Dryers

HIGHLIGHTS

PROCESS AND TECHNOLOGY STATUS – Dryers are an increasingly important appliance, particularly in developed countries with climates that are not amenable for outdoor drying. For example, it has been estimated that drying accounts for approximately 7% of US electricity consumption and that in 2009, 79% of US households owned a laundry dryer. The US domestic tumble dryers market has grown by more than 50% over the last 15 years, mostly driven by sales of electric dryers. The EU domestic market also appears to be dominated by the electric dryer, although market penetration is lower compared to the US. In Europe, annual sales were in the range of 4.1 - 4.4 million units (2005). In comparison, the global commercial market is much smaller; the volume of tumble dryers sold is approximately 85,000 units per year. In the EU approximately 30,000 units are sold per year. The EU commercial market is growing on average by 2% a year. In the US, commercial market growth is slightly higher at 3% a year. More energy efficient technologies are available on the global market. The most notable are heat pump condenser dryers and gas tumble dryers. Heat pump condenser dryers are currently only a few percent of the global market. Heat pump condensers are the only dryer where heat is recovered and returned to the air stream flowing into the drum. Only in Switzerland and Austria have sales reached significance at over 25% of the market (2009), but there are signs that the technology is breaking through as sales have risen to 10-15% in Germany and Italy. In many countries, gas tumble dryers also represent a very small percentage of the domestic market; 0.3% in the UK, the Netherlands and Portugal. In the US, sales figures for electric and gas dryers are similar.

PERFORMANCE AND COSTS – In 2010/11, the national average energy efficiency of domestic laundry dryers in Europe, USA, Canada and Australia was approximately 0.7 kWh per kilogram of dry fabric. Switzerland has improved its average efficiency to 0.69 kWh per kilogram in 2010, but along with Austria it has seen annual growth in energy consumption due to increased ownership and usage. The gap between countries' average efficiencies has narrowed. Within each country, however, technology profiles are still quite different. In Canada and the US, most technologies have energy efficiencies that are in the range +/- 7% from the national average. In comparison, the Australian and EU markets have a greater range (+/- 25%) and include products which are much more efficient (and less efficient) compared to the Canadian and US markets. This highlights the potential for energy savings if the most efficient technologies were available in every country. Switzerland plans to ban the sale of tumble dryers that do not achieve EU energy labelling class A standards from 2012. More generally, it seems that the EU energy labels have been most successful at reducing sales in the lowest label classes. The EU energy labelling system is currently undergoing small changes to include gas dryers and review the energy categories. Gas dryers are not yet included in energy efficiency labelling in the EU, but they are typically equivalent to class B [expert opinion]. Heat pump (condensing) dryers are most efficient and are typically in class A. On average they consume less than half the energy of conventional vented and condensing dryers. They have energy efficiencies of 0.3 - 0.4 kWh per kilogram compared to 0.6 - 0.9 kWh per kilogram for a typical conventional dryer. There is a price premium for heat pump products of 30% from major brands. For example, in Germany, the average price of heat pump dryers was €1618 (2012). Recent entrants into this area are significantly cheaper, so the market could be developing. For example, the Creda heat pump dryer was released onto the UK market (2011) at approximately €475.

POTENTIAL AND BARRIERS – There is potential for reductions in energy consumption from dryers. In the best performing parts of the market, the technology is already there but due to the 13 year lifetime of dryers, there is a delay between annual sales and the new technology occupying a significant proportion of the existing stock. Higher costs are one of the biggest barriers limiting sales of the most efficient dryers. Price and longer drying cycles are significant barriers to the uptake of heat pump technology in the US market. There may be a lack of customer interest/awareness when it comes to energy labelling in Europe. Lower market demand may prevent manufacturers from selling the most efficient technologies if they do not believe customers will pay for it. Another minor barrier is the constant market demand for low capacity dryers, either due to the lower price or because customers lack space to accommodate larger models. Compact dryers are amongst the least energy efficient types. For gas dryers, there are barriers such as customer concerns over safety and additional installation considerations that might put consumers off purchasing them. Once a purchase has been made, there are a number of customer behaviours which can impact the real world efficiency of the dryer. These include the use of delay timers, leaving the appliance on stand-by mode, lack of cleaning of dryer components, using the appliance at half load and others. These should also be targeted to ensure appliances are used in the most efficient manner and some technology solutions, like sensor controls, can help to mitigate these.

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