



2016 Resource Plan Stakeholder Working Group Update – Scenarios

December 2016

Topics to Review



- Resource Planning Chart Updated
- Scenarios
 - Sensitivities
 - Descriptions

Resource Planning Chart (*not targets*) Updated



2014 Resource Plan Road Map												Current Progress (No changes in Conventional Gen for 15/16)					
Year	Coal	Nuclear	Gas	Local Storage	Demand Response	Energy Efficiency	Biomass	Solar	Local Solar	Wind	% Renewables	Demand Response	Energy Efficiency	Solar	Local Solar	Wind	% Renewables
Until end of 2015	602	436	1,497				112		63.0 ⁵	1,041	28%	116	392.8		60	1,341	26%
2016								200 ⁴	13.0 ⁶	754 ⁷	51%	17	53.2	157.5	14	4	33%
2017				1				150	6.0 ⁶	(91.5) ⁸	54%			268		(91.5)	39%
2018			(235) ³	1					7.0 ⁶	(34.5) ⁸	53%			170			
2019				1					9.0 ⁶		53%						
2020	(235) ¹			1	100 (cumulative)	700 (cumulative)		200 ⁴	12.0 ⁶		57%						
2021				1	20				14.0 ⁶		56%						
2022				1	20				16.0 ⁶		55%						
2023	(367) ²			1	20				18.0 ⁶	(165.6) ⁸	56%						
2024				1	20				20.0 ⁶		52%						
2025				2	20			200 ⁴	22.0 ⁶		56%						
Total Resources	0	436	1262	10	200	700	112	750	200⁹	1503							

Note:

- 1) Equivalent MW reduction of AE's share of Fayette to achieve 20% below 2005 CO₂ levels
- 2) Retirement of AE's share of Fayette at the end of 2023
- 3) Net of Retirement of Decker Steam Units and addition of 500 MW Combined Cycle
- 4) New utility scale solar additions
- 5) Existing and new local solar additions
- 6) Total local solar additions including community solar
- 7) Net of committed wind and new additional wind
- 8) Expirations of existing wind contracts
- 9) Additional 90 MWs of Local Solar by 2025 contingent upon affordability evaluation



Scenarios & Sensitivities

- Scenarios cover a wide range of values for key uncertainties
- Planning horizon covers from 2017 to 2026 with end effects considered
- Assume PPA for future resources as long as it is more economical than ownership on a levelized cost basis
- 3 broad strategies:
 - 1) Do nothing / no additional generation but meet DSM & rooftop goals
 - 2) Plans meeting current goals plus additional renewables or storage
 - 3) Plans meeting current goals plus additional gas generation
- In total:
 - 14 scenarios including variations
 - Sensitivities to ERCOT-wide market conditions:
 - Carbon cost
 - Natural gas cost
 - Demand level
- The top plans are further studied for high solar penetration & high ancillary services requirements



Scenario Descriptions

- Strategy 1: Do-nothing scenarios
 - SC1 – Current system, no new additions, PPAs expire per term (Does not meet goals)
 - SC1-A – Current system, no new additions, PPAs expire per term, **meet renewable goals** using RECs

- Strategy 2: Council Goals plus renewables or storage
 - SC2 – Current Council goals: reduce/retire FPP, retire Decker in 2021, 900 MW DSM, 55% renewable, 200 MW PV (100 MW local) by 2025
 - SC2-A – Current goals + 100 MW additional local PV
 - SC2-B – Current goals + 500 MW utility scale PV
 - SC2-C – Current goals + 75% renewables by 2026
 - SC2-D – Current goals + double local storage goal to 20 MW
 - SC2-E – Current goals + 300 MW CAES
 - SC2-F – Current goals + 100 MW additional DSM + Double local storage goal to 20 MW
 - SC2-G – Current goals + 300 MW additional DSM + Triple local storage goal to 30 MW
 - SC2-H – SC2-F+ 300 MW CAES
 - SC2-I – SC2-G+ 300 MW CAES
 - SC2-J – Current goals + 75% renewables by 2026 + 300 MW CAES



Scenario Descriptions (Cond..)

- Strategy 3: Council Goals plus natural gas capacity
 - All additions of gas units occur after Decker retirement in 2021
 - SC3-A – Current goals + 300 MW new natural gas (NG) peakers (GTs)
 - SC3-B – Current goals + 500 MW (new 2x1) NG combined cycle (CC)
 - SC3-C – Current goals + 500 MW NG CC + 300 MW NG GTs
 - SC3-D – Current goals + 200 MW Sand Hill CC expansion
 - SC3-E – Current goals + 200 MW Sand Hill CC expansion + 300 MW GTs
 - SC3-F – Current goals + 330 MW new 1x1 NG CC