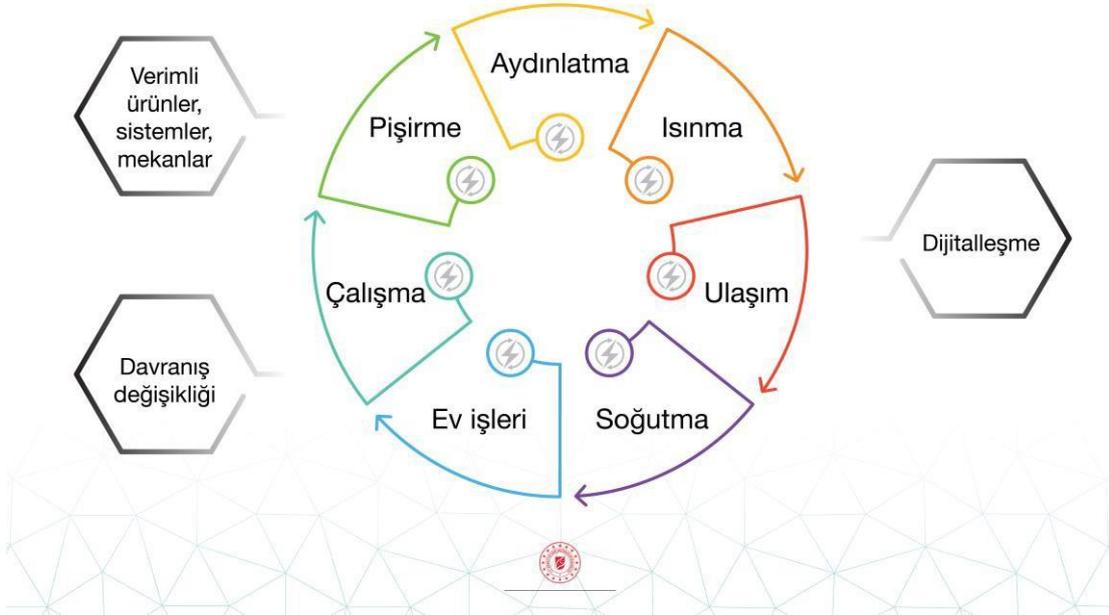




# Energy Efficiency at Work, at Home, on the Road

Department of Energy Efficiency and Environment

## İşte, Evde, Yolda Enerji Verimliliği



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## Energy Efficiency in Lighting

- ✓ Passive solar lighting should be used for natural lighting.
- ✓ Walls should be painted in light colors.
- ✓ Lamps with a high energy efficiency class (LED) label must be preferred.
- ✓ Lighting with a high luminous efficacy (lumen/watt) should be preferred.
- ✓ Lighting projects must be determined after lux meter measurements are made.
- ✓ Capacity greater than the comfort level should not be preferred.
- ✓ Motion sensor lights should be installed in the hallways, meeting rooms, and toilets.
- ✓ The dimming feature should be utilized.
- ✓ An automatic lighting control system should be used.
- ✓ Electrochromic/thermochromic smart glass windows should be preferred.
- ✓ Electronic ballast should be preferred instead of magnetic ballast.
- ✓ Streets, avenues, parks, and gardens should have LED lighting compliant with standards.

## Energy Efficiency in Heating and

- ✓ Deciduous trees should be planted in the south facade of buildings.
- ✓ Roofs, facades, floors, doors, and windows should be thermal-insulated.
- ✓ Curtains should be opened in the winter to make the maximum use of solar energy.
- ✓ Anything that can create a thermal bridge must be avoided.
- ✓ Appropriate seals should be used to prevent air leaks around doors and windows.
- ✓ At least double-pane windows should be used, and seasonal settings should be observed.
- ✓ Radiator reflectors should be installed behind radiators.
- ✓ All heat transfer obstructions around radiators must be removed.
- ✓ Curtains should not hang over radiators.
- ✓ Furniture should not be placed right in front of radiators.
- ✓ Thermostatic valves should be used on radiators in order to keep the ambient temperature constant.

