The development of a surface retorting technology to produce oil from oil shale must proceed through a series of scale-up steps before a successful commercial-sized plant can be realized. The current stage of development and the number of scale-up steps taken will affect the time and cost of commercialization but also the chance of success or failure.

Approximate capital and operating costs as a function of plant size as well as the rate of achieving a plant's design capacity and its dependence on the scale-up factor are used to compare possible development scenarios of a hypothetical technology.

The analysis illustrates that for a particular project, there is an optimum number of intermediate plants that maximize the weighted net present value. Also a new unproven technology must promise a significant advantage over a demonstrated technology to justify development costs.