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Optimal Path to a Laser Fusion Energy Power Plant STEPHEN BODNER, Berkeley Research Associates — There was a decision in the mid 1990s to attempt ignition using indirect-drive targets. It is now obvious that this decision was unjustified. The target design was too geometrically complex, too inefficient, and too far above plasma instability thresholds. By that same time, the mid 1990s, there had also been major advances in the direct-drive target concept. It also was not yet ready for a major test. Now, finally, because of significant advances in target designs, laser-target experiments, and laser development, the direct-drive fusion concept is ready for significant enhancements in funding, on the path to commercial fusion energy. There are two laser contenders. A KrF laser is attractive because of its shortest wavelength, broad bandwidth, and superb beam uniformity. A frequency-converted DPSSL has the disadvantage of inherently narrow bandwidth and longer wavelength, but by combining many beams in parallel one might be able to produce at the target the equivalent of an ultra-broad bandwidth. One or both of these lasers may also meet all of the engineering and economic requirements for a reactor. It is time to further develop and evaluate these two lasers as rep-rate systems, in preparation for a future high-gain fusion test.

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