



GENERATION PLAN UPDATE

Presented by:

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Informational Update

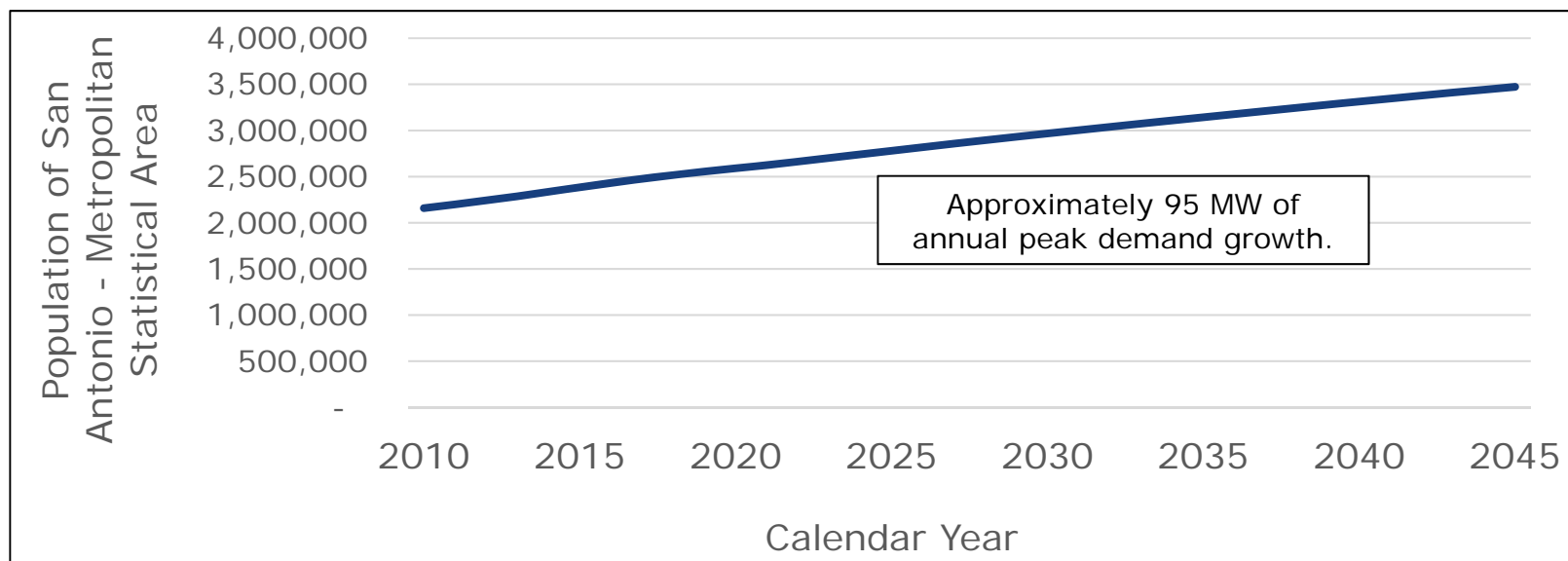


AGENDA



- **POPULATION GROWTH**
- **50+ YEARS OF GENERATION DIVERSIFICATION**
- **GENERATION PLAN UPDATE**

PROJECTED POPULATION GROWTH



Notes: Data source is IHS Markit. San Antonio Metropolitan Statistical Area is made up of 8 counties: Atascosa, Bandera, Bexar, Comal, Guadalupe, Kendall, Medina, & Wilson. Dataset shown with 2010 to include reference to the 2010 U.S. census.

Projections have the area gaining approximately 1 million residents over the next 20 to 30 years.

CPS ENERGY - GENERATION DIVERSIFICATION

1970s TO 2020s



1970	1980	1990	2000	2010	2021
1,700 MW	3,250 MW	4,000 MW	5,000 MW	7,200 MW	7,350 MW
Various issues with natural gas supply led to higher customer bills.	Coal was added.	Nuclear was added.	High efficiency, flexible natural gas technologies were added.	Renewables added & nuclear ownership increased.	2018: Began to move away from coal by retiring the Deely coal units.

