

Building owners/managers and responsables for repair and maintance

Every **public building** is used by many people each day: visitors,workers, service persons, etc.

Studies and common practice are unanimous in saying that **user behaviour matters** a lot when it comes to improving energy efficiency and reducing the building's carbon footprint. Even the technical-only measures one can adopt (such as a building's retrofitting) are less effective or more expensive if carried out in isolation.

What follows is a collection of tips to improve your own energy efficient behaviour when visiting or working in a public building.

Are you a building owner? Then you may want to hang this set of cards in a visible area of your building.
Are you a building user? Then feel free to read, comment, and share the following contents with your peers.

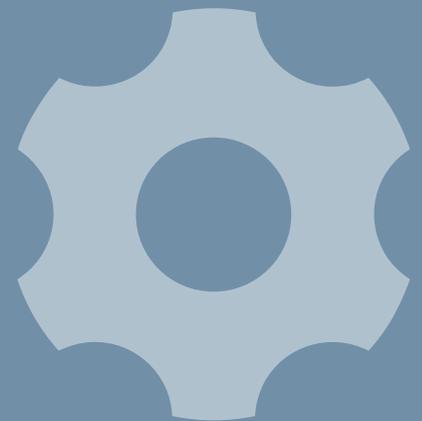
We hope you will enjoy, at least some of, these tips and take stock of them to achieve real behavioural change!



Building owners/ Managers

Prepare for change

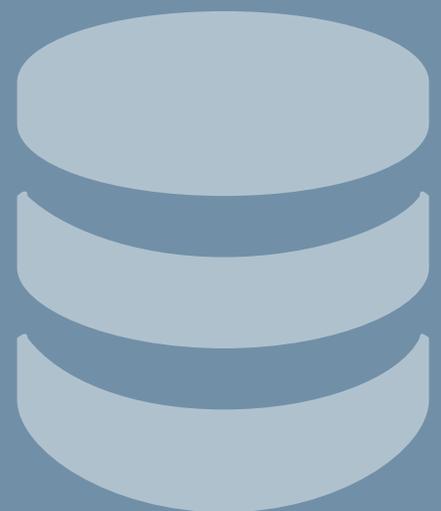
- Set up a to do list for Energy Efficiency improvements.
- Analyse the possibility to change contracts with utility companies.
- Set up energy performance contract with building manager.
- Seek grants and allocate budget on energy efficiency investments.



Building owners/ Managers

Invest in

- Audits and energy certificates.
- Smart metering systems.
- Trainings and communication actions.



Building owners/ Managers

Get informed

- Know the building.
- Know the users.
- Know the consumption patterns.
- Be aware of gaps and problems.



Building owners/ Managers

Mobilize the building's actors

- Explain proper building use to occupants.
- Communicate roles and tasks (e.g. to cleaning staff).
- Share with the building occupants the details of the energy bills paid.
- Instruct the building occupants on the functioning and use of the thermostats to control heating.
- Inform the building occupants on the benefits of turning idle devices off before leaving the room.
- Squeeze the work schedule to reduce the number of hours of lighting / heating / air conditioning.
- Allow employees to work from home every now and then (e.g. on alternate days or for specific tasks).



Responsibles for repair and maintenance

Building shell

- Use silicone, putty or draught excluder to reduce air infiltrations through windows and doors.
- Seal air leaks located in all cavities present in the building.
- Inspect regularly wood and aluminum window frames to spot cracks exposing to moisture or decomposition.
- Add a low emissivity window film to reinforce thermal insulation of glass.
- Add a solar control window film decreasing the amount of energy that passes through the glass.
- Clean windows periodically to allow a good penetration of natural light in the building.
- Improve insulation of roller shutter box, which is often a significant point of air leakage.
- Install a sealed roller tape guide, removing the thermal bridges due to air infiltrations in its openings.
- Do periodic maintenance of room surfaces to keep their reflection coefficient high over time.



Responsibles for repair and maintenance

Heating system

- Appropriate thermostat program for heating, hot water and cooling, etc.
- Disconnect the electric domestic hot water tank in case it is not working for more than three days.
- Install thermostatic radiator valves.
- Install a radiator booster.
- Verify the correct operation of the ventilation system's timers and controls.
- Analyze the combustion and maintenance of heating boilers.
- Put silver foil behind radiators to avoid heating the wall and reflecting heat back into the room.
- Add or repair HVAC distribution system (ducts & pipes) insulation, to reduce losses in distribution.



- Install a programmable thermostat.
- Relocate thermostats to appropriate areas.
- Install dampers on flue gas ducts.
- Install motion sensors for HVAC systems.
- Analyze the combustion and maintenance of heating boilers.
- Install a control system to keep temperature stable of the heating and cooling equipment.
- Clean the radiator surfaces from accumulated dust, acting like a layer of insulation.
- Purge radiators at the beginning of the heating season from the air trapped in the system.



Responsibles for repair and maintenance

Domestic hot water

- Add or repair domestic hot water storage tank insulation.
- Add or repair domestic hot water distribution systems.
- Maintain and inspect domestic hot water electric pumps.
- Install a timer for the domestic hot water recirculation pump.
- Install a timer for the domestic hot water boiler.
- Install mixing valves in the outlet of the DHW tank.
- Install taps with flow reduction (faucet aerator).
- Add or repair water heaters insulation.
- Install thermostatic taps.



