

a strategy for

IBEC STRATEGY TO PROMOTE SUSTAINABILITY IN RESEARCH

Institute for Bioengineering of Catalonia (IBEC)

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INTRODUCTION

IBEC is committed to promote more sustainable practices in research and administration, to contribute, in our daily work, to fight climate change and pollution.

In September 2019, IBEC promoted, together with the rest of the research centers members of the Barcelona Institute for Science and Technology (BIST), the issue of a statement supporting the global call to action to confront climate change launched by the Climate Change Strike movement. The statement was signed by the director of IBEC, Josep Samitier, together with the director general of BIST, Gabby Silberman, and the directors of the other six BIST centers, Luis Serrano (CRG), Lluís Torner (ICFO), Miquel Pericàs (ICIQ), Pablo Ordejón (ICN2), Ramon Miquel (IFAE) and Francesc Posas (IRB Barcelona)

The statement is as follows:

"We work in some of the most advanced research institutions in our country, recognized with awards and certifications of excellence, employing world-class scientists, and participating actively in the international science arena. As such, we are well placed to know the science behind climate change. Likewise, we also have a direct duty to ensure that our scientific conclusions revert to our society.

We are both privileged observers and human beings inhabiting this planet. We therefore feel compelled to preserve nature and issue the following statement in connection with the Global Climate Strike actions that are taking place around the globe.

- 1. **Scientific evidence is strong.** All publicly funded research is openly available so that anybody can examine its methodology and reproduce its conclusions. This transparency ensures that anything we say can be verified, irrespective of who said it or who funded their research.
- 2. The conclusions from the Intergovernmental Panel on Climate Change (IPCC) are informed by solid science reported transparently for all to examine. Its conclusions are inescapable.
- 3. The main conclusions are that **global warming emergency is a fact**, that it is **caused by humans** and that, if prompt actions are not undertaken, it will have **catastrophic effects** and disruptive consequences (from mass migrations to changes in the food we eat) for the whole planet.

For these reasons we, the BIST centers, declare our **explicit support to the call for action that has been launched around the world** by movements such as Global Climate Strike. We invite all science-related and academic personnel to join this call to action. Available data are already strong enough to ignite short and long term personal, social, and political actions. **It is time for change**."

Following this commitment, and with the support of the Direction of IBEC, the IBEC Sustainability Committee was created at the end of 2020, composed by members of the different profiles of the institute: Researchers, Technicians and Administration.

The members of the committee have been working on the collection, analysis and suggestion of actions which aim to make our Institute more sustainable. These are collected in this Action Plan for Sustainability, which is an evolving working document that will be reviewed an improved upon its implementation.

The plan aims to tackle the most relevant issues related to climate change and pollution: Energy and water consumption, Waste, Use of chemicals and other hazardous products and Travel and commuting to work

The plan also includes transversal actions like:

- Training
- Communication and awareness
- Involvement in other local and global initiatives for sustainability
- Evaluation of lab practices and obtention of a certification of sustainable laboratories: green lab certification
- Research on Energy and Environmental sustainability
- Definition and monitoring of indicators, follow-up and updating of the Plan

All actions included in the Plan and future ones will be discussed and agreed among IBEC's decision-making and consultation bodies and will need the involvement of all staff to ensure its successful implementation while IBEC continues with its fundamental mission to conduct interdisciplinary research at the cutting edge of knowledge in the bioengineering field to improve health and quality of life.

FORESEEN ACTIONS OF THE PLAN

1/ Direct Actions related to climate change and pollution.

Energy

By changing slightly some daily habits, we can contribute to reduce the consumption of energy at our labs, thus help to protect the environment. There is a series of good practices that we can carry out and, in this way, actively contribute to reducing energy consumption. IBEC will promote the adoption of measures to save energy, by setting up an awareness campaign with daily routines to save energy. Some messages included will be:

- **Turn off lab equipment** when you finish to use it or if you see that an equipment of your lab is not being used.
- Switch off computers/screens and light in the offices whenever possible and always before leaving your workspace.



