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Technological progress is an important issue in long-term energy demand projections and in environmental analyses. Different assumptions on technological progress and diffusion of new technologies are among the reasons for diverging results obtained using bottom-up and top-down models for analyzing the costs of greenhouse gas mitigation. This paper examines the effect on aggregate energy efficiency of using technological vintage models to describe technology diffusion. The focus is on short- to medium-term issues. Three different models of Danish energy supply and demand are used to illustrate the consequences of the vintage modelling approach. The fluctuating utilization rates for power capacity in Denmark are found to have a significant impact on average fuel efficiencies. Diffusion of electric appliances is linked to economic activity and saturation levels for each appliance. In the sector of residential heat demand, fuel price increases are found to accelerate diffusion by increasing replacement rates for heating equipment.

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