Energy and Landscape Lighting

Many of our clients want to know about the energy consumption of their lighting systems. The good news is that the low-voltage MR16 bulbs ("lamps" in lighting terminology) we use most commonly in our installations deliver very bright light for the amount of energy they use. This means that we can use 50-watt lamps to light up the tallest oak trees and may only need 20-watt lamps for smaller ornamental trees like crape myrtles. MR lamps have multifaceted-mirrored reflectors that concentrate their light into a desired beam spread and allow fixtures to be smaller than those using other types of lamps. In addition, we often use MR16 IRC lamps for additional energy savings. IRC lamps have a special coating on the glass lamp capsule that reflects heat produced inside the lamp back to the filament. This allows a 20-watt MR16 IRC lamp to produce approximately the same amount of light as a normal 35-watt MR16 lamp.

In order to calculate the energy actually used by your system, you start by adding up the wattage of all the lamps in the system. Although people are accustomed to thinking that "watts" refers to the brightness of a lamp, it is actually a measure of power, or the rate at which energy is used, and we can only know that a higher wattage lamp is brighter than a lower wattage lamp when they are the same kind of lamp. If you don't want to add up the wattage of all of your lamps, you may get a quick estimate of the total wattage of your system by taking the sum of the capacity of all your transformers. For example, if you have two transformers, one a 300-watt transformer and one a 600-watt transformer, you know that the maximum wattage your system would use is 900 watts. (Actual wattage would be less since we don't load the transformers to capacity.)

To calculate the energy your system uses, you must also look at the amount of time you use your lighting. Your electric bill tracks energy usage in kilowatt-hours (kWh), the product of power and time. If you have your lights on an average of 5 hours per night, then in a month's time your 900-watt system will use 135 kWh. First, divide 900 by 1000 to convert watts to kilowatts and then multiply by 5 hours per night x 30 nights per month. To find out how much the system costs to run per month, multiply by the price your utility charges. For example, at 6.3 cents per kWh, your 900-watt system would cost 135 kWh x $.063/kWh or $8.51 per month to run. Keep in mind that your system may be smaller and use less energy – we would expect a 900-watt system to include approximately 20 to 40 light fixtures.

We usually suggest that our clients control their lighting by an automated system if they expect to use the lights frequently. That way the lights can be set to go off automatically when clients retire for the evening, avoiding the necessity to remember to turn the lights off.

There are exciting developments on the horizon that will further decrease energy used by landscape lighting. LEDs (light-emitting diodes) are highly efficient

sources of light, and progress is being made toward LEDs that are bright enough, appropriately colored, reasonably-priced and field-tested for use in the landscape. We currently recommend using fixtures that employ MR16 lamps rather than fixtures that are specifically LED fixtures while we wait for improvements in LEDs. LED units are being developed that will replace MR16 lamps in standard low-voltage landscape fixtures in the same way that compact fluorescent bulbs replace ordinary incandescent bulbs in household fixtures. This means that you can install MR16 fixtures today and still reap the benefits of LEDs in the future.

We are also looking forward to the day when solar lighting is practical in the landscape. Currently we have not found any fixtures that produce enough light from self-contained solar panels to be effective. Of course, larger solar panels mounted on roofs may provide power to an entire house, including the landscape lighting.

- Barbara Kulp, MPSLD