- Shut the Sash of the fume hood. Increase ventilation only in emergencies.
- Reduce the frequency and duration of opening the doors in freezer/ultrafreezers
- Whenever possible, avoid using air conditioning or heat and always try to set temperatures that consume less energy.

Some examples of communication materials/tools/actions will be:

• Messages on the occasion of a significant global activity and posters to promote sustainable practices and/or against global change.







• Stickers to be placed in every computer/equipment.



- Study with the institutions owning/managing its spaces (PCB, UPC) options to promote energy saving like installing automatic systems for switching off lights, control of temperature....
- Creation of a working group with the researchers to evaluate best practices to decrease energy consumption. For example:
 - » Promoting the use of a system of storage so that items are easily found (less time with the door open).
 - » Remove unnecessary chemicals and/or samples regularly to decrease freezer load and make space for new supplies.
 - » Stablishing opening times for ultrafreezers.
 - » Arrange for up-to-date inventories, detailing what goes where inside each drawer of the freezer/ ultrafreezers. Stick a copy of this on the freezer door to minimize searching times with the door open.
 - » Raising ultrafreezers temperature. Consider the possibility to adjust the ultrafreezers temperature from -80°C to -70°C.
 - » Unplug unnecessary equipment when not in use.
- IBEC will promote, in collaboration with the institutions owning/managing its spaces (PCB, UPC) the use of energy coming from sustainable sources. An initial inquiry will be made about the origin of the energy consumed at IBEC.

Water

Most laboratory spaces use large quantities of water primarily to achieve their larger air conditioning systems loads. Nevertheless, a laboratory's water efficiency can also be improved by making few changes into lab operations. IBEC will promote the responsible use of water. Some messages could be:

• Limit the use of distilled and deionized water. The energy and water used by water purification systems to create high quality water can be considerable. Thus, use purified water only when necessary and match the experimental process to the quality of water required. For instance, to prepare buffers, medium for cell culture or some reagents distilled water is sufficient. To perform analytical chemistry



water is sufficient. To perform analytical chemistry a high-quality level of water, like deionized water, must be used.

- **Reduce single-pass cooling.** Many experimental set-ups, especially related with chemical synthesis, require water for cooling (e.g., rotavaps, condensers...). Instead of running water down the sink, install a recirculating loop through a cold-water bath as an alternative.
- Use auto service autoclaves efficiently. Wait until it is fully loaded before starting. Don't run an autoclave to sterilize a single item.
- Report leaks promptly.

Some examples of communication materials/tools/actions will be:

- Messages on the occasion of a significant global activity and posters to promote sustainable practices and/or against global change.
- Stickers to be placed near the distilled and deionized water supply points.
- Check all the lab taps to be sure that they are equipped with aerators. Low-flow aerators can be installed on taps to reduce water consumption by up to 50%.
- Consider the possibility of installing alternative equipment that does not rely on water in laboratories, for example waterless condensers.

Reduce, reuse, and recycle waste

Life sciences researchers produces huge amounts of hazardous waste and plastic waste annually and IBEC wants to empower researchers to reduce the environmental impact due to this waste production in our labs. Hard work must be done not only to reduce the waste but also to change the mentality of the IBEC people since some efforts on the planification of the experiments and material used should be done to achieve this goal.

Also, IBEC will promote the reduction of waste in other areas such as in offices (related with administrative work) and in caterings of events organized by the Institute.

Some messages included will be:

- Follow PCB and UPC (Besòs campus) general waste recycling procedures.
- Label and dispose hazardous waste according to PCB guidelines.



- Reduce the use of disposable plastics by considering the use of glassware.
- Reduce the volume of disposable plastic purchased. Do not order unnecessary plastic products that will never be used.
- Find ways to **treat and reuse** some disposable plastics items.
- Reduce the use of paper. Be conscious of printing practices.

Some examples of communication materials/tools/actions will be:

• Messages on the occasion of a significant global activity and posters to promote sustainable practices and/or against global change.





