



# WHOLESALE POWER MARKET ANALYSIS FOR LPEA

Wholesale power market analyses to help LPEA assess the reliability and costs of potential alternative supply portfolios

**For Presentation to LPEA Board & Members**

April 17, 2019

# BACKGROUND

- **La Plata Electric Association (LPEA) is evaluating alternative supply options, including the risks and benefits of securing electric service from a provider other than the current LPEA wholesale electric service provider: Tri-State Generation & Transmission (TSGT)**
- **Energy Strategies was retained to help LPEA on issues associated with the wholesale power market, including assessing the costs and expected reliability associated with alternative power supply options**





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# RELIABILITY & ANCILLARY SERVICES

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# TSGT WHOLESALE ELECTRIC SERVICE CONTRACT PROVIDES:

## ENERGY SERVICE

Full-requirements  
energy provision

## CAPACITY SERVICE

Full-requirements  
capacity provision

## PLANNING RESERVES

As part of providing  
energy and capacity,  
TSGT provides planning  
reserves

WESC also includes  
restrictions on LPEA's  
ability to build local  
projects (5%) or procure  
its own energy mix

## TRANSMISSION

TSGT arranges for  
transmission service to  
LPEA points of delivery

## ANCILLARY SERVICES

TSGT arranges for and  
provides ancillary  
services for LPEA

## INCREMENTAL RENEWABLE ENERGY CREDITS (RECs)

TSGT retires incremental  
RECs necessary to meet  
LPEA's Colorado RPS  
requirements

RPS Compliance (RECs)

Transmission/ ancillary  
service

Generation-related services

\*Note, the WESC, today, does not guarantee reliability. It states: "If Seller's (TSGT) generation and sources of supply are inadequate to serve all of Member's demand and Seller is not able to secure additional sources of supply, then in that event, Member's service may be interrupted pursuant to a written policy that has been adopted by Seller's Board of Directors that establishes procedures for such interruptions"



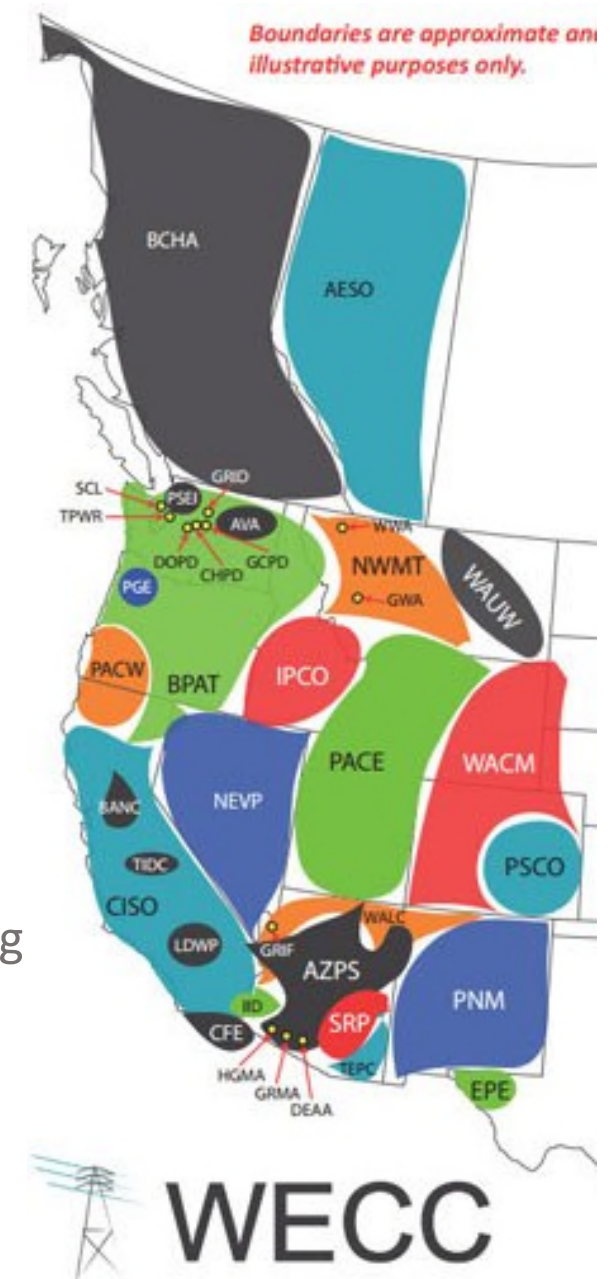
# KEY TERMS/CONCEPTS

- **Ancillary Services**

- ❖ Necessary to support the transmission of capacity and energy from resources to loads while maintaining reliable operation

