

City of El Paso Renewable Generation Study

AUGUST 2021



Resource Planning: Balanced Approach



Reliability

- Sufficient capacity for all hours of the year
- Regulation of variable renewable resources
- Grid stability of Bulk Electric System



Customer Affordability

- Efficient use of resources
- Development and cost of new technology
- Optimal cost portfolio baseline
- Expect baseline may include early renewable and storage investments



Environmental

- Emission reduction
- Carbon-free energy goals
- Analyze versus base-case

Resource Scenarios to Be Analyzed

Least Cost Case

Counterfactual for assessing other cases

Base Case (RPS Compliant)

The New Mexico Renewable Energy Act (REA) applies to all cases except for the least-cost case

Low Carbon Cases (High Renewable & Clean Energy Integration)

Scenarios that increase the share of zero-carbon resources by more than existing policies

High Distributed Generation Case

Higher penetration of distributed solar

High Demand-Side Management Case

Higher levels of energy efficiency and demand response

Greater Renewable and Storage Cost Declines

Cost declines greater than forecasts

Potential Resource Options

Preliminary listing of resources to be considered in 2021 IRP:

- | | | |
|--------------|---------------------------|-----------------------------|
| ▪ Solar | ▪ LM/DR – EE ¹ | ▪ Imports |
| ▪ Wind | ▪ Battery Li-Ion | ▪ Gas Fired Reciprocating |
| ▪ Biomass | ▪ Other Energy Storage | ▪ Gas Fired CT ² |
| ▪ Geothermal | ▪ Other Renewables | ▪ Gas Fired CC ³ |

Other resources and technology to be explored:

- Energy Storage – Pumped hydro, flow batteries, underground compressed air, hydrogen flywheels
- Nuclear – Modular nuclear possible option upon Palo Verde retirement but not prior to 2045
- Gas Turbine – Conversion to hydrogen fuel
- EV and Customer Sited Batteries

1. LM/DR-EE: Load Management/Demand Response- Energy Efficiency
2. Combustion Turbine
3. Combined Cycle

Modeling and Inputs

Modeling objectives:

- Verify reliability to ensure sufficient resource availability to meet customer energy needs
- Assess variability of load, resource outages, and renewable energy output
- Estimate portfolio costs for resources, fuel, and energy

Modeling inputs:

Forecast

- Customer Load
- Distributed Solar
- Energy Efficiency
- Electric Vehicle

Resource Characteristics

- Solar & Wind Output
- Battery Storage Availability
- Resource Dispatchability
- Demand Side Resources

Resource Costs

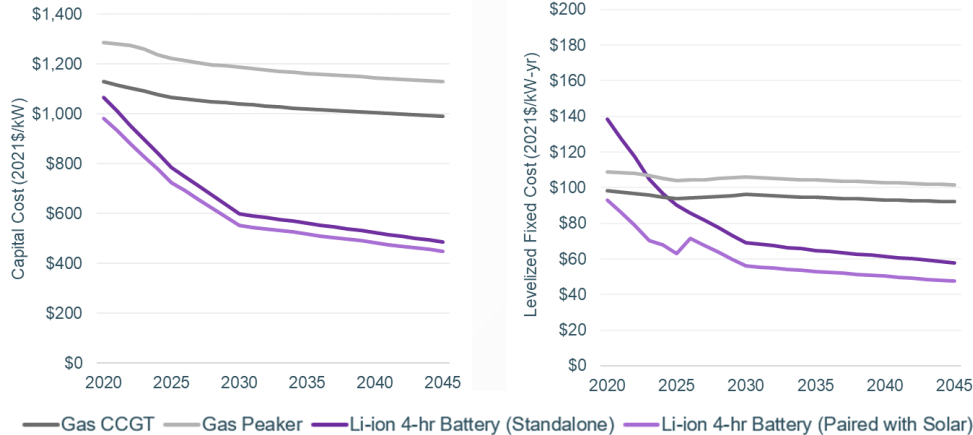
- Equipment and Construction
- Operating and Maintenance
- Fuel
- Purchased Power

