

Abstract Submitted
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Recent progress on the high-field path to commercial fusion energy¹ ROBERT MUMGAARD, Commonwealth Fusion Systems, SPARC TEAM, CFS TEAM — CFS and the MIT are developing the high-field path to commercial fusion energy, characterized by a focus on leveraging innovation, compact size, simplicity, and near-term deployment of fusion energy systems based on the high-field tokamak enabled by recent innovations in REBCO magnets. Key developments over the last year include full-scale REBCO TF magnet demonstration, sub-scale R&D on REBCO CS and PF magnets, scale-up of the REBCO supply chain, and applications of the technology to non-tokamak fields. Extensive analysis has shown a robust physics and engineering basis for SPARC, a high field, net-energy tokamak, with access to reactor-relevant burning plasma physics.. The addition of an advanced divertor configuration enables SPARC to explore heat exhaust solutions at reactor-identical parameters. The final site selection for SPARC is anticipated in the fall and construction is expected to start in 2021. In parallel, work continues on ARC, the compact pilot plant proposed by MIT and CFS. Concept refinement has been steered by market insights from end-users and led to several different classes of plant that share the same physics and engineering base. In support of ARC, R&D has started on liquid immersion blankets, molten salt, tritium extraction, and supporting subsystems with funding by several agencies including ARPA-E and non-US entities. CFS continues to encourage a fusion dialogue to non-government entities, partnerships, and fusion technology programs that prioritize climate-relevant commercial deployment.

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