PASADENA

Pasadena Water and Power

Bonanza Solar Facility Project

City Council

February 26, 2024

Item 22

Introduction

- Checklist for Proposed Bonanza Project:
  - ☑ 2018 IRP – Stipulates all new long-term energy shall be renewable/carbon-free
  - ☑ IPP Divestment – Provides required replacement energy and capacity
  - ☑ Resolution 9977 – Furthers the City's goal to Carbon-Free by 2030
  - ☑ 2023 IRP – Identified solar and battery as important sources of clean energy
  - ☑ RPS Compliance – Advances mandated compliance with the State Renewable Portfolio Standards (RPS)
  - ☑ Resource Adequacy (RA) Compliance – Contributes toward meeting RA requirements by the California Independent System Operator (CAISO) to ensure reliability

Background

- 2023 Power Integrated Resource Plan (IRP) was adopted and set one of the most advanced decarbonization goals in the country
  - > 100% Carbon-Free energy supply by the end of 2030 (Resolution 9977)
  - > Requires a significant build-out of resources
- Increased resource needs to replace the energy and capacity of the Intermountain Power Project (IPP) ending 2027
  - > Energy replacement
  - > Resource Adequacy (RA) for CAISO compliance
  - > Renewable Energy Credits (RECs) to meet state mandated RPS compliance

Bonanza Project

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- Bonanza Solar Facility Project
  - > Photovoltaic Solar: 300 MW
  - > Battery Energy Storage System (BESS): 195 MW of 4-hr storage
  - > Location: Clark County, Nevada
  - > Includes Full Capacity Deliverability Status ("FCDS")
    - Ensures facility interconnection and the ability to deliver its full output to the CAISO grid
  - > Developer is EDF Renewables, Inc. (EDF) – one of the largest renewable energy developers
    - Contracting entity is Bonanza Solar, LLC – a subsidiary of EDF
- PWP's Share
  - > Photovoltaic Solar: 105 MW
  - > BESS: 55 MW
    - Azusa Light and Water will receive 20 MW of solar and 10 MW BESS

Contract Terms

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- Southern California Public Power Authority (SCPPA) Fixed Price Renewable PPA Term
  - > Term length: 20 year (1/1/2028 – 12/31/2047)
  - > COD: 12/31/2027
- Expected Energy (Annual): 303,534 MWh
  - > Highest Quality (PCC1) of RECs
- RA Capacity: 62.5 MW
- Price
  - > Solar: $47.76/MWh
  - > BESS: $16.84/kW-mo.
- Annual Cost: $25,611,400
- Lifetime Contract Cost: $512,228,000

Market Data

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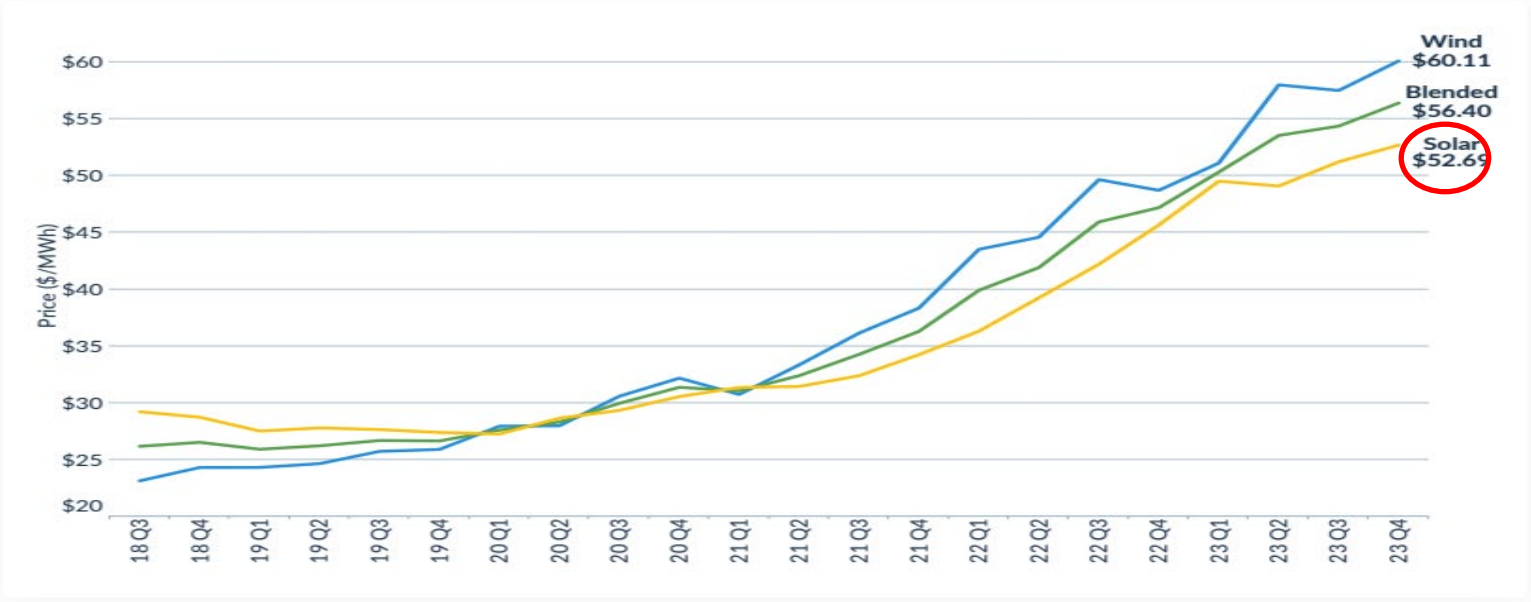
Q3 2018 TO Q4 2023

