Initiative
Energieeffizienz- und
Klimaschutz-Netzwerke

List of Short-Term Measures to Save and Substitute Energy at Companies

In view of increased natural gas and electricity prices, many companies are facing the challenge of reducing their short-term energy consumption. To this end, the Initiative Energieeffizienz- und Klimaschutz-Netzwerke (Initiative for Energy Efficiency and Climate Protection Networks) presents practical measures, which are both low in cost and easy to implement. These help companies in industry, commerce and the service sector to reduce their energy consumption and mitigate the rising cost of energy.

Categories of Measures

Organisational measures – people-oriented

Measures that aim at raising awareness amongst employees and encourage changes in behaviour to reduce the amount of energy consumed.

Organisational measures – technically oriented

Measures that generate energy savings by adapting and optimising energy-consuming equipment and systems as well as technical processes.

Low-cost measures, i.e., any measures that cost less than about €1,000

Measures with extremely low associated costs compared to the potential gains in energy efficiency, such as the optimisation of heating and cooling systems or compressed air systems.

Implementation Period

Quick to implement, i.e., in under four weeks

Measures:

- ☐ Adjustment of operational processes: Set up a task force on energy-related issues
- ☐ Adjustment of operational processes: If necessary, change how offices are laid out/partitioned; place several people in one office for efficient use of heating (if required, take into account how different people may feel comfortable at different temperatures)
- ☐ Adjustment of operational processes: Set energy efficiency and energy substitution targets for a defined time period
- ☐ Adjustment of operational processes: Check tyre pressure of the company trucks more frequently to reduce diesel consumption that could have been avoided
- ☐ Adjustment of operational processes: Speed up planning on major investments in energy efficiency and substitution that are already under consideration
- ☐ Adjustment of operational processes: Place signs or stickers with energy-saving information at suitable locations (e.g., on the wall next to the radiator valve)
- ☐ Lighting: Switch off the lights in rooms that are not in use or that receive a lot of sunlight during the day
- ☐ Office/IT/administration: Use only one monitor at office workstations
- ☐ Office/IT/administration: Switch off electronic devices when not in use and do not run them in standby mode; use timers or power strips with an on/off switch
- ☐ Compressed air: Switch off compressed air operation in full or in part when not in use (e.g., at the weekend)
- ☐ Compressed air: Remove manually operated compressed air guns or limit their use
- ☐ Active employee involvement: Invite energy and environmental managers from other companies to learn more about best practice measures
- ☐ Active employee involvement: Temporarily dispatch energy scouts to companies nearby or use the services of energy scouts sent by neighbouring companies
- ☐ Active employee involvement: Conduct a competition among employees to generate ideas on further energy efficiency and energy substitution measures
- ☐ Active employee involvement: Identify opinion leaders (group members who pick up information early and communicate widely; informal social role independent of formal position) to actively involve them during the implementation of measures
- ☐ Active employee involvement: Offer in-house training options to employees with the prospect of further training (e.g., interim energy officers)
- ☐ Active employee involvement: Take targeted measures to increase intrinsic motivation through speeches, information as well as offerings with anadditional value for employees
- ☐ Active employee involvement: Introduce regular group meetings with machine operators to present examples of successful optimisations

Measures:

- ☐ Active employee involvement: Regularly communicate progress regardingenergy efficiency and energy substitution as well as the price of natural gas and electricity to employees
- ☐ Active employee involvement: Raise awareness among staff through targeted meetings (e.g., 'leakage table')
- ☐ Cooling and ventilation: Open windows all the way to vent room instead of leaving window tilted open
- ☐ Heating: Avoid using air-conditioning systems for heating; check and adjust outgoing temperature and thermostat settings
- ☐ Heating: Regularly bleed radiators; clear radiators that are blocked by furniture and remove panels or cladding
- ☐ Heating: Optimise the heating curve by reducing the room temperature by at least 1°C (minimum temperature: 19°C) when in use; when rooms are not in use (at night and at the weekend), set the temperature even lower
- ☐ Heating: Reduce hot water consumption by reducing the amount of and time during which hot water is available, e.g., temporarily or completely switch off instantaneous water heaters
- ☐ Heating: Keep doors and gates closed and re-close them immediately after use
- ☐ Heating: Separate the tap from the central circuit and only provide cold water

