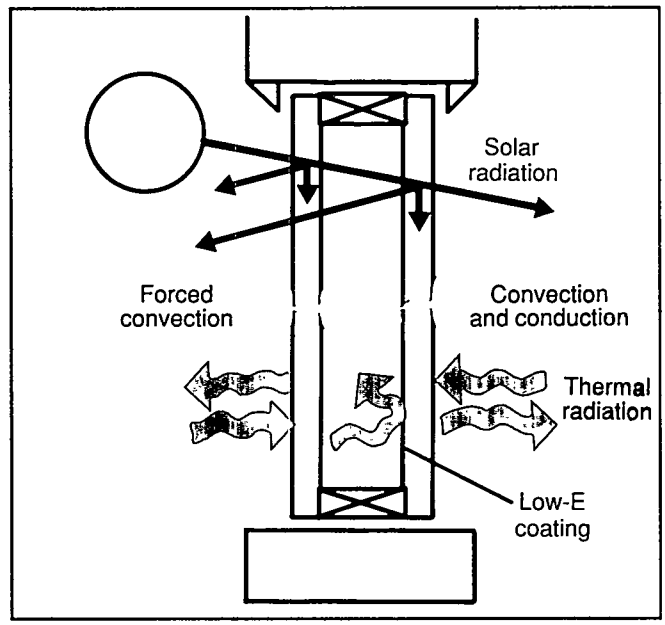
embark on a program of research, project demonstrations, and feasibility assessments in over 50 communities to redevelop this concept. As a result, cogeneration/district heating systems have been constructed and are operating successfully at three large universities and in Trenton, New Jersey. Together, these four systems have saved the equivalent of several thousand barrels of oil annually through combined heat and electric power production. More importantly, DOE's feasibility assessments have formed a basis for subsequent design and development using local government and private sector funding. Thirteen cities have proceeded with detailed designs for construction of DHC systems. The cities of Baltimore; St. Paul; Galax, Virginia; Provo, Utah; Piqua, Ohio; and Lawrence, Massachusetts have new district heating systems. Construction of DHC systems on college campuses has increased more than five fold since 1950. DOE's district heating and cooling development program currently yields energy savings of over 5 trillion Btu per year nationwide and has produced over $70 million of construction activity. Net energy savings in the year 2000 are predicted at 163 trillion Btu, equivalent to 28.1 million barrels of oil with a current economic value of over $421 million.

Low-E Window Coating

In response to the energy crises of the early and mid-1970s, DOE initiated a research program to identify innovative energy saving technologies that could be applied to commercial and residential buildings. Research determined long wave infrared radiation heat exchange through windows to be a major source of energy loss in buildings. Low emissivity (Low-E) glass coatings were known to reduce this problem, yet the window and glass industries were unable to commit sufficient research resources to solve numerous technological problems connected with these coatings. DOE sponsored a broad range of basic technology research activities including: Low-E coating technology research, computer simulation of alternative Low-E window designs, coating test facilities, and technology transfer programs to disseminate Low-E research program results. DOE's investment in Low-E technology research directly stimulated the glass and window industries to invest heavily in advanced coating technology. Low-E windows became commercially available in 1983, and in 1986 twenty manufacturers sold over 50 million square feet of Low-E windows representing almost 10 percent of all residential window sales. Energy savings from Low-E windows sold in 1986 exceeded 2.5 trillion Btu, currently valued at over $15 million. The industry estimates that Low-E windows will account for 20 to 50 percent of the residential window market by 1990.



Low-E coating reduces window heat loss resulting from radiation transfer.

DOE-2

The DOE-2 building energy simulation program was developed as an unbiased analytical tool in the public domain to assist in the design and evaluation of building performance and energy conservation technologies from the perspectives of energy use, efficiency, comfort, and cost. Operating on a wide variety of computers ranging from personal computers to mainframes, DOE-2 has become the stand-