

Development of Clean Energy through Fusion: ClimateTech Startup Focused Energy Works to Revolutionize Energy Production



FOCUSED ENERGY

Hessen, Darmstadt, Aug 18, 2021 ([IssueWire.com](https://www.issuewire.com)) - ● Inertial fusion energy could enable large-scale production of safe, carbon-free energy

- The goal: develop an efficient fusion power plant in the coming years
- Fusion energy is a safe and scalable technology that could ensure a clean energy supply in the future with resources that are globally available

The urgent need to eliminate the use of fossil fuels requires new, clean, reliable energy sources. In recent years, a promising avenue to clean energy production has been developed as an alternative to wind and hydropower: fusion energy. Thanks to the recently founded ClimateTech startup Focused Energy, the use and commercialization of one approach to this solution, inertial fusion energy (IFE) is now within reach. This approach to controlled fusion involves the use of high-power laser beams to spark a fusion reaction. In addition, the high-power laser technology developed for the IFE approach will revolutionize the way materials can be analyzed. This could, for example, be of importance in areas such as the inspection of bridges for deficiencies. This spin-off technology from the IFE mission can significantly reduce the difficulty and time-consuming effort that is currently required for such inspections.

Focused Energy was founded by four people. Founders include two experienced laser-plasma physicists Professor Dr. Markus Roth from the TU Darmstadt, Germany, and Professor Dr. Todd Ditmire from the University of Texas, Austin, as well as Dr. Anika Stein, an engineer who is also an expert in the implementation of complex projects (e.g., at ThyssenKrupp Marine Systems) and Thomas Forner, an experienced entrepreneur and founder of multiple companies, who contributes considerable expertise in corporate financing and development. The startup is based in Darmstadt. Prof. Roth and Prof. Ditmire have a long history of working together: 25 years ago, they met at Lawrence Livermore National Laboratory (LLNL) in California while working together on using high-intensity lasers for plasma physics research. After two and a half decades of extensive research and testing in the fields of laser technology and plasma physics, Prof. Roth and Prof. Ditmire alongside their team of leading experts at Focused Energy are trailblazing the way to utilize new technologies and make inertial fusion energy profitable for the transition to clean energy. Thomas Forner and Dr. Anika Stein are establishing and implementing the necessary structures and partnerships needed to commercialize this new technology.

The combination of high power lasers and novel targets enables fusion energy production

Inertial fusion requires compressing and heating the fusion fuel to get energy gain (more energy out than is put in). By using a combination of high-energy lasers and ultrafast petawatt lasers, it is now possible to separate compression and heating; this enables an efficient, controlled method of creating fusion energy. The high-energy lasers compress and heat the outer surface of a small millimeter-sized target containing hydrogen isotopes. This outer shell very rapidly evaporates. As a result, the surface expands acting like a rocket engine that then compresses the hydrogen fuel in the shell by over a factor of one thousand. Ultrafast short-pulse lasers are then used to ignite a spark in the compressed gas which triggers a fusion reaction with temperatures of over 200 million degrees Fahrenheit. As a result of this ignition, more energy is released than was originally needed by the lasers to set the fusion reaction in motion. This new inertial fusion technology represents a controlled and secure way to produce large quantities of clean, climate-friendly energy.

“The controlled production of fusion energy is an invaluable breakthrough in science. In the face of climate change and increasing global energy demand, we will soon have an instrument at our disposal to produce an almost unlimited amount of reliable and clean energy”, explains Prof. Dr. Markus Roth. Recent technological advances will enable the startup to develop commercial fusion power plants for energy production which will be able to generate several gigawatts of power. As a first step, a test experimental facility is to be built in Hesse, Germany, within the next few years.

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About Focused Energy

Focused Energy is a startup dedicated to developing fusion as a means of generating clean alternative energy for the growing needs of society. The company is supported by the TU Darmstadt and was founded in July 2021 after years of extensive research. The founding and management team encompasses entrepreneur Thomas Forner (CEO Focused Energy), engineer Dr. Anika Stein (COO Focused Energy) as well as the two laser and fusion experts Prof. Dr. Markus Roth (TU Darmstadt, CSO Focused Energy) and Prof. Dr. Todd Ditmire (UT Austin/Texas, CTO Focused Energy). Further information can be found at www.focused-energy.world
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