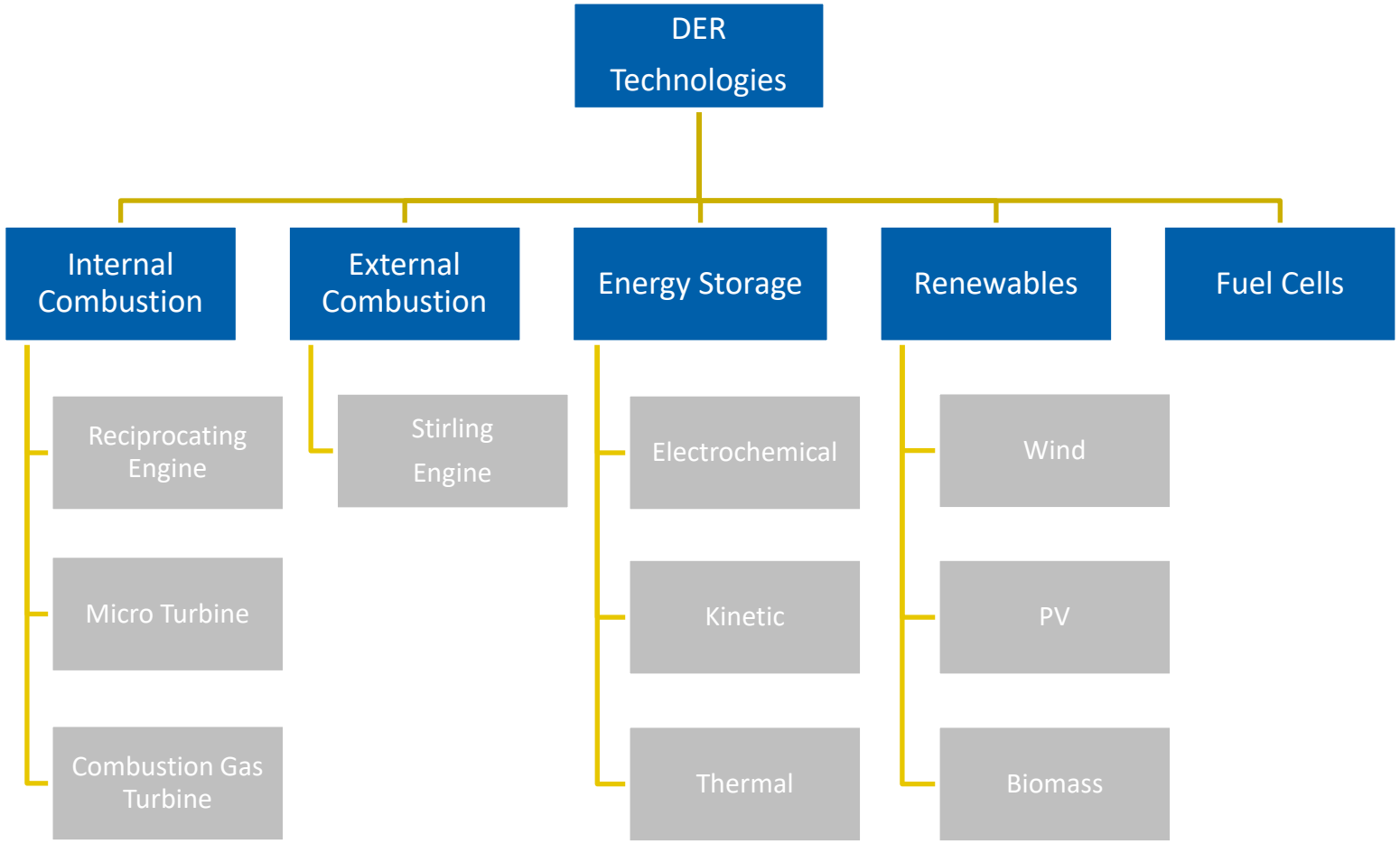
TECO
TAMPA ELECTRIC
AN EMERA COMPANY

Distributed Energy Resources (DER)

