


DISPATCHABLE ENERGY RESOURCES

San José City Council
October 4, 2022

Lori Mitchell, Director of Community Energy
Jeanne Solé, Deputy Director of Power Resources
Harry Briggs, Principal Power Resources Specialist
Prachi Avasthy, Division Manager of Risk Management, Contracts & Administration

SAN JOSE 
CLEAN ENERGY
A Program of the City of San José

NEW RENEWABLES AND RELIABILITY

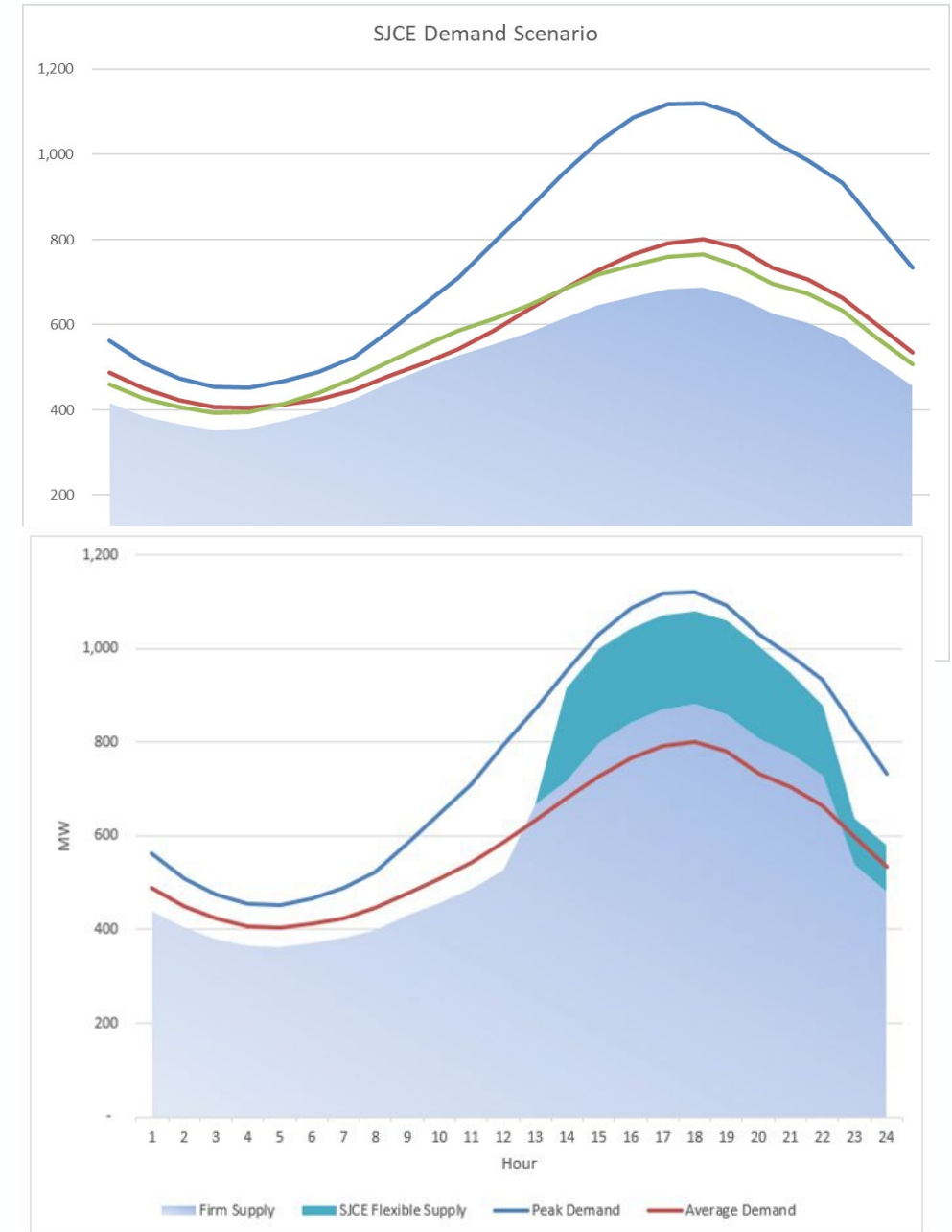
Since 2019, SJCE has contracted for over 500 MW of new renewable energy and storage resources

