

Resource Costs

Estimated Levelized Cost of New Dispatchable Resources, 2016 (\$/MWh)

Plant type	Dispatchable Technologies	Average Capacity Factor (%)	Fuel Type	Overnight Capital Cost 2016 (\$/MWh)	Heat Rate Btu/MWh	Base				Low	High
						Levelized Capital Cost	Levelized O&M	Levelized Fuel	Levelized Total		
Advanced Combined Cycle		55%	Natural Gas	800-1000	6,480	12.58	8.51	30.04	51.13	37.72	80.41
Advanced Combustion Turbine		10%	Natural Gas	400-900	8,200	46.18	10.85	38.31	95.34	64.57	151.21
Compressed Air Energy Storage (CAES)		24%	Gas/Air	1500-2000	4,227	92.55	9.87	26.55	128.97	105.99	161.68
Battery Storage		7%	Battery	775-2000	N/A	278.60	32.01	36.25	346.86	212.34	495.56

Estimated Levelized Cost of New Non-Dispatchable Resources, 2016 (\$/MWh)

Plant type	Non-Dispatchable Technologies	Average Capacity Factor (%)	Fuel Type	Overnight Capital Cost 2016 (\$/MWh)	Heat Rate Btu/MWh	Base				Low	High
						Levelized Capital Cost	Levelized O&M	Levelized Fuel	Levelized Total (Base)		
Onshore Wind (West Texas)		40%	Wind	See Note 2	N/A	23.69	2.71	0.00	26.40	23.00	30.00
Onshore Wind (South Texas)		30%	Wind	See Note 2	N/A	30.55	5.08	0.00	35.58	31.00	40.43
Photovoltaic (>50 MW West Texas)		33%	Sun	See Note 2	N/A	27.25	5.75	0.00	33.00	28.00	38.00
Photovoltaic (<20 MW Local)		20%	Sun	See Note 2	N/A	74.08	11.87	0.00	85.90	74.00	100.00

Notes:

- The above costs are levelized costs in \$/MWh and do not include revenues. The revenues vary depending upon the resources and their performance in the ERCOT market
- Sources of Technology Cost
 - Advanced Combined Cycle and Combustion Turbine per Energy Information Administration (EIA) 2014 update, adjusted based upon various discussion with vendors to reflect Austin Energy specific requirements
 - Wind and Photovoltaic per latest AE Estimates from the latest Request for Proposal offers as a starting point and projected future capital costs (Range factors the latest approved tax credits & the timing of build out)
 - Demand-Side Management per AE budget estimates within ERCOT
 - CAES per market indicative offers
 - Battery Storage per AE estimates from the Shines Project and market indicative proposals (Range factors the timings of the build out and assumes a 10% cost decline per year)
- Levelized capital cost estimates assumes 100% Debt, Nominal After-Tax Weighted Cost of Capital (WACC) of 5.00%, Book life is based upon the life of the asset
- High estimates include emission cost of \$12 per metric ton for annual CO2 emissions, if applicable to technology (based on average of prices used in ERCOT's analysis of impact of the Clean Power Plan)
- Natural Gas Price \$5.00 per Mbtu, low \$3.00 - high \$9.00 per Mbtu
- Fuel cost for batteries and CAES includes the cost associated with their mode of operation (charging & discharging)
- The average capacity factor for CAES and Battery Storage assumes both modes of operations (charging & discharging)
- The Battery Storage assumes a capacity degradation of 6% per year.