Energy Saving Measures

EMAS Days 2023

28 November 2023
# Overview

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Introduction

World Energy Outlook
Today's energy shortages and high prices make it more important than ever to use energy wisely.
Global energy landscape has been characterized by uncertainty and fragility. While some of the immediate pressures have subsided, fossil fuel prices remain volatile.

Effects of climate change are already visible, global average surface temperature is 1.2 °C above pre-industrial levels. Urgent global cooperation is needed to tackle climate change and energy security challenges.

**IEA’s World Energy Outlook**

- **New clean energy economy**
  - Increasing presence of solar PVs and electric vehicles.
  - Growing momentum towards a cleaner energy future.

- **End in sight for fossil fuels**
  - On-track to see peak demand before 2030. IEA sees the beginning of the end for the fossil fuel era.

- **Role of renewables**
  - Solar PV expected to contribute significantly to new power capacity, however there is still unexploited growth potential.

Ed Hawkins, University of Reading, https://showyourstripes.info/ro/globe
Survey Results
Energy sources and general energy savings

**Primary heating energy source**

- District heating: 1 institution
- Natural gas: 5 institutions
- Electricity/Heat pump: 5 institutions

**10 institutions**
- Review of heating and cooling management
- Lighting replacement
- Adjustment of HVAC parameters

**Between 5-7 institutions**
- Enhancement of metering systems
- Refurbish heat/cooling energy generation
- Improve building insulation
- Upgrade ventilation systems
- Smart buildings

**Less than 5 institutions**
- Install or expand renewable generation on-site
- Replace heat/cooling energy generation
- Waste heat reuse

**11 institutions purchase certified green electricity from the grid**

**5 institutions have installed PV capacity on-site**

**3 institutions have cogeneration plants**
### Summer specific measures

**Measures implemented over the summer period**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turn off air humidification</td>
<td>2</td>
</tr>
<tr>
<td>Switch-off of water heaters in restrooms and kitchenettes</td>
<td>3</td>
</tr>
<tr>
<td>Ventilations of rooms at night</td>
<td>4</td>
</tr>
<tr>
<td>Closing of blinds/drapes/curtains during the day centrally</td>
<td>6</td>
</tr>
<tr>
<td>Switch-off all non-essential lights in non-office areas as early as possible</td>
<td>7</td>
</tr>
<tr>
<td>Optimise essential lights</td>
<td>8</td>
</tr>
<tr>
<td>Adjustment of air conditioning and cooling to higher temperatures than in the past</td>
<td>11</td>
</tr>
</tbody>
</table>

### Energy savings

Positive effects observed across institutions:
- Between 2.5% and 8% reduction
- 346 MWh
- Financial savings

Focus placed on direct reduction, rather than mitigating external factors that influence energy consumption.

Most institutions paired the measures with a dedicated awareness raising campaign.

Feedback from staff on the impact on office work was varied and balanced.
## Winter specific measures

### Planned and implemented winter measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>Planned</th>
<th>Implemented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relocation of staff within the building to reduce the areas to be heated and lighted</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Shutdown of computers, screens, printers and photocopiers at night</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Mandatory outside doors closure</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Increase of teleworking</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>No heating of common spaces</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Cogeneration system</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Switch-off of water heaters in restrooms and kitchenettes</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Switch-off of decorative lights</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Adjustment of air conditioning and cooling to higher temperatures than in the past</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Switch-off of all non-essential lights in non-office areas at night</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Automation of heating and/or lighting processes</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Lower heating temperature than 21 C (in office spaces)</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

### Energy savings

Positive effects observed across institutions:
- Between 7% and 41% reduction
- Approx. 4,000 MWh
- Considerable financial savings

Focus placed on direct reduction, rather than mitigating external factors that influence energy consumption

Most institutions paired the measures with a dedicated awareness raising campaign

Feedback from staff on the impact on office work was varied however more negative than what experienced in summer.
Practice Case
Joint Research Centre
Locations:

Overview of the JRC infrastructure Brief:

- More than 4,000 persons hosted on 6 sites (on 5 countries)
- More than 250 buildings under management
- “Office” space (m²) << “non-office” space (m²)
- 56 Research Infrastructure (incl. 19 nuclear facilities)
- > 32,500 m² nuclear “island” in Ispra (decommissioning)
Major constraints for introduction of energy-saving measures

• Different Hosting Countries’ legislations.

