Energy Saving Measures

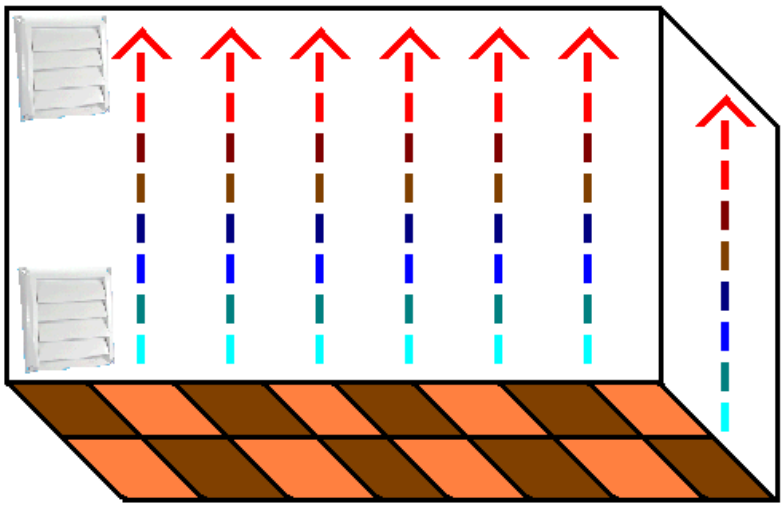
As we all know the prices for electricity has risen up due to the instability in the price of crude oil and the alarming rate at which green house gasses (GHG) are being produced. This triggered the introduction of various solutions in the market which either perform efficiently or increase the efficiency of a particular device or application. At first thought one would think about the relatively expensive renewable energy sources (RES), double glazing or buying of a more efficient refrigerator. Perhaps others would avoid using refrigeration systems or similar commodities which would employ a reasonable amount of electrical power. But are these the only solutions envisaged to improve the electricity bill?

The following tips will aid households to reduce their electricity bill up to 30%.

Whether its a chilly Winter or a stick Summer electrical energy is employed to heat or cool a space accordingly. Stereotypically radiators and radiators are the main culprits for the exorbitant consumption of electricity. A substantial amount of heat in Winter is lost though the static ventilators attached to the top of the wall usually in the corner of the room. On the other hand worn insulation complements a significant amount of contribution to the loss of heat in Winter of cool air in Summer. One should always check the different kinds of insulation periodically. These include but are not limited to

- glass panels' rubber inserts
- window and door insulation/sealing
- refrigerators' insulation

As an addition to the current system one can utilise adjustable ventilators which can be shut or open (manual/automated) according to the application. The use of the top ventilator in Summer can push the warm air out of the room offering a circulation of air without loosing any of the refrigeration. The use of a similar bottom ventilator in winter can avoid the loss of the warm air while obtaining air circulation. Ventilators are either electrically adjusted via solenoids or else mechanically in the form of a non return valve.



Solar Screen Filters

A typical Maltese Summer consists of extensive exposure to sunlight translating into the heating up of buildings. Older buildings, which were built of thick walls, suffer from insulation issues at a lower degree. Modern buildings are being improved by covering their roofs with sun screen fabric (tent)**.** It was discovered that such a layer would shield the building from solar radiation such that less need for refrigeration would be required.

Various research sows how refrigeration consumes a large amount of electrical energy. Fuel is added to fire when the insulation of the unit worn out. This translates itself into the loading of the compressor which in turn consumes more electricity. The degradation of the rubber insulation does not necessarily required the replacement of the entire unit, but various shops can change the rubber at a reasonable price. The energy being consumed by the refrigerator can be monitored by a watt meter or by an energy metre where fluctuations in power show possible degradation for the simulation.

Intelligent use of energy can be affected by knowing the actual power being consumed by various kind of appliances in our home. This can be done using a watt metre which will show the energy being consumed by an appliance at that particular instance and operation. It is important to not that any appliance on stand by such as televisions, laptops and charger consume a relatively exorbitant amount of energy. Stand-by mode is usually highlighted by a red led for multimedia appliances such as television and audio related apparatus. A watt metre can provide immediate feedback to the user and an incentive to switch off anything which is in stand by mode.

The use of such an apparatus would show the high wattage of electric heating systems such as instant water heaters and water kettles. Ideally a water kettle should be used as least as possible. For example, if a water kettle holds a maximum of 1 litre of water, then the kettle should be filled entirely and its excess liquid should be contained in a vacuum flask (Thermos) to avoid any losses.

A similar situation occurs for the hot water used in the bathroom. One should avoid long baths, instead shorter shower take less time and energy. The thermostat should be adjusted such that no cold water is required to adjust the temperature. Moreover it is of utmost importance to compromise the thermostat's temperature and the volume of liquid required.