- ☐ Adjustment of operational processes: Avoid business trips and hold online appointments using video conferencing tools. Use public transport when business trips cannot be avoided
- ☐ Lighting: Reduce lighting to the minimum level required, avoid shading or multiple/too many lights, unscrew lamps if they are not needed
- ☐ Compressed air: Do not allow hoses to bend or crimp to improve the flow of compressed air
- ☐ Compressed air: Optimise compressed air generation such as by lowering the level and range of pressure
- ☐ Compressed air: Locate and repair compressed air leaks using an ultrasonic locator to optimise flow of compressed air
- ☐ Compressed air: Reduce compressed air at the weekend and during the night as a control measure
- ☐ Active employee involvement: Reduce speed when travelling on motorways
- ☐ Cooling and ventilation: Adjust the cooling temperatures: Flexible setpoint temperatures/range-based control, do not use rigid setpoint temperatures and increase standard range
- ☐ Cooling and ventilation: Reduce the speed of air-conditioning systems during non-production times; reduce the flow rate, e.g., increase the outgoing temperature at the weekend
- ☐ Cooling and ventilation: Switch off air conditioning or switch to free cooling in the winter
- ☐ Cooling and ventilation: Reduce the air exchange rate
- ☐ Cooling and ventilation: Cleaning, maintenance and servicing of outdoor air conditioning units
- ☐ Cooling and ventilation: Change temperature in server rooms and clean rooms, increase target temperatures and adjust at the weekend and during the night

Measures:

- ☐ Cooling and ventilation: Increase the target temperature or adjust the flow temperature to the outside temperature ('cooling curve'; analogous to the heating curve).
- ☐ Machines and process technologies: In the case of pump sets (often three pumps), leave the third or last pump switched off
- ☐ Machines and process technologies: Reduce temperature as much as possible during washing processes
- ☐ Machines and process technologies: Use electric slider in unused lines
- ☐ Machines and process technologies: Optimise pump flow (optimise volume only as required)
- ☐ Machines and process technologies: Perform regular maintenance on electric motors, which includes thoroughly cleaning the machine and checking lubricants, bearings, collectors and coils (also measure the insulation resistance)
- ☐ Machines and process technologies: Regularly lubricate/oil moving parts, e.g., conveyor belts and roller conveyors
- ☐ Machines and process technologies: Switch off machines and equipment during work breaks where this can be done easily
- ☐ Cross-sectional technologies: Measure electricity and gas consumption during production shutdowns; based on this, check all equipment during a plant tour and switch off if the equipment is not being used and does not need to be kept in standby mode
- ☐ Cross-sectional technologies: Regularly search for leaks in vacuum lines and connections/applications, compressed air systems and lines as well as refrigeration systems and lines
- ☐ Cross-sectional technologies: Check the boiler or heating system and perform regular maintenance (times, temperatures, use of condensate heat from flue gas and steam units)
- ☐ Cross-sectional technologies: Check (automatic) timers to ensure that time is set correctly and adjust if necessary
- ☐ Heating: With gas condensing boilers, reduce flow and return temperatures to improve efficiency during generation
- ☐ Heating: To provide additional thermal insulation for the shell of the building, automatically lower roller shutters and slats at night
- ☐ Heating: Switch off heating completely during the summer period; switch off the local heating network

- ☐ Insulation: Insulate fittings, flanges and condensate tanks
- ☐ Compressed air: Replace old compressed air guns with efficient models
- ☐ Compressed air: Replace fittings, existing couplings, blow-off valves, spiral hoses and plug nipples with low-loss models
- ☐ Cooling and ventilation: Optimise the ventilation drive of the fan and install an automated control system; if necessary use a frequency converter for variable volume flows; check the recirculation control system
- ☐ Heating: Install electronic thermostatic valves

⏳ Short-term measures, implemented in up to two months

Measures:

- ☐ Adjustment of operational processes: Present the potential savings from the measures and the natural gas saved in monetary terms
- ☐ Adjustment of operational processes: Develop energy-saving checklists for individual operating areas. Announce small budgets for low-cost measures at the checklist meeting
- ☐ Adjustment of operational processes: Invite expert speakers to lecture on special topics relating to energy efficiency (presentation and company tour)
- ☐ Adjustment of operational processes: Report monthly/weekly energy consumption of the production unit (feedback exchanged between production staff and managers) to raise awareness for the targets defined for the end of the yearrespectively
- ☐ Adjustment of operational processes: Increase motivation and awareness of employees through information events, working groups, competitions and internal communication
- ☐ Adjustment of operational processes: Optimise staffing at workstations and in production units regarding holiday leave oremployees working reduced hours
- ☐ Adjustment of operational processes: Make regular use of energy scouts to identify energy loss
- ☐ Adjustment of operational processes: Remind employees of or set up a new suggestion system for organisational or low-cost measures and be clear in giving praise
- ☐ Active employee involvement: Emphasize recognition of employees in their professional and social environment (e.g., through family, customers, sub-suppliers, colleagues, etc.) by showing their commitment to saving energy in the regional press, for example
- ☐ Active employee involvement: If there are no energy scouts at the company yet, ask capable trainees to participate in available trainings. In Germany, energy scout courses are offered by the GermanChamber of Industry and Commerce
- ☐ Active employee involvement: Train the drivers who operate straddle carriers, telescopic handlers, waste disposal vehicles, forklift trucks and wheel loaders with regard to energy-efficient operation of the vehicles