## Energy Efficiency in Heating and

- ✔ (Smart) thermostats should be used.
- ✔ Double doors / revolving doors should be used at main entrances.
- ✔ Combi-boiler, radiator, fan coil unit maintenance and burner adjustment should be performed before the heating season starts.
- ✔ In combi-boilers and water heaters, the domestic water temperature should not exceed 40 °C.
- ✔ Instead of continuous ventilation, short and intensive ventilation should be used.
- ✔ A suitable size air conditioner with a high efficiency class should be used.
- ✔ The air inlet and outlet of the air conditioner indoor and outdoor unit should be free.
- ✔ The air conditioner indoor and outdoor unit should be protected from sunlight.
- ✔ When the air conditioner is on, it should not be immediately brought to a low temperature and the room should not be instantly cooled down.
- ✔ The blowing speed of the air conditioner should not be kept too high.
- ✔ The air conditioner outdoor unit should be placed in cool and shaded place.
- ✔ The connection pipes of the air conditioner outdoor unit should be insulated.

## Energy Efficiency in Heating and

- ✓ The flue gas temperature must be kept low (within chemical restrictions).
  - ✓ Boiler heat losses should be minimized.
  - ✓ Hot water/steam lines, chillers (cooling systems), fan coil lines must be insulated.
  - ✓ Valve insulation jackets should be applied to valves and flanges.
  - ✓ Heat sharing systems (heat cost allocator / calorimeter) should be used in buildings with central heating systems.
  - ✓ Combined heat and power (CHP) systems should be used.
  - ✓ Where technically feasible, heat pumps should be used.
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## Energy Efficiency in

- ✓ Walking or cycling should be preferred to travel to places within a short distance.
- ✓ Public transportation should be used.
- ✓ Braking suddenly or pressing on the gas should be avoided unless necessary.
- ✓ When the vehicle is stationary, the ignition must be turned off.
- ✓ Periodic vehicle maintenance must be performed.
- ✓ Windows should not be opened while riding in order to prevent air flow.
- ✓ Efficient driving techniques training must be received.
- ✓ Vehicles should not be overloaded. All unnecessary loads in the trunk must be removed.
- ✓ Tires with a high efficiency class must be preferred. Air pressure must be kept at the optimum level.
- ✓ Vehicles with high engine volume such as minibuses, pickup trucks, trucks, and off-road vehicles should not be preferred unless necessary.

## Energy Efficiency in

### Washing Machines, Dishwashers, Tumble Dryers

- ✓ Products with high energy classes must be preferred.
- ✓ The machine should not run at full capacity. Prewash should not be used unless necessary.
- ✓ Economic programs should be used.
- ✓ Using more than recommended amounts of detergent should be avoided.
- ✓ Detergent types that clean at low temperatures should be preferred.
- ✓ Preferably, the laundry should be hung to dry. Where it is necessary to use a dryer, high-efficiency dryer models with heat pumps should be preferred.
- ✓ The laundry should be washed at temperatures as low as possible.
- ✓ Dishwashers with quick wash or rinsing cycles should be preferred.
- ✓ The dishwasher should have a low-temperature program setting.
- ✓ Leftovers on plates should be wiped off with the napkins used during the meal.

# Energy Efficiency in

## Vacuum Cleaners, Hair Dryers, Irons

- ✓ Among models with the same suction power, the one with the lowest electricity consumption should be preferred.
- ✓ Instead of vacuums with bags, vacuums with water tanks should be used.
- ✓ In vacuums with bags, vacuum bags should be frequently emptied.
- ✓ While taking a shower, an hourglass should be kept in the bathroom. The shower duration should not exceed 4 minutes.
- ✓ Instead of cooling the hot water with cold water, the water temperature must be lowered on the combi-boiler.
- ✓ Shower heads that consume less water should be preferred. Aerators should be used.
- ✓ The temperature of the hair dryer should be kept at the lowest.
- ✓ Hair should be dried with a towel as much as possible.
- ✓ When buying an iron, those with low drying power and high steam capacity should be preferred.
- ✓ Before ironing, the laundry should be hung on the hanger and should be damp while ironing.
- ✓ The iron should be unplugged a few minutes before the ironing is finished in order to take advantage of the remaining heat.

