Report December 22, 2025

Summary:

- **TAE-TMTG Merge: Fusion Breakthrough or Trump Pump-and-Dump?**
- **Can TAE Start Building a Working Fusion Generating Plant in 2026?**
- **Getting the Lead Out and the Helium In**

TAE-TMTG Merger: Fusion Breakthrough or Trump Pump-and-Dump?

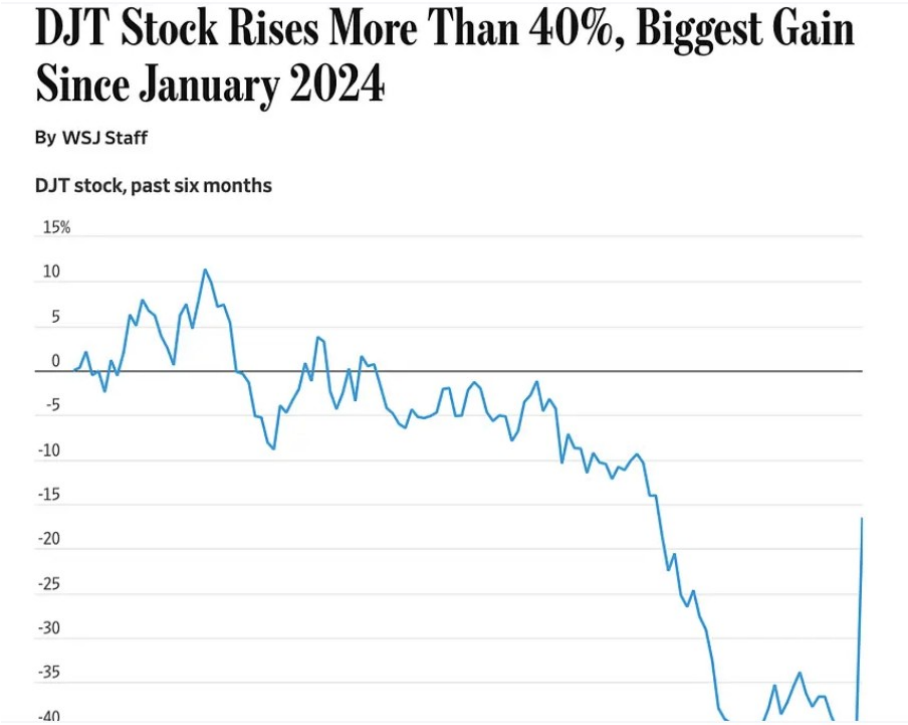
The merger announced Dec. 18 of the Trump Media and Technology Group and fusion company TAE was widely reported, but the reactions have been widely varying. Some have described it as a major financial breakthrough for fusion, others as a pump-and-dump scheme to fleece small investors. Naturally, people have asked what we think. There are a couple of questions here. First, what is likely to be the reasons behind this deal? Second, how credible is the merged company's claim that it will start building a working fusion generator this year? Let's take them one at a time.

It is not at all likely that Donald Trump, the main shareholder in TMTG, and his eldest son Donal J. Trump Jr., TMTG board member, initiated this deal to help achieve fusion energy. **Mr. Trump happens to be President, so if he really wanted to help fusion he could have had the US Department of Energy allocate $10 billion dollars to fund every possible route to fusion, including all the dozens of fusion companies operating today.** That's what the Fusion Industry Association, the organization of the fusion companies (including ours) has recommended. There is widespread bipartisan support for fusion in the US congress, so he would have had no trouble getting it into his budget. But instead, his proposed budget **reduced** fusion funding by 6%.

In addition, as President Trump has pledged to do everything possible to support the fossil fuel industry and has appeared to have kept this pledge so far. Actually getting a working fusion generator to produce cheap, clean unlimited energy would cause oil prices to plummet. That would not exactly help fossil fuel companies, most of which would then face bankruptcy. So why would Trump do that?

On the other hand, if the motivation for this deal on the Trump side is to help TMTG, it at least makes sense. TMTG lost $400 million last year. By the beginning of this year, TMTG shares had dropped by 63% from a high of $97 to $36. By Dec.17, the share price had fallen another 71% to just $10.40. A big bet on Bitcoin was going sour and the social media component was steadily losing money. But in the day since the merge was announced,

the stock rose by 50%, although that makes it still down almost 60% for the year. The psychological boost was simply based on “He’s trying something new.”



The TMTG stock (with stock symbol DJT) got a good bounce from the merger with TAE, but only reversed a couple of months losses.

So, if that is the motivation (and we can’t see another one) why did TMTG invest in fusion rather than, say, AI? For one, fusion is getting some media attention. But equally important, almost all private fusion companies (ours certainly included) badly need more capital than they are getting. So in this up-and-coming industry, assets can be acquired cheaply. While the deal is valued in the press as $6 billion, the actual cash involved is $300 million to buy half a company that was valued at about $2-3 billion—quite a bargain.

For TAE, the deal was one for short term gain—an immediate $300 million that they were no doubt having trouble raising. Whether this will help them get to commercial fusion energy is another story, which we get to in our next news item.

Can TAE Start Building a Working Fusion Generating Plant in 2026?

As part of the merger announcement, TAE announced plans to begin in 2026 construction on a fusion power plant that will actually produce electricity for the grid by 2031. Is this possible? For context, TAE has now become the fourth fusion company to claim that they have begun construction on an operating power plant—so have CMS, Helion and Helical Fusion in Japan.

