LPPFusion Report
April 19, 2021

Summary:

- **Wefunder Campaign Hits $300,000 in First Month**
- **Anode Received, Re-Assembly to Start**
- **Biden Infrastructure Plan Needs Fusion**

Wefunder Campaign Hits $300,000

LPPFusion's new Wefunder crowdfunding capital campaign got off to a roaring start with over $300,000 raised in the first month from 375 investors. Investors came from 19 countries: Australia, Austria, Bosnia And Herzegovina, Canada, Chile, Finland, France, Germany, India, Netherlands, Norway, Philippines, Poland, Saudi Arabia, Singapore, Spain, Switzerland, United Kingdom and the United States.

We have already passed the minimum $200,000 goal that allows us to collect money from Wefunder to fund our ongoing research. Our next target is $500,000, but we are just beginning. The expanded campaign, which will run at least through 2021, had been made possible by changes in SEC rules that allow unlimited number of non-accredited investors to invest in crowdfunding.

By the way, some of you may have noticed that mention of the Wefunder campaign was accidently removed from LPPFusion's own website investor page. This was just a technical glitch, which has been fixed. The campaign is on and will continue!

We have also been asked by several investors about future share price increases in the event of new progress in our experiments. We can't give specific guidance on this, but our Board of Advisors is in agreement that there will be such increases as our results improve. The Board will decide when and how much as events develop. In the event of a price increase, the Wefunder campaign will briefly close, but will re-start swiftly with a new price.

If you have not yet done so, please visit our Wefunder campaign and watch our new video. If you have visited, please tell others about us. And if you have invested—thank you!

Anode Received, Re-Assembly to Start

Our new beryllium anode stalk has arrived at LPPFusion's lab in Middlesex, NJ. (See Fig. 1) The stalk, which will be installed at the very center of the FF-2B device, will carry the current from the intense current filaments as they converge and from the tiny plasmoid where the fusion reactions take place. The anode tip also gets the most intense energy from the plasmoid and the hot plasma around it. To better protect the anode, we've moved the inner surface further away from the plasmoid and made a number of other design changes to strengthen the part.

Fig. 1 Our new beryllium anode stalk safely sitting inside a glove box, which protects us from any beryllium dust we may generate in working with the stalk. The upper opening in the part is where the plasmoid will form when the anode is in use inside FF-2B. Note the thinner wall of the new anode, which actually strengthens the part by moving the metal away from the heat source along the device axis.

After a careful inspection, we took the anode to be annealed. This is a standard process where the part will be briefly exposed to high temperatures and then rapidly cooled. Annealing relieves the surface stresses that build up during the machining process, and greatly reduces weak points that can lead to cracking. Once this is done, we'll treat the anode with a chemical bath that will strip off the thin layer of beryllium oxide. Even though this layer is only 10 nm thick—a hundred atomic layers—it can cause problems. Beryllium oxide is an electrical insulator, so when the mega-ampere currents in FF-2B hit the anode, the oxide will be vaporized. In 2019, this caused a thick layer of dust to deposit everywhere in our vacuum chamber, interfering with subsequent shots. The chemical bath, safely carried out within our sealed glove-box—will eliminate this oxide layer. It won't have time to reform in the time it will take us to put the anode inside the vacuum chamber.

While the anode is getting annealed, LPPFusion Research Scientist Syed Hassan will be busy starting re-assembly of FF-2B with our brand-new smaller switches. We expect the switches will allow us to generate higher peak currents and more fusion yield once our new experiments get under way, still expected sometime in May.

Biden Infrastructure Plan Needs Fusion

President Biden's infrastructure plan includes the goal of getting to no net carbon emission by 2050. The Fusion Industry Association (which LPPFusion is a member of) has proposed a way of making that goal practical—and even well exceeding it. The FIA is proposing a $1 billion Fusion Energy Development Plan that will have the US Government match private fusion expenditures dollar-for-dollar. As outlined in FIA's March 31 statement, such a plan would fund a broad-based fusion effort that could build working fusion generators within this decade. A rapid roll-out after that of cheap, clean fusion generators could eliminate fossil fuels well before the Biden target of 2050.

Without fusion, the Biden plan's proposed spending of about $250 billion per year for the next 8 years (which is for all infrastructure, not just energy) would not make a big dent in the estimated $30 trillion required to eliminate fossil fuel use in the US with only solar and wind power. But fusion generators as cheap as those LPPFusion expects to develop would allow complete replacement of fossil fuels for a total capital investment of less than $500 billion.

The US Congress has already authorized a small public-private fusion program at $60 million per year. Money still needs to be appropriated to make this program a reality. The FIA's significantly larger 5-year plan, with the government spending $200 million per year, would be big enough to allow every possible route to fusion to be fully funded. This is the only certain way to get to fusion energy rapidly. It would be a tiny fraction of the planned infrastructure and research expenditures. But it would be the only practical route to eliminating fossil fuels. We at LPPFusion fully support the FIA proposal. We hope that all of our supporters will let their representatives know about this plan.