



## The answer to the Sept 2022 Brain Teaser - What is Going to Happen to Europe this Winter?

What is Going to Happen to Europe this Winter? The problem calls for a simplistic modeling of gas flows and storage levels over the winter season, Oct. 1 to Mar. 31, 182 days. The table below shows the results and math. Scenarios 6 and 7 are respectively for: i) cold and mild winter; ii) reducing consumption by 15% and 6%; iii) replacing 50% and 25% of Russian gas; iv) to arrive at 15% and 16% of storage by end of winter. Note there are many other reasonable combinations.

In spite of Nord Stream pipelines down resulting in minimal Russian gas, Europe is doing a great job building storage by increasing supply and reducing demand, while weather is cooperating. However, winter cold blasts can quickly draw down gas storage, which means there is still plenty of uncertainty remaining.

<b>What is Going to Happen to Europe this Winter?</b> SDP Brain Teaser Sep-2022	Winter Daily Supply BCFD A	Winter Daily Demand BCFD B	Winter Daily Deficit BCFD C	Winter Storage Draw BCF D	Winter Ending Storage BCF E	Winter Ending Storage % Fill F	Winter Linear Shortfall Days G	Winter Empty Estimate Date F
Math (Vol1 = Initial Storage = 3,500 * 85% = 2,975 BCF)	Per Given Info	Per Given Info	B-A	C*182	Vol1-D	E / 3,500	If E=0; (Vol1- C)/(B-A)	If E=0; ~Apr 1 -G
Scenario 1: Normal Winter with Full Russian Gas Supply	45.0	55.0	10.0	1,820	1,155	33%	N/A	N/A
Scenario 2: Normal Winter with 50% Reduced Russian Gas Supply	37.5	55.0	17.5	3,185	0	0%	12	Mid-March
Scenario 3: Normal Winter with No Russian Gas Supply	30.0	55.0	25.0	4,550	0	0%	63	Late January
Scenario 4: Normal Winter with No Russian Gas Supply Consumption Reduced 10%	30.0	49.5	19.5	3,549	0	0%	29	Early March
Scenario 5: Normal Winter with No Russian Gas Supply Consumption Reduced 10% and one third of Russian gas replaced	35.0	49.5	14.5	2,639	336	10%	N/A	N/A
Scenario 6: Cold Winter with No Russian Gas Supply Figure out a realistic combination to end with 15% storage.	37.5	51.0	13.5	2,457	518	15%	N/A	N/A
Scenario 7: Mild Winter with No Russian Gas Supply. Figure out a realistic combination to end with 15% storage.	33.8	47.0	13.3	2,412	564	16%	N/A	N/A