Market-Averaged Continental Index



Nationwide Market-Averaged PPA Price Index for Solar in Q4 2023 is **$52.69**

LEVELTEN ENERGY
Q4 2023 PPA PRICE INDEX NA

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RPS Position

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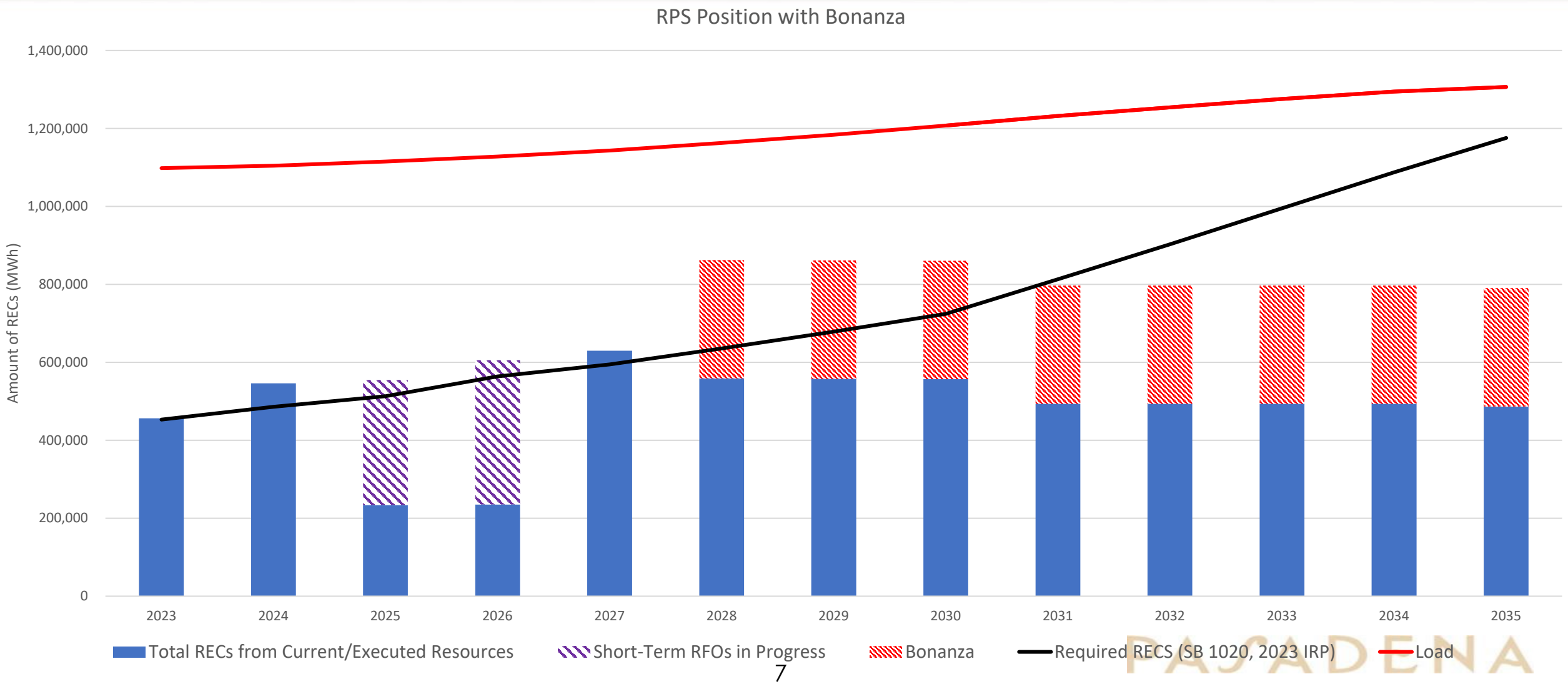