Modeling and Inputs

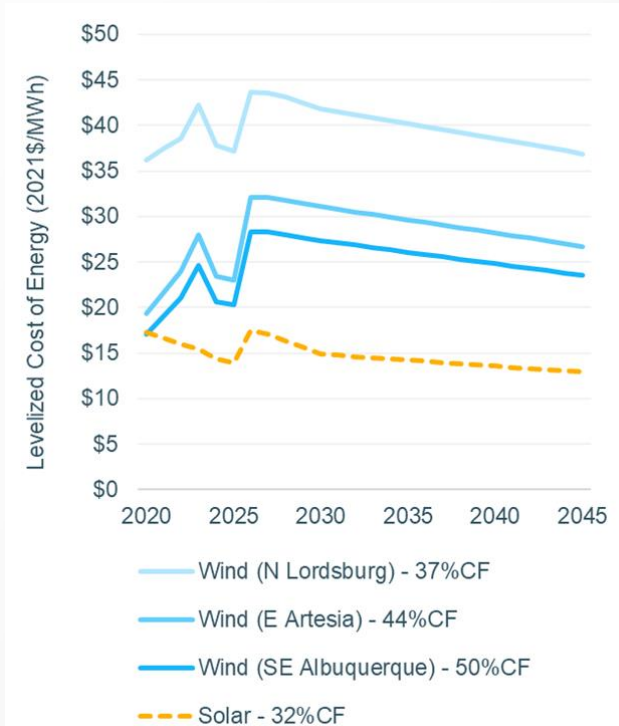
Costs determined via publicly available information:

- LAZARD'S costs for capital and O&M
- National Renewable Energy Laboratory utilized to estimate renewable and storage cost declines
- Market information for recent resource contract announcements
- Market forecasts for fuel costs

