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The Perfect Storm - 2021

There seems to be a lot of finger pointing with regards to who is at fault for the power outages across Texas and Oklahoma during the last couple of weeks. While there are certainly multiple parties that failed to perform up to expectations during the "perfect storm," there are undoubtedly steps that could have been taking in advance to help prevent the severity of the problem.

There is no hiding the fact that the two primary forms of "renewable" energy, wind and solar, completely failed during this winter storm. In most cases, their production went to near zero as the wind turbines could not function due to ice on the blades and the solar panels couldn't produce because of lack of sunshine and snow and ice covering the solar panels. Unfortunately, their failure took place during a "peak demand" moment as more and more people needed reliable energy to heat their homes during the extreme freezing temperatures. This failure to perform should be of deep concern as we experience the continued progression towards more renewable energy sources.

Another reason for the failure was due to many natural gas production facilities and processing plants' failure to properly winterize their facilities for such extreme weather. The natural gas found in Oklahoma and Texas is mostly considered to be a "wet gas," meaning it has a lot of hydrates (moisture) in it. Those hydrates have to be separated from the gas prior to distribution. Because there are hydrates (moisture) in the gas… the pipes, valves, vessels and tanks that support the transmission of the gas are more susceptible to freezing. Once the pipes and valves freeze up it stops the production, processing and transmission of the gas, thereby drastically reducing available supply during a time when demand is in full force. As we all learned in Economics 101 – The principle of Supply and Demand…If supply goes down and demand goes up then prices rise - dramatically in this case, because supply was severely limited due to freezing issues at the natural gas facilities and demand was surging due to efforts by people to warm their homes in arctic temperatures. Prior to the storm the spot price of natural gas was just under $3.00/MMBtu (per metric million British thermal unit) …during the peak demand of the storm prices surged to nearly $1,000/MMBtu.

In Oklahoma and Texas there is a wide range of "winterization" policies amongst the energy producers. Some producers will happily invest in proper heat trace and insulation in order to protect their facilities and prevent freezing issues. Remember, freezing doesn't just cause a temporary supply problem and lost revenue problem…it is extremely hard on your equipment and can cause permanent damage. When liquids freeze, they expand and when pipes and valves expand, they crack, and leaks develop…which can cause a whole other environmental issue with regards to "spills." Therefore, there are many producers that see these potential risks and invest in proper insulation solutions to help prevent them.

On the other end of the spectrum, you have producers that have calculated the risks and have chosen to not properly or fully insulate and winterize their facilities, primarily due to the costs involved. They assume the risk that the winter temperatures will not reach a point where the freezing is severe enough to warrant the cost of the investment in proper winterization efforts (insulation). Many winters the gamble pays off…if we have a mild winter, then the producers can deal with a few days of sporadic freezing and headaches to save money by not insulating. But when we have a harsh winter, the costs associated with lost production, paying crews overtime to thaw out lines, replacing damaged valves,

replacing insufficient insulation, etc.…almost always ends up costing significantly more than if they would have simply insulated their facilities to begin with.

Simple math can easily bring this to light ("simple" because there are many more factors to the economics of a producing well than shown here, but I am trying to make a point). Assume you have an oil/gas well that produces 1,000 bbl/day (not that uncommon in Kingfisher County). The current price of oil is around $60/bbl. Therefore, that well will produce a revenue of $60,000 per day. Now, assume the producer chose to not properly insulate their well and the associated equipment and it freezes up. During this storm we are likely going to see 11 straight days of temperatures below freezing. That is lost (or some would say "deferred") revenue of $660,000 ($60,000/day X 11 days) from this one well. For comparison purposes, here in Oklahoma, NeoInsulation can winterize a single well location with heat trace and insulation for about $15,000-$30,000 depending on the size of the facility. So, a $15-30k investment would have prevented $660,000 in lost revenue (not including the costs associated with equipment replacement, labor for repairs, etc.) from one single well. Now – imagine that this producer has over 500 wells (again, not uncommon in Kingfisher county) and you can see how economical proper insulation actually is.

The storm and associated temperatures that we have seen this month is certainly unusual, but not unprecedented. In fact, there was a severe storm in Texas in 2011 that caused severe power outages. It was significant enough that the **Federal Energy Regulatory Commission and the North American Electric Reliability Corporation** issued a 200-page report on the cause and solutions to prevent it from happening again. One of their primary findings…. facilities need better insulation. Unfortunately, many did not take heed to the findings of the report and we find ourselves in the position that we are in today.

The report cited can be found here:
https://www.ferc.gov/sites/default/files/2020-05/ReportontheSouthwestColdWeatherEventfromFebruary2011Report.pdf

My hope is that through the effects of this storm energy companies will see the economic benefits of being proactive vs reactive with their winterization efforts and the value of being protected with proper heat trace and insulation. It is hard for me to imagine that Texas and Oklahoma, the #1 and #4 energy producing states in America, are suffering from rolling blackouts, lack of electricity and limited gas supply for their citizens to heat their homes.

"An ounce of prevention is worth a pound of cure." – Benjamin Franklin.

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