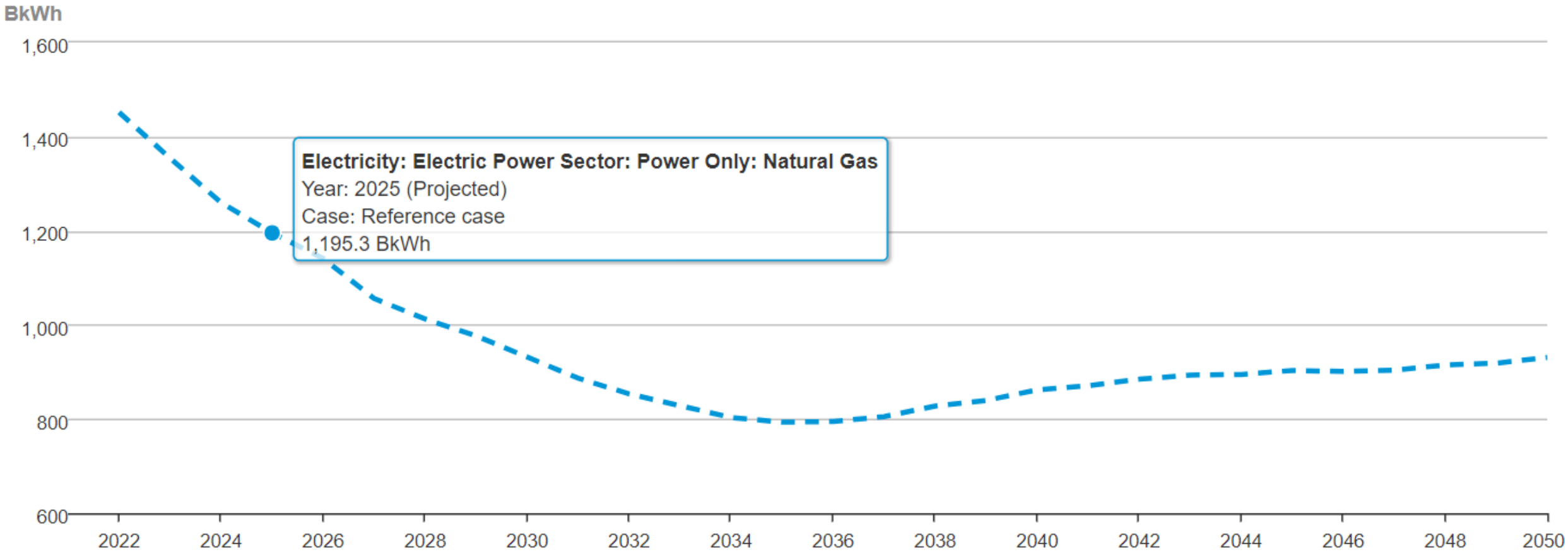
During World War II, [Nobel laureate, Ken] Arrow was assigned to a team of statisticians to produce long-range weather forecasts. After a time, Arrow and his team determined that their forecasts were not much better than pulling predictions out of a hat. They wrote their superiors, asking to be relieved of the duty.

They received the following reply, and I quote **“The Commanding General is well aware that the forecasts are no good. However, he needs them for planning purposes.”**

Electricity: Electric Power Sector: Power Only: Natural Gas

Case: Reference case

DOWNLOAD



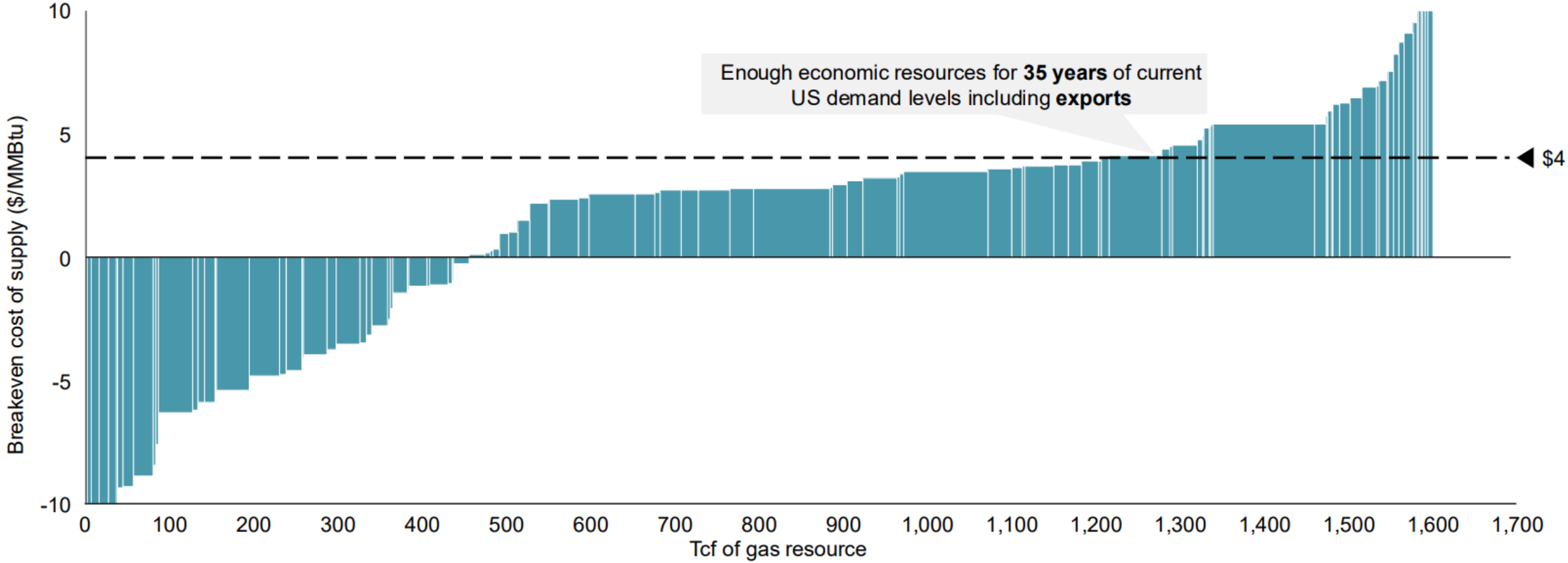
eia Data source: U.S. Energy Information Administration