- ☐ Adjustment of operational processes: Load profile management for electricity and gas, in particular to reduce peak loads
- ☐ Adjustment of operational processes: Manually decommission high-speed steam generators
- ☐ Adjustment of operational processes: Optimise the operation of tunnel and continuous furnaces
- ☐ Adjustment of operational processes: Inspect parts of equipment and check if it is necessary to operate them; if possible reduce operating times
- ☐ Adjustment of operational processes: Regularly read energy consumption/heat meters and compare with target/expected value; carry out regular load curve analyses
- ☐ Lighting: Demand-oriented control (install motion detectors, presence detectors, switch-off device)
- ☐ Insulation: Insulate lines and fittings
- ☐ Compressed air: Check the required compressed air quality during generation

Measures:

- ☐ Compressed air: Distribution – provide intermediate buffer storage upstream of devices with a frequently cycling load
- ☐ Compressed air: Preventive maintenance (e.g., filters, clamps, (overrun) timers) during generation
- ☐ Compressed air: Zone distribution lines, (automatically) shut off individual areas for faster detection of leaks
- ☐ Cooling and ventilation: Use trees/plants as sources of shade and for natural cooling/to improve the indoor air quality
- ☐ Cooling and ventilation: Add/use cooling lubricant and auxiliary media only as required
- ☐ Cooling and ventilation: Optimise or install heat recovery units in air-conditioning systems
- ☐ Machines and process technologies: Install auxiliary heating system that is decoupled from the engine on company trucks
- ☐ Machines and process technologies: Operate systems only as needed, e.g., by minimising the preheating of system, switching off systems immediately after the end of the process and reducing stand-by consumption through suitable measures; reduce ‘safety buffers’
- ☐ Machines and process technologies: Draw up an overview of heat sources and sinks in the company and check whether they can be used to preheat water, burner air or fuels
- ☐ Cross-sectional technologies: Purchase green electricity (or increase the share of green electricity) or natural gas with biogas component (usually 10 per cent) in order to reduce natural gas consumption
- ☐ Cross-sectional technologies: Prioritise the use of existing oil, LPG or wood-fired boilers to reduce natural gas consumption
- ☐ Heating: Check whether possible to switch from steam to the use of warm or hot water

- ☐ Lighting: Install efficient lamps or lighting systems (LED)
- ☐ Insulation: Increase insulation in heat-intensive systems and processes (e.g., extrusion machines, curing/nitriding furnaces) to minimise radiation losses
- ☐ Insulation: Insulate or re-insulate pipes, window, door and gate seals, warm/hot water fixtures, steam and thermal oil pipelines and storage tanks as well as condensate collection stations
- ☐ Compressed air: Optimise air intake on air compressors, e.g., reduce intake temperature
- ☐ Cooling and ventilation: With high-speed doors, analyse the door opening and set automatic opening and closing if necessary
- ☐ Cooling and ventilation: Retrofit summer thermal insulation for room cooling (e.g., heat shields for glass roof surfaces) or, if shading is possible, equip the switches with a timer or other controller
- ☐ Heating: Partition off areas that can be heated in large halls and rooms
- ☐ Heating: Replace old, inefficient heating pumps with high-efficiency pumps rated to the required performance class (avoid over-dimensioning)
- ☐ Heating: Repair the economiser of steam boilers
- ☐ Heating: Condensation of steam vapours in hot baths via drip trays, etc.

Medium-term measures, implemented within a few months

Measures:

- ☐ Adjustment of operational processes: Implement energy controlling and/or simple energy management in order to continuously monitor energy consumption and energy-saving measures
- ☐ Active employee involvement: Have in-house employees trained (technical maintenance) duringappointments with external maintenance companies, so that they can subsequently carry out the tasks themselves
- ☐ Active employee involvement: Commend highly energy-efficient production groups or machine operators

