

1.3 DISTRIBUTION OF ENERGY FOR LIGHTING

Energy efficiency refers to the amount of energy required to provide appropriate light. The specific requirements of a lighting system depend on the type of tasks to be accomplished in a particular space.

Defining a specific lighting need is a rather complex task. It involves not only the measuring of (technical) parameters (e.g. illuminance, contrast, colour, temperature, etc.), but it is also

influenced by subjective perceptions, which vary from region to region, or even from person to person. For the purpose of the Technology Radar, different everyday lighting needs can be broadly classified into three groups, according to the types of spaces where light is required.

1. Domestic lighting.
2. Lighting the workplace (i.e. options for commercial and institutional buildings).
3. Lighting outdoor spaces.

There are undoubtedly numerous different specific lighting cases valid for each group. However, for each of these ‘lighting need groups’ it is possible to identify the conventional inefficient lighting technologies that are predominantly used. The search for superior options involves examining the different technical options available and comparing their energy demand

Much more than a lamp

Lamps are sources of artificial light and, therefore, are central elements of any lighting system. In most cases, however, both the quality of light and energy efficiency can be significantly improved by the correct selection of other ‘auxiliary’ elements of the system.

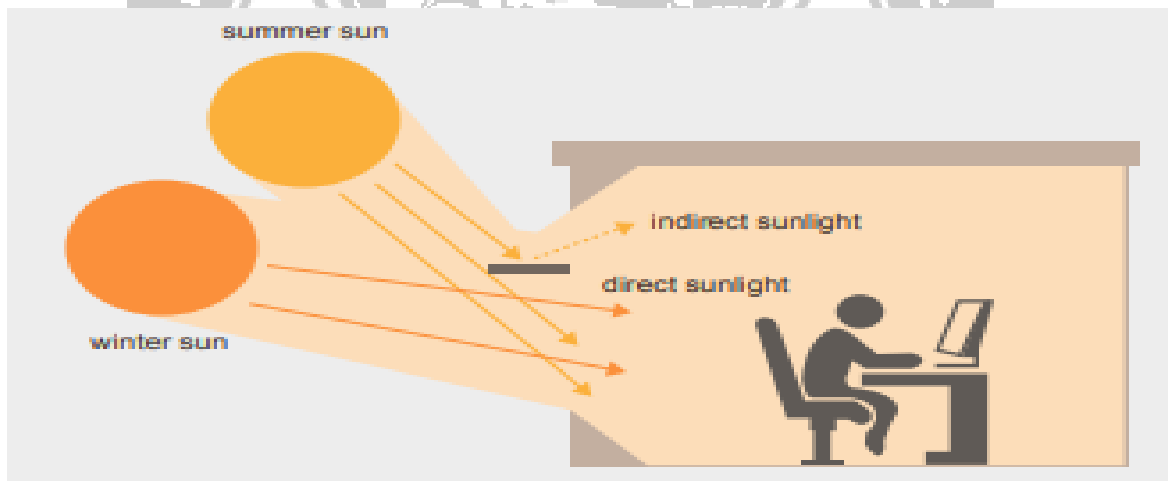
The most common perception sees the lamp as the device required to fulfil our lighting needs. However, when looking for more energy efficient ways to meet our needs, it is preferable to think in terms of lighting systems, i.e. a set of elements, which, by combining different functions and properties, provides

appropriate artificial light and avoids unnecessary energy losses.

The Technology Radar classifies the components that can make up an energy efficient lighting system into five groups:

- Components for improving the use of daylight
- Lighting controls
- Ballasts
- Luminaries
- Electric Lamps

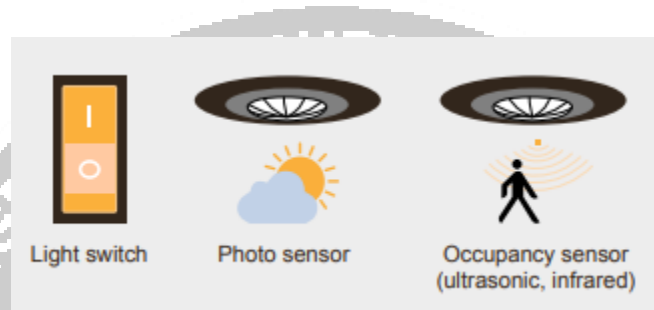
Components for improving the use of daylight



- Daylight is probably the most “energy efficient” lighting option. It seems also to have positive effects on health and productivity
- Harnessing natural daylight for lighting indoor spaces can be a complex task.
- The availability of daylight is constrained by the design of buildings. Issues such as the availability and orientation of windows
- The floor-to-ceiling height and the layout of the rooms influence the ingress of daylight as well as the options for distributing it within the building.

Lighting controls

Lighting control technologies comprise a combination of devices and control strategies that allow for the provision of lighting services that can be varied in accordance with actual levels of natural daylight and the needs of the location.



- Illuminated rooms (e.g. bathrooms), corridors or stairways that are empty during long periods.
- Rooms or corridors with large windows or transparent walls where electric lights are continually on regardless of the supply of natural daylight.

Ballasts



Ballasts are power regulation devices that are required by most electric lamps. The main function of electrical ballast is to ignite the lamp, limit the supply of electrical current, transform the voltage and correct the power factor.

In certain types of lamps, the ballast is already integrated into the commercial product, such as in the case of compact fluorescent lamps. However, for many applications