## Energy Efficiency in

### Ovens, Stoves, Kettles

- ✓ If possible, the oven door should not be opened till the end of the cooking time.
- ✓ The oven should be closed 5-10 minutes before the end of the cooking time.
- ✓ Oven gaskets should be checked to make sure that heat is not leaking.
- ✓ In winter, after cooking, the oven door should be kept open, and the heat of the oven should be used to heat the room.
- ✓ The lids of pots and pans should be put on while cooking.
- ✓ Pressure cookers and steam cookers should be used for cooking.
- ✓ The lid should be on while cooking.
- ✓ Water should be heated only as much as needed. If possible, a gas stove should be used for heating. The lid should be on while heating water.
- ✓ For heating small amounts of food, microwaves should be used instead of ovens.

# Energy Efficiency in

## Refrigerators and Deep Freezes

- ✓ Refrigerators or freezers with a capacity larger than needed should not be purchased.
- ✓ The refrigerator temperature should be set to +4 °C, the freezer temperature should be set to -18 °C.
- ✓ The refrigerator should be placed away from sunlight or heat-emitting appliances such as ovens or radiators.
- ✓ There should be a distance of 10-15 cm between the wall and the refrigerator.
- ✓ Hot food should be chilled down before putting in the fridge.
- ✓ Frozen food taken out of the freezer should be thawed in the fridge.
- ✓ Food should be placed in the refrigerator in a way to leave enough room to allow for good air circulation.
- ✓ Refrigerator seals, gaskets, and rear condenser should undergo periodic maintenance.
- ✓ Food must be packaged to prevent moisture formation.
- ✓ The unnecessary parts of the protective packaging of food should be removed.

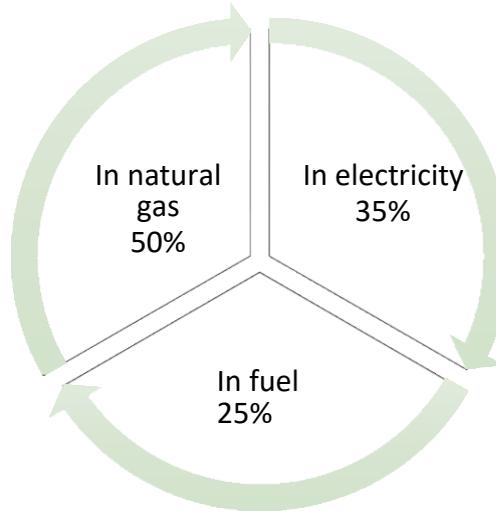
## Energy Efficiency at Work

- ✓ In offices, computers should be put into sleep mode when taking short breaks.
- ✓ Devices should not be kept in standby or sleep mode. They should be turned off.
- ✓ A single publicly-available printer should be used for all employees.
- ✓ When printing documents, less color and unfilled shapes should be preferred.
- ✓ Elevators should not be used on lower floors as much as possible.
- ✓ It should be made sure that office devices such as computers, printers, and paper shredders bear the “Energy Star” sign.
- ✓ If possible, laptop computers should be used instead of desktop computers.
- ✓ The optimal screen brightness should be preferred to maintain eye health.
- ✓ Unnecessary printouts should not be taken. Due care should be shown to work in an electronic environment.

## Energy Efficiency in Entertainment

- ✓ The optimal screen brightness should be preferred to maintain eye health.
- ✓ Televisions with screens larger than needed should not be preferred.
- ✓ The volume level of devices such as TV or radio should be at a level that can be heard.  
The volume should be kept low.
- ✓ Contrast should not be increased more than necessary on TV.
- ✓ TV, multimedia, and game systems should not be left on standby. They should be turned off by pressing the power button.
- ✓ Modems and satellite receivers should be turned off when not in use.
- ✓ Extension cords with an on/off switch should be used.
- ✓ Chargers should not be left plugged in the power socket.