AUGUST 18, 2020

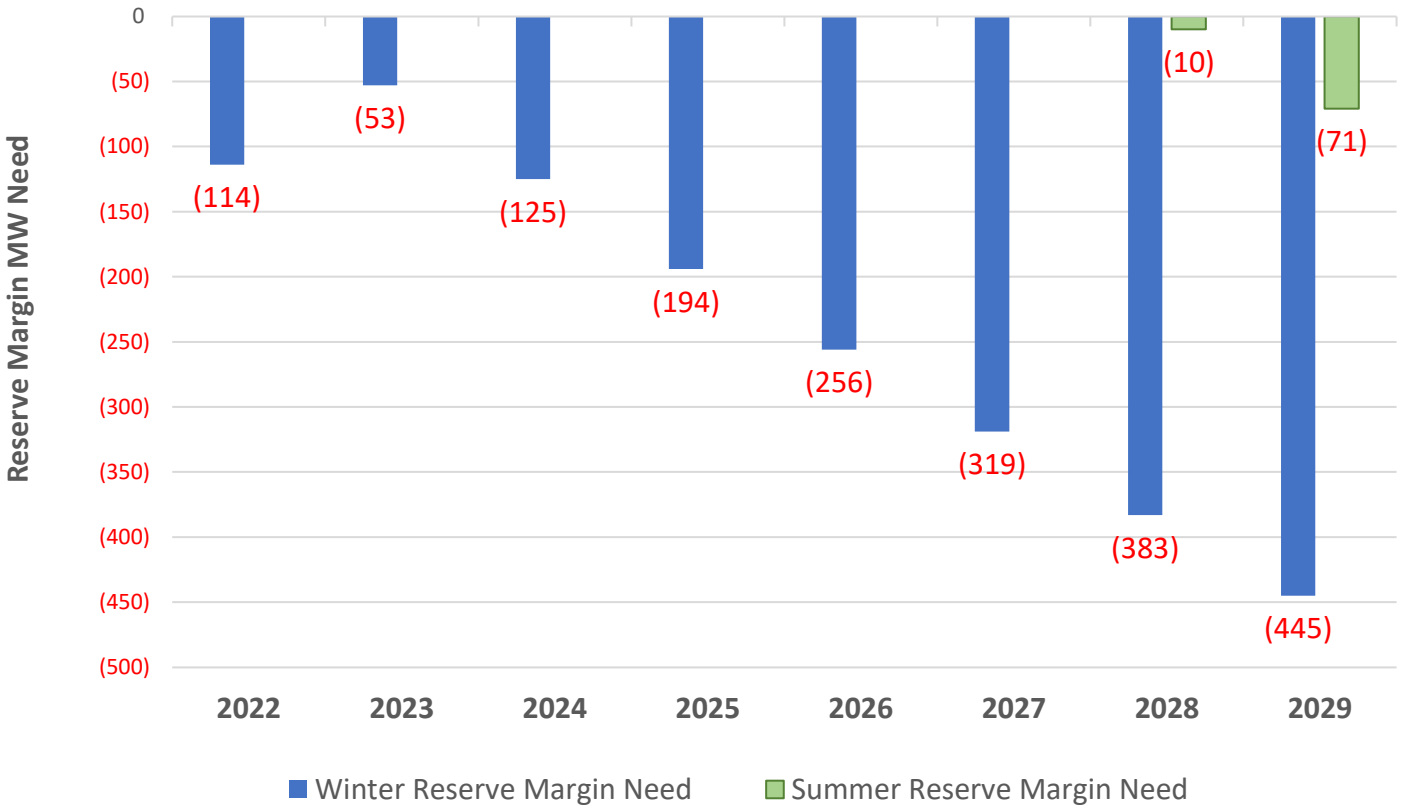
Distributed Energy Resources



2020 Ten Year Site Plan Expansion

- The Polk 2 combined-cycle conversion (2017), SoBRA photovoltaic generation additions (2019 – 2021), and the Big Bend 1 Modernization (2023) have provided the TEC system with abundant low-cost energy and the solar summer firm capacity contribution has shifted the reserve margin needs to the winter.
- One way to meet the winter capacity need would be to add large peaking combustion turbines (CTs) at existing central stations. This approach could result in having excess winter capacity in the year the unit goes in-service, until the demand grows, and the reserve margin declines.
- Another alternative, more streamlined approach, is to meet winter peaks with a portfolio of smaller distributed resources that allow for a more agile deployment of capacity that better matches the reserve margin need.
- The system is expected to benefit from flexible, quick response peaking capacity that reciprocating engines and battery storage delivers.
- The portfolio of distributed energy resources in the 2020 TYSP plan enables resiliency and reliability of service to our customers.