- Make posters with diagrams explaining the classification of general waste and hazardous waste. Try
 to adapt the poster dedicated to hazardous waste to the type of activity that takes place in each
 laboratory.
- Study with PCB the possibility of placing containers dedicated to:
 - » The recycling of uncontaminated plastic in certain areas of some laboratories, such as culture rooms.
 - » Paper recycling near printers or in administrative areas.
- Include treatment methods to reduce or eliminate liquid hazardous waste.
- Create a leaflet with tips to reuse disposable materials, for instance:
 - » Use autoclavable plastics flasks and dishes to reuse them.
 - » Reuse pipette tips.
- Study the purchase of equipment to promote re-use of materials such a machine for tip washing.
- Awareness campaigns to reduce unnecessary printing.
- Configure the computers with the option to print double sided and black and white by default.
- Study the possibility of using recycled paper in our printers.
- Introduction of a system of Electronic invoices and signatures in IBEC processes.
- We will also carry out some actions related to the waste generated in the organization of events and meetings in our institute like:
 - » Reduce the use of disposables and plastics in caterings.
 - » Promote the use of proximity food (also in PCB).
 - » Install a bin to recycle coffee capsules.
 - » When it is needed to replace the coffee machine, a new one with compostable capsules or without them will be installed.
 - » Avoid the use of bottled water by
 - installing whenever possible fountains and use reusable water bottles and mugs at work.
 - in meetings, a jug with water will be offered to participants, instead of bottled water.

Purchasing

Some years ago, IBEC introduced an online system for purchasing which has simplified the process for purchasing and in theory was going to decrease paperwork, printing and paper consumption. However, purchasing has become so easy that often purchases are not properly planned and there may be several orders to the same supplier on the same day, which means several transports (and therefore more transport charges and energy consumption and pollution) and more disposable packaging. IBEC will promote a more sustainable purchasing system and some of the messages will be:



- **Consolidate orders**. Consolidating the orders will reduce the packaging as well as the CO2 emissions associated to transport.
- **Reduce the quantities of purchased chemicals.** Purchasing chemicals in larger containers at an initial lower unit cost, rather than smaller containers, appears to be a good way to save money. However, often this way to save is not real neither effective and leads to several problems like expired or degraded chemicals accumulation that finally must be removed as hazardous waste.
- Maintain and use an up-to-date inventory of chemicals and lab supplies. Always check the supplies available at the lab before ordering to prevent over-purchasing and waste of resources.
- **Purchase green**. When buying scientific supplies, always try to choose sustainable options to reduce energy and water consumption and hazardous waste.

Some examples of communication materials/tools/actions will be:

• Newsletter on the occasion of a significant global activity and posters to promote sustainable practices and/or against global change.



- Set up a working group with representatives from the Finances, Core Facilities, and people form the group making orders to stablish common best practices and if agreed change the process for purchasing in the IBECnet.
- A sustainable purchasing guide will be redacted and informative sessions about best practices for purchasing will be performed including:
 - » Consolidation of orders.
 - » Maintain and use an up-to-date inventory including chemicals and single-use plastic material.
 - » Promote the sharing of reagents using the existing common chemical database.
 - » Order the least hazardous chemical products.
 - Creation of a list of greener alternatives to the most hazardous products and more bought consumables and promotion of its use.



- » Purchase equipment considering the energy class label.
- Application of sustainability criteria in tenders.

Travel and commuting to work

Nowadays, many workplaces have promoted mobility policies to reduce the number of staff commuting to work using single occupant vehicles, for instance carpooling. Furthermore, the use of public transport and other sustainable means of travel such as bicycles, scooters, etc. are being increasingly promoted, especially in big cities like Barcelona. At IBEC we want to encourage the use of sustainable ways to commute to work. We also want to make researchers aware of the importance of reducing air travel.

Some messages include will be:

- Change the way you commute. Use eco-friendly ways of transport or consider walking if you do not live far from IBEC.
- **Reduce flight frequency.** Consider the video conferences/meetings or if possible, consider the use of train.