Projected Storage Cost Declines



Projected Solar and Wind Cost Declines

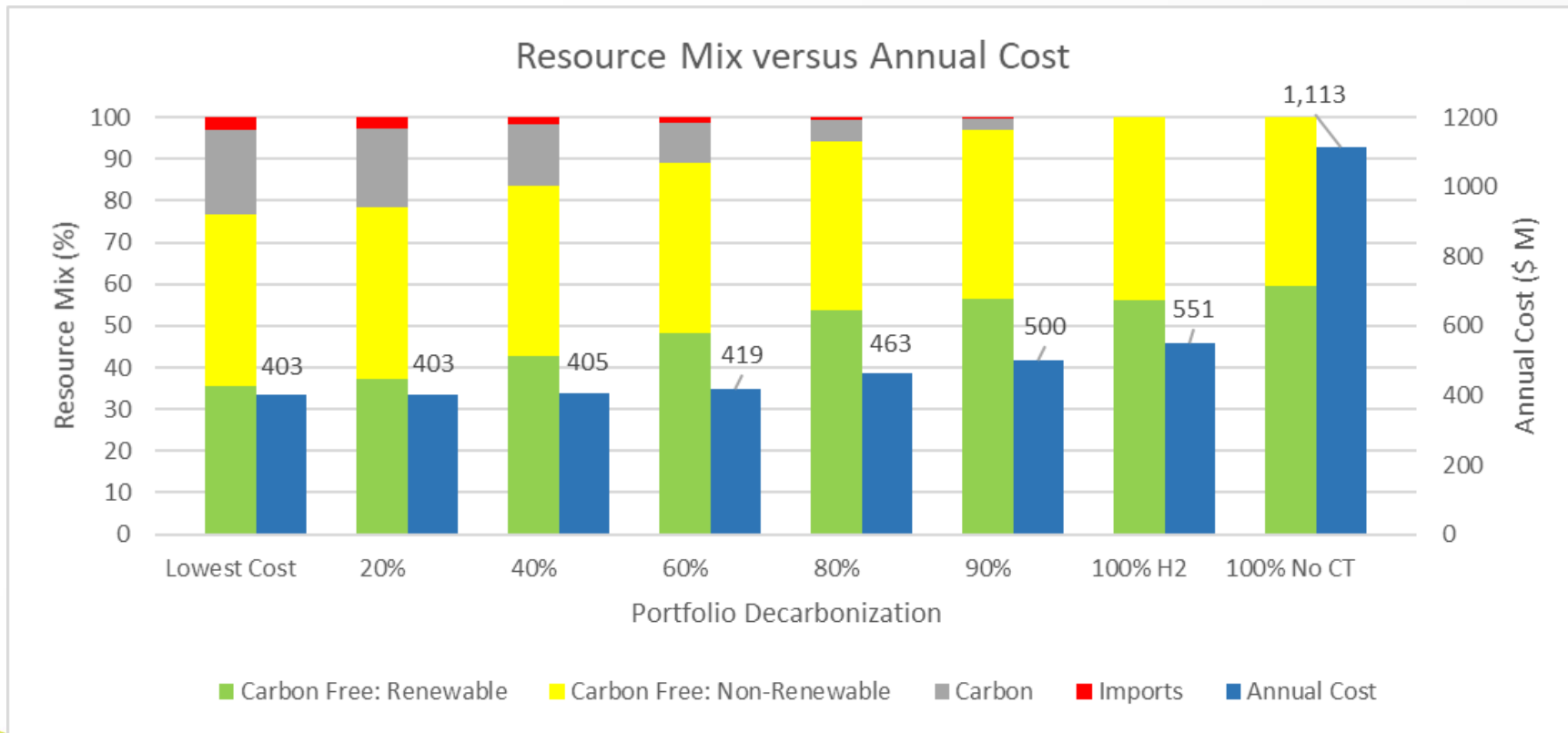


Carbon Reduction Resource Scenarios

Imposed carbon reduction requirements in the modeling to drive selection of renewables:

PORTFOLIO NAME	PORTFOLIO DESCRIPTION	CARBON FREE (%)	RENEWABLE (%)
Lowest Cost	Meets State RPS	76	36
20%	20% Carbon Emission Reduction by 2040	78	37
40%	40% Carbon Emission Reduction by 2040	84	43
60%	60% Carbon Emission Reduction by 2040	89	48
80%	80% Carbon Emission Reduction by 2040	94	54
90%	90% Carbon Emission Reduction by 2040	97	56
100% H2	100% Carbon Emission Reduction by 2040 with Hydrogen Fuel	100	56
100% No CT	100% Carbon Emission Reduction by 2040 with Only Renewables (Existing Nuclear)	100	60

Resource Scenarios vs. Cost Impact



Modeling Sensitivities

Modeled various sensitivities to assess impact in resource mix and portfolio cost

- High adoption for distributed solar (High Dist Solar)
- High adoption for demand response and energy efficiency (High DSM-EE)
- Carbon tax – three levels (Low Carb Tax, Med Carb Tax, High Carb Tax)
- Greater cost declines for renewables and storage - incorporated RREAC feedback (Low Renew - Stor Cost)
- High gas fuel cost (High Gas Cost)