RA Position

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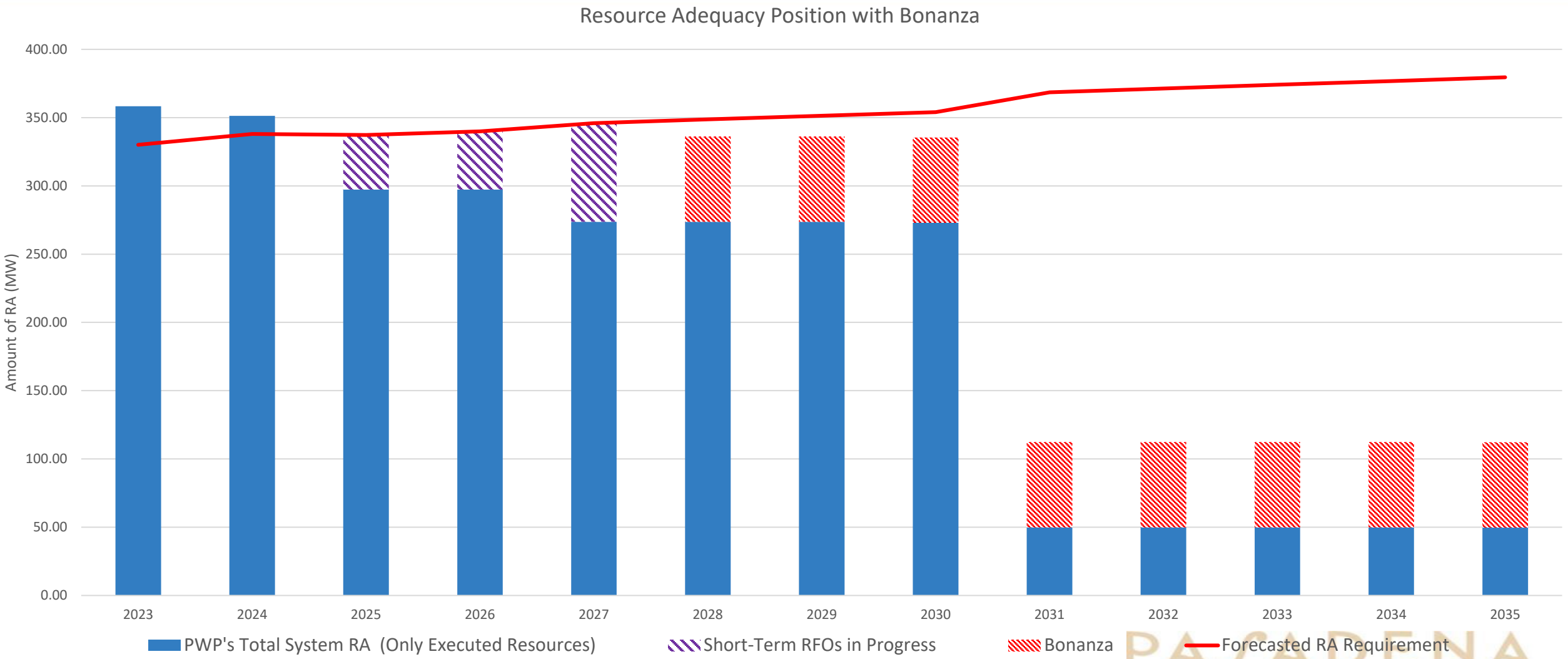