BENEFITS OF DIVERSIFICATION

EFFECTIVE RISK MITIGATION



- Reduced exposure to fuel supply disruption from any single fuel source



- Benefited our community with some of the lowest rates in the nation
- Reduced exposure to price increases or spikes from any single fuel source



- Enabled our downward trend in carbon intensity even though our energy needs have increased
- Reduced exposure to regulation or market design changes



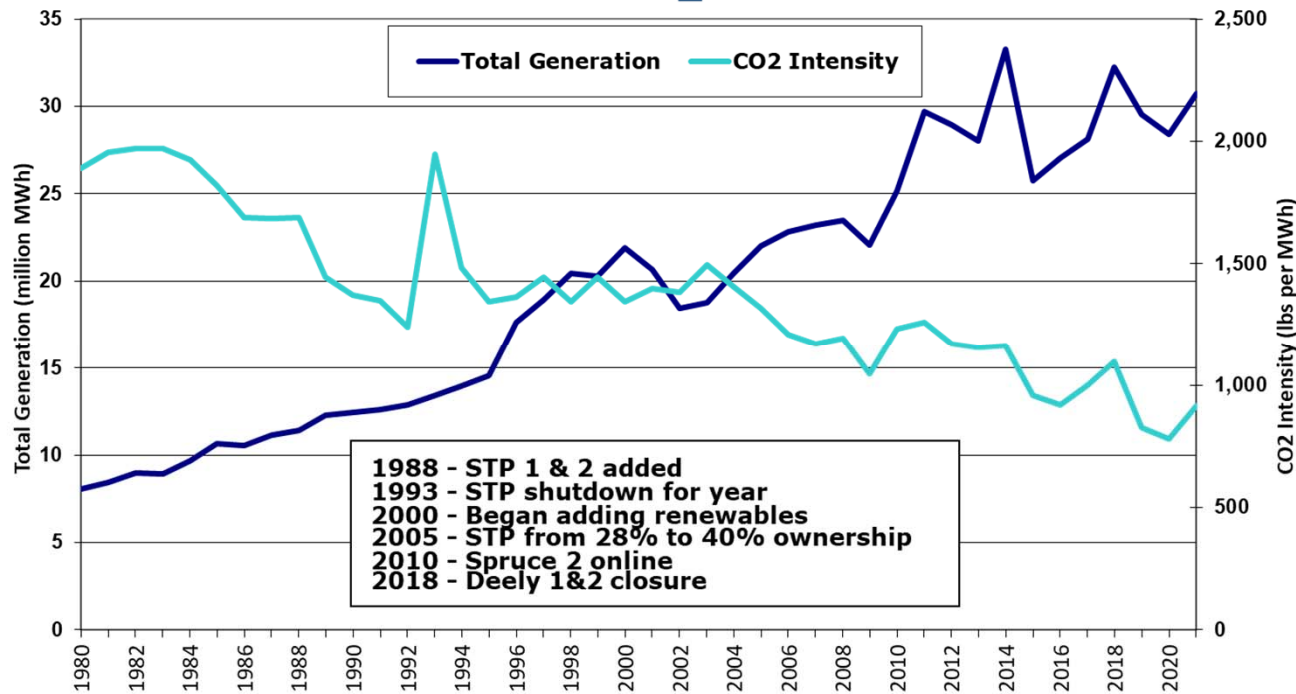
Diverse generation fuel types and technologies help us manage risk over the long term.

We expect our generation mix to continue to evolve.

