

# EBU

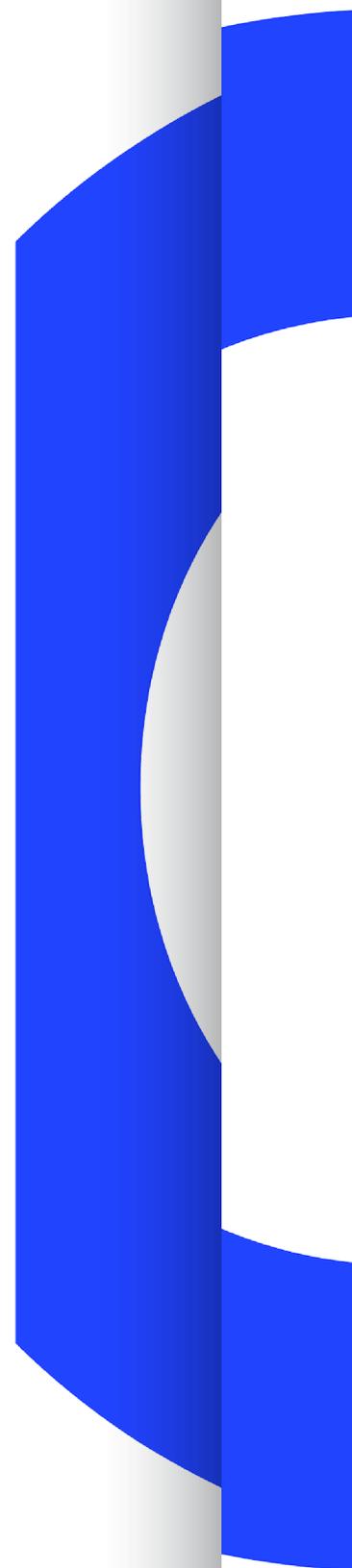
OPERATING EUROVISION AND EURORADIO

## TR 057

### **BROADCAST: GREEN BUILDINGS**

## Strategic Report

Geneva  
November 2020



## Abstract

The aim of this document is to capture and share best practices amongst our Members. With new buildings we can learn from each other and share advice and new ideas that can be incorporated into the architectural plans of new builds and refurbishments.

Not everyone can move to, or build new constructions, but guidance on simple green changes that can be implemented in your current building(s) is also given.

Finally, the document gives direction on environmentally-friendly operations to make your office practices greener.

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## Broadcast Green Buildings

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### 1. Background

The definition of sustainability is an approach consisting of three aspects - environmental, economic and social. All three aspects are intertwined. For example, reducing energy consumption can also reduce costs; if the social aspects of a building promote health and wellbeing, staff will be more productive. Therefore, it is important to understand that all three aspects work together hand-in-hand. We believe that for any significant change to occur, all three aspects need to be looked at together, and we understand that for many organizations the economic aspect is the bottom line. In this document we focus on the environmental and economic prongs of sustainability.

One of the main goals of a building's advanced energy-management systems is to minimize energy consumption. Energy conservation in buildings is achieved by controlling heating/cooling, ventilation and lighting. Organizations can achieve their sustainability requirements by cutting emissions, lowering energy usage, sourcing products from fair-trade organizations, and by ensuring that their physical waste is disposed of properly and with as little carbon-footprint as possible.

## 2. Current Green Architecture

The top 10 eco-buildings<sup>1</sup> in the world have various methods of being sustainable. It is important to follow the guidance based on your location, bearing in mind some steps will be better suited to certain climates.

A building in Amsterdam stands out for its rooftop solar panels, which cover an area of 4100 m<sup>2</sup>. Its massive north-facing atrium provides daylight throughout the building and Ethernet-connected LED lighting, controllable from smartphones, is used for the offices. The building also has sensors that measure temperatures and CO<sub>2</sub> levels. It uses a rainwater-harvesting system that utilizes stored water for flushing the toilets and for watering the plants.