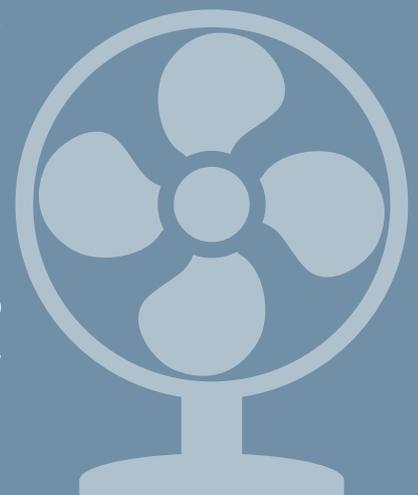
- Lower the domestic hot water temperature set-point at 60° C or lower (40° C) if the system has protection against legionella.
- Fix the dripping taps in public restrooms to prevent leakages and save water.
- Clean the domestic hot water tank and heat transfer surfaces to avoid sediments.
- Adjust the temperature of the thermostat so that it stays below 21° C in winter and above 25° C in summer.
- Add or repair boilers insulation to protect people from contact with hot surfaces and keep water hot for long.



Responsibles for repair and maintenance

Mechanical ventilation, cooling and air conditioning

- Upgrade and maintain the filters of the HVAC system clean from dust reducing the efficiency of the coils.
- Use ceiling fans instead of air conditioning when possible.
- Verify the correct operation of the ventilation system's timers and controls.
- Install humidity sensors.
- Place the condenser unit in a ventilated area without solar radiation.
- Clean heat exchangers of chillers.
- Install an efficient destratification fan system.
- Use free-cooling to renew the inside air of a room, to avoid starting up the compressor of the cooling system.



Responsibles for repair and maintenance

Electronic appliances and elevators

- Draft a “last out = power down” checklist(*) related to:
 1. all lights, including bench and desk lamps
 2. coffee machines
 3. UV lamps
 4. water chillers
 5. ovens
 6. water baths
 7. shakers
 8. computers (unless marked to be left on)
- Reduce the number of personal printers and replace them with a common networking one.
- Organize multiple printing or photocopying jobs to avoid switching the equipment on & off.
- Disconnect the vending machines in case they are not working for long time (e.g. during holiday).
- Fit timers to equipment, so they are only on when needed.
- Identify power-hungry equipment and adopt an energy efficient pattern of use.



- Remove refrigerators from places next to heat sources (including other appliances).
- Install coffee machines with thermal jugs and vacuum insulation to keep coffee warm for long.
- Deploy multiple power strips with switch in all rooms and/or programmable plugs.
- Deploy solar chargers to charge mobile phones or other portable devices.
- Use paper towels to dry hands in restrooms instead of electric dryers.
- Regularly inspect and maintain the elevator system, to foresee breakdowns and prevent malfunctions.

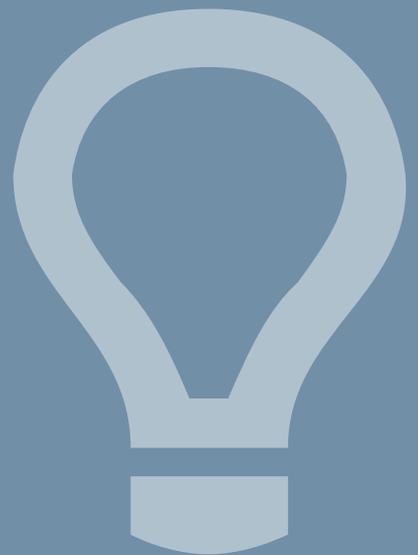
(*) If you would like to see an example of a “last out = power down” check-list you can download the following document:
https://www.sheffield.ac.uk/polopoly_fs/1.250149!/file/shutdownchecklist2013.



Responsibles for repair and maintenance

Lighting

- Install motion sensor faucets .
- Change to accent lighting where possible.
- Foresee lighting zoning through manual switches.
- Optimize interior security lighting.
- Regularly clean and maintain lamps and luminaires to increase visual comfort of users and energy savings.
- Reduce the number of lamps where lighting levels are acceptable and measured as such via a light meter.
- Reduce the number of luminaires where lighting levels are acceptable and measured as such via a light meter.
- Foresee different lighting scenarios for the same room depending on the activities done therein.
- Place floor lamps and hanging lamps in room corners to exploit reflection of light into the walls.
- Combine general lighting with task lighting allowing to concentrate light only where and when it is needed.



About the project

The purpose of this leaflet is to familiarize the buildings' end- users with efficient use of buildings. The publication was co-funded by the INTERREG TOGETHER project. The project aims at increasing the energy efficiency of public buildings and encouraging the use of renewable energy sources. Complex (technological, financial, and managerial) solutions are being developed and tested, which need no or minimal investment, and try to save energy (and money) by changing attitudes. The project will result in an innovative energy management approach based on international experience and the involvement and commitment of the operators, users, and tenants of public buildings (i.e. parties having a vested interest in the maintenance of the infrastructure). Seven Central European countries collaborate in the project: Italy, The Czech Republic, Slovenia, Croatia, Poland, Hungary, and Slovakia. Representatives of various sectors, such as municipalities, scientific institutions, and energy authorities cooperate for the success of implementation.

Project website: www.interreg-central.eu/together
Facebook: www.facebook.com/TogetherPRTV2016

