

several other innovations suggests that inadequate training is a common and critical barrier to technological change in the buildings industry.

None of the case studies involved an industry consortium or licensing from a national laboratory to industry. The cost of establishing industry consortia is probably a major deterrent to the industrial consortium strategy. Patent policies and procedures, in turn, have made it difficult for DOE laboratories to obtain patent waivers and thereby license technologies.

There are many factors that affect the appropriateness of one technology transfer strategy over another, including: the nature of the R&D results being transferred, the potential applications, the producer and consumer markets, and DOE's goals and resources. The role of each of these factors is discussed.

The report also suggests specific activities that are appropriate to stimulate the further penetration of several of the case study innovations. For instance, a consumer information program is recommended for radiant barriers and the heat pump water heater. Further technical development is needed before tracer gas testing will gain widespread use. A less expensive version of the Wisconsin audit is required to enable widespread adoption. Dielectric coatings, low-E windows, solid-state ballasts, DOE-2, CIRA, the new supermarket refrigeration system, and the flame retention head oil burner have all achieved self-generating growth rates and do not, at this point, require further government support.

CONCLUSIONS

Energy-saving innovations for buildings have a major potential role to play in improving the nation's energy security and international competitiveness. We have examined the processes by which 12 technologies sponsored by the U.S. Department of Energy were successfully commercialized,