16 Battery
Portfolio 17 Battery

Unit Generation

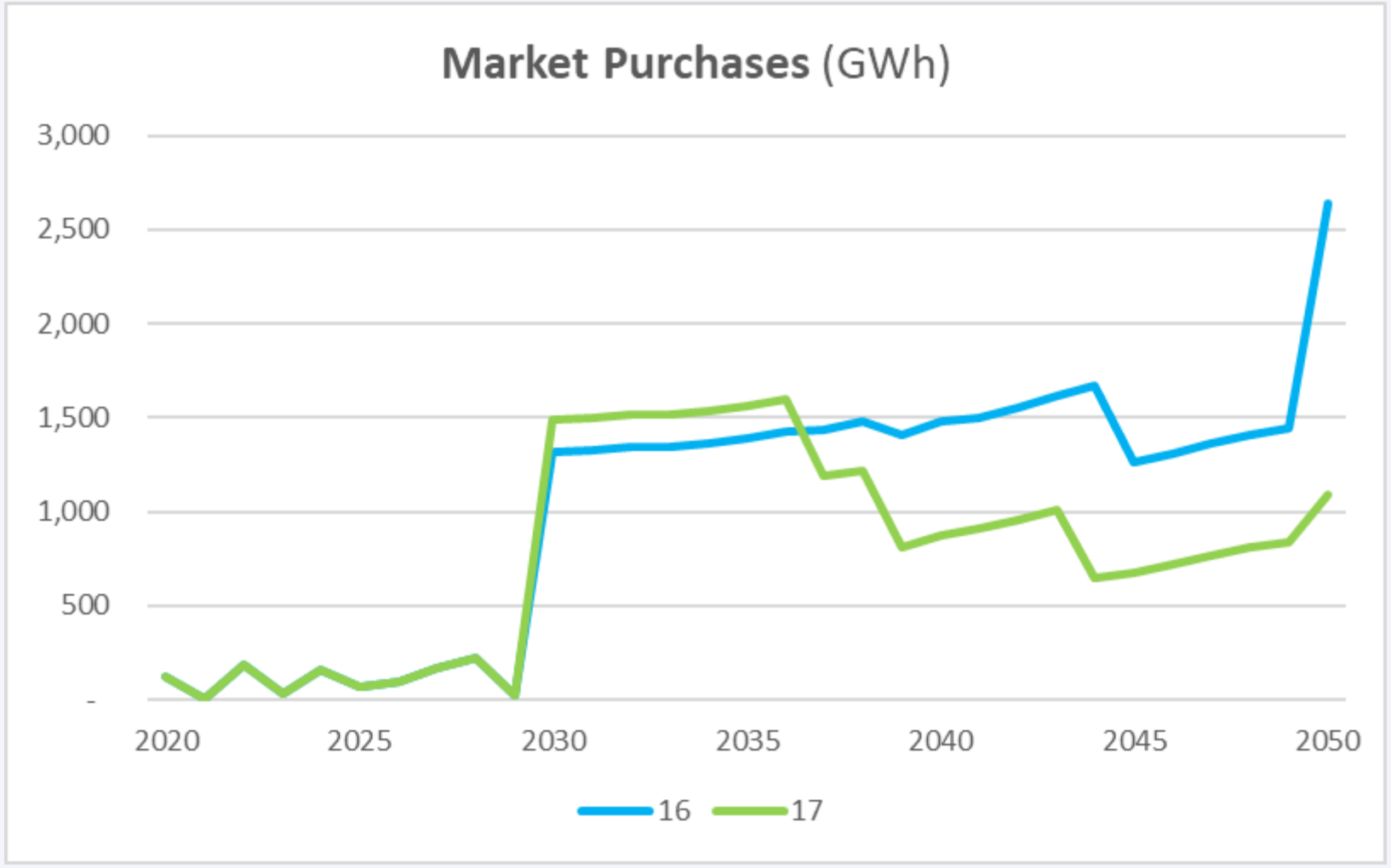








Market Purchases



100% Renewable Portfolios

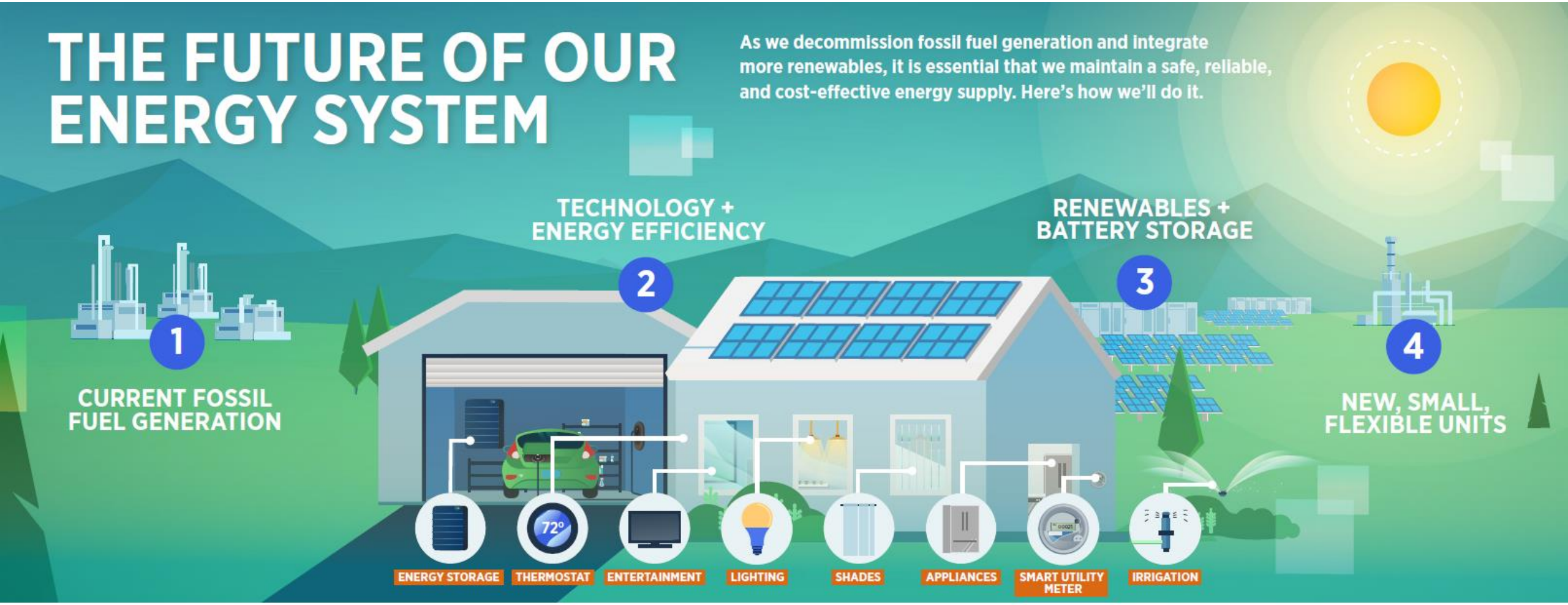
Portfolio	CO2 Target	Retirements	New Resources	Attribute Ranking	Total Score Normalized	Reliability	Cost / Implementation	Environment / Stewardship	Flexibility / Diversity	Innovation
15	100% by 2030	Drake/Nixon/Front Range 2030	Renewable/Storage/DSM	8	82.8	73	24	100	50	60
18	100% by 2040	Drake 2035 Nixon/Front Range 2040	Renewable/Storage/DSM	10	74.2	80	34	53	50	60
19	100% by 2050	Drake 2035 Nixon/Front Range 2050	Renewable/Storage/DSM	12	67.3	73	44	38	63	30

Energy Vision

Provide resilient, reliable and cost-effective energy that is environmentally sustainable, reduces our carbon footprint and uses proven state-of-the-art technologies to enhance our quality of life for generations to come.

THE FUTURE OF OUR ENERGY SYSTEM

As we decommission fossil fuel generation and integrate more renewables, it is essential that we maintain a safe, reliable, and cost-effective energy supply. Here's how we'll do it.



1 TODAY, WE HAVE ABOUT 1,000 MEGAWATTS OF FOSSIL FUEL ELECTRIC GENERATION. IN THE COMING YEARS, WE WILL DECOMMISSION MORE THAN A QUARTER OF IT.

2 THE COMMUNITY INCORPORATES SMART TECHNOLOGY (INCLUDING SOLAR PANELS, STORAGE SYSTEMS, AND ELECTRIC VEHICLES) IN THEIR HOMES AND BUSINESSES AND PARTICIPATES IN ENERGY EFFICIENCY, REDUCING THE AMOUNT OF NEEDED REPLACEMENT GENERATION.