Humidity drawbacks

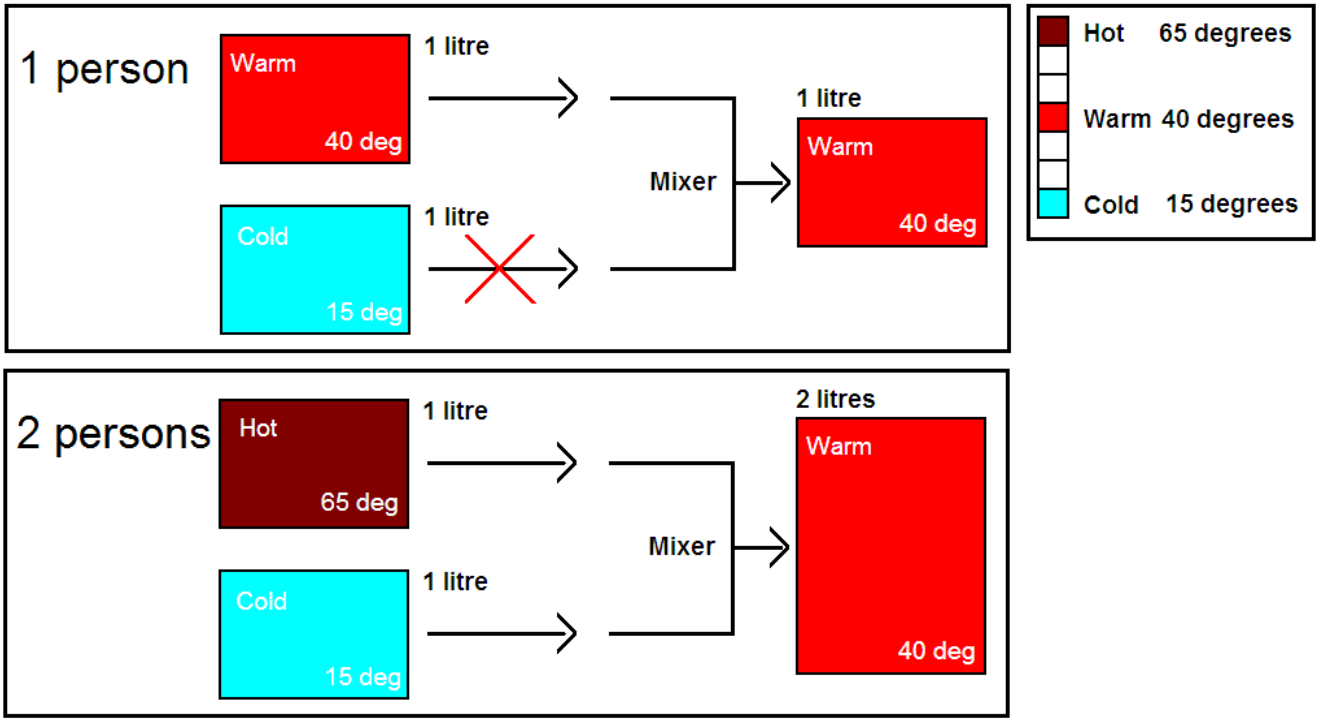
It is a matter of fact that the Maltese island are overwhelmed by humidity. Due to the fact that water has a very high specific heat capacity that it absorbs a substantial amount of energy from the surroundings. It absorbs the heat produced by a radiator in Winter. Conversely in Summer humidity stores a substantial amount of heat making it more difficult to cool the given place. In this light a dehumidifier should be used to remove water from the air. Lack of decent insulation would translate into higher humidity levels. Such levels can be monitored using a humidity scale. Given that the humidity levels remain relatively high inspite of a dehumidification unit, than one should check his insulation.

Water

It is calculated that around 40% of the electricity generated at the local power stations is consumed by the reverse osmosis plants. This resulted in the expensive bills for water. The consumption of water may be translated into carbon emissions in this respect. Ideally, the flow of water should be blocked while washing our teeth or any other similar situations. Automated water taps employ motion or infra red sensors which limit the flow to the time in which the user's hand or body are close enough to the water tap. Such taps are retro fit – that is they can be easily installed without any modifications. The procedure would consist of shutting the water regulator, unscrew the existing tap and fit the new unit.

Domestic Hot Water

A storage water heater drains a substantial amount of power implying that inadequate use leads to large losses. Latest models have a thermostat knob locate on the outside panel of the heating unit. It enhances the way we can adjust the temperature according to our needs. Additionally, the water's temperature can be adjusted to the volume of hot water to be consumed. If a single person is going to get a standard shower than a relative low temperature will be set, ideally without involving the mixing of hot water to the colder water. On the other hand if 3 people are going to have a bath after each other, then I would recommend that the temperature is increased so that it could be mixed with cold water to obtain the desired temperature for more volume than the first case.



