



CASE STUDY

ASSIGNMENT

SOLAR WATER HEATING PROJECT

Assignment 1 : Residential Domestic Hot Water / Somerville, MA

DESCRIPTION OF ASSIGNMENT

You have been hired by an architect to determine the feasibility of a residential solar hot water system in Somerville.

SITE INFORMATION

The architect gave you following information: The building is a 3 storey brownstone in Somerville, MA. The owner lives with his family (5 people) in the upper part and further rents the ground floor to a couple. Hot water is produced via a gas-fired boiler heating the coil of a conventional storage tank. The temperature of the hot water is 60°C/ 140°F. It is safe to assume that the people use 33 gal/person/day of hot water. The architect wants to use evacuated tubes from Viessmann. The collectors are to be mounted due south at an angle of 30°. This is a closed loop system using propylene glycol as anti-freeze protection. The storage tank is to be sized at 1 gal/ft² of collector area.

FINANCIAL INFORMATION

The total installed system cost is at \$190/ft² of collector area. This includes material cost as well as labor. The current gas price is \$2.30/therm. The architect assumes that the project will receive the National Grid residential rebate (15% of installed cost, capped at \$1,500), that the system is eligible for the Massachusetts residential renewable energy tax credit (15% of installed cost capped at \$1,000), and eligible for the Federal residential tax credit of 30% (capped at \$2,000).