ENVIRONMENTAL IMPROVEMENTS



CPS Energy CO₂ Intensity*



1988 - STP 1 & 2 added
1993 - STP shutdown for year
2000 - Began adding renewables
2005 - STP from 28% to 40% ownership
2010 - Spruce 2 online
2018 - Deely 1&2 closure

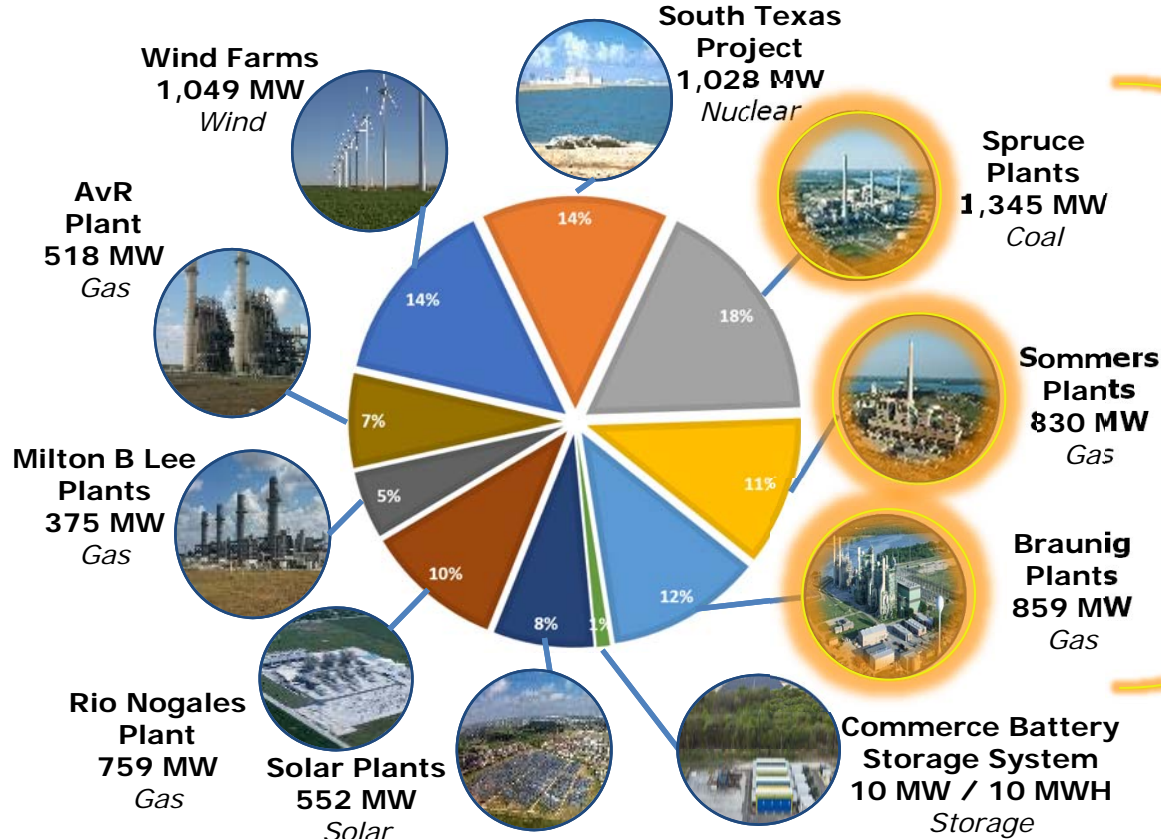
* Pounds of CO₂ per net MWh of generation from all sources: coal, natural gas, nuclear, wind & solar, & market purchases

Our carbon intensity has been on a beneficial downward trend since 1980, even though our energy needs have increased.