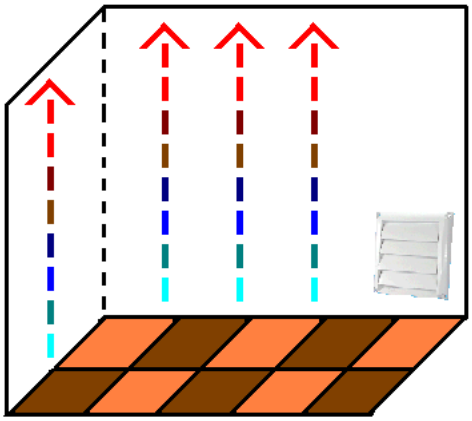
A/C Chilling Ventilation

Domestically, most air-conditioning systems are used in Summer during the evening. It is a matter of fact that this seasons may be unbearable due to the southern winds and high levels of humidity. The easiest enhancement in such a situation is to operate the air conditioning system at a relatively low temperature for thirty minutes and then switch the air-conditioning unit to ventilation mode. This will yield a very similar result to that of a system operating continuously in refrigeration mode. Such a procedure be carried out manually or by the use of special functions designed by the manufacturer of the unit. Ideally, the IEE or IEEE should endorse such a function to domestic air conditioning systems.

Under door insulation

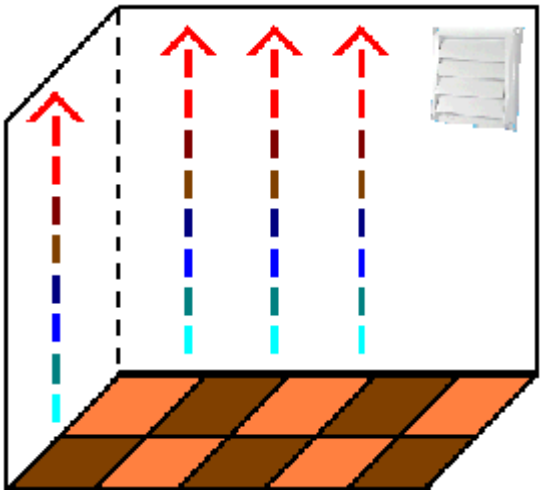
One of the main issues when dealing with loss of heat or cold air is draft. The use of under door twin draft guards can significantly alleviate this loss. As observed in the picture it is extremely easy to install such insulation. Particularly in Summer, the air at the lowest temperature will escape from the bottom outlets while in Winter the hot air will escape from the upper outlets.

Indoor ventilation



In Winter, various kinds of radiators are used for space heating. By convection heat rises up thus warm air could easily get lost through ventilators at higher heights. Air changes could be maintained by using ventilators at lower altitude.

Conversely, in Summer air conditioning systems are utilised to lower the temperature of the air contained in the room. In this case the installation of a ventilator at the top of a wall could push the warm air out while avoiding the loss of treated air.



The perfect compromise can be met by installing two ventilators as described. Additionally these will need manual or automated adjustments before the corresponding seasons.

Simple tips for refrigeration

dust, cooker, door/humidity, energy metre

The operation of any kind of refrigerator relies on the use of radiators in aim of dissipating heat or absorbing heat in Summer and Winter correspondingly. In the warmer seasons its aim is to lower the ambient temperature. This occurs by releasing the heat through its radiators, hence any form of external heat source such as a stove or cooker can affect the efficiency of the refrigerator's motor. By keeping it away from heat sources such as cookers, stoves or exposure to sunlight, the efficiency and efficacy can be alleviated. This improvement is usually noticed by the less frequent start-ups of the compressor.

Dust accumulates on radiators' surface from time to time making it more difficult to release heat from the radiator (chilling). In such a case the electrical drive inside the compressor will operate for longer periods of time. As a safety measure the power should be voided form the unit before cleaning it. The compressor requires 15 minutes cool down before being switched on again otherwise its wear and tear is increased.

Besides from isolating the unit from external heat sources, it is very important that a refrigerator operates in low levels of humidity. In winter the water molecules will absorb the radiators' heat themselves. Similarly in Summer the vapour will conceal an additional heat source (absorb the cold). Water has the highest specific heat capacity, thus it will obstruct any change in temperature. Correct dehumidification will aid at maintaining the best efficiency of any kind of refrigeration units. In the case of refrigerators, it is very inconvenient to locate them near a door or any kind of aperture. The molecules would oppose any change in temperature.

White washing shafts in brilliant white

In architecture shafts are conventionally associated with the ventilation and ducting purposes. By painting the walls in a brilliant white sunlight could be reflected across the façades such that light and heat can be transmitted through the apertures in the shaft. Moreover, heat can aid the extraction of humidity from our buildings. Sustainable societies have lived sustainability for thousands of years relying on similar means.

The absorption and reflection of sunlight can be improved by the installation of solar reflectors as portrayed adjacent. The use of active of passive reflector/refractors can improve the reception of sunlight.