E-WASTE
(LIGHT BULBS AND LAMPS)

DESCRIPTION: All equipment whose primary function is to provide electric light: general lighting comprises 75% of the total, spread across 7 sectors (residential, office, shop, hospitality, industrial, outdoor and architectural); automotive (20%); and backlighting (electronic screens that emit light as a by-product – these are covered under other e-waste).

GLOBAL PRODUCTION/DISPOSAL: The global lighting market was valued at around USD 73 billion in 2011 with rapid yearly growth: it is expected to exceed USD 100 billion by 2020[1]. Lighting is estimated to consume 20% of global electricity production.

COMMON SOURCES: Major lighting types include:

- **Incandescent** bulbs are an old-style, very inefficient technology containing a tungsten filament that releases a lot of waste heat as well as light. Their short lifespan (1000 hours) means they need to be replaced more often.
- **Tungsten halogen** lights are incandescent bulbs with gas surrounding the filament, they provide a more focused light that is often used in spotlights/display lighting and use slightly less energy than tungsten filament bulbs.
- **Ceramic discharge** lamps (CDM) are a more efficient display lighting alternative to tungsten halogen lights.
- **Fluorescent** tubes (used in many offices) and **Compact Fluorescent** Lights (CFLs) are far more efficient but use gas and solid chemicals, including toxic mercury and phosphor, inside the lamp to create light.
- **Low pressure sodium** lights are highly efficient lamps that give a diffuse (and low-glare) yellow light, commonly used for road and tunnel lighting.
- **High pressure sodium** lights are a quick-starting, very efficient and long-life light particularly suited for floodlighting and larger outdoor spaces that need to be lit for long periods. They are not made for frequent switching and should not be used with presence detectors.
- **Metal Halide** lights are long lived, medium-efficiency lights used in many retail, outdoor and warehouse settings: they warm up slowly and are more expensive than other light types.
- **Light Emitting Diodes** (LED) are known for their extremely long life and very high efficiency. They can be used for interior, exterior and equipment applications. Although not classed as hazardous waste, they contain small quantities of lead, arsenic, nickel and copper. LED lights are expected to make up 70% of all lighting by 2020.

IMPACTS IF NOT MANAGED CORRECTLY: Fluorescent light bulbs containing heavy metals such as mercury are a hazardous waste stream and cannot be disposed of in mixed waste. If they break during use, transportation or disposal, they can release their toxic contents to land or waterways. Most lights contain valuable and toxic metals that may leach into soils/waterways and take up space if disposed of in landfills.

OPTIONS FOR REDUCING: LED lights have by far the longest lifespan for most lighting purposes and much lower levels of hazardous materials than fluorescent lights. The average lifespan for an LED light

is 25,000 hours, compared to just 1,000 hours for incandescent bulbs; and 10,000 for fluorescents (tube or CFL). The life of fluorescent lights is further reduced in areas where lights are switched on and off regularly as this shortens their lifespan. Seek advice when choosing lights that will be used with controls such as dimmers or motion sensors.

OPTIONS FOR RECYCLING: Most lights contain highly recyclable and valuable metals and many developed countries have comprehensive recycling schemes that will accept many kinds of lamps. The glass, metals and plastics are broken down into smaller pieces that are separated and sent on to other recycling plants for further recycling, and turned into something new.

Some countries have stringent laws requiring fluorescent tubes and CFLs to be recycled, so that the mercury and phosphor they contain can be safely collected and reused.

Some suppliers or manufacturers may offer a take-back scheme. Choose LED instead of fluorescent lights in countries that do not have hazardous waste facilities to recover the mercury.

OTHER OPTIONS (LAST RESORT): It is permitted to dispose of LED, halogen and incandescent light bulbs in your household garbage if you cannot find a recycling solution. CFL and fluorescent light bulbs contain mercury, therefore open dumping as well as burning at low temperature must be absolutely avoided. (They can be incinerated at high temperatures in appropriate specialist facilities). They can be brought to landfills (ideally engineered/sanitary type) in a sealed container as a last resort. If your waste is being incinerated, dispose of lamps separately; you should search a wider geographic area for proper disposal options.

OTHER COMMENTS: Energy efficient lights will also save you money on your energy bills as well as reducing greenhouse gas emissions. Governments around the world have passed measures to phase out incandescent light bulbs for general lighting in favour of more energy-efficient lighting alternatives. Phase-out regulations effectively ban the manufacture, importation or sale of incandescent light bulbs for general lighting.

DID YOU KNOW?
The energy consumption of one LED bulb is up to 10 times lower than an incandescent bulb and half of a fluorescent bulb.

ENDNOTES

1 McKinsey, 2012, Lighting the Way: Perspectives on the global lighting market.

UN environment GREENING THE BLUE. SAY YES TO LESS

FOR MORE INFORMATION, PLEASE VISIT WWW.GREENINGTHEBLUE.ORG/WASTE-MANAGEMENT