GENERATION TRANSFORMATION



OUR CURRENT PORTFOLIO



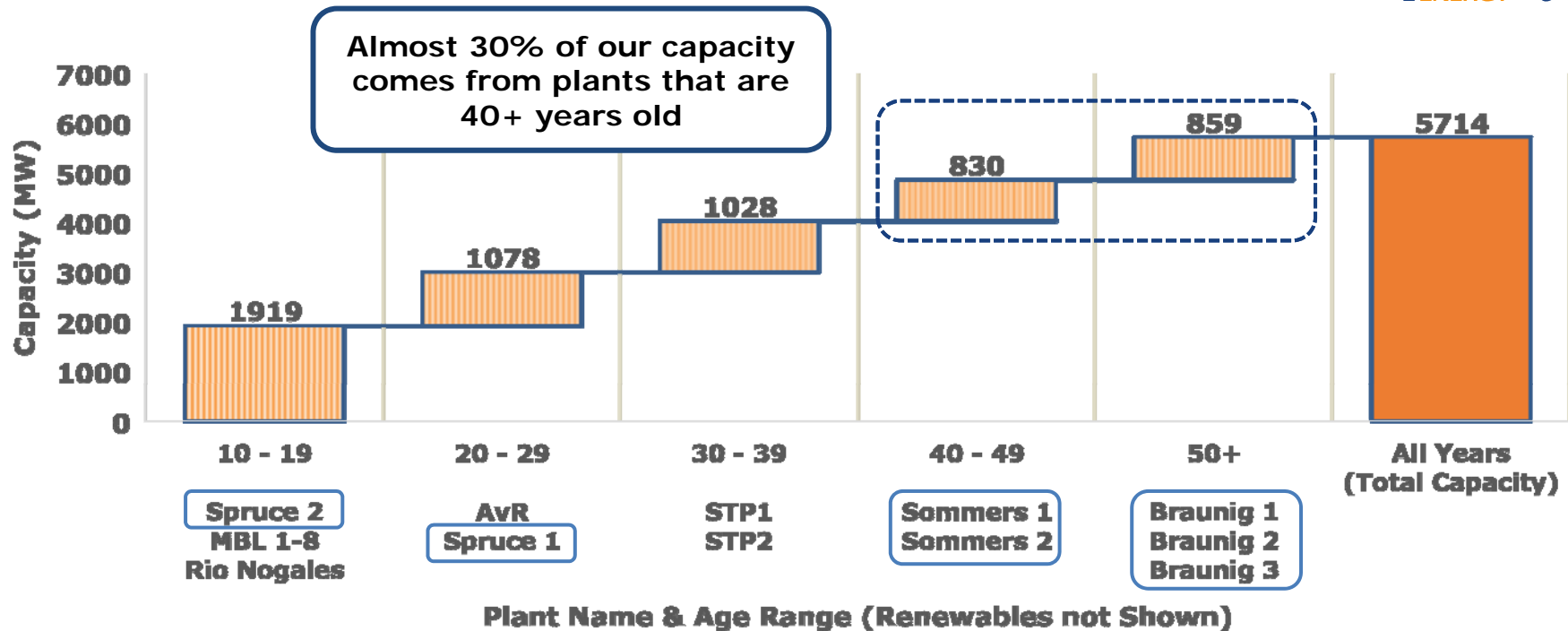
TECHNOLOGY OPPORTUNITIES

- Wind & Solar Generation
- Coal-to-Natural Gas Conversion
- Natural Gas / Hydrogen Generation
- Battery Storage
- Pumped Storage
- Geothermal
- Compressed Air Energy Storage
- Other

Combination of existing & emerging technologies will enable the transformation.

FOCUS ON AGING GAS & COAL

OVER 3,000 MW OF GENERATION CAPACITY



We must thoughtfully prioritize the order of plant changes to maintain reliability & affordability.

OPPORTUNITIES & CHALLENGES



Working in parallel to expedite our portfolio transition.

1 Braunig 1, 2 & 3 Gas Plant



**FLEXPOWER
BUNDLE IN
PROCESS**

2 Sommers 1 & 2 Gas Plant



**PLANNING
UNDERWAY**

3 Spruce 1 & 2 Coal Plant



GENERATION PLANNING

TIMELINE DISCUSSION



Define Goals		Develop Scenarios				Deliberate on Options		Decide on Direction	Deliver Plan
Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	2023+

RAC Engagement:

Review Back Cast	Review February Feedback	Update on Scenario Progress	Review Preliminary Scenario Results	Discuss Potential Options	Review Suggested Option	Update on Execution Progress
Discuss Timeline	Discuss Scenarios & Assumptions				Provide Input to BoT	
Receive Public Input through RAC						

CAC Engagement:

Discuss Timeline	Introduce Scenarios	Review Preliminary Scenario Results	Discuss Potential Options	Review Suggested Option	Update on Execution Progress
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Additional Community Engagement:

Continuous Awareness & Dialogue with the Community Fall Open House

RAC GEN PLAN INPUT

FEB 2022 RAC MEETING (PAGE 1 OF 2)



- **Generation Resources:**

- What are the energy sources being used right now
- Combined cycle plants: cost
- Nuclear
- Cost of shutting down/replacing older plants
- Spruce -> natural gas
- Purchase of 200 MW of solar energy
- Renewables: current & future methods, cost estimates
- “New tech: how much \$ paid for by ___?” as screening tool
- Solar: farms or rooftop?
- Rooftop solar & battery

- **Save Now (Energy Efficiency):**

- Energy efficiency & demand response
- Effect of removing STEP on energy demand (over past 4 years)
- Include STEP into demand grid/model

RAC GEN PLAN INPUT

FEB 2022 RAC MEETING (PAGE 2 OF 2)



- **Modeling:**

- Clarity around emissions projections
- Discussion around assumptions of modeling
- Models for all clean energy sources
- Rate of return for each scenario
- Include contracted renewables/how will renewables be modeled?
- Absence of Braunig plants
- Maximize clean energy & reserve energy
- View examples from other areas
- What simulations are we using
- Model of probability of different generation & price outcome
- Capture future weather in model
- Safe # for renewables? Dispatchable vs non-dispatchable recommended breakdown

WE ARE A CHANGING UTILITY



3,000 MW impacted by 2028*



Braunig Plants Retirements
859 MW
Gas

2024



Sommers1 Retirement
420 MW
Gas

2026



Spruce2 Gas Conversion
785 MW
Gas

2028



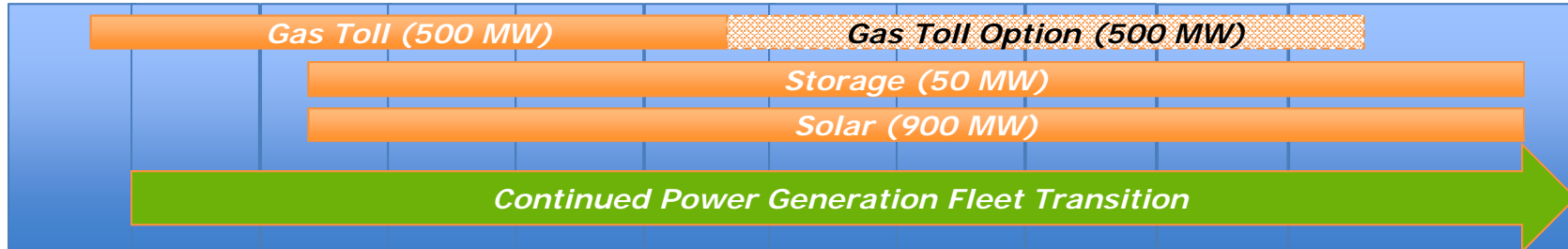
Spruce1 and Sommers2 Retirement
970 MW
Coal/Gas