Another building uses a rainwater-harvesting system that can collect and filter 254600 litres of water. It also has 5 aerobic composters that efficiently treat human waste without releasing an unpleasant odour. The building's rooftop additionally carries photovoltaic cells that generate 230 megawatt-hours a year, which is sufficient to operate the building.

Many new buildings have a bioclimatic façade with windows that automatically control light intake, allowing for optimized daylight entry, and gardens on their terraces, which contribute to the cooling of the interior spaces.

One building in a colder climate employs a double-skinned façade and high thermal mass concrete to control the heating and cooling of the building. An aerodynamic system employs the atrium's natural stack effect to elevate (warm) waste air and pass it through heat exchangers to warm incoming (cooler) air. Rapeseed from local farms is used to produce fuel for building operation. Moreover, the designers have prepared the building for possible future climatic changes, based on the predicted weather data for 2050.

One building is 100% naturally ventilated via tapered ventilation ducts. The air is changed every half hour, providing a continuous supply of fresh air. The natural ventilation is combined with natural lighting to reduce energy consumption. It is expected to cover its innovation costs within 10 years from its completion date in 2013.

In another building, concrete structure is used for the building because of its various applications and high thermal mass, and the building's green roof collects rainwater for evaporative cooling towers. In the case of Public Service Media (PSM), it could be used to cool data centres.

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<sup>1</sup> <https://www.arch2o.com/sustainable-office-buildings-worldwide/>

### 3. What are our Members doing in their new structures?

This section focuses on Members' new green buildings and provides practical guidelines on how these are being created. The ideas can be provided to your Facilities Manager and architects to assess the feasibility of the ideas herein and possibly incorporate them into your blueprints.

#### 3.1 *The Construction Site*

There are ways of minimising the environmental impact of a building during its construction. As part of the building tender, environmentally friendly requirements can be added.

The RTS is trying to create a green construction process for its new building in Lausanne by especially paying attention to:

- a. Land preparation (demolition of existing buildings).
- b. Protection of air quality during the construction process.
- c. Groundwater and water protections, water disposal, construction site wastewater.
- d. Soil protection.
- e. Construction noises.
- f. No heating during large work.

The materials and products used are conventional and standard whilst having a low environmental impact. They are recyclable, durable, weather-resistant and are easy to maintain with a low rate of renewal/maintenance using conventional and non-polluting means.

Separation/recycling/reuse possibilities and planned:

- a. Organic composite materials.
- b. Synthetic pads and sealing product that are difficult to separate.

Consideration of end-of-life:

- a. Environmentally harmful insulation.
- b. Materials from halogen-free installations.
- c. Environmentally harmful PVC materials.

In Finland, the YLE adheres to the requirements of sustainable development in its construction projects. The new spaces can be modified, and environmental friendliness is considered in the materials used. The recycling of construction waste is given high priority. The Directive on the energy performance of buildings will steer planning in the direction of energy-efficiency and low energy use. When putting construction projects out to tender, environmental planning will have high priority in the selection of the winning bid.

The RAI's energy strategy aims at improving energy management through constant monitoring of the consumption patterns, stressing the possibility of obtaining substantial structural savings in terms of management costs. As far as the RAI's property assets are concerned, the main efficiency-related initiatives can be divided into four areas:

1. Interventions on the systems for cooled water production and replacement of refrigerators.
2. Renewal of conditioning and cooling facilities.
3. Renewal of the assets' thermic isolation.
4. Refurbishment of some offices and TV production centres. Some of the abovementioned initiatives have already been implemented while some others are still in a preliminary design phase.

Last but not least, based on the characteristics of the Italian territory, the RAI is currently monitoring the seismic risk to which its property assets might be subject. This is preliminary in bringing forward a programme for the anti-seismic renovation of its premises.

### **3.2 Energy Reduction**

The ORF reduced its costs by optimising the operating time of air conditioning and by the replacement of incandescent light bulbs by energy saving lights. The studios have global energy measures. They also reduced the use of air and water cooling.