Some examples of communication materials/tools/actions will be:

- » Awareness campaign about the CO2 emission and pollution of air travel and private transport to commute to work.
- » Flying less campaign. Instead of flying to attend meetings and conferences the use of video conference platforms should be encouraged.
- » An informative text will be included in Travel forms to make users consider using more environmentally friendly alternatives like train.
- » Explore tools for car sharing to work.
- » Explore options to foster the use of public transport or bike to commute to work.

2/ Transversal Actions

Training

- A mandatory course for PhD students about environmental challenges and sustainable practices in research will be include in IBEC's training catalogue. The course will be included as a requirement for the obtention of IBEC's certificate of doctoral award.
- An overview of sustainable practices will be included in the induction plan of every new member of IBEC.
- Organization of talks about topics related to sustainability (3/year).

Communication and awareness

- A leaflet of sustainable practices will be produced and distributed to every member of IBEC.
- A dedicated section in IBEC's website will be devoted to Sustainability: the plan, the committee, activities, resources...
- Sustainability will be included in IBEC's newsletter, INSIDEIBEC
- Communication materials will be produced on the occasion of a significant global activity to promote sustainable practices and/or against global change.
- Throughout the year there will be 2 campaigns focused on promoting the change on two specific issues identified by the IBEC Sustainability Committee.
- A network of eco-reps will be promoted in each lab/office to help implement measures for sustainability and suggest new ones.

Involvement in other local and global initiatives for sustainability

IBEC will be an active member in the initiatives of the Green Deal of the European Commission.

We continue our collaboration of the BIST working group for sustainable research in order to share best practices and joint efforts, including communication campaigns, training, etc.

We will also study the convenience of joining global networks of institutions to foster sustainable research.

Evaluation of lab practices and obtention of a certification of sustainable laboratories: green lab certification

IBEC will study different options to perform an evaluation of our lab practices and the convenience of obtaining a green lab certification. This evaluation will determine the current state of our laboratories in terms of sustainability and will be the starting point for the continuous improvement of our laboratory practices, thus contribute to minimize the environmental impact of our labs. Generally, the topics covered on this evaluation are infrastructure energy, fume hoods, large equipment, cold storage, water, purchasing, resource management, green chemistry and green biologics, recycling and waste reduction, travel, ...

Research on Energy and Environmental sustainability

Climate change and pollution is already affecting health and wellbeing of millions of people. Bioengineering is a powerful tool to study, prevent and mitigate those negative effects. As part of its mission IBEC aims to contribute to research and innovation on energy and environmental sustainability.

Moreover, in the framework of the Strategic Plan 2021-2025 of the Barcelona Institute of Science and Technology (BIST), Research and Innovation for Sustainability has been included as one of the three strategic research initiatives to be fostered and jointly developed among the 7 centres that form BIST: CRG, IRB, ICFO, ICIQ, IFAE, ICN2 and IBEC.

IBEC will foster research on this topic by including it as a priority in IBEC's internal calls. It will also actively seek opportunities for funding and collaboration with BIST and other international institutions through, among others, the Green Deals calls of the European Commission.

¢¢Definition and monitoring of indicators

A collection of monitoring indicators will be gathered and followed-up in order to evaluate the impact of the measures. Baselines will be defined since 2018 and objectives will be set for the following years. The historical data will allow to stablish objectives. Ideally indicators should be disaggregated per laboratory. The following list of indicators is proposed. The list might be modified depending on the availability of data.

- Energy consumption
- Water consumption
- Paper consumption
- Hazardous Waste
- Number of orders via IBECnet
- Number of Green references available at IBECnet
- People trained in sustainable practices
- People attending awareness activities
- Number of research projects on energy and environmental sustainability

The development of the Plan will be periodically reviewed by IBEC Sustainability Committee and the Direction of IBEC. More actions will be included as a result of the different working groups created and the output of the actions in place.



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