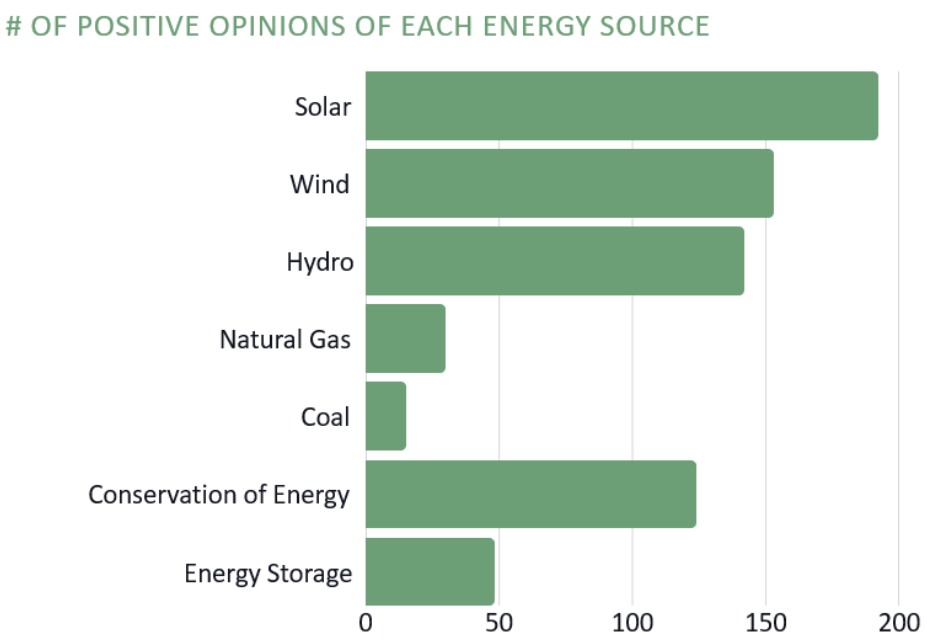
3 OUR COMMUNITY AND ENVIRONMENT BENEFIT FROM UTILITY-SCALE SOLAR AND STORAGE PROJECTS (GROWING CARBON-FREE GENERATION TO MORE THAN 260 MEGAWATTS BY 2023).

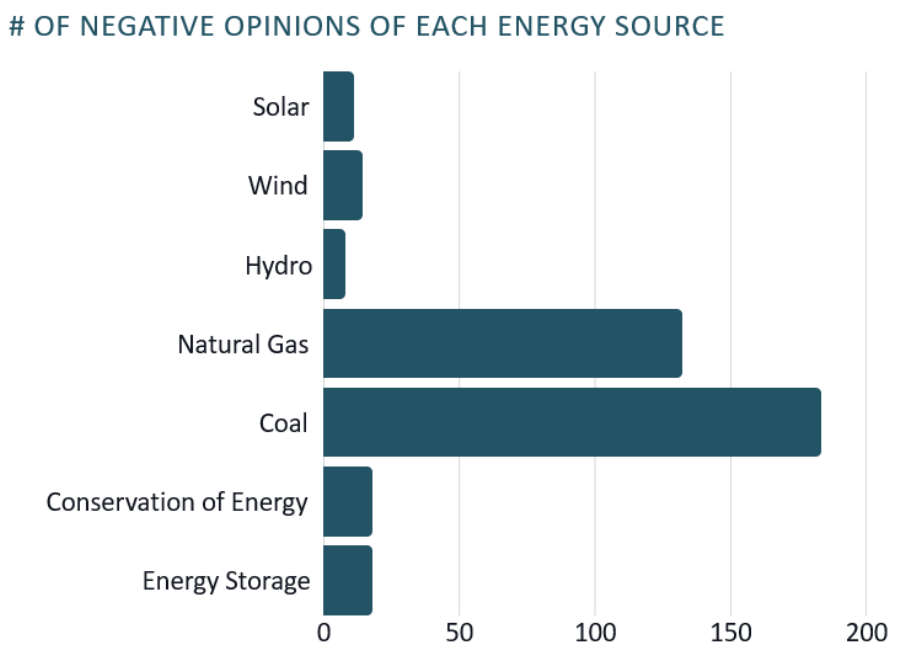
4 MINIMAL AMOUNTS OF NATURAL GAS GENERATION CAN BE OUR BRIDGE TO NEW TECHNOLOGIES.

