

The questions Lorriman asked during the survey were those of any consumer thinking of investing in solar energy. The first question: should it be used to heat the house (space) or the water? It appears that, while many active solar space heating systems are being installed on new family dwellings, construction considerations limit most retrofitted systems to hot water facilities. Should the solar system be factorybuilt and then installed, or assembled from parts at the building site? Site fabrication offers more opportunity for innovation and is likely to be cheaper at present, but in time, factory-built is almost certain to become cheaper.

Like any new heating system, solar energy should be considered in light of the materials used, the fabrication methods and maintenance problems. "Maintenance questions," Lorriman continues, "have been almost entirely overlooked in the literature. Some problems are endemic to solar collectors — water and dust being the worst and most obvious. Both can enter the collectors and reduce efficiency. Sometimes, moisture and dust working together can become corrosive. We suspect urban pollutants are even more destructive, but they remain an unknown factor."

After the unknowns come the unanticipated problems, such as the situation that occurred during a recent installation. "A solar collector module expanded during a sunny day," Lorriman relates, "and over-stressed the sealant used to make the array water tight before the compound had cured. The choice was to change the sealant or wait for an overcast day. We found a new product that saved the day, but the event uncovered yet another issue. New materials are constantly entering the field and while many promise great things, they have to be evaluated and the information disseminated throughout the industry. Writing standards to cover them and their applications will require some hard thinking."

Concludes Lorriman: "Some basic decisions must be made very soon, by both the industry and government. The industry must decide whether to produce cheap, replaceable systems or more expensive, durable ones. Durable systems may eliminate some costconscious consumers, but will benefit both consumers and manufacturers in the long run. Similarly, governments must decide whether to help manufacturers offset development costs, or subsidize consumers. To aid both would be best, of course, but spending restraints make it unlikely."

Doug Lorriman hopes the report produced from his survey will provide some impetus to resolve those questions facing industry, government and the consumer. "The intent of the study," he says, "was to identify problems with an eye to overcoming them. I hope it will lead to the fulfillment of the whole idea of renewable energy."

Doug Lorriman's report to NRC has been issued as #1 of the Solar Technical Series by the Solar Energy Office. Entitled "An assessment of problems experienced with operating solar systems in Canada and northern United States", the report is available from Supply and Services Canada, Hull, Quebec, K1A 0S9. Stephen A. Haines