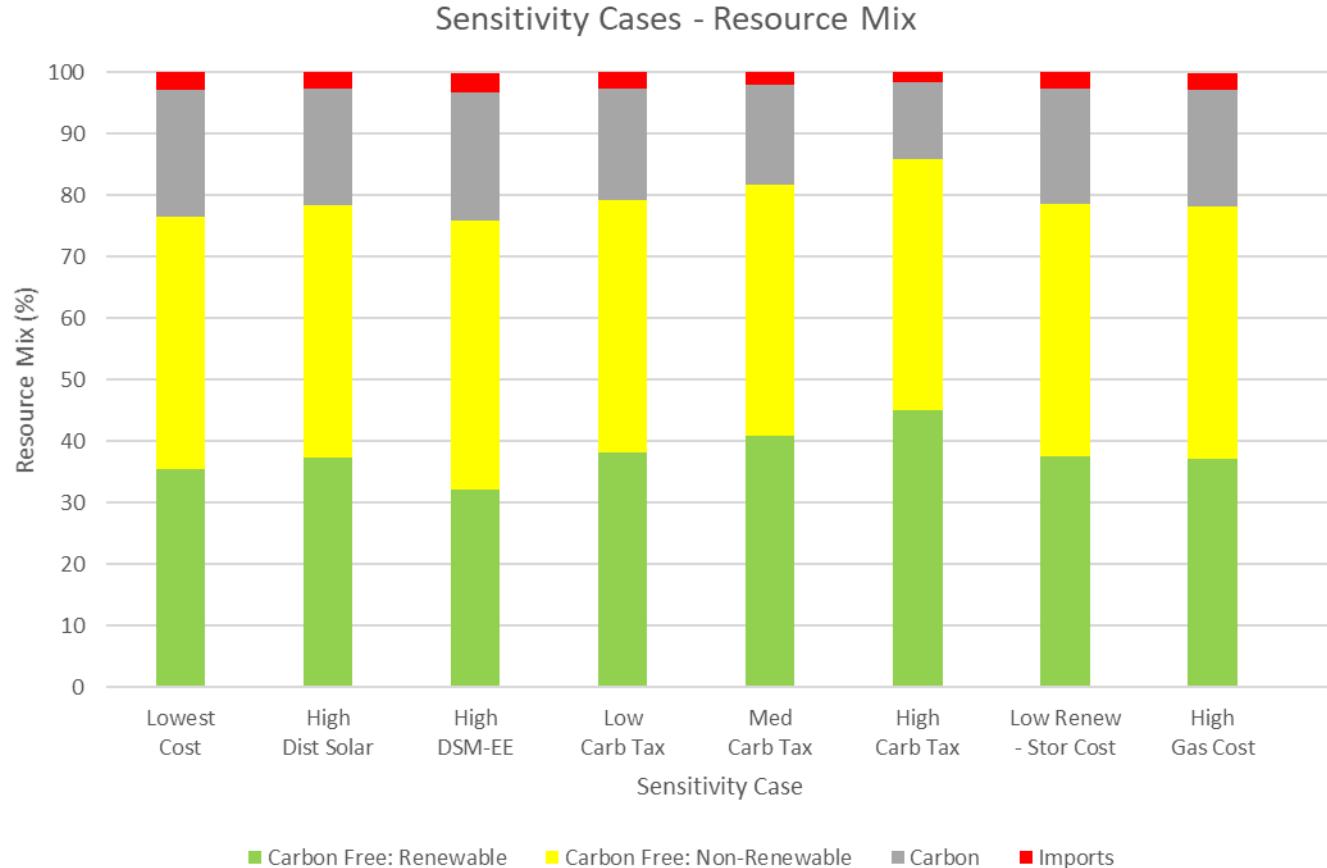
Sensitivities allow us to assess:

- Rate of renewable integration
- Impact to final level amount of renewable integration
- Decarbonization impact

Conclusion

- Sensitivities do not significantly impact resulting resource mix
- Reliability analysis to ensure sufficient resources to serve energy in the hours needed drive final portfolio resource mix

Resource Sensitivities vs. Least Cost Resource Mix





Community Solar Program Expansion

- Currently 5 MW of capacity, serving approximately 2,500 customers
- Customers subscribe for capacity from the community solar facilities and receive the associated energy produced on their monthly bill
- Expansion may allow a reduced cost subscription option for qualifying low-income customers

Legislative & Regulatory Changes & Grant Opportunities

- Legislative & Regulatory Changes – Anticipated technological improvements and price declines obviate the need for any at this time
- Grant Opportunities
 - EPE is awaiting results from its grant application for an energy storage project
 - INVEST in America Grant Opportunities
 - Opportunities for smart grid, renewable energy, hydrogen, and energy efficiency grants
 - Opportunities to work with school districts and El Paso Water on potential renewable and energy efficiency grants

Proposed Dedicated Solar Plus Program (DSPP)

- A renewable energy supply alternative for educational, non-military governmental, large commercial, and industrial customers
- Program supplied by competitively procured utility-scale solar PV resources (estimated between 10 to 40 MW per facility)
- Multiple customers and accounts can subscribe and receive a share of the renewable energy production
- Voluntary, long-term program – price fixed for term of the agreement (hedging opportunity)
- Renewable energy will offset energy otherwise produced with EPE's system generation resources



