

# Third Laureate Applied Research



- ◆ **Project Title:** Design and Construction of Shiraz Solar Thermal Power Plant
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## **Abstract:**

Consumption of fossil fuel produced serious environmental impact by rising pollution and global warming. Most governments promote renewable energy utilization, among them especially solar energy. Iran have great potential to replace fuels by solar in various sectors such as electricity generation. With high solar potential in Iran, the first solar power plant with 250 kW capacity is designed, both in basic and details and constructed recently in Shiraz. This plant is comprised of two oil and steam cycles. Oil cycle include the field of 48 collectors. Steam cycle contains, heat exchangers, dearetor and storage tanks. Solar radiation will be absorbed by hot oil passing in the receiver tubes and transfer it by heat exchangers to produce superheat steam. Each collector is 25m×3.4m with steal structure, parabolic mirrors, receiver tubes, hydraulic system and various measuring instruments. The plant controls by two systems, first to control the collectors' field and next to control the seam cycle. The power plant is tested several times. It is shown that the collectors' field is able to meet the design condition of producing oil with 265 °C and steam with 20 bar pressure and 230 °C. The steam produced can be used for; steam turbines, desalination, distilling, cooling, etc. Having the technology of making large scale commercially parabolic collectors and solar power plant, Iran is the first country in the region that is able to harvest solar energy for its future sustainable energy development programs.