- **Balancing Authority (BA)**

- ❖ Entity that integrates resource plans ahead of time, maintains load-interchange-generation balance within a Balancing Authority Area (BAA) and supports interconnection frequency in real-time
  - ❖ BAs maintain load-resource balance within their BAAs
  - ❖ BAs have certain responsibilities for maintaining reliability in their area under mandatory reliability standards and can face large fines for violating those standards



# ANCILLARY SERVICE PROVISION

- **LPEA's load sits within the Western Area Power Administration (WAPA)-Colorado Missouri (WACM) Balancing Authority Area and today WACM (via TSGT) provides LPEA with a number of services to ensure reliability**
  - ❖ WACM, as the BAA, is responsible for maintaining reliability & balancing load/generation within the area that LPEA sits
  - ❖ WACM is also obligated to offer ancillary services to customers within its BAA, and does so under the terms of its Open Access Transmission Tariff
- **Under an alternate power supply contract, LPEA's Balancing Authority Area would not change and it would continue to receive many of the same reliability based services from WACM**
  - ❖ Under an alternative power supply arrangement all ancillary services would be offered to LPEA under the terms of WAPA and TSGT's open access transmission tariffs

Source: WAPA's Transmission Webpage ([here](#))



# LPEA's ELECTRIC SERVICE TODAY & IN THE FUTURE?

	Generation	Transmission	Ancillary Services	Distribution
<b>TODAY provided by:</b>	TSGT & small, local power production inside LPEA	Combination of TSGT, WAPA-CRCM; procured by TSGT	Mostly provided by the WACM BA, but TSGT provides some services as well	Generally, provided by LPEA
<b>FUTURE, assuming an alternate energy supplier, may be provided by:</b>	Many options, including local production, contracts with renewable energy providers, contracts with thermal generators, procurement of energy in the wholesale energy markets, and contracting with a power marketer to support various procurement options	Likely a combination of TSGT and WAPA, contracted for by LPEA	Continue to be provided by WACM BA and, likely, some would continue to be provided by TSGT	Generally, provided by LPEA
<b>Different or Same Provider</b>	Different, but BAA will continue to ensure sufficient generation to meet load requirements in real-time	Same (just different construct/charges)	Same (just different construct/charges)	Same

**→ THE RELIABILITY OF LPEA'S ELECTRIC SERVICE WILL REMAIN EQUIVALENT TO TODAY**





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# TRANSMISSION ASSESSMENT

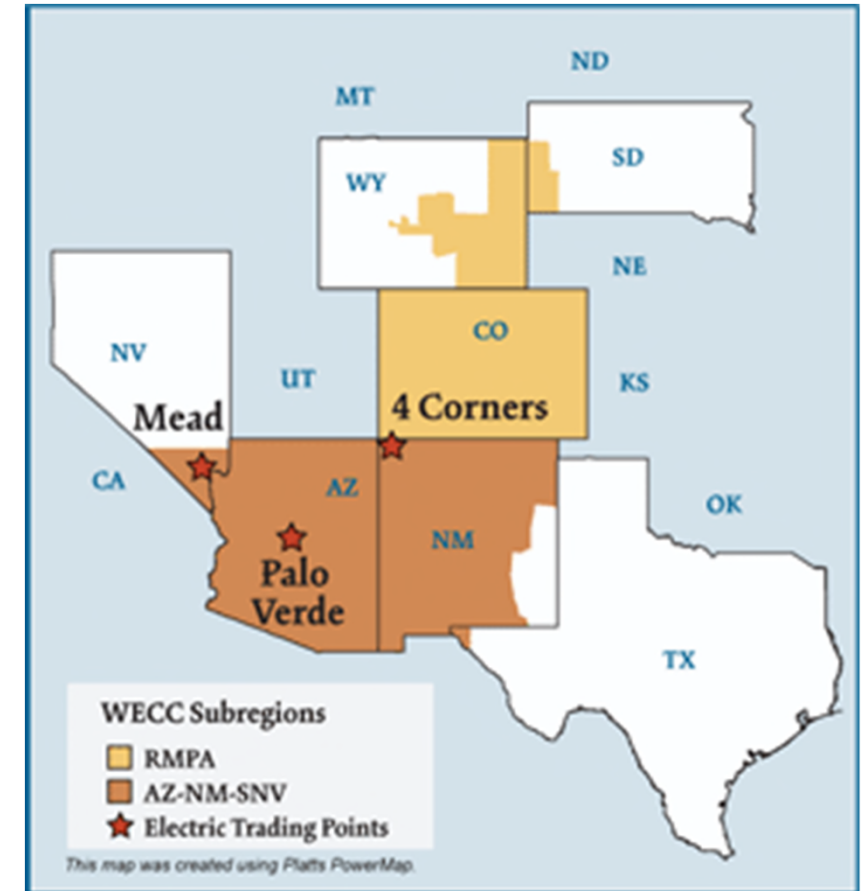
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# A NOTE ABOUT GENERATION

