

Source: <http://www.need.org/needpdf/PlugLoads.pdf>

## What are Plug Loads?

- Plug loads are electrical devices or appliances that draw power through an electric outlet
- Schools typically have 120/240-volt electrical systems with many different loads ( a load is any device powered by an electrical system )
- Anything that has an ON/OFF switch can be a load and managing the use of these loads can help save electricity and money
- A quick survey of the typical classroom and school building reveals many kinds of plug loads, such as:
  - coffee makers
  - computers/monitors
  - fans
  - desk and table lamps
  - microwaves
  - refrigerators
  - televisions
  - DVD/VCR players
  - window air conditioners
  - vending machines
  - printers and scanners
  - fax machines
  - copiers
  - fish tanks
  - projectors
  - ranges and stoves
  - vocational equipment
  - refrigerated drinking fountains
  - clocks
- A survey of all plug loads in the school will help students, teachers, and school staff find ways to reduce electricity use, promote sustainability, and save money
- Reducing plug load creates additional funding for other educational costs (ex. salaries, textbooks, school supplies, equipment, . . .)

## How Much Electricity Do Plug Loads Use?

- Estimates are that up to 25 percent of the total electricity consumed by a school is from plug loads

## Phantom Electrical Loads

- The DVD in a classroom has been flashing the time "12:00 a.m." since it was installed four years ago. The only time it has not been flashing is when a power outage occurred last winter. This is a prime example of an electronic device in today's classroom that consumes energy when the switch indicates it is off.
- The cost for this flashing for four years could add up to more than \$10. With hundreds of these devices in a district, that can amount to a significant energy cost.
- This consumption of electrical energy is classified as a phantom load. Phantom loads are also known as standby power or leaking electricity.
- Phantom loads exist in many electronic or electrical devices found in schools. Equipment with electronic clocks or timers, with remote controls, portable equipment, and office equipment with wall cubes (small box-shaped plugs that plug into AC outlets to power appliances) all have phantom loads.
- This equipment can consume from three to 20 watts when turned off. As technology changes, these values are being reduced and it is estimated that with new technology as much as 75 percent of this phantom load can be reduced.

## Calculating Phantom Load

- Below is an example for a typical TV in a school building:

TV Phantom Load: 5.5 watts      Hours per day turned off: 22 hours

The total energy used during the year would be:

$5.5 \text{ watts} \times 22 \text{ hours/day} \times 365 \text{ days/year} = 44,165 \text{ watt-hours or } 44 \text{ kWh.}$

- At an average commercial rate of \$0.10/kWh, the cost would be \$4.40 per year. (Note: for a typical home TV's phantom load cost, use an average residential rate of \$0.12/kWh and an average turned off time of 19 hours per day)
- To get a more accurate figure for a school TV, you would take into account the number of days when the TV is not used at all (summer vacation, weekends, holidays, etc.) where the phantom load would be drawn for 24 hours instead of 22 hours
- Remember, this is just for one school TV - in a large school district, there could be a hundred or more TVs
- To reduce this energy consumption, unplug the TV when not in use (or have it plugged into a power bar and turn the power bar off)
- In addition to unplugging, it is recommended that future electronic purchases require a minimum "Standby/Phantom Load"