Colorado Springs Utilities
It's how we're all connected

Youth Input

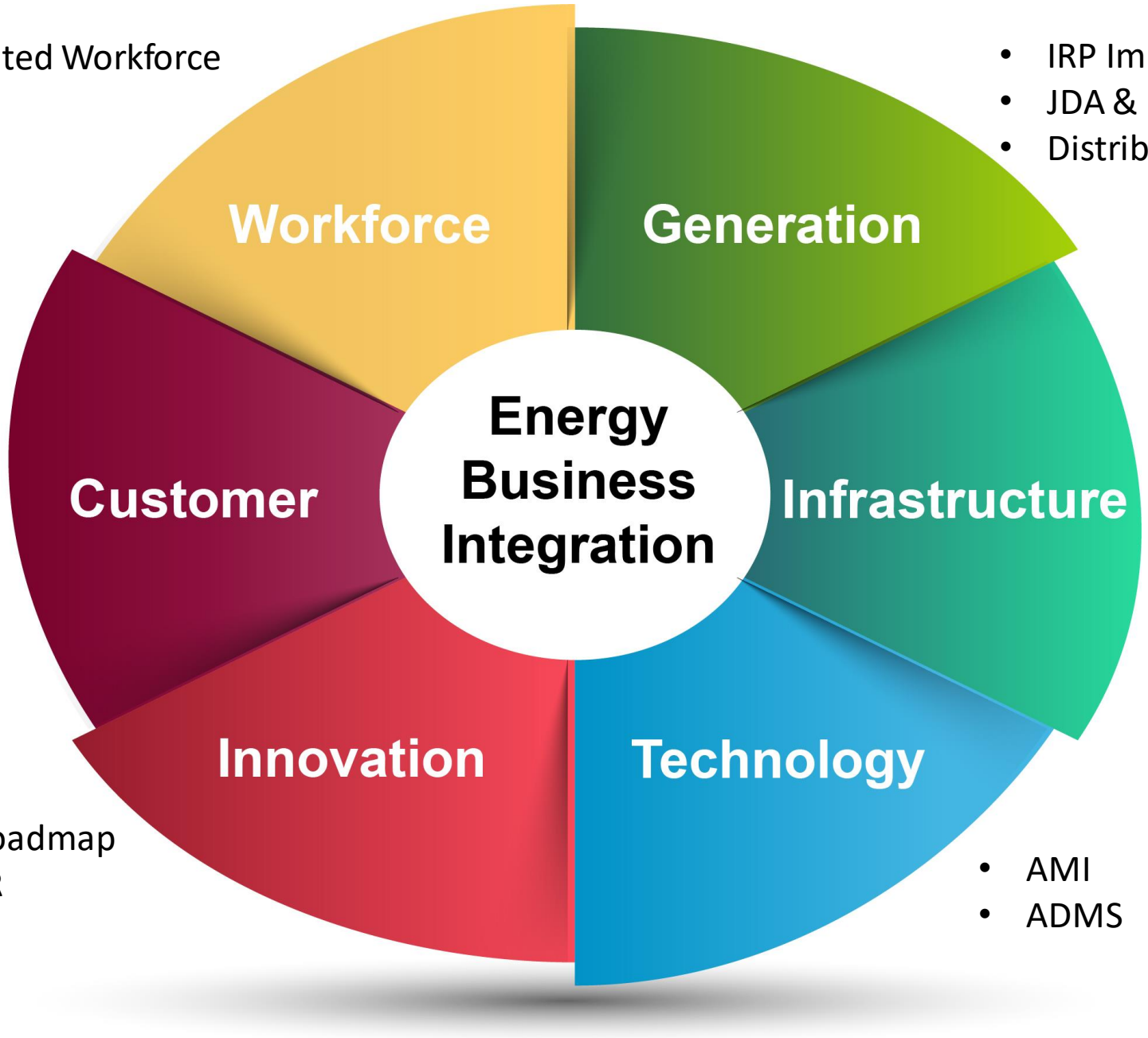
DO YOU HAVE A POSITIVE OR NEGATIVE OPINION OF THE FOLLOWING ENERGY SOURCES?





- Integrated Workforce Plan

- IRP Implementation
- JDA & Energy Markets
- Distributed Generation Siting



- Rate Modernization and Customer Outreach

- Transmission Projects
- Military Resilience
- Drake Studies

- Energy Roadmap
- DSM/DER

- AMI
- ADMS