

Electric Dryer Energy Considerations

By Bruce Fast

Electric dryers are extremely heavy electricity users. Just notice the size of their power cord. On average, a dryer uses 3kw of electricity. If your electricity costs \$.15 per KW, and you run your dryer for 1 hour per load, you are pumping \$.45 worth of heat out of your house. In summer, it's nice to pump that heat out, but in winter it's such a waste.

But during the heating season (winter) the numbers are even worse than this. The dryer is taking air from inside your house, and pumping it into the great outdoors. Where does it get the air from? Why, through the cracks around your doors and windows, of course. So not only is it throwing perfectly good hot air out of your house, but it is sucking cold air into your house. A double-whammy.

There are a couple of devices on the market that make it easy to redirect your hot air into the house in winter. A good idea, you say. Well, not so much. There are two problems with dryer vent air. It is dirty – it is usually only filtered through a simple screen. It is moist. This is a bigger problem than all that. If you dump moist air into a house that is not moisture controlled, you are setting yourself up for mould problems. Yuck! If you have a moisture controlled house, as I have, then outside air is going to get pumped into your house, and the moist, warm air is going to get pumped out. Hmmm.

So to solve the problem we must address these two issues: cleanliness, and moisture. My solution is as follows: We will filter the air through a replaceable furnace filter. Furnace filters do a job from rather decent to amazing depending on how expensive a filter you buy. We will remove the moisture from the air with a dehumidifier. The more moist the air is, the more effective the dehumidifier is, so we couple the dehumidifier with the dryer exhaust. Linking two appliances together that were not engineered to be linked can be problematic. The dehumidifier will be running for shorter or longer than the dryer cycle, and the dehumidifier will move more or less air than the dryer exhausts. To solve this problem we will loose-couple them. In this way, if the dehumidifier is running while the dryer is off, it can get some air to breathe. (It might get very upset and break down if there is no air flow.) If the dryer is running while the dehumidifier is turned off, it can blow its exhaust somewhere. (If it can't it won't dry the clothes, and it might get very upset and break down.)

Now, it seems awfully wasteful to add yet another energy hog appliance just for the heat recovery.

Here's where you may be wrong. There is an interesting phenomenon of electricity – it converts to heat with 100% efficiency. So for every watt of electricity we stuff into the dehumidifier we get 1 watt of heat out of it. So our electricity bill will go up a bit, but our overall heating bill will drop. (If you want to accurately calculate the benefit, well, good luck. You will have to calculate the \$ per watt of your heating system – after its inefficiency. Then you will have to calculate the fact that the heater (dehumidifier) isn't located in the ideal location to heat your home. The latter isn't that big of deal because the heat kinda smears around within the insulated cocoon of your home.)

So your net savings from this thing is approximately as follows:

Dryer energy used (about 3kw) * duration per load * loads per month

Plus, the cost to heat the cold air that the dryer has sucked into your house

Plus the difference between the cost of the dehumidifier's electricity and the cost of heating your home via your furnace.

All this times the duration of your heating season.

In my situation (I am in Canada, north of Anchorage) my heating season is a good 6 months long. This system pays for the dehumidifier and build in about 1 year.