Similarly, the RTS's new building is reducing its operational energy consumption and CO<sub>2</sub> emissions, enhancing its waste, water and heat emissions envelope and employs efficient equipment and the use of renewable energy. The building will be designed to approach the Minergie-P<sup>2</sup> energy performance. The building could be certified Minergie-P with a shadow point persistent to the photovoltaic installation in the roof, together with an EPFL heat pump using lake water as the heat source resulting in 100% energy self-sufficiency.

To satisfy the Vaud (local) law on energy:

- There is the insulation thicknesses according to Vaud law.
- 20% of electricity is self-produced.
- Lighting fixtures are 100% LED.
- Presence detectors, designed to cover 95% of the building surfaces, control lighting and heating.
- Electricity: based on applicable performance classification by device type, A-light fixtures.
- Minimal heat loss using monoblocks and cold recovery is used for restoration.

Of the energy that the YLE buys, its cooling energy is 100% emission-free. Thirty percent of its heating energy is produced without emissions. Areas with the greatest potentials for energy savings have been mapped out and there will be moves to increase automation to optimise equipment consumption.

Some Members are continuously monitoring their energy usage in their new and current constructions to deliver maximum efficiencies through best practices.

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<sup>2</sup> <https://www.minergie.ch/fr/a-propos-de-minergie/labels-de-construction/minergie-p/?l>

### **3.3 Water Conservation**

Members' water consumption was also reviewed, and the emphasis was on resource conservation. The **ORF** Centre uses water from its own well. This water is used as part of the air conditioning and cooling system. Drinking water from the municipal supply is also saved. Grey water (typically, water from sinks, showers, baths, washing machines or dishwashers and condensates from air conditioning) is used locally for toilets, urinals, car washing, fountains and green irrigation.

The **RTS** uses water from Lac Lemman to help cool the server rooms in their Geneva building.

## 4. Making older buildings green

Not everyone can move to or build new constructions, but there are some practical guidelines<sup>3</sup> that can be used in older buildings to make them greener and more sustainable. The recommendations are based on different budgets.

### ***Integrating renewable and low-carbon technologies to supply buildings' energy needs***

Look for quick and simple ways to make the changes, e.g. install solar panels and move to presence sensors for lighting. Exploring the potential of both 'smart' and information communications technologies to better interface with the world around us, for example through smart electricity grids that understand how to transport energy where and when it is needed.

All upgraded YLE premises currently have LED lighting guided by presence sensors. LED lights are also used for the illumination of underground parking facilities. Twelve charging points for electric vehicles have been set up and there are plans for more. There are also plans for setting up solar panels and procuring wind energy from energy suppliers. Automation is to be increased in controlling illumination in all premises.

### ***Water efficiency***

Explore ways to improve drinking and wastewater efficiency and management, harvesting water for safe indoor use in innovative ways, and generally minimising water use in buildings. Consider the impact of buildings and their surroundings on stormwater and drainage infrastructure, ensuring that these are not put under undue stress or prevented from doing their job. Ensure that embodied resources, such as the energy or water used to produce and transport the materials in the building are minimised so that buildings are truly low impact.

### ***Materials efficiency***

Use fewer, more durable materials and generate less waste. Account for a building's end-of-life stage by designing for demolition waste recovery and reuse. Engage building users in reuse and recycling.

### ***Social efficiency***

Bring fresh air inside the building, delivering good indoor air quality through ventilation. Avoid materials and chemicals that create harmful or toxic emissions.

Incorporate natural light and views to ensure users' comfort and enjoyment of their surroundings and reduce lighting energy needs in the process. Ensure that people are comfortable in their everyday environments, creating the right indoor temperature through monitoring systems.

Recognise that our urban environment should preserve nature and ensure that diverse wildlife and land quality are protected or enhanced, by, for example, remediating and building on polluted land or creating new green spaces.

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<sup>3</sup> <https://www.worldgbc.org/how-can-we-make-our-buildings-green>

## 5. Green operations

Once inside the buildings, the more familiar green operations initiatives are those we are all accustomed to a great deal more than those concerning the construction of the building itself. This section highlights the green policies currently in many organizations, but also taking them a step further.