- **Alternative generation options for LPEA could include various combinations of supply, including:**

- ❖ Power Purchase Agreements (PPAs) with renewable energy resources
- ❖ Ownership/PPA for energy storage, hydro, other carbon-free resource
- ❖ Contract or purchase of conventional generation resources
- ❖ Procurement of electrical output in the wholesale energy market
  - Generally conducted at “trading hubs”, locations where significant amounts of power is bought and sold
  - The map to the right shows some of the biggest electric trading points in the Southwest area
  - Note Four Corners is the closest trading hub to LPEA and will likely require the least transmission costs to access it
  - We expect that an alternative power supplier would procure much of the power to serve LPEA at the Four Corners trading hub



**Graphic source:** FERC, <https://www.ferc.gov/market-oversight/mkt-electric/southwest.asp>





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# ENERGY COST & POWER SUPPLY MIX

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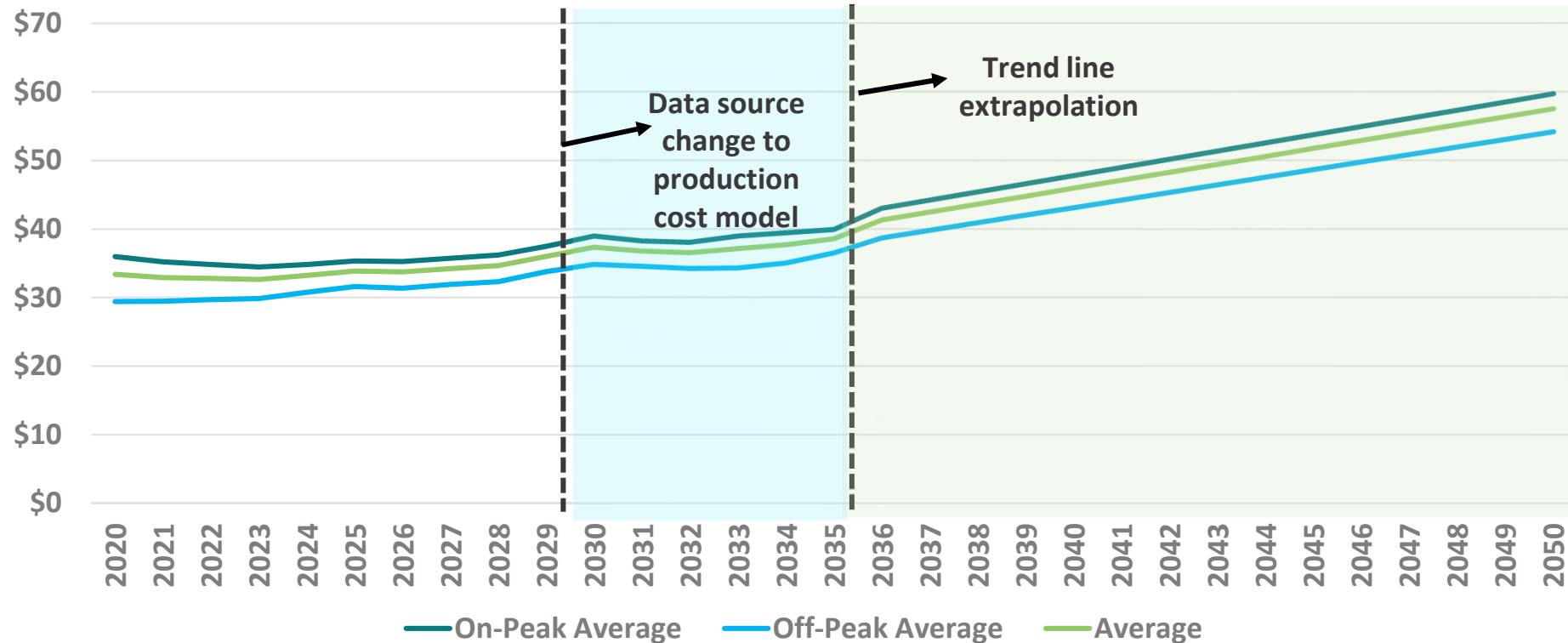
# LPEA PORTFOLIOS FOR STUDY