• Variety of buildings types, ageing and use (offices, warehouses, datacentres, laboratories, canteens…).

• Legal mandate and nuclear licences (calibrated equipment, ventilation, extraction, pressure…).

• Business continuity and other entities hosted on site (other EC services, police, firefighters, carabinieri, EUROPOL, security guards…).

• Other specificities.

Energy-saving measures introduced

• Temperature setting 19 degrees (with exceptions)

• Temperature setting 27 degrees.

• Reduced schedule of heating/cooling and ventilation operating at max nominal power outside working hours.

• Improved switch-off of utilities during holidays

• Miscellaneous site management actions (street lighting, cold water, exploitation of space, behavioural change…).

• Infrastructure investments.
A recap of our energy saving measures in Winter 2022/2023

- 26.2 % (- 25,400 MWh) Energy consumption in August ‘22 – March ‘23 VS average previous 5 years.

A recap of our energy saving measures in Summer 2023

- 27.9 % (- 13,700 MWh) Energy consumption in April 23’– August ‘23 VS average April – August ‘17 – ‘21
Practice Case
General Secretariat of the Council of the EU
Overview of the General Secretariat of the Council of the EU:

- 5,000 people hosted on average (40% is staff)
- 3 administrative/conference buildings, 1 crèche
- Heated surface: JL 147,000 m², EB 61,000 m², Lex 66,400 m², Crèche 4,630 m²
- Regular meetings with delegates from Members States
- 5 European summits per year + occasional multilateral summits
A recap of our energy saving measures in Winter 2022/2023

Actions as of August 2022 to contribute to the European Gas Demand Reduction Plan and in line with Belgium’s energy saving regulations:

- temperature setting to 19°C;
- margin of adjustment available in offices from +/−3°C to +/−1°C;
- temperature setting in JL Atrium to 16°C and in EB Forum to 14°C;
- delayed start-up schedule for the ventilation systems in the meeting rooms of the EB;
- no illumination of the EB lantern and other special event illumination.

In Winter 2022/2023 we saved 5,400 MWh. To put that into perspective, this represents the approximate annual gas consumption of 420 households (Brussels average).
A recap of our energy saving measures in Summer 2023

Actions to continue the efforts also during summer:

- start-up temperature for air-conditioning to 27°C with +/- 1°C as margin of adjustment in offices
- no air-conditioning in the JL Atrium (only natural ventilation)
- same start-up schedule for the ventilation systems in the meeting rooms of the EB as in winter
- action “low down your external blinds”
- optimization of freezers, and some of them off
- optimization of the chiller in the press zone
- relamping (LED)

In Summer 2023 we saved **600 MWh**. To put that into perspective, this represents the approximate annual electricity consumption of **300 households** (Brussels average).
We are mainly keeping the same measures as last year.

**An outlook of our next steps on energy saving**

- change in the winter setting from 19° to 20°
- some works carried on during summer with expected energy savings in winter
- other to come

**Works done**

- replacement of boilers: 3 of the existing boilers replaced by 8 smaller boilers (total max power from 7,5MW to 7,05MW)
- insulation of the steam system pipes

**Ongoing/future works/measures**

- replacement of transformers
- adjustment of ventilation schedule in JL
Practice Case

European Central Bank
European Central Bank - Outlook

Location: Frankfurt

**President:** Christine Lagarde
More than **3,500 staff members**

**MAIN BUILDING:**
- District heating
- Advanced, thermal envelope (high rise)
- Listed building Großmarkthalle (challenge from operational perspective)

**EUROTOWER:** Biogas including combined heat and power

**JAPAN CENTER:** District heating (steam network)
A recap of our energy saving measures in Winter 2022/2023

To contribute to the European Gas Demand Reduction Plan and in line with Germany’s energy saving regulations, as of September 2022 the ECB

→ Momentum was used to widen the focus on all types of energy (power supply, district heating)
→ Lowered the maximum temperature in our offices to 19 degrees
→ Turned off heating in open areas (such as atrium)
→ Switched off the decentralised water heaters for hand-washing basins and cleaning
→ Turned off any night-time external lighting that was not essential and optimised lighting in non-office areas, and
→ Limited air humidification to 30%

In Winter 2022/2023 we saved 3,600 MWh. To put that into perspective, this represents the approximate annual consumption of 200 German households.
A recap of our energy saving measures in Summer 2023

The medium-term measures were the following:

- **Turn off all non-essential lights** in non-office areas as early as possible and optimise essential lights

- **Continued** the switched off decentralised water heaters for hand-washing basins and cleaning

- **Turn off air humidifiers in air conditioning units.** The recommended range for commercial and institutional buildings in German regulation is between 30% and 60% humidity has been monitored

- **Adjust air conditioning and cooling** to higher room temperatures, on average three degrees higher than in the past

Main Building: reduction of 464 MWh in cooling (out of 1,793 in total)
Climatic corrections on energy consumption data

What is the need for climatic corrections on energy data?

