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Tokamak Energy and the high-field spherical tokamak route to fusion power

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Tokamak Energy is a privately funded company based in the UK with a mission to deliver a faster route to fusion. Founded in 2009, Tokamak Energy is developing compact fusion power plants based on two promising technologies: Spherical Tokamaks (STs) and magnets made from High Temperature Superconductors (HTS). The inherent compactness and improved efficiency of the spherical tokamak, coupled with the favourable properties of HTS magnets, open a route to efficient power production at significantly lower net power outputs than previously considered possible.

Currently, two main development streams are progressing in parallel: i) advancing high field spherical tokamak physics and engineering on ST40, the highest field (BT=3T) device of its kind; and ii) HTS technology development, which has characterised tape performance and developed key technologies and is now focused on demonstrating a high field tokamak magnet system at substantial scale.

In the next stage of development, these new technologies and understanding will be combined to deliver the world's first device capable of fusion energy gain and industrial scale power production – ST-F1. ST-F1 is currently in the concept design stage and is aiming to demonstrate the viability of commercial fusion.

Primary author: MCNAMARA, Steven (Tokamak Energy Ltd)

Presenter: MCNAMARA, Steven (Tokamak Energy Ltd)

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