

PRACTICAL FUSION NOW!

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A nuclear power programme to reduce CO₂ emissions by 65-80% by 2050 requires a rapid, sustained build of new reactors. With a service life of 60 years these plants need long fuel supply contracts. By 2030, on current plans, the global fleets of only 1200 reactors will have contracted for the entire IAEA Red Book Uranium resource of 20Mt, with a modest impact on CO₂ emissions. Fission breeders will then be available, but too late and will breed too slowly to support both themselves and a growing fleet of PWRs [McNamara].

Low power Fusion breeders are 15 times more productive and a 30MW unit can make top-up fuel for a 600MW-th fission reactor from Depleted Uranium or fresh Thorium. It will be shown how a small Spherical Tokamak could meet the needs, using existing technologies [Galvao et al.], by 2020. The same fusion cores can be used for Tritium production, destruction of difficult nuclear wastes, as a driver for a Uranium reactor blanket and electricity production, or studies of advanced material behaviour in fusion neutron fluxes. There will be other fusion contenders for these roles.

McNamara, B. '**Fission & Fusion Futures**', hosted at www.gt-mhr.ga.com, 2007

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