→ Energy consumption is often highly correlated to environmental conditions (outside temperature)

→ This makes it difficult to evaluate implemented efficiency/savings measures

→ In order to minimise external factors, climatic correction approaches could be applied

→ Keywords: HDD - heating degree days
  CDD - cooling degree days
  https://www.ddegreedays.net/articles

Main Building: reduction of 1253 MWh in heating (out of 5539 in total)
Communication to internal stakeholders

**General tips and tools** for the communication of critical topics

**Specific examples:** How to respond to critical stakeholders within your organization
General tips and tools

1. Proactively involve stakeholders
2. Refute misinformation
3. Avoid boomerang effects
4. Communicate clearly
General tips and tools

1. Proactively involve stakeholders

- **Participation and co-determination**: Give your employees the opportunity to actively participate in decision-making processes.
- Involvement and participation create a **sense of responsibility** and promote commitment to environmental and climate protection measures.

How could employee participation and co-determination look like?

<table>
<thead>
<tr>
<th>Surveys and votings can be used to</th>
<th>Appointing staff for specific tasks</th>
<th>Collecting feedback and ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Receive opinions on the status quo of a specific situation</td>
<td>• As communicators for environmental awareness events in the different divisions of the organization (e.g., as Environmental Representatives)</td>
<td>• Setting up a designated e-mail address</td>
</tr>
<tr>
<td>• Check the acceptance of the implemented measure</td>
<td>• As data providers for specific data needed e.g., for the carbon footprint calculation</td>
<td>• Setting up a physical mailbox</td>
</tr>
<tr>
<td>• Collect feedback</td>
<td></td>
<td>• Implement feedback rounds in meetings or workshops</td>
</tr>
<tr>
<td>• Measure specific carbon emissions (e.g. commuting or business travel)</td>
<td></td>
<td>• Implement idea competitions and set incentives for participation (e.g., through participation prizes)</td>
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</table>
General tips and tools

2 Refute misinformation and communicate correctly

- Successful communication depends on the **credibility and transparency** of the communicator
- Information from sources perceived as **credible** usually leads to more solid views and is **more convincing**

How does credible and transparent communication work?

<table>
<thead>
<tr>
<th>Examples of credible external sources:</th>
</tr>
</thead>
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<td>Publications of the European Union, Federal Government and ministries</td>
</tr>
<tr>
<td>Publications and databases from scientific institutes</td>
</tr>
<tr>
<td>Examples:</td>
</tr>
<tr>
<td>- <a href="#">Federal Environment Agency</a></td>
</tr>
<tr>
<td>- <a href="#">Web of Science</a></td>
</tr>
<tr>
<td>- <a href="#">Potsdam Institute for Climate Impact Research</a></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Examples of non-credible external sources:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wikipedia</td>
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<tr>
<td>Blogs</td>
</tr>
<tr>
<td>Forums and discussion groups</td>
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<tr>
<td>Social media platforms</td>
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<tr>
<td>Messenger services</td>
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<table>
<thead>
<tr>
<th>Open and transparent communication:</th>
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</thead>
<tbody>
<tr>
<td>Open and transparent communication about the progress of the project</td>
</tr>
<tr>
<td>Ensures that all stakeholders are informed about the status and can contribute</td>
</tr>
</tbody>
</table>
Refute misinformation and communicate correctly

Examples of open and transparent communication
General tips and tools

3 Avoid boomerang effects

- Repetition makes information more familiar, and familiar information is generally perceived as more truthful than more recent information.
- Since misinformation is inevitably repeated when it is refuted, one suspected danger is that refuting the misinformation could backfire by making the misbelief more familiar.

4 steps to avoid the boomerang effect:

1. State the truth first
   - If it can be done easily in a few clear words, state what is true first. This allows you to frame your message - you lead with your talking points, not someone else’s.
   
