Reduced Energy Guide
Simple steps to reduce our impact on the environment and save money across our students' union shops and bars

Vending Machines

What is a vending machine?
A vending machine provides snacks or beverages without the need for a cashier. This reduces labour costs and enables 24 hr use in some areas.

How does it work?
Once the customer pays for the product, it should become available because either:

- The machine has released it, and it has fallen into an open collection compartment
- The machine has selected it and placed it in a collection area
- A door or drawer has become unlocked and should be opened
- A knob can be turned or pulled and in doing so releases the product

Sometimes the product is prepared by the machine such as in the case of hot drinks machines.

How much energy does it use?
Throughout our research in students' unions across the UK, we assessed a variety of vending machines. An indicative energy consumption is provided below.

<table>
<thead>
<tr>
<th>Vending machine type</th>
<th>Indicative TEC (kWh/24hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refrigerated food</td>
<td>4.08</td>
</tr>
<tr>
<td>Refrigerated drink</td>
<td>5.04</td>
</tr>
<tr>
<td>Hot drinks</td>
<td>5.1</td>
</tr>
</tbody>
</table>

The lighting in vending machines uses approximately 1/5 of the total energy used by the machines.

When does it use energy?
Refrigeration uses energy in a cyclical manner due to the nature of the refrigeration cycle. The energy consumption of the fridge increases massively when the cycle starts and drops off inbetween cycles. Hot drinks machines do not use much energy most of the time, but use it in bursts to heat the water that is stored ready to dispense drinks.
**General guidance on energy efficient operation**

**Refrigerated vending**
- Do not place equipment against windows or in direct sunlight
- Always ensure ventilation grilles on cooling equipment are unobstructed
- Regular cleaning of the ventilation grilles should be carried out

**Hot drinks machines**
- Ensure ventilation grilles are unobstructed to ensure overheating does not occur.

**Shutdowns**

**Refrigerated vending:**
These devices take around 10 hours to achieve a serving temperature (3-4°C) from switch on. To achieve this, the appliance will use roughly 3 days' equivalent of energy. It is therefore recommended that these units are only shutdown if the period exceeds three days.

**Hot drinks vending machines:**
Hot drinks machines take little time to return their water to serving temperature. They can be switched off overnight and turned back on when the trading area is opening. Savings will be achieved from switching off overnight; however, the water is boiled around a quarter of the number of times during idle periods than it is during operation. It is therefore estimated that an overnight switch off will save around 1 kWh. A timer plug will take around 6 months to payback when fitted to a hot drinks vending machine to turn it off overnight.

**Refrigerated vending machines – Energy controls**
These are units which are designed to improve energy efficiency by synchronising the energy input to the demand in motor driven devices. Due to the nature of these products they also have a positive impact on the life of the machine, as they lead to less wear in the motors.

This type of device is available through various suppliers. The devices work by reducing the voltage or the current or both that are delivered to the motor. It is important to note that this type of device will deliver poorer paybacks on sites that have had a voltage correction device fitted (e.g. powerperfector).

Most vending equipment supplied by Coca-Cola Enterprises uses an internal programmable energy saving controller. The programmer has an internal real time clock with a radio reference that also automatically adjusts for daylight saving time shifts. It enables lighting and refrigeration to be independently timed to predetermined settings and vending to be enabled or disabled as required up to four times each day. Depending on the settings this can result in a 15% saving for a twelve hour shutdown. The controller also monitors and controls the temperature of the product electronically.

*Please see glossary for definitions* and disclaimer.