TEC's Capacity Needs Relative to the 20% Firm Reserve Margin Requirement



Notes: Includes SoBRA solar and Big Bend Modernization

Expansion Plans Alternatives

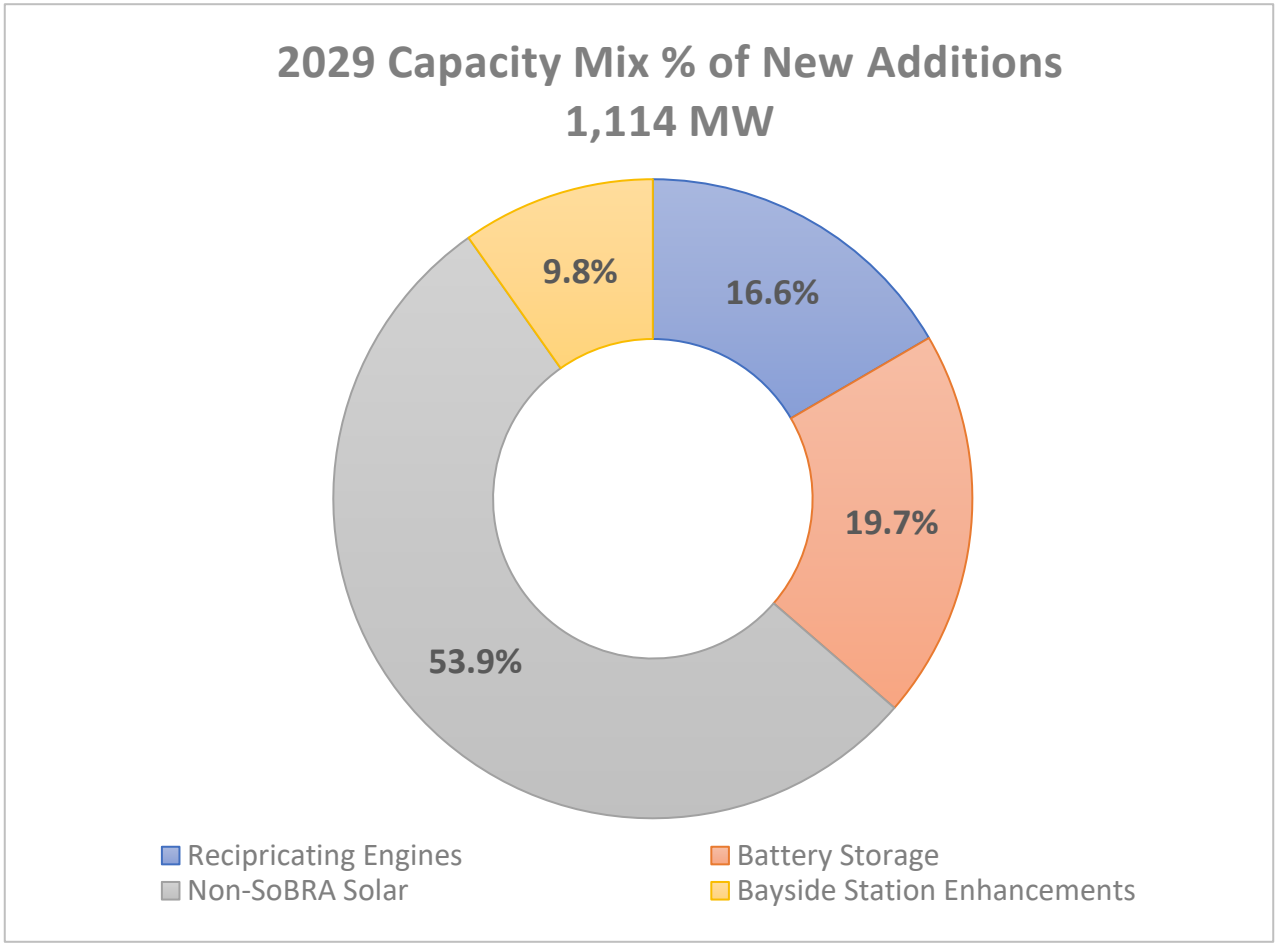
Centralized Generation Plan

Year		Winter RM%
2021	SoBRA Tranche 4 (47 MW) ; 150 MW Utility Scale Solar Big Bend Modernization CTs	20%
2022	225 MW Utility Scale Solar PPA Placeholder (Seasonal)	20%
2023	225 MW Utility Scale Solar ; Big Bend Modernization ST 245/229 MW Simple Cycle CT	25%
2024	_	22%
2025	_	21%
2026	245/229 MW Simple Cycle CT	25%
2027	_	23%
2028	_	22%
2029	_	21%

