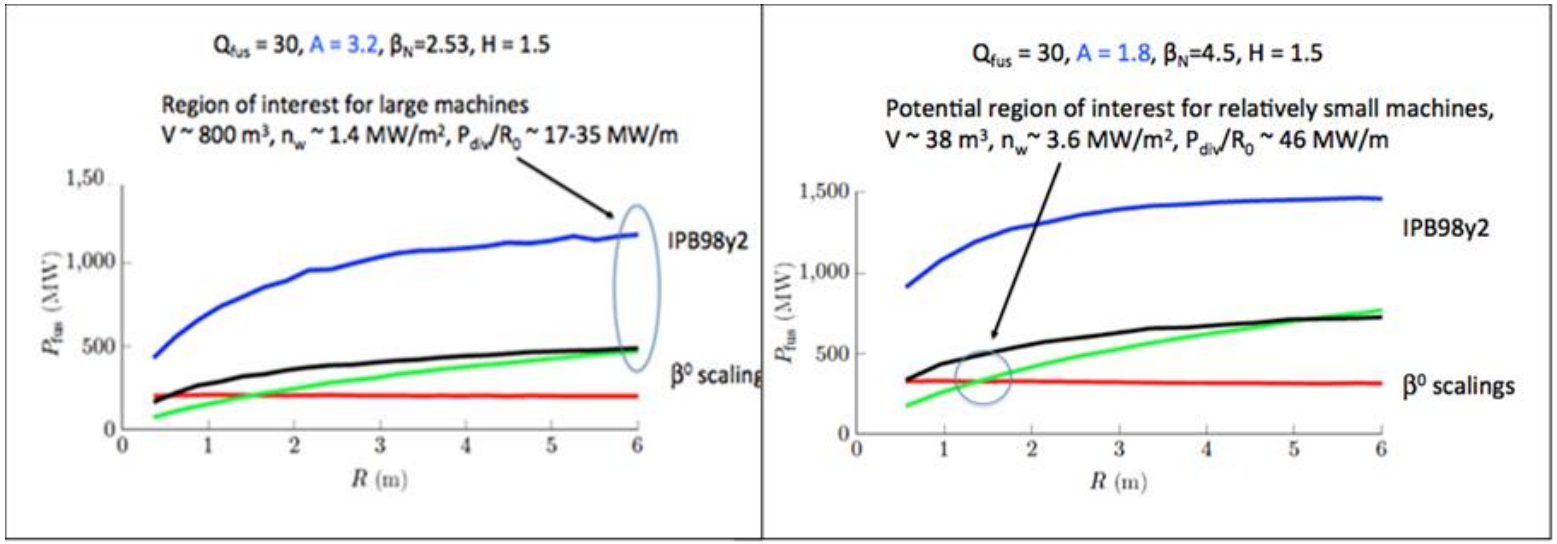
Compact Fusion Energy based on the Spherical Tokamak*

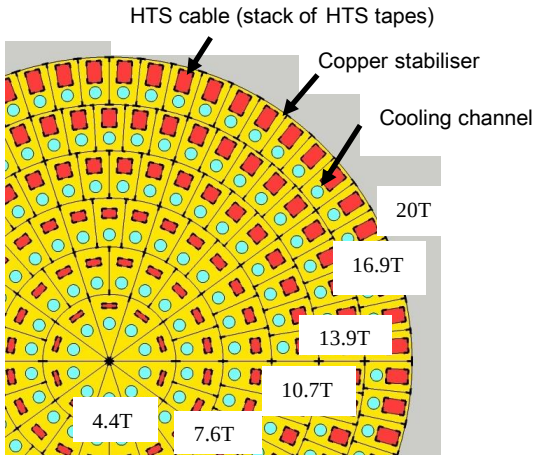
PAPER EX/P3 - 36



It has been shown [1] that a compact Spherical Tokamak could produce high gain, Q_{fus}, at moderate/low fusion power. Key aspects determining the minimum size are engineering constraints, the confinement time of a high-field ST and the lifetime of high temperature superconductor under neutron bombardment. All are under investigation at TE and elsewhere.

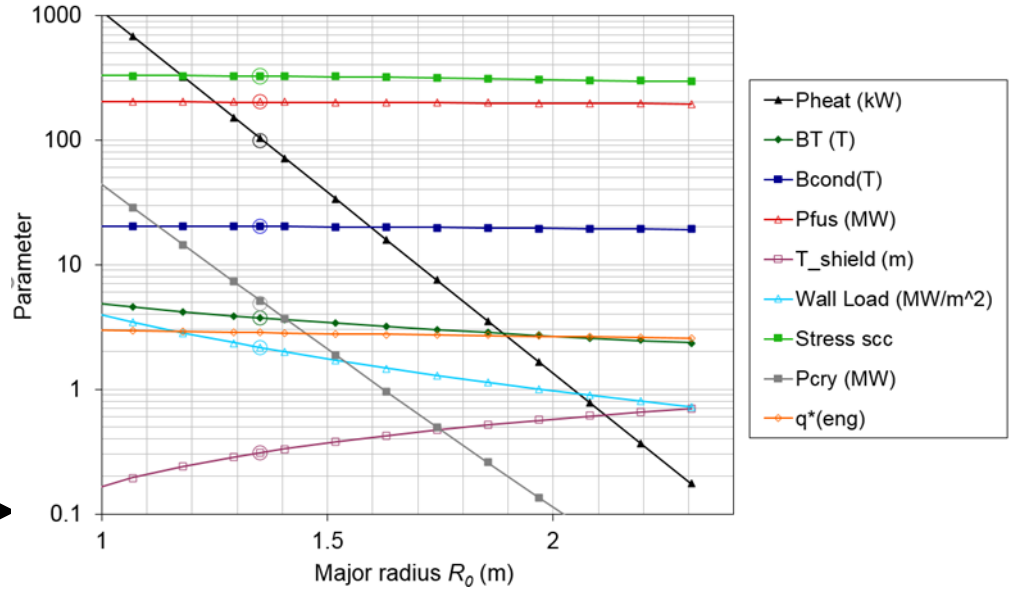
In this paper, a design of an HTS centre rod and its stress are presented:

Divertor and wall loadings are estimated



. Example of a monolithic HTS centrepost.

The shielding optimised, and the reduction in HTS centre-rod heating as major radius is scaled from 1m to 2m shown:



Centre-rod heating reduces from 1MW to 1kW as major radius increases from 1m to 2m

***Sykes, Costley, Windsor et al, Tokamak Energy Ltd**

[1] *COSTLEY, A.E., HUGILL, J. and P BUXTON, P. Nuclear Fusion **55** (2015) 033001*