

## **HIPER: THE EUROPEAN PATH TO INERTIAL FUSION ENERGY**

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Anticipating the success of the National Ignition Facility in the USA, scientists from across Europe are developing the case for a next generation laser fusion facility to be constructed in Europe. The High Power Laser Energy Research Facility (HiPER) is being strategically driven by an ambitious medium term goal for the production of clean energy via Inertial Fusion Energy (IFE).

HiPER is a formal pan-European collaborative project between 26 institutions which seeks to establish proof-of-principle of commercial power production from laser driven inertial fusion, “Laser Energy”. The preparatory phase of the project, which commenced in April 2008, is funded jointly by European member states and the European Commission. It will run until April 2011 and conclude with the preparation of a business case for funding of the Technology Development Phase phase which will run for approximately 7 years prior to facility construction.

At a meeting in March 2009, the HiPER Executive Board took the important decision to make an early down-selection to concentrate on developing a solution based on high repetition rate operation. This fundamental decision requires a project strategy consistent with demonstrating ignition capability at 10Hz repetition rate.

HiPER is concentrating its efforts on some of the most significant issues associated with laser energy. In particular, optimised solutions for rep-rated operation in a number of key areas are under consideration including:

- A diode pumped solid state laser (DPSSL) architecture
- Advanced target design
- Mass production of targets, target injection and engagement
- Debris management and reactor design

This paper will set out the project’s delivery strategy, highlight recent scientific and technical progress in the key areas above and explain how the project is moving forward in an international context.

Plans for the development of a prototype beam line operating in the 1 – 10kJ, 10Hz regime will be discussed.