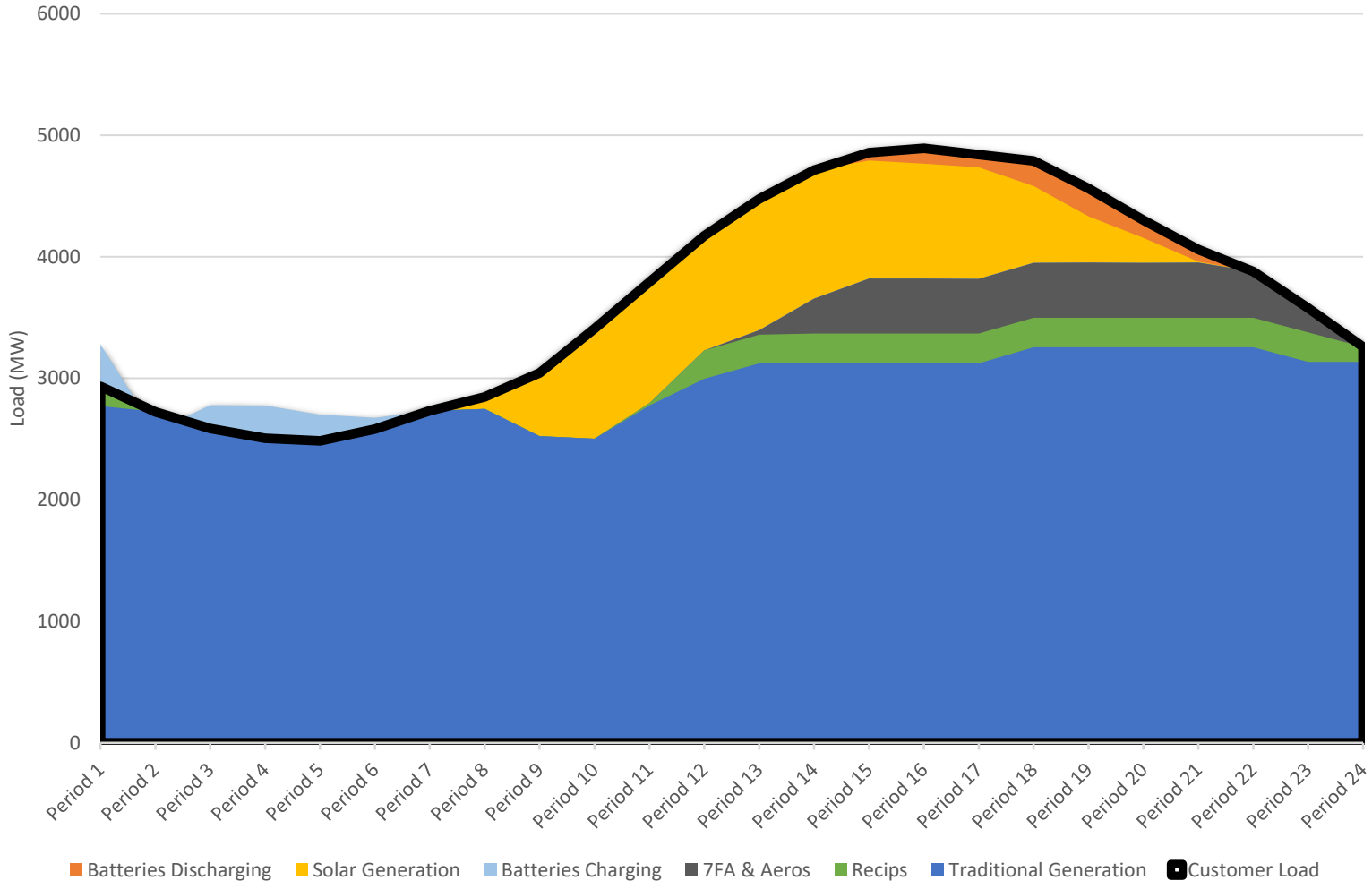
Distributed Generation Plan

	Winter RM%
SoBRA Tranche 4 (47 MW) ; 150 MW Utility Scale Solar Big Bend Modernization CTs	20%
225 MW Utility Scale Solar 92.5 MW Recips ; 30 MW Battery Storage	20%
225 MW Utility Scale Solar ; Big Bend Modernization ST Bayside 1 Advanced Hardware 50 MW	22%
Bayside2 Advanced Hardware 67 MW	22%
18.5 MW Recips ; 10 MW Battery Storage	21%
60 MW Battery Storage	21%
74 MW Recips	21%
60 MW Battery Storage	21%
60 MW Battery Storage	21%

2020 Ten-Year Expansion Plan Capacity Mix



Sample Summer Generation Dispatch with DERs



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DER Value Streams

Value	DER Type	Value Type	Value Proposition
Greener, Cleaner Energy	Nat Gas DG - Solar PV - Battery Storage	Optimization, Financial	Fuel savings from optimized dispatch , increased efficiency (Heat Rates)
Emergency Response	Nat Gas DG - Battery Storage - Solar PV	Resiliency	Reciprocating engines or /or storage at closer to the load provides increased resiliency for all customers
Storm Restoration	Nat Gas DG - Battery Storage	Resiliency	Decrease in storm restoration time
Ancillary Services	Nat Gas DG - Battery Storage	Optimization	Strategically located to relieve congestion of transmission and/or distribution. Quick start, fast ramping, able to handle multiple starts and stops during the day.
Energy Price Arbitrage	Battery Storage	Optimization	Charge when power prices are low (Off-Peak) / Discharge when prices are high (On-Peak)
