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## Economic Analysis and Environmental Aspects of Photovoltaic Systems

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Photovoltaic (PV) systems provide electric energy, and the range of uses for electricity and the situations in which it is employed are enormous. Moreover, there are numerous other well-developed and widely used technologies for supplying electricity. Conventional fossil-fuel and hydroelectric generation are presently far more widely deployed than PV. The question arises, then, of how PV systems can penetrate the world's electric supply in competition with these alternatives, or, more narrowly, how a PV system can compete with other electricity sources for a specified application. At this point in time, there are many PV systems that do compete successfully in applications for which they are particularly suited. In other applications, PV systems have been deployed with the support of financial subsidies from private or public sources in order to either satisfy defined energy needs or to demonstrate the potential for PV systems. In all cases, it is useful to understand the economic viability, whether present or future, of any PV system in a given application. It is the purpose of this chapter to define and illustrate methods of defining the economics of PV systems as measured by conventional financial criteria and the cost of delivered energy. The cost of delivered energy is a fundamental characteristic of PV systems, and it can be influenced by the design and performance of the system, as well as by the sources and costs of capital to fund the system. The choice to deploy PV in a given situation is also influenced by other issues, including competition from the established electric supply, financial risk, and environmental, political, and humanitarian concerns.