2030

CAAP**



2050



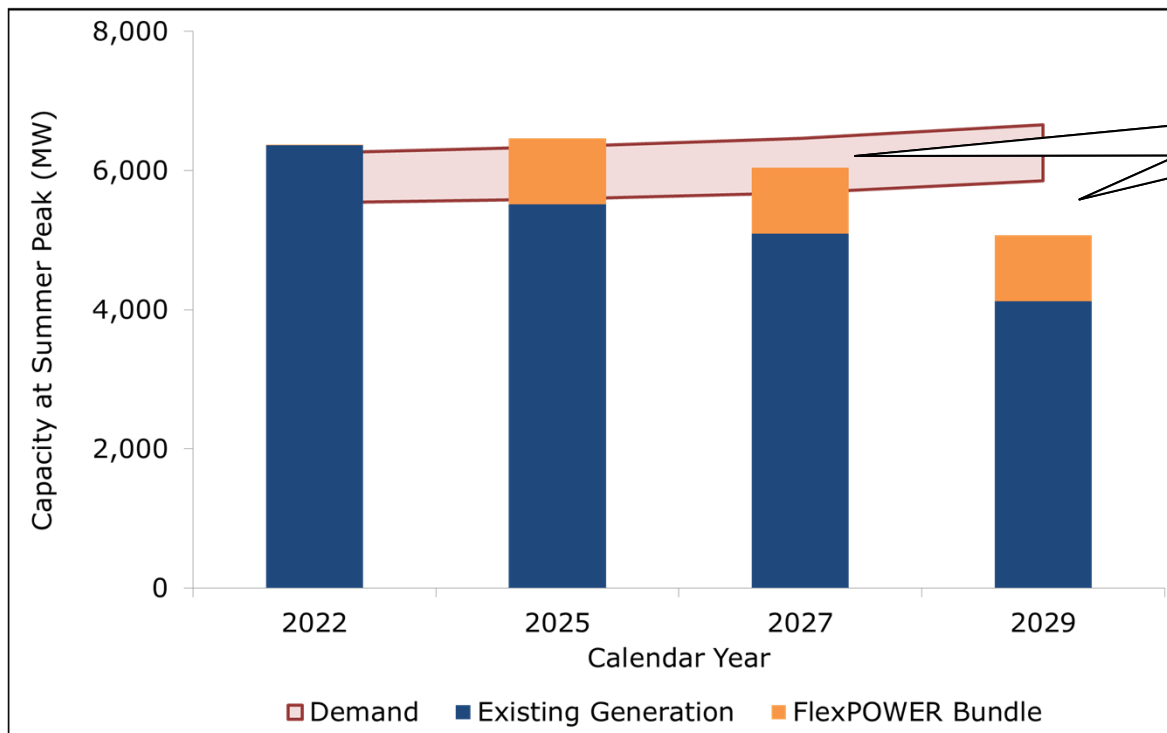
* Spruce 2 gas conversion & all retirement dates are preliminary & for discussion purposes only.

** CAAP is the City of San Antonio Climate Action & Adaptation Plan.

Fleet transition offers the opportunity to integrate emerging technologies into our generation portfolio.

CAPACITY PLANNING

WE MUST CAREFULLY COVER S.A.'S NEEDS



Planning is underway to fill capacity gaps.

Our generation planning strategy is to provide sufficient capacity to protect our customers from exposure to high market prices.

PORTFOLIO MODELING*

PROPOSED STARTING POINT



Possible Retirements:

- Braunig 1: Mar 2025
- Braunig 2: Mar 2025
- Braunig 3: Mar 2025
- Sommers 1: Mar 2027
- Spruce 1: Dec 2028
- Sommers 2: Mar 2029

Planned Additions:

- Solar: 2024 to 2025
- Storage: 2024
- Firming: 2022

Other:

- Possible conversion of Spruce 2 from coal to gas: Dec 2027

* Spruce 2 gas conversion & all retirement dates are preliminary & for discussion purposes only.

PORTFOLIO MODELING

PROPOSED PORTFOLIO OPTIONS



Portfolio	Aspects
Renewable	<ul style="list-style-type: none"> • Wind, solar, & other • Storage
Natural Gas	<ul style="list-style-type: none"> • Combined cycle • Reciprocating internal combustion engine
Blended	<ul style="list-style-type: none"> • Economic maximum renewables: Wind, solar, & other • Economic storage • Natural Gas: Combined cycle & Reciprocating internal combustion engine

Notes:

1. Spruce 2 converted to gas in all of the above portfolios
2. Each portfolio assessed with and without "Save Now".
3. Emerging technology assumptions to be included.

Capacity is needed to address customer growth and unit retirements (Sommers 1 & 2, Spruce 1).

PROPOSED MODELING PROCESS



- Assumptions
 - Customer usage, Energy Efficiency, Generation cost and performance, generation additions, generation retirement schedule, fuel prices, market prices, financial assumptions, etc.
- Modeling
 - Each portfolio to be run through our production cost model over a 25-year forecast horizon and compared to a baseline portfolio
 - Uncertainty analysis included
 - Favorable projects to be run through our financial model to assess financial metrics and bill impact
- Points of Consideration
 - Affordability
 - Reliability/Resiliency
 - Environmental Responsibility
 - Workforce Impacts
 - Risk

Questions?

