Spherical tokamaks (ST) with minor to major radii ratios, A, over three times higher than conventional fusion experiments, provide a compact and economically viable alternative path to a fusion reactor operation. Along with high temperature superconductor (HTS) magnet technology, compact spherical tokamaks are the central area of research at Tokamak Energy Ltd. with its present device, ST40, currently in operation. ST40 is a burning-plasma experiment machine designed with a toroidal magnetic field of up to 3 T, comparable with or exceeding that of present-day large aspect ratio tokamaks. ST40 has target machine parameters of plasma current, Ip = 2 MA, total neutral beam heating power, P_{NBI} = 2.0 MW, steady state duration of Δt = 1 s, A = 1.6 – 1.9 and minor radius, R_{min} = 0.4-0.5 m. Demonstration in ST40 of central ion temperatures matching or exceeding those observed in the largest tokamaks is the first step towards demonstrating the viability of the ST concept. Achieving those temperature requires accessing high confinement regimes. Results from the first studies on ST40 to access high confinement operations in hydrogen and deuterium plasmas will be presented. The context of these power threshold values and edge plasma parameters within this new operational space will be described, along with their impact on plans for upcoming pedestal physics experiments.