PORTFOLIO CASE	LOCAL SUPPLY	REMAINING GENERATION COMPOSITION		FUTURE YEARS
<b>Baseline Supply</b> – intended to mimic the composition of LPEA’s current supply from Tri-State	5% from current resources: 5 MW (42,000 MWh) waste heat 350 kW (650 MWh) solar array 1 MW (2,750 MWh) single axis solar 80 kW (450 MWh) hydro	30% non-carbon & RPS compliant	70% wholesale market purchases	Incremental resources based on economics
<b>50/50 Supply</b> 50% non-carbon in 2020, increasing to 100% by 2050	10% comprised of: Current resources (see baseline supply) 20 MW (53,000 MWh) local solar PV added in 2025	50% non-carbon & RPS compliant	50% wholesale market purchases	2040: 80% non-carbon 2050: 100% non-carbon
<b>80/20 Supply</b> – 80% non-carbon in 2020, increasing to 100% by 2050	10% comprised of: Current resources (see baseline supply) 20 MW (~53,000 MWh) local solar PV added in 2025	80% non-carbon & RPS compliant	20% wholesale market purchases	2050: 100% non-carbon
<b>100 Supply</b> – 100% non-carbon, wholesale purchases to balance	10% comprised of: Current resources (see baseline supply) 20 MW (~53,000 MWh) local solar PV added in 2025	100% non-carbon & RPS compliant	(market purchases as needed)	Maintain 100%