Renewable Generation Study Next Steps

- EPE expects to complete technical modeling of scenarios in the April timeframe
- Adoption of a draft Company-wide climate and renewables goal
- EPE is moving forward with an application for facility and program approval for the DSPP at the Commission
- Evaluation of other voluntary program options is ongoing

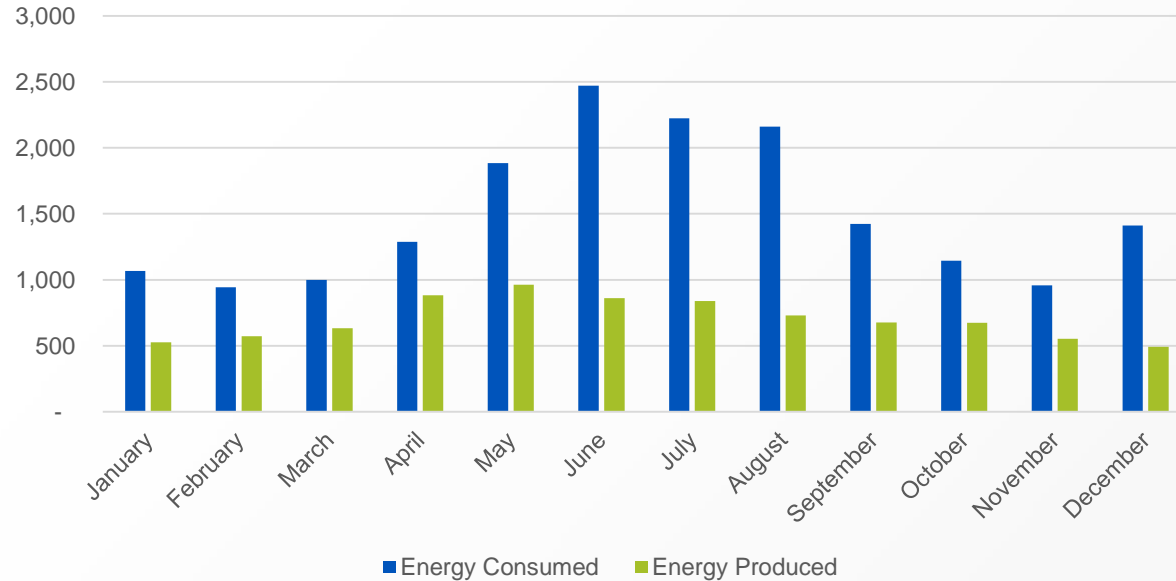
Appendix

Review of Study Deliverables

- 9.5(b)1** - The technical feasibility of integrating utility-scale renewable generation into EPE's utility system and the changes and impacts EPE's transmission and distribution system
- 9.5(b)2** - Possible costs and operational impacts related to the integration of utility-scale renewable generation into EPE's Texas service territory
- 9.5(b)3** - Legislative or regulatory changes, if any, that may be required to increase utility-scale renewable generation in EPE's Texas service territory and the legislative strategies necessary to implement such legislative or regulatory changes
- 9.5(b)4** - Potential voluntary renewable generation program offerings to allow customers to increase their use of renewable resources within the El Paso, TX city limits and EPE's Texas service territory
- 9.5(b)5** - Reasonable commitments that EPE can make to increase the integration of renewable generation in EPE's Texas generation portfolio
- 9.5(b)6** - Grant opportunities for EPE, the City, or both to increase the integration of renewable generation in EPE's Texas generation portfolio
- 9.5(b)7** - Potential renewable generation programs to assist with low-income assistance programs such as the Low-Income Home Energy Assistance Program or additional incentives for distributed generation

Community Solar Program Expansion: Program Overview

2020 Texas Community Solar
3kW Subscription



- 47% of energy consumed was provided through the program subscription
- Annual net bill increase under the program was \$20