Black Start Capability	Nat Gas DG - Battery Storage	Resiliency	Decrease in restoration time after disruption event
Renewable Integration	Nat Gas DG - Battery Storage	Optimization, Reliability	Operational flexibility
T&D Investment Deferral	Nat Gas DG - Solar PV - Battery Storage	Reliability, Financial	Lower customer rates
Decrease in T&D Line Losses	Nat Gas DG - Battery Storage	Optimization, Reliability	Fuel savings
Offset Demand Charges	Battery Storage	Financial	Offset peak demand, lower demand charges
Power Quality	Battery Storage	Reliability	Reliable, always on service
Heat Rate Improvement	Nat Gas DG (Recips)	Optimization	Fuel savings

Conclusion

- Tampa Electric Company has selected a mix of elements that provides a robust, reliable, and resilient cost-effective expansion plan.
- The decentralization of assets through the deployment of a portfolio of distributed energy resources including utility-scale solar, battery storage and reciprocating engines is a favorable option for all Tampa Electric's customers.
- The resources work in concert to provide cost savings, operational flexibility, environmental and reliability benefits for customers, and value through improved efficiency and system reliability.
- The geographical flexibility and quick deployment timeframe of DERs enables the TEC system to adapt to changing needs that "long lead" centralized generation simply cannot match.

Distributed Energy Resources fit Tampa Electric's need: match load growth, provide operation flexibility, are highly reliable, cost effective, and adapt easily to changing circumstances.