- ☐ Adjustment of operational processes: Change the storage locations in the high-bay warehouse/plant warehouse to adapt to a modified upstream product/product structure as well as quantities to reduce demand for electricity or diesel (for forklift trucks and wheel loaders, for example)
- ☐ Lighting: Design bright interior spaces, install mirrors/use light chimney
- ☐ Office/IT/administration: Use highly efficient IT hardware
- ☐ Compressed air: Use compressed air conditioning/steam traps during generation
- ☐ Compressed air: Use boosters to avoid excessively high volumes of compressed air being held in reserve
- ☐ Compressed air: Decentralise generation at different pressure levels
- ☐ Compressed air: Use a higher-level controller for several compressors
- ☐ Compressed air: Check and optimise cable cross-sections, dimensioning and routing to ensure optimised distribution
- ☐ Compressed air: Use high-efficiency compressors in production
- ☐ Cooling and ventilation: Use alternative cooling sources, e.g., river water, groundwater, etc.
- ☐ Cooling and ventilation: Adapt fans to the ventilation requirements (take non-productive times into account) or reduce the exhaust air volume flow when using electrostatic filters
- ☐ Cooling and ventilation: Automatically control recirculating air heaters
- ☐ Cooling and ventilation: Insulate the duct system
- ☐ Cooling and ventilation: Top up refrigerant
- ☐ Cooling and ventilation: Segregate consumers based on required temperature/set up different temperature circuits; enclose areas or systems that are cooled when in use and operation
- ☐ Machines and process technologies: Perform data-based evaluation of individual power units (e.g., fouling of heat exchangers by monitoring of heat transfer coefficients) in order to clean them at the right time
- ☐ Cross-sectional technologies: If possible, offset inefficient manual operation through automation (e.g., light barriers/infrared sensors with switching functions)
- ☐ Heating: Integrate waste heat from other sources (air compressors, chillers, server rooms, process waste heat, dryers, etc.) into generation

Measures:

- ☐ Heating: With taps that are actually used, replace the domestic hot water tank with a combination of domestic hot water tank and heat pump
- ☐ Heating: Use heat pumps where this can be quickly implemented
- ☐ Heating: Decommission boiler units

- ☐ Office/IT/administration: Switch to virtual servers (transfer physical servers to the cloud)
- ☐ Insulation: Insulate factory roofs (from the inside) by spraying on insulating material; apply reflector foils behind wall-mounted radiators
- ☐ Compressed air: Replace compressed air tools with other technical alternatives
- ☐ Compressed air: Centralise vacuum systems
- ☐ Cooling and ventilation: Check the installation location (shaded, well ventilated, etc.), north side/subsequently shade from sun
- ☐ Cooling and ventilation: Maintain and optimise distribution and components – regularly clean the heat exchanger surfaces, especially the air coolers
- ☐ Machines and process technologies: Blow-off droplets (using a low-pressure blower) on production parts before they enter the thermal dryer
- ☐ Machines and process technologies: Restructure the piping in hot baths/electroplating plants with different temperatures following examination by means of the pinch method
- ☐ Machines and process technologies: Reverse the polarity of electrostatic filters for exhaust gas cleaning at higher temperatures
- ☐ Cross-sectional technologies: Replace older electric drives with high-efficiency electric motors (rather than old, stock units where appropriate)
- ☐ Cross-sectional technologies: Procure measuring devices to determine energy losses (digital timers with power consumption measurement, laser pyrometer, infrared camera, CO_2 measurement, residual oxygen measurement, ultrasound for compressed air leaks, voltage and current meter, etc.)
- ☐ Cross-sectional technologies: Replace dark radiators with panel radiators
- ☐ Cross-sectional technologies: Replace mechanical steam trap with Venturi trap (avoid steam loss during condensate discharge)
- ☐ Heating: Procure district heating or wood chips instead of natural gas where possible, i.e., where connections/infrastructure are available
- ☐ Heating: Use hydraulic heat recovery to supplement the heating system
- ☐ Heating: Use ceiling fans for air circulation
- ☐ Heating: Check hydraulic balancing on appropriate heating systems/frequency converter controller/pump performance
- ☐ Heating: Disconnect the tap from the central circuit and install an electronic instantaneous water heater (230 V model)

Initiative Energieeffizienz- und Klimaschutz-Netzwerke

The Initiative Energieeffizienz- und Klimaschutz-Netzwerke (Initiative for Energy Efficiency and Climate Protection Networks) supports companies of all sectors and sizes to implement measures for greater energy efficiency and climate protection.The network initiative is supported by 21 business associations and organizations and the German federal government as project partners.

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The Initiative Energieeffizienz- und Klimaschutz-Netzwerke supports

80 MILLIONEN GEMEINSAM FÜR ENERGIEWECHSEL

Project partners of the initiative

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The list of short-term measures is continuously being updated and can be downloaded in English and German at www.effizienznetzwerke.org. In addition, selected measures are further described in more detail in factsheets (in German) and published on the website.