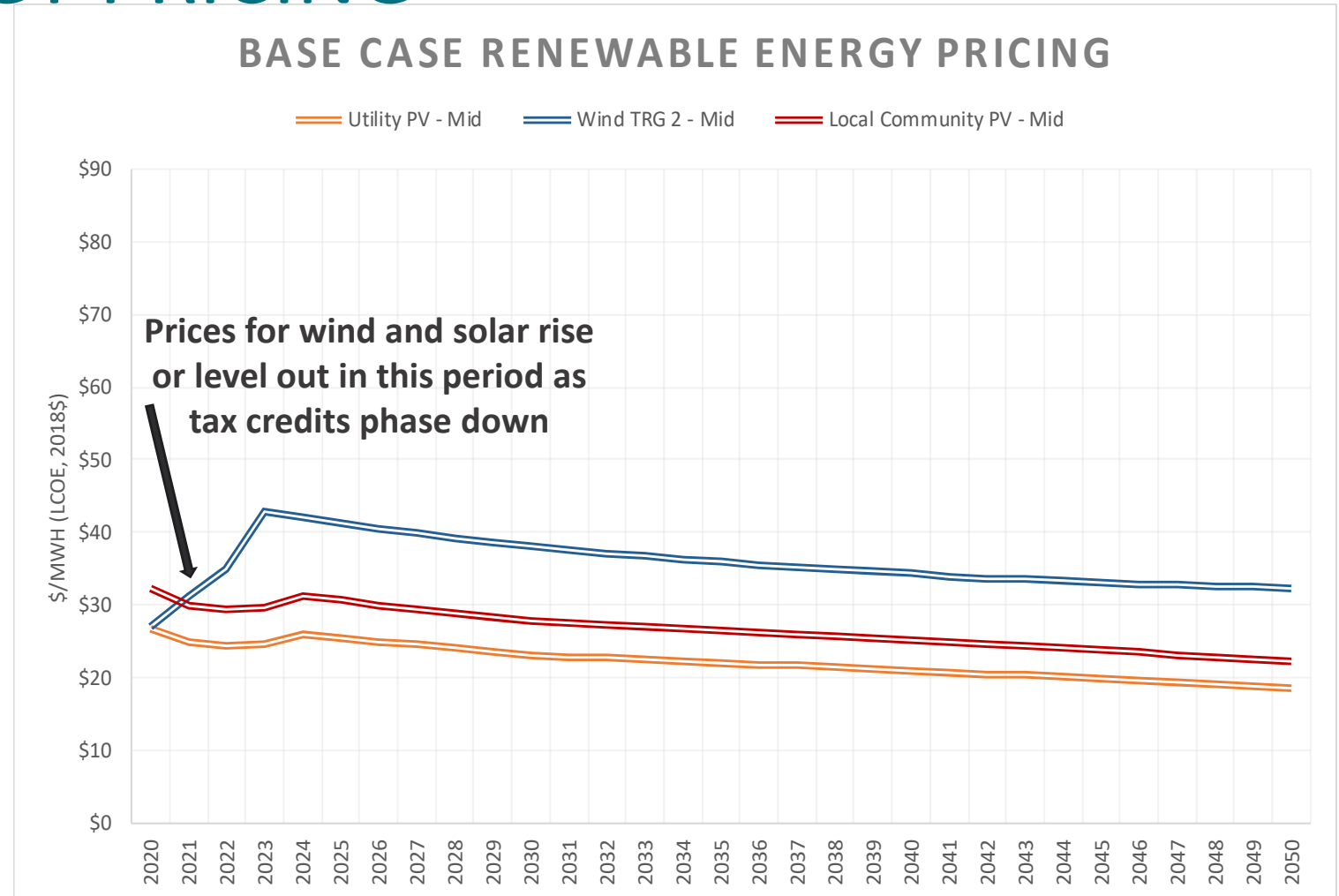
# WHOLESALE POWER PRICES IN LPEA PORTFOLIOS

### Four Corners Wholesale Energy Price Forecast for LPEA Portfolios (2018\$/MWh)



# RENEWABLE ENERGY PRICING

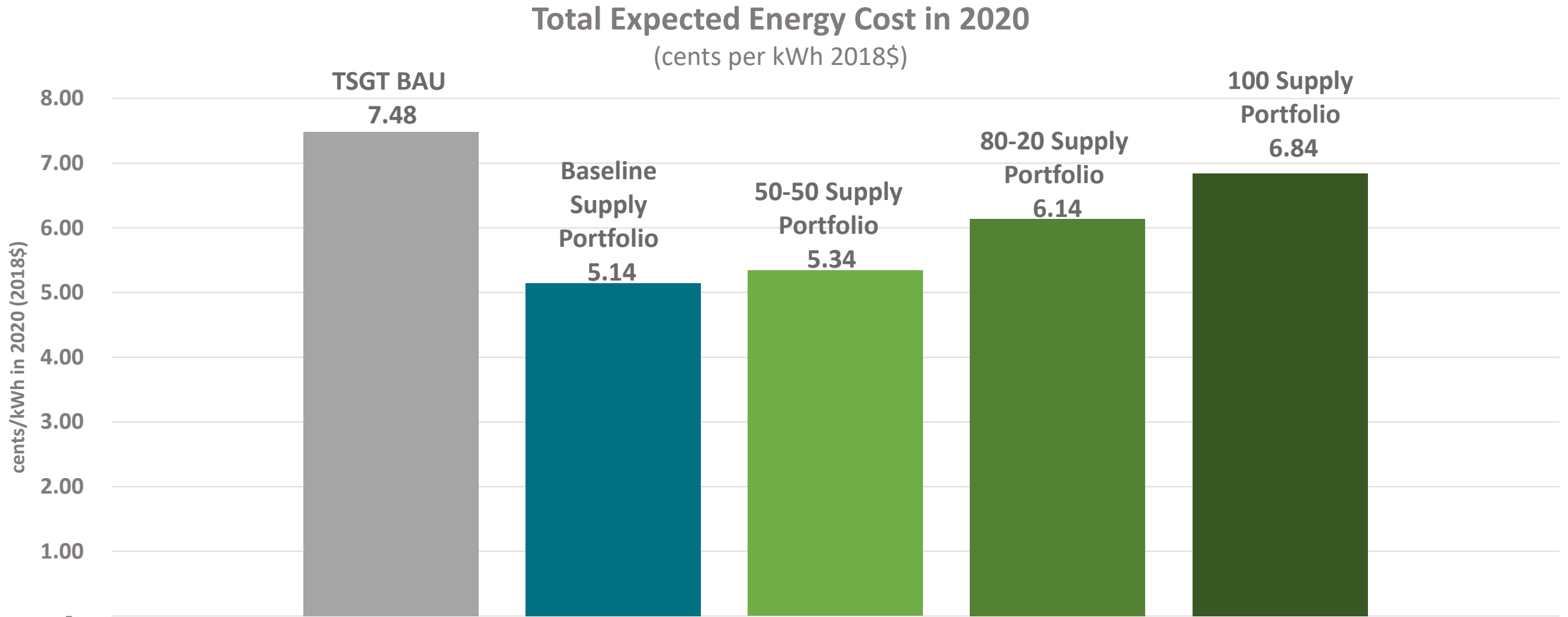
- **Solar resources may be able to be connected directly to LPEA’s system, may be connected to TSGT or to WAPA**
  - ❖ They will incur some ancillary service charges & a renewable integration adder is applied
- **Wind, however, would likely require another leg of transmission (and associated costs) on PNM or PSCo’s systems**
- **In times where renewable generation exceeds LPEA’s load, additional transmission charges will be applied in order to sell those resources in the wholesale spot market**



**Source:** NREL’s Annual Technology Baseline, converted to 2018\$. Mid-utility PV case consistent with indicative pricing provided by renewable energy developers for utility-scale solar (≥50 MW) accessible to LPEA. Local community solar (≈20 MW), developers indicated would have a roughly 20% pricing premium (providing the basis for the community solar costs). Wind costs are Technology Resource Group (TRG-2), which per [NREL’s WindVision report](#) have an approximately 49% capacity factor by 2020, which is similar to capacity factors that may be available from wind in New Mexico.



# COMPARISON OF POWER SUPPLY COSTS



\*Note these numbers **do not** take into account the “exit fee” for terminating the Wholesale Electric Service Contract (WESC) with TSGT





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# RTO & MARKET DEVELOPMENT

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# RTO BENEFITS

- **Operational benefits from more efficient use of existing generation and transmission**
- **Lower peak capacity needs**