Energy Position

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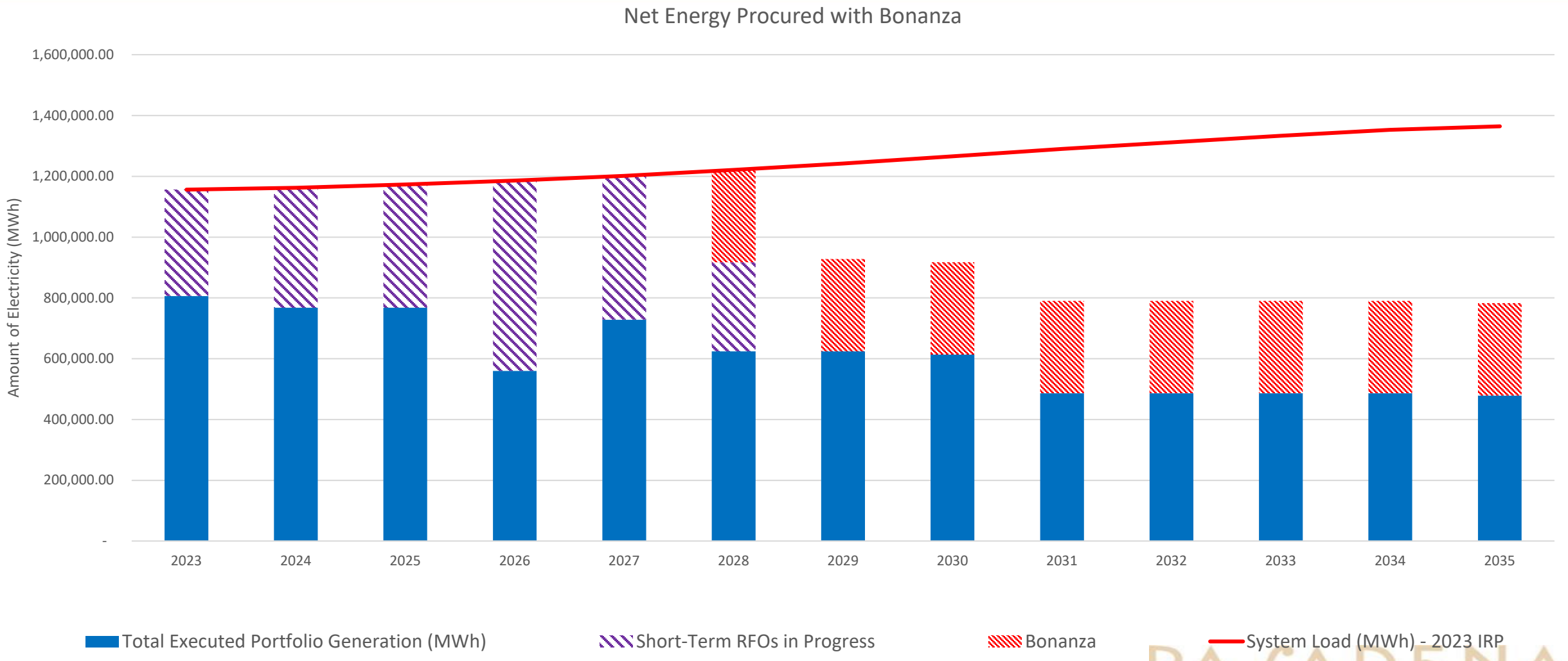

Estimated Electric System Average Rate Impact

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Bonanza **All-in Cost Estimate of Energy, RECs, and RA**	**2028** 105 MW of Solar + 55 MW of BESS
Price in $/MWh(solar) or $/kW-month(BESS)	$47.76/MWh (Solar) + $16.84/kW-mo. (BESS)
Total Estimated Annual Cost	$25,611,400
PWP Estimated Annual Sales (kWh) in first full year	1,147,591,770
$ Per kWh rate impact estimate	$0.022
¢ per kWh rate impact estimate	2.2¢
Estimate impact to electric system average rate (23.72¢ per kWh base)* **Electric System Average Rate estimate includes PCA adjustments as of December 31, 2023**	**9.4%**

***Note: The estimated impact to the electric system average rate reflects the impact of the *additional* cost for the project. Other rate components, including expiring resources, have the potential to be highly variable and are not considered herein. Other components will be considered during the cost of service studies.**