- 62 MW solar + storage in Kern County; fixed delivery from 6 a.m.-10 p.m. every day (online)
- 225 MW wind in New Mexico (online)
- 200 MW solar + 10 MW storage (coming)
- 45 MW of long-duration storage (coming)
- 34 MW of geothermal (coming)

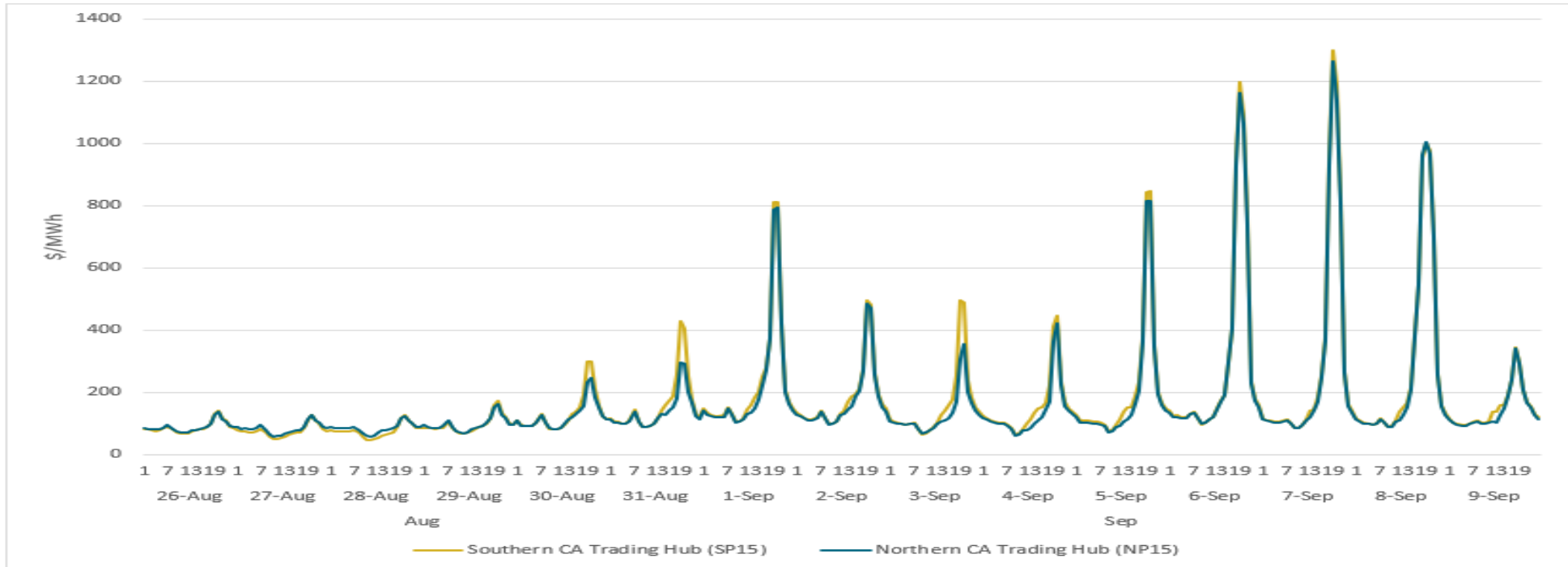


SJCE PORTFOLIO CHALLENGES

- **High Load:** Each year SJCE will have days when load is 25-50% above average
 - Particularly on hot days during the afternoon and evening in the summer
- Exact days are hard to predict
- High loads often correlated with high prices:
 - More demand for limited resources
 - Less efficient and more expensive power plants must operate to meet demand and set real time CAISO power prices
- Hot summer days (>90°) can be 3 times more costly than average summer days



EXAMPLE: SEPTEMBER HEAT WAVE



CAISO Day Ahead market prices in Northern (NP15) and Southern (SP15) trading hubs. Prices increased 3-5x during the most recent heat wave.