- **Renewable integration**
- **Transmission planning (including to more cost effective resources)**
- **Enhanced reliability**
- **LPEA considerations include:**
  - ❖ Transmission
  - ❖ Planning reserve margins







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# KEY TAKEAWAYS

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- **Reliability of LPEA's electrical service under an alternative supply arrangement is expected to be equivalent to reliability of electrical service under TSGT**
- **LPEA will need to secure transmission service to support its new generation resources and will likely do so as a Network Customer of TSGT and WAPA**
  - ❖ Those entities will need to conduct studies to determine what (if any) transmission upgrades would be necessary and to confirm WAPA transmission service is necessary in addition to TSGT service, which we expect it will be



# KEY TAKEAWAYS

- **Wholesale energy market prices, in real terms, are expected to remain rather flat over the next 5-10 years**
  - ❖ There is significant uncertainty surrounding price forecasts in later years
  - ❖ Given relatively low prices and future price uncertainty, there may be a benefit in “locking in” a low power price now
- **LPEA should be able to secure alternative power supply options, including portfolios with higher amounts of carbon-free generation at a lower cost than it pays for service from TSGT today**
  - ❖ But this report **does not** assess the exit fee for terminating the TSGT contract
- **Organized wholesale energy market developments could offer opportunities for LPEA, but also require consideration in alternative supply contracting**





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# THANK YOU

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