Forecasted Metrics with Bonanza and Projects In-Progress

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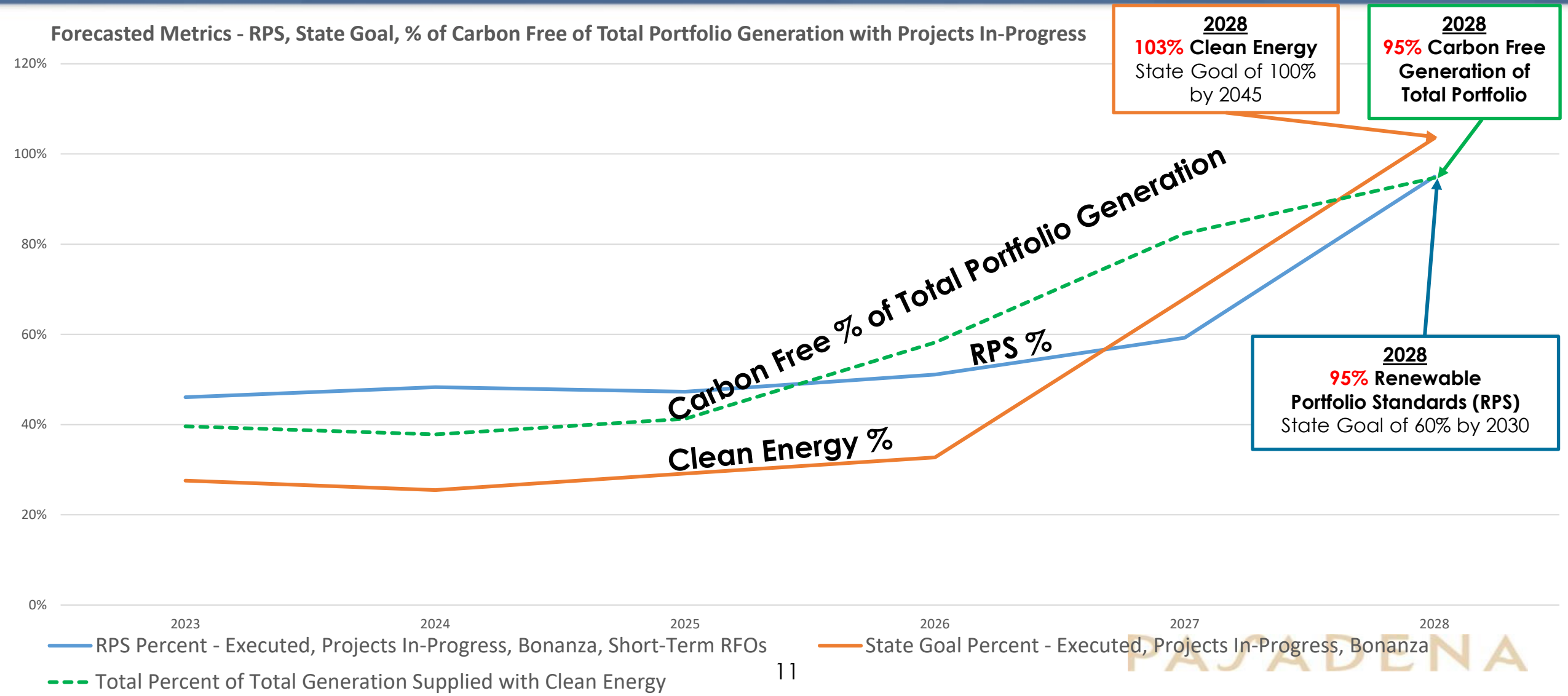

Forecasted Metrics at 2028 Waypoint Compared to IRP

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Metrics	IRP Forecast at 2028 Waypoint	Trajectory for 2028 Waypoint as of February 26 (Today)	Difference between IRP Forecast and Today's Trajectory
Clean Energy Position - State Goal 100% by 2045	107%	103%	**-4%**
Renewable Portfolio Standard - State Goal 60% by 2030	97%	95%	**-2%**
Percent of Carbon-Free Generation over Total Portfolio	95%	95%	**0%**
GHG Emissions below 1990 levels - State Goal 100% by 2045	87%	87%	**0%**
Hourly Carbon Free Position - 2023 IRP Goal 100% Carbon-Free by 2030	55%	68%	**13%**

Recommendation

- Authorize the City Manager, or his designee, to enter into a contract with SCPPA for the purchase of renewable energy and capacity from Bonanza Solar, LLC that includes daily delivery of a maximum of 105 megawatts of solar energy and up to four hours of dispatchable battery energy storage not to exceed 55 MW during a 20-year contract term beginning December 31, 2027 for an amount not-to-exceed $512,228,000.

Backup Slides

Forecasted Metrics at 2028 Waypoint

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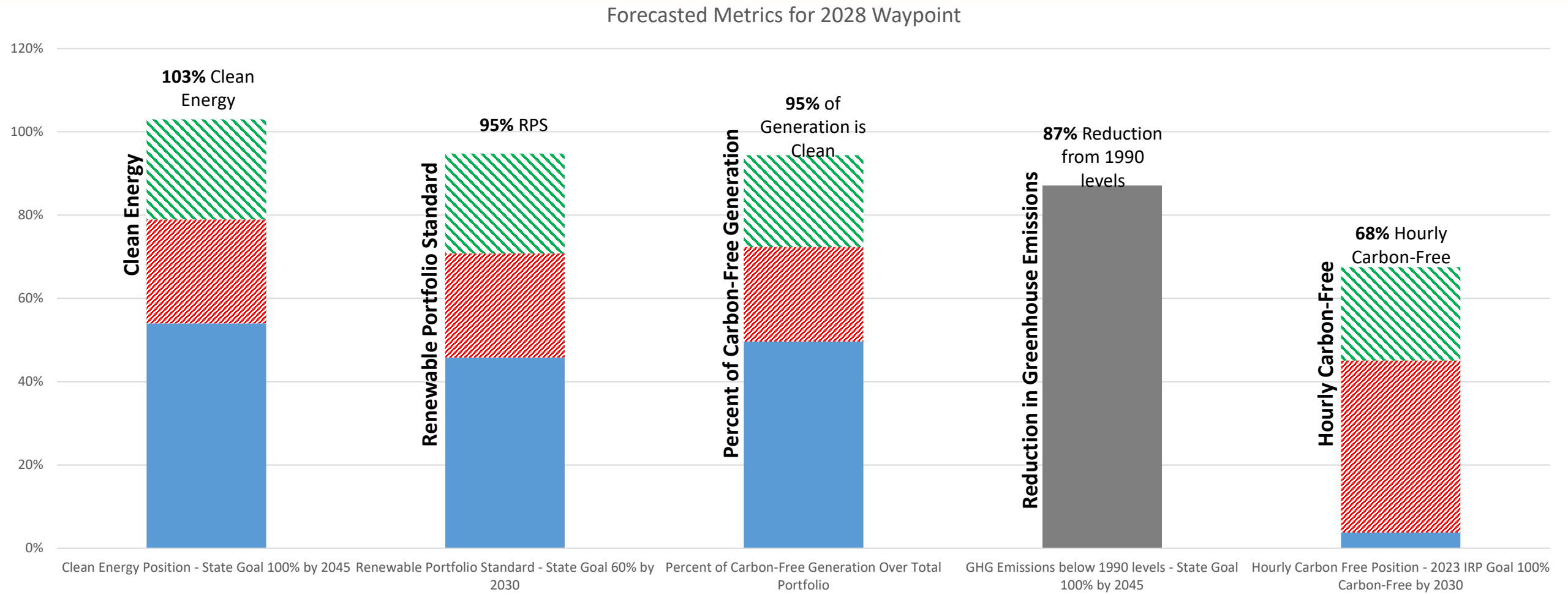