DRIVING TOWARDS CAAP GOALS

KEY ACTIVITIES



- Board of Trustees - ongoing dialogue, feedback & future actions
- Public input – actively facilitated through the RAC
- Transparency – information sharing with stakeholders, CAC
- Regulatory advocacy – partnering with stakeholders
- Execution – timely implementation of solutions
- Resiliency – programs to manage extreme conditions

Success is providing affordable, reliable, environmentally responsible power on-demand to meet the needs of our growing community & achieving our CAAP goals.

SPRUCE UNITS BACKGROUND



- Spruce Coal Units 1 & 2
- Constructed: Spruce 1: 1992;
Spruce 2: 2010
 - Spruce 1: 30-years-old;
Spruce 2: 12-years-old
- Capacity: Spruce 1: 560 MW;
Spruce 2: 785 MW; 1345 MW
total
- Low sulfur coal from Powder
River Basin in Wyoming



19% of CPS Energy total generation in FY2021

SPRUCE 2 GAS CONVERSION

PURPOSE



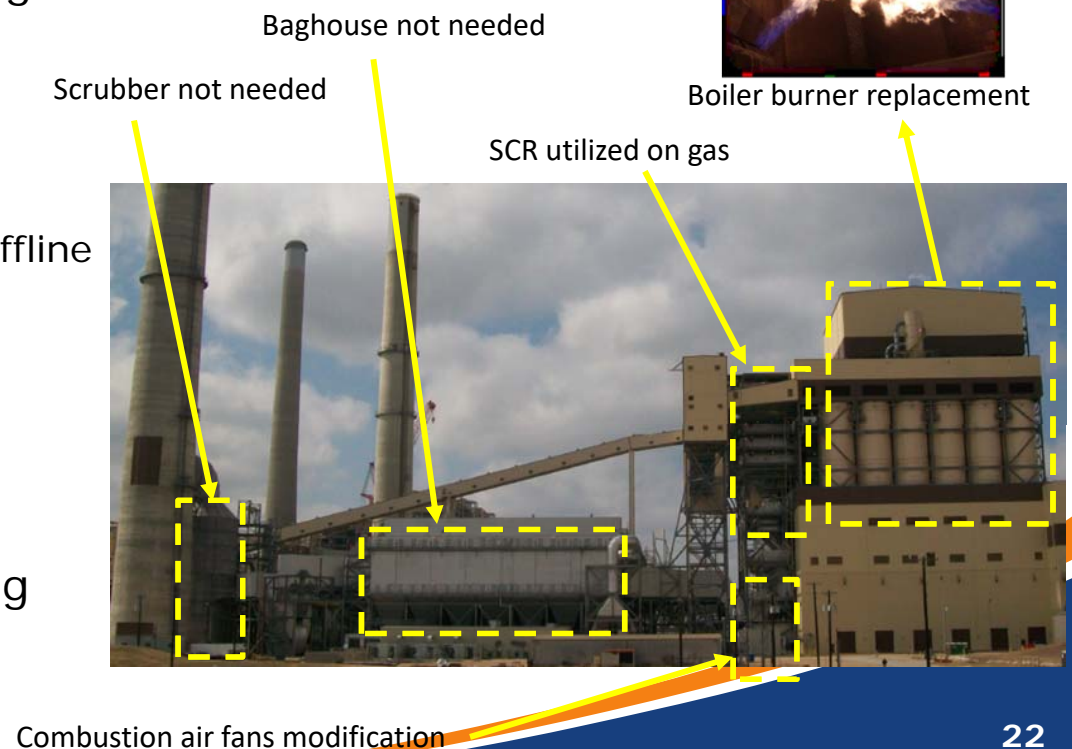
- Concept under review, not approved by Board
- Motivation:
 - Flexible Path Strategy, Move to cleaner resources
 - City of San Antonio's Community-wide Climate Action and Adaptation Plan (CAAP) to be a carbon neutral community by 2050
 - Significant investments expected for future environmental compliance