   “Thank you for sharing your concerns. We understand that it is important to be critical of our environmental impact. In fact, we have made some significant progress in recent years.”

2. Point out the misinformation
   - Mention the misinformation only once, right before setting the record straight. Repeating the misconception once helps to update beliefs.

   “You think that we are only doing environmental protection superficially in order to maintain a positive image. This is an important concern, but it is not true. Let’s take a closer look.”
### General tips and tools

#### Avoid boomerang effects

- Repetition makes information more familiar, and familiar information is generally perceived as more truthful than more recent information.
- Since misinformation is inevitably repeated when it is refuted, one suspected danger is that refuting the misinformation could backfire by making the misbelief more familiar.

<table>
<thead>
<tr>
<th>3</th>
<th>4 steps to avoid the boomerang effect:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Explain what is wrong with the information</td>
<td>4 Mention the truth again</td>
</tr>
<tr>
<td>• Contrast the correction with the incorrect information. Make sure the refutation clearly accompanies the misinformation</td>
<td>• Mention the fact again so that the fact is what people take in last</td>
</tr>
</tbody>
</table>

“**Our measures are by no means superficial. We can show concretely how we have reduced our energy consumption by 30% over the last five years.**”

“So our efforts are by no means just a facade; they have a real and positive impact on the environment.”
Communicate clearly

- Avoid scientific jargon or complex, technical language
- Well-designed diagrams, videos, photos and other visual aids can be helpful to clearly and concisely convey corrections that involve complex or statistical information
- Tailor the message to the audience and use a messenger that the audience trusts

Examples of clear communication

<table>
<thead>
<tr>
<th>Pictograms</th>
<th>Simple language</th>
<th>Bullet points</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Use of pictograms, pictures and icons for visualization</td>
<td>• Use of simple language for better understanding</td>
<td>• Break down facts into bullet points to make information more digestible</td>
</tr>
</tbody>
</table>
Examples of clear and visual communication
Specific examples: How to respond to critical stakeholders within the organization

Adjusting the temperature to save energy within the organisation

**Problem description:** In order to improve energy efficiency in the organisation's premises, the temperatures in the organisation's buildings were adjusted to specific limit values. Due to the temperature adjustment, some offices are now colder in winter and warmer in summer.

**Solution approach**

1. **Show empathy and understanding:**
   Start the conversation by showing understanding for the employee's worries and concerns.

   "Since I can no longer regulate the heating in my office myself, I have been freezing in winter. I can't work like that."

   "Thank you, for sharing your concerns with us. I understand and I want to make sure that your concern is taken seriously."
Specific examples: How to respond to critical stakeholders within the organization

<table>
<thead>
<tr>
<th>Solution approach</th>
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<tbody>
<tr>
<td>2. <strong>Clearly explain the background:</strong> Explain the reasons for the temperature adjustments in the offices and emphasise the importance for environmental protection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Solution approach</th>
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<tbody>
<tr>
<td>3. <strong>Find an individual solution:</strong> Work together to find a solution that takes into account the employee's needs but also considers energy efficiency</td>
</tr>
</tbody>
</table>

“Let me explain why we have made the temperature adjustments. Our organisation has decided to be more energy efficient. These temperature adjustments are part of this larger goal and allow us to save energy efficiently.”

“Do you have colleagues who always feels hot and that you could switch offices with? Otherwise, I can talk to facility management, to see if we can increase the temperature in your office.”
Specific examples: How to respond to critical stakeholders within the organization

Solution approach
4. Find clear communication:
   Agree on clear steps and deadlines for implementing solutions or measures. Make sure that the employee knows exactly what the next steps are.

Solution approach
5. Feedback and follow-up:
   Regularly review the implementation of the agreed solutions and ask for feedback and suggestions from the employee to make continuous improvements

“I will contact our facility management team and have them look into the possibilities. We will look into this immediately and give you an update as soon as we have more information.”

“How are you doing in your office? Was the temperature adjustment of 2°C enough for you to feel more comfortable?”
Discussion

Any questions:
Contacts

General Secretariat of the Council of the EU: environmental.management@consilium.Europa.eu

DG Joint Research Centre of the European Commission: Luca.PIRINU@ec.europa.eu & Thierry.STIEVENART@ec.europa.eu

European Central Bank: GreenECB@ecb.europa.eu