### 5.1 *Transport*

Sustainable modes of transport - public transport and bicycles should be encouraged through loyalty points, free rental of bicycles and reduced car parking facilities. A mobility plan should be put in place to help reduce transport impact, such as reduced car parking spaces, buses run on behalf of the organization, better public transport links and encouragement of car sharing.

Offering the use of shuttlebuses that frequently travel around the PSM buildings and to- and from- railway stations to the offices where the distance cannot be walked.

Members such as RTÉ will monitor its travel and transport. It is committed to reducing its impact through promotion and encouragement of sustainable options for business travel and commuting. Where possible, it will apply and promote sustainable transportation of goods and services with all its stakeholders.

The RAI is gradually replacing the existing vehicles in its fleet that are at the end of their life-cycle with bi-fuel, hybrid or electric models.

To optimize its vehicle fleet management and reduce the impact of fuel consumption, the internal RAI car-sharing service has been enhanced. The present system of exclusively assigning vehicles to each single sector has been replaced by a centralised system that makes vehicles available to (groups of) different users on a case-by-case basis. Thanks to the application of this management system to the Rome TV Production Centre (Saxa Rubra), the number of shared vehicles passed from 11 to 81 in 2019.

The RAI has arranged with the local public transport companies to provide its employees with transport subscriptions at a preferential price to enhance home-workplace mobility. Moreover, the RAI has implemented several agreements for car, scooter and bicycle sharing services, while parking for bicycles is available in various premises to favour the use of employees' own bicycles. Preferential arrangements with shops specialised in the sale and repair of bicycles are also in place.

As far as business travel is concerned, the goal is to foster the use of trains rather than aeroplanes. To this end, preferential arrangements with railway companies such as Italo NTV and Trenitalia have been renewed on a national scale, resulting in a meaningful increase in the use of trains (+6.8%) and a slight reduction in the use of planes (-1.9%) currently.

### 5.2 *Environmentally friendly products*

All detergents used in the ORF Centre are environmentally friendly and have the EU Ecolabel. Hybrid sweepers have been used at the ORF Centre, which are much cheaper to use and have a lower environmental impact. The overuse of strong chemicals is not a good idea for the general health of

employees and replacing these with eco-friendly detergents is good for the environment and staff, and these days it can also be cost effective.

### **5.3 Canteen**

At the ORF, the canteen and catering has also adopted increased ecological practises, through avoiding single use plastics, using more regional and organic food, serving less meat and more vegetarian/vegan meals. Encouraging staff to use their own reusable cups/cutlery/plates/mugs can be effected through a reduced pricing of canteen food or through a loyalty scheme.

### **5.4 Recycling**

The ORF's Green programme productions use renewable (electrical) energy, power saving equipment, electric vehicles, sets made of recyclables where possible, recycled water for cooling equipment and public (low emission and electric) transport access to venues for the audience.

ORF in-house printing uses eco-label for ecological printed products and uses recycled printing paper - and recycles used printed paper. Overall, the best practice is in not printing when not required; this both saves paper and energy to drive the printers. To print fewer publications, they should be available online as far as is possible.

Recycle paper, plastics (the main principal is to reduce/eliminate plastics) and food waste. Most countries now have the facilities to recycle paper and PET plastics. Some countries also help with food waste, but if they do not, the PSM organization can get in touch with local farms to see if they can help (reuse as pigswill).

Special attention has been paid to the importance of sorting waste. The YLE is part of the WWF Green Office network. The annual goals of the network and the progress made are reported annually as part of its reporting on corporate social responsibility. In the future, principles of sustainable development will be promoted through campaigns, training, and the internal Green Office channel and network.

At the end of 2019, the RAI and the World Wildlife Fund (WWF) jointly launched the "plastic free" campaign, which the RAI has adopted within the framework of Corporate Social Responsibility processes, to eliminate single-use plastics from all its premises in Italy. The first operative phase