			Historical	Projection					
		Scenario	2023	2025	2030	2035	2040	2045	2050
U.S. Generation (TWh)	Nuclear	1-Ref		798.02767	781.91309	474.22831	346.53575	203.11988	12.278072
	Hydro	1-Ref		280.92406	280.86537	276.78069	279.29901	274.31661	274.10022
	Bio/Other	1-Ref		44.715347	44.896576	45.29626	45.157346	42.876605	42.871263
	Bio CCS	1-Ref		0	4.636E-07	2.3546575	2.3227359	2.9895913	3.7006433
	Coal	1-Ref		642.20428	426.84528	431.73619	265.49741	154.32304	95.791126
	Coal CCS	1-Ref		0	4.736E-06	1.025E-05	9.98E-06	7.719E-06	5.937E-06
	NGCC Ex.	1-Ref		960.63579	967.53085	906.65171	832.92974	702.13003	691.67535
	NGCC New	1-Ref		215.76121	391.84421	423.37763	592.87202	749.94272	929.98335
	NGCC CCS	1-Ref		0	9.096E-06	12.374325	11.746955	9.737288	8.608808
	Peakers Ex.	1-Ref		47.808677	69.496566	54.331297	31.721868	15.606791	16.127741
	Peakers New	1-Ref		7.5802736	25.79409	36.696947	36.519033	58.127009	79.877694
	Hydrogen	1-Ref		7.706E-07	0.2150189	0.0059304	9.045E-06	1.332E-05	2.31E-05
	Wind	1-Ref		556.27197	772.02975	1451.2515	1513.791	1487.0436	1571.7022
	Solar Central	1-Ref		365.61687	447.33511	815.26322	1218.3923	1519.7044	1804.636
	Solar Distributed	1-Ref		133.10133	207.23025	268.0368	289.27987	327.84928	313.62857
	Energy for Load	1-Ref		4011.7	4228.1	4433.9	4745.9	5173.7	5507.1
Installed Capacity (GW)	Nuclear	1-Ref		98.527567	98.527567	62.3764	49.37248	33.19648	2.4430031
	Hydro	1-Ref		78.141316	78.141316	78.141316	78.141316	78.141316	78.141316
	Bio/Other	1-Ref		7.8369229	7.8369234	7.8369239	7.8369243	7.3890546	7.3890549
	Bio CCS	1-Ref		0	7.595E-08	0.376435	0.3764351	0.4817532	0.6076891
	Coal	1-Ref		118.95664	83.163286	77.840107	51.343005	34.007304	22.6646
	Coal CCS	1-Ref		0	7.413E-07	1.66E-06	1.981E-06	2.219E-06	2.37E-06
	NGCC Ex.	1-Ref		253.03606	253.03606	253.03606	253.03606	251.52558	248.83989
	NGCC New	1-Ref		48.206792	79.82788	108.70392	144.979	188.88938	244.07901
	NGCC CCS	1-Ref		0	1.574E-06	2.211211	2.2112123	2.2112139	2.2112157
	Peakers Ex.	1-Ref		177.63374	172.45615	164.18753	149.0847	119.04657	107.16681
	Peakers New	1-Ref		22.667485	52.517287	83.016128	147.56002	269.20713	316.71473
	Hydrogen	1-Ref		1.702E-06	3.157E-06	5.093E-06	7.742E-06	1.105E-05	1.47E-05
	Wind	1-Ref		163.21895	216.71054	378.25876	384.97105	386.4086	413.18849
	Solar Central	1-Ref		149.03107	184.93577	334.52621	500.52409	632.81839	751.88533
	Solar Distributed	1-Ref		64.21929	100.61452	129.61424	144.60769	159.86621	155.98948
	NGCC Dual Fuel	1-Ref		3.9010795	3.9010889	3.9011016	3.9011184	3.9011411	3.9011681
	Energy Storage	1-Ref		62.889238	80.023744	91.437187	116.07237	134.6646	174.09144

The US LNG export sector's dramatic development was enabled by the "Shale Revolution"[1], unlocking 35 years of gas resources with break-evens below $4/MMBtu

Lower 48 US Onshore Commercial Gas Resources by Play[2]

$/MMBtu, Tcf of gas resource



1 Common term for the rapid expansion of the US oil & gas production post 2010, enabled by the combined effect of two nascent technologies: hydraulic fracturing and horizontal drilling.
2 PDP (proved developing and producing); $2/MMBtu breakeven for PDP is assumed, not modeled; Breakeven cost of oil supply indudes a 10% rate of return.
Source: S&P Global Commodity Insights.