## Energy Saving to Be Achieved If All Recommendations



## Digitalization in Energy

- ✓ Smart Home Systems
- ✓ Remote-controlled, internet-enabled home appliances, AI-enabled heating-cooling systems,
- ✓ Real-time tracking sensors and software,
- ✓ Automated vehicles
- ✓ The smart city concept,
- ✓ The Blockchain-based lifestyle concept
- ✓ Digital economy and circular economic developments, should be closely followed.

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## Do You Know These?

- ✓ A traditional light bulb converts 80% of energy to heat.
- ✓ Energy efficient lamps use 80% less energy, and last 25 times longer.
- ✓ Motion sensitive light sensors offer up to 75% additional energy savings.
- ✓ Dimming offers up to 50% additional energy savings.
- ✓ General lighting consumption is 4 TWh, which corresponds to 1.5% of the nationwide consumption.
- ✓ Lowering the room temperature by just 1 degree saves 7% energy
- ✓ Facade insulation saves at least 35% energy.
- ✓ Radiator reflectors placed behind radiators saves up to 6% energy.
- ✓ Heat loss from an uninsulated valve = Heat loss from a 2.5 meter pipe of the same diameter.
- ✓ In the UK, living spaces are 21°C and bedrooms are 18 °C.
- ✓ Reducing the heating temperature by just 1 degree saves 20 billion m<sup>3</sup> natural gas in the EU.
- ✓ Every 100 kg unnecessary load on the vehicle causes an additional fuel consumption of 1 liter per 100 kilometers.

- ✓ 0.5 bar less air in the tires accounts for 5% more fuel consumption
- ✓ Vehicles with internal combustion engines emit 14 kg of carbon dioxide per 100 km, while an electric vehicle emits 8 kg of carbon dioxide.
- ✓ Unplugging the iron a few minutes before finishing ironing saves 5% energy.
- ✓ Reducing the shower duration by just 1 minute saves 18 tons of water per capita.
- ✓ Regularly cleaning the filters of vacuums saves %10 energy.
- ✓ Hair dryers use almost 95% of their energy to heat air and only 5% to blow it
- ✓ Every time the oven door is opened, 20% of its heat is lost.
- ✓ Placing the refrigerator closer to heat sources such as an oven or a radiator accounts for up to 10-20% percent more energy consumption.
- ✓ Cooking with lids on saves 60% energy.
- ✓ In refrigerators, energy consumption is reduced by 20% from class F to Class E.
- ✓ Heating small amounts of food in the microwave saves %50 energy.

- ✓ Adjusting the burner flame to heat only the bottom of the pot saves 30% energy.
- ✓ Heating water on the stove instead of electric kettles accounts for 2.5 times less energy consumption.
- ✓ The indoor temperature in the office should be a maximum of 22 °C in the winter and a minimum of 24 °C in the summer.
- ✓ The indoor temperature in government offices in Japan is a maximum of 20°C in the winter and \_\_\_\_\_ a minimum of 28°C in the summer.
- ✓ The indoor temperature in government offices in Germany is a maximum of 19°C.
- ✓ A printer left on standby overnight uses enough energy to produce 1,500 copies.
- ✓ A desktop computer consumes five times more energy than a laptop computer.
- ✓ The residential standby energy loss is 1TWh per year.
- ✓ Energy management systems, early fault detection, and artificial intelligence applications yield up to %30 energy saving.

- ✔ Digital technologies and preventive maintenance practices reduce machine downtimes by 30-50%.
- ✔ 1 billion smart homes, and 11 billion smart home appliances by 2050.
- ✔ 82% of the organizations with smart production practices have increased their efficiency.
- ✔ The global energy demand of the building sector is expected to be reduced by 10% by the year 2040 through digitalization.
- ✔ Digitalization applications in transportation also hold the potential to save 25% energy in freight and passenger transportation.

**#aklınlaVerimliyaşa**