POTENTIAL SOLUTIONS

Proposed: Flexible Resources for Resource Adequacy AND Dispatchable Energy

Other solutions:

1. Demand Side Management: SJCE is pursuing; scale is limited
2. Batteries: Will bring recommendations to Council on October 25 and November 29
3. Buy power forward before prices are affected by weather and other disruptions
 - Results in significant excess supply: Not economically viable
4. Options and Weather Derivatives: SJCE is not allowed to use these products per Risk Management Regulations. SJCE not currently staffed to manage these products

DISPATCHABLE ENERGY

Dispatchable energy refers to sources of electricity that can be turned on and off to meet customer load:

- Battery storage
- Natural Gas
- Hydro

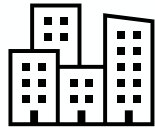
Plants will run when needed and the cost to run (fuel plus operation and maintenance) is less than the market price for electricity



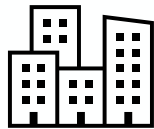
SOLICITATION SUMMARY

- April 5, 2022: Request for Information for capacity and dispatchable energy or other solutions that assist in meeting demand during SJCE’s peak load hours
- June 15, 2022: Request for Offers to procure Resource Adequacy (“RA”) and the right to dispatch energy from a Physical Resource
- Results: 3 entities; 5 projects
 - 2 Solar plus Storage: Not shortlisted, not competitive with offers in ongoing solicitation for Long-Term Renewables and Storage, RA uncertain
 - 1 Stand-Alone Storage: Not shortlisted, not competitive with offers in ongoing solicitation for Long-Term Renewables and Storage, RA uncertain
 - **2 Natural Gas Plants with technologies to reduce carbon emissions: Shortlisted**
 1. Middle River Power: natural gas plant with 1-hour battery share one interconnection point
 2. Sentinel Energy Center: natural gas plant to be retrofitted to burn blend having up to 30% green hydrogen

CONTRACT STRUCTURE



1. Fixed Capacity Payment
2. Operate when economic:
SJCE will pay:
 - Operations & Maintenance
 - Fuel CostsSJCE will get market price



1. System Capacity to ensure Grid Reliability (RA)
2. Generate Electricity when SJCE Demand Peaks
3. Generate Electricity during Market Wide Disruptions

GREENHOUSE GAS CONSIDERATIONS

Selected projects emit carbon but transition existing natural gas plants to cleaner alternatives

Middle River Power (MRP): add battery with priority for limited interconnection capacity

- MRP estimates this reduces gas plant operating hours by 50-70%
- Battery charged from grid during low-cost hours; coincides with solar generation

Sentinel Energy Center (Sentinel): add ability to burn green hydrogen (up to 30% blend)

- Hydrogen is a clean energy source that only emits water vapor and leaves no residue in the air
- Green hydrogen is produced by splitting water into hydrogen and oxygen using renewable electricity
- 11% GHG emission reductions when SJCE opts to burn green hydrogen
- Current cost of green hydrogen high for systematic use
- Costs likely to moderate over time with increasing projects and infrastructure

MIDDLE RIVER POWER

- Operates 2+ Gigawatts of power plants in California
- Operates an additional ~3 Gigawatts throughout the United States
- Successfully developed and contracted:
 - 100 MW Solar project with a 50 MW battery in Victorville, CA
 - 60 MW standalone battery in Coso Junction, CA
 - 130 MW geothermal project in Coso Junction, CA

SENTINEL – PLANT OPERATING SINCE 2013

- Jointly owned by Diamond Generating LLC, Partners Group and Voltage Finance LLC
- Diamond Generating LLC (50% ownership)
 - Owned by Mitsubishi
 - Ownership interest in 11 operating power generating facilities in U.S. and Mexico, having total output capacity of approximately 5,200 MW
- Partners Group (25% ownership)
 - Large, independent investment firm
 - \$131 billion in assets under management
- Voltage Finance LLC (25% ownership)
 - Owned by private investors and managed by an independent board of directors
 - One director is a member of the Infrastructure Group of Guggenheim Partners

QUESTIONS?

Recommendations:

- Authorize the Director to negotiate and execute a power purchase agreement with Middle River Power, or its affiliate MRP Pacifica Marketing LLC, to buy Resource Adequacy and Dispatchable Energy products from a natural gas plant and associated battery; and,
- Authorize the Director to negotiate and execute a power purchase agreement with Sentinel Energy Center, LLC, to buy Resource Adequacy and Dispatchable Energy products from a natural gas plant that will be retrofitted to have the capability to burn a natural gas and green hydrogen blended fuel.

Staff:

- Lori Mitchell: Director of Community Energy
- Jeanne Solé: Deputy Director of Power Resources
- Harry Briggs: Principal Power Resources Specialist
- Prachi Avasthy: Division Manager of Risk Management