In our view, none of these claims are at all credible. The problem is not the near-term goal of getting electricity by 2031. Lots of fusion companies, including ours, are aiming for similar goals. The problem is that none of these

four companies have completed the scientific research needed to design a fusion generator. So, none of them can start construction of something they have not and can't design right now.

How do we know they have not completed scientific research? The universally-acknowledged goal of the research phase of fusion energy is to achieve net energy in the laboratory—more energy out of a device than is put into it. That shows that electricity production is possible in a commercial generator designed on the basis of the net energy lab experiments. **None of the four companies have reached net energy, none are close to reaching it and, in fact, none are anywhere near as close as LPPFusion is.**

Let's take TAE. We can't compare how much fusion they've produced with energy input because they are using pure hydrogen, not any fusion fuels, so they are not getting any fusion at all. Also, they don't release how much energy they put into their machine. (From their papers, the input energy must be more than 10 times as much as the input into LPPFusion's FF-2B device) However, comparisons can still be made since we all agree that net energy requires a combination of high temperature, high density and adequate confinement time. TAE has released those figures.

Compared with our best results, TAE's are comparable for the product of density and confinement time, called $n\tau$. They have 60 billion seconds x particle/cm^3 and we have 90 billion seconds x particle/cm^3. **But they achieved that with a temperature of 1 keV (11 million K) and we got 250 KeV (2.8 billion K), or 250 times better.**

To get to net energy we both have to increase $n\tau$ to around 2 quadrillion seconds x particle/cm^3, so for TAE that's a factor of 3,000 on top of the 250 times increase in temperature. That's not even close. To put it another way, TAE's Norm machine, their latest, uses a current of 300kA to confine the plasma. For a net energy machine, they would need abut 3,000 times more or 1GA--a billion amps.

It's not possible to expect extrapolation over so many orders of magnitude to be accurate. Far more experiments and improvements are needed before any confident prediction of breakeven.

And that's what TAE had planned. They were going to build another bigger experimental device called Copernicus before they designed and built a power generator, which they called DaVinci in the plans. But with the merger announcement, all of a sudden Copernicus has disappeared and they are starting to build DaVinci right away. On top of that, they are substantially altering the design of the machine—the one they call Norm is the first and only one of the new design that they've built.

So if, as is now planned, they are going to start building a power generator, the chance that they will make major mistakes in design is practically 100%. Instead of speeding the path to fusion, they'll slow their progress by wasting money and time on engineering dead ends. It's sort of as if some company in 1900 had said, "Never mind about the control of heavier-than-air craft. We know the science and we are building a jetliner that will take 200 people across the Atlantic."

To be fair, this is not exactly the first time that fusion management (and, more rarely, fusion scientists) have said that "the science is done". That was said 50 years ago, too, when the decision was made to focus on the tokamak and DT fuel. The motivation was the same—to reassure potential funders. But it was not true then and is not true now. We'll know the science is done when some group demonstrates net energy. Then the design of a power generator can start.

In the meantime, if you want to invest in a "pure fusion" play, if you want to invest in the company that is leading in peer-reviewed published lab results—well, you've come to the right place!

Part of the energy storage for TAE's Norm device. Despite having at least ten times the energy input as LPPFusion's FF-2B device, TAE's achieves 100 times lower temperature.

Getting the Lead Out and the Helium In

Our long-awaited anode replacement has encountered yet another delay. The anode is awaiting annealing—a heating and cooling process need to strengthen beryllium (and many other metals) after machining. The beryllium annealing process has to be done in a helium-filled chamber to avoid oxidation or other chemical reactions with the heated metal. However, the company that does our annealing has run out of helium and won't be resupplied until the new year, so we won't get the anode back until early January.

In the meantime, the lab is undergoing a high-intensity cleaning. After the anode broke in August and a new disassembly and assembly was needed, Research Scientist Dr Syed Hassan pointed out that we had not had blood tests in a long time to confirm that our safety procedures were working. That reminded Chief Scientist Eric Lerner that we had not tested the dust in the lab for too long as well—since 2019.

Fortunately, the blood tests for lead came back as normal. But the dust tests detected both beryllium and lead in the dust. The beryllium level was 30 times less than OSHA safety standards but the lead was significantly more than the OSHA standards. So, despite the lack of health consequences for us, we had to temporarily close the lab until we can have a professional crew clean everything of the dust. We expect this to happen in December.

We've identified the sources of both the lead and the beryllium. We use lead bricks to add mass on the top of the machine because the magnetic fields generated during firing push the upper and lower plates apart. The lead bricks are wrapped in tape to prevent the formation of dust. In 2021, we noted that earlier wrappings had torn. We decided to replace the lead bricks with steel plates from exercise machines, an economical choice. However, in the months after the pandemic lock-down, there was a shortage of exercise equipment and we could only replace half the lead. So, we re-wrapped the rest securely and cleaned the dust routinely.

Subsequently we made two oversights. First, we did not test the dust to see if all the lead was gone and we forgot to replace the rest of the lead when the steel plates became available. As the safety experts we consulted this month

explained, the lead dust almost certainly accumulated in the heating system ducts and was slowly recirculated into the lab over the years.

As part of the clean-up, we are now getting all the lead out of the lab and putting in all steel plates. The cleaning crew will clean out all the ducts. We'll talk about the much smaller beryllium dust problem in the next report.