SPRUCE 2 GAS CONVERSION

KEY ASSUMPTIONS/SCOPE



- Key Assumptions
 - Capacity & efficiency - unchanged
 - Timeline to convert to gas is estimated up to 5 years
 - Includes up to 24 months for permits
 - Approximately 3 months for offline tie-in work
- Scope
 - Gas Supply Modifications – increase on site line size
 - Boiler – modify fuel burners, control upgrades and fan sizing modifications
- Cost – estimated \$48 Million



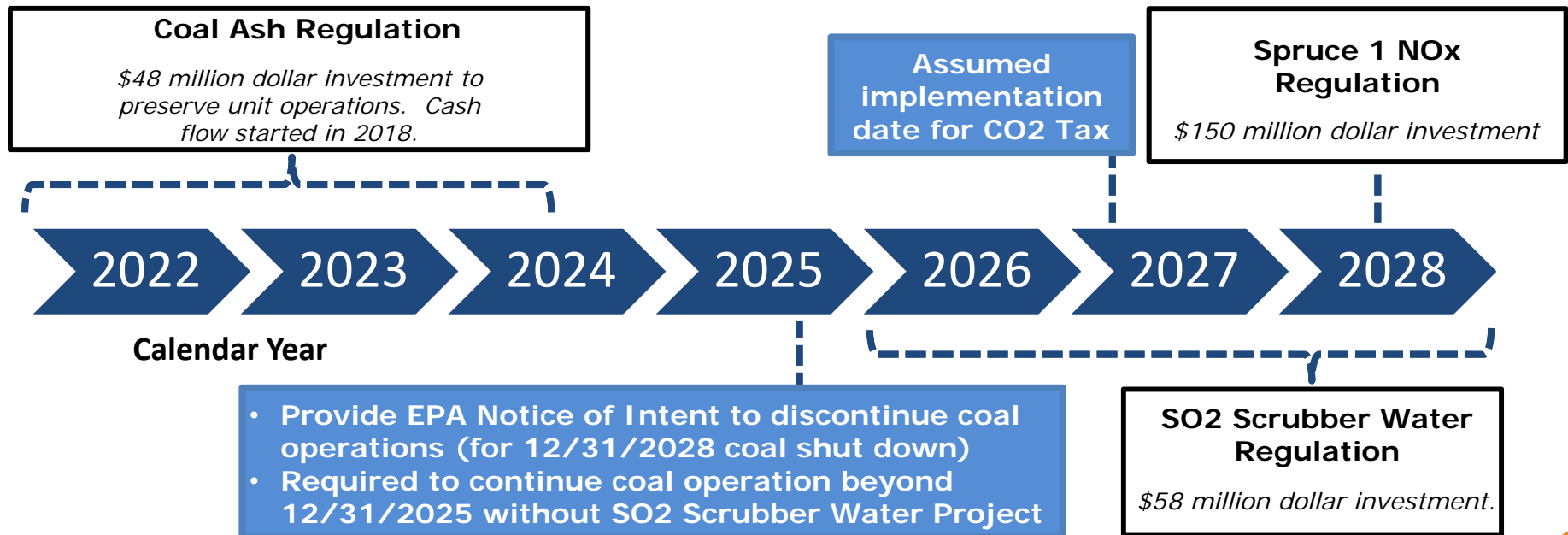
SPRUCE 2 GAS CONVERSION SCHEDULE



Task Name	Year 1		Year 2		Year 3		Year 4		Year 5	
	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2
New Generation										
Spruce 2 Gas Conversion: 785 MWS										
Begin Preliminary Activities	█									
Procure Owner's Engineer	█	█								
Develop EPC Scope Of Work		█	█							
Procure EPC Contractor			█	█						
Permitting			█	█	█	█				
EPC Spec Development/Equip Procurement					█	█	█	█		
Construction									█	
Startup										█
Operation on Gas										█

COAL ENVIRONMENTAL COMPLIANCE

SIGNIFICANT INVESTMENTS EXPECTED



Investments beyond the on-going annual capital / O&M spend are expected for continued environmentally compliant coal operations.