IPP Comparison

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Component	IPP	Bonanza
RA (MW)	108	62.5
Energy	946,000 MWh (maximum possible)	303,000 MWh
Renewable Energy Credits ("RECs")	No	Yes
Annual Average Cost	$60 million	$25 million

Methodologies of Metrics

Metric	Description	Formula
Percent Clean Energy (State Goal)	This percent shows how much of PWP's load is supplied with Clean Energy	$\frac{\text{Sum of All Qualifying Clean Electricity Supplied Annually (MWh)}}{\textit{Annual Load (MWh)}}$
Percent RPS	This percent shows how much of PWP's load is supplied with renewable energy	$\frac{\text{Sum of All Qualifying Renewable Electricity Supplied Annually (MWh)}}{\textit{Annual Load (MWh)}}$
Percent of Carbon-Free Generation over Total Portfolio	This percent shows how much of the electricity PWP has contracted is carbon-free	$\frac{\text{Sum of All Qualifying Clean Electricity Contracted(MWh)}}{\textit{Sum of All Contracted Electricity (MWh)}}$
Percent Reduction in Greenhouse Gases	This percent shows the reduction from 1990 levels of Greenhouse Gases which was 918,622 metric tons. The requirement is to reach 85% reduction by 2045	$\frac{\text{Sum of Greenhouse Gases Emitted (Metric Tons)}}{\textit{918,622 Metric Tons}}$
Percent Hourly Carbon-Free	This percent shows how many hours in a year are supplied with 100% carbon-free electricity over the total number of hours in a non-leap year (8760 hours)	$\frac{\text{Number of Hours Supplied with 100\% Carbon-Free Electricity}}{\textit{8760 Hours}}$

Forecasted Metrics in Waypoint 2028 with Bonanza

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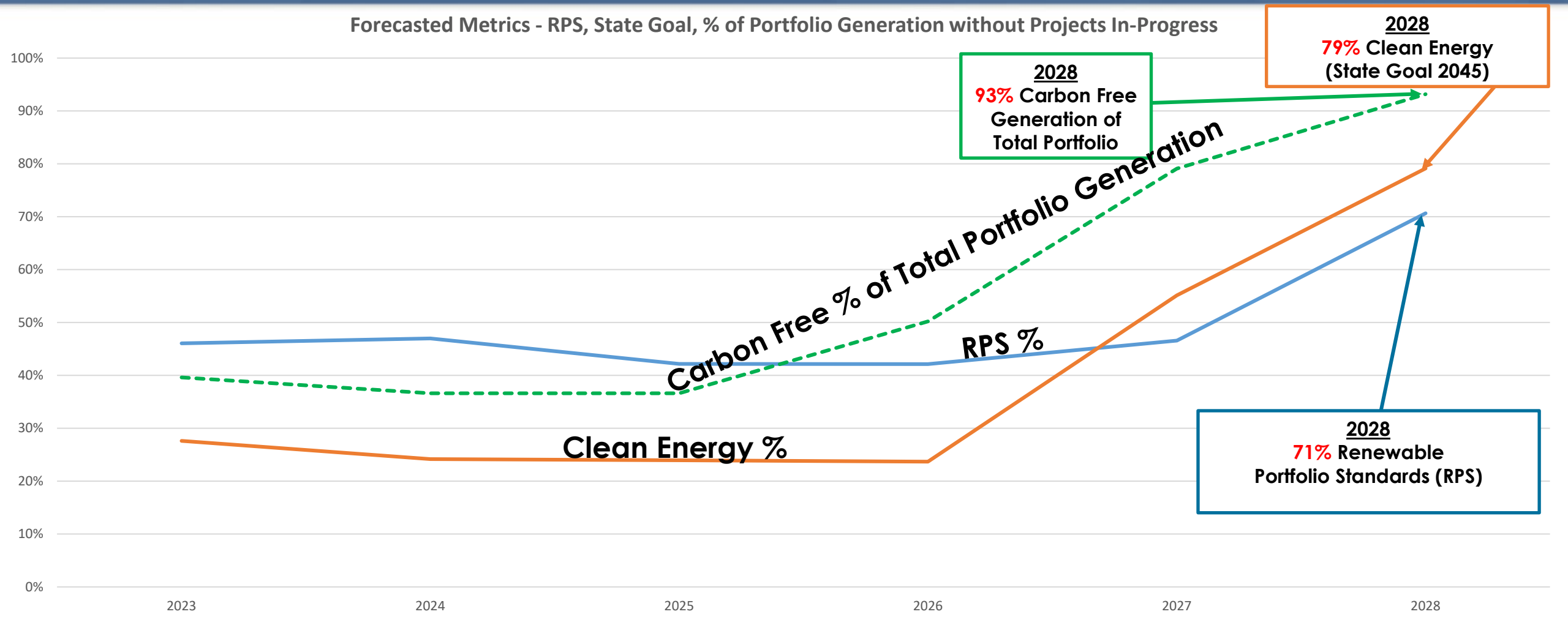

Forecasted Reduction in GHG Emissions

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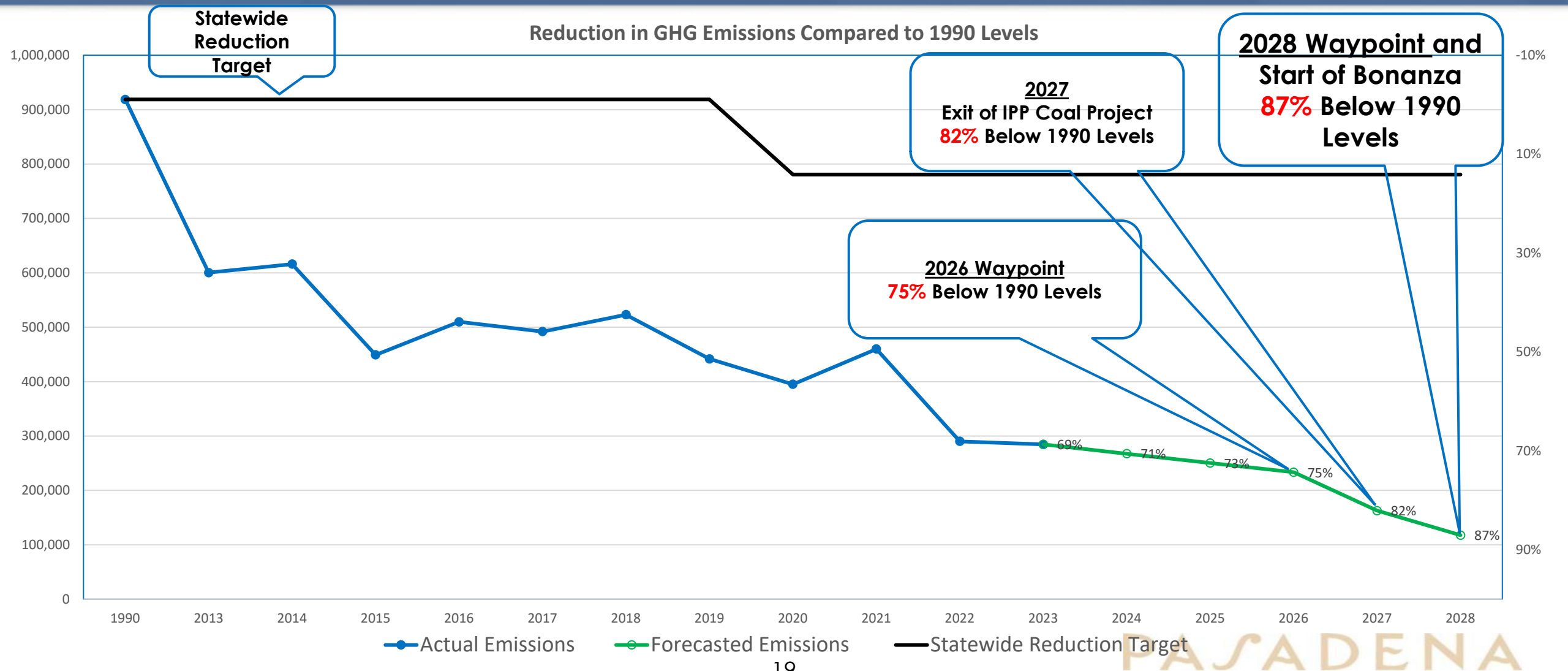

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Estimated Number of Homes Powered

- Bonanza will produce 303,534 MWh of electricity every year
- Typical Home uses ~500 kWh/month
  - > Conversion to MWh = 500 kWh/1000 = 0.5 MWh/month
  - > This is around 6 MWh every year
- Bonanza will provide Clean Energy to ~51,000 Homes
  - > 303,534 MWh/ 6 MWh = ~51,000

Market Condition Updates

- Purchase Power Agreement ("PPA") market has undergone significant changes with many factors shaping current trends:
  - > Tax credit financing and variations
  - > Import tariffs and trade policy uncertainty
  - > Inflation and rising interest rates
  - > Demand for renewable energy resources
  - > Supply shortages of renewable developments
  - > CAISO transmission queue requirements
  - > Land use assessments and environmental analyses

Solar Proposals Prices Received

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Bonanza's Price Includes:
*FCDS (Provides RA) (Rare in today's market)
*In CAISO
*Reputable Developer (lowers project risk)
*Provides Highest Quality of RECs (PCC1s)
*Includes co-located Solar for Storage

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Battery Proposal Prices Received

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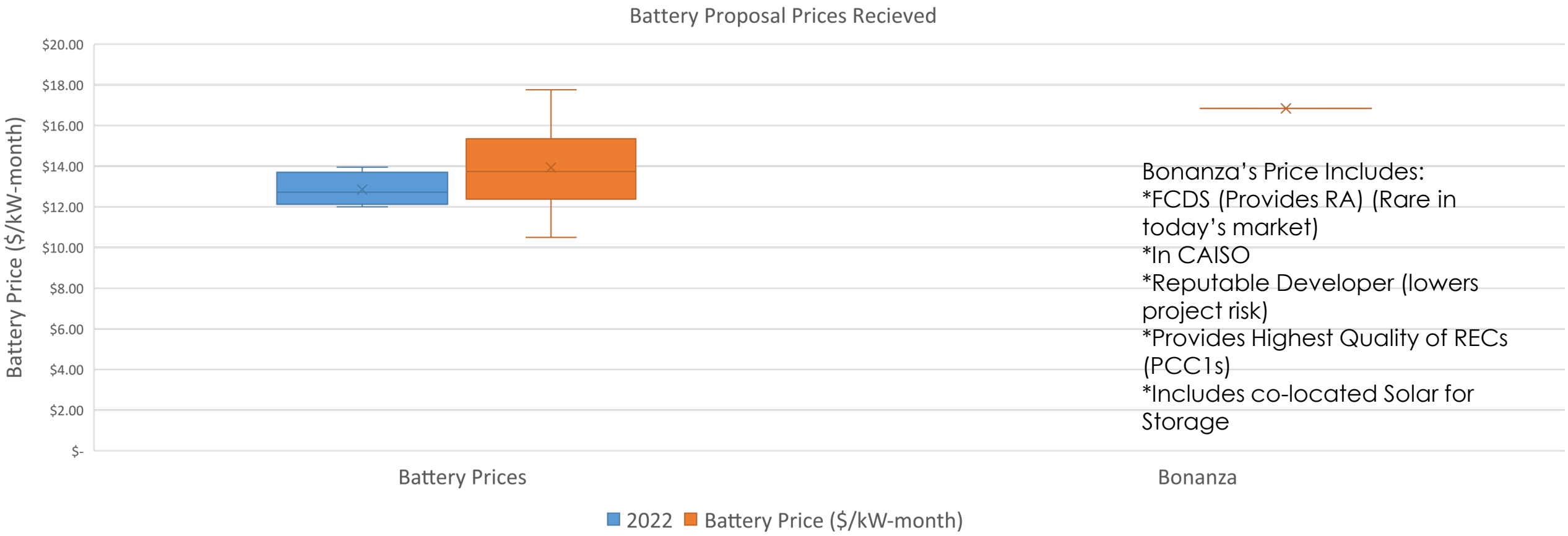

Bonanza's Price Includes:
*FCDS (Provides RA) (Rare in today's market)
*In CAISO
*Reputable Developer (lowers project risk)
*Provides Highest Quality of RECs (PCC1s)
*Includes co-located Solar for Storage

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ELECTRIC RATES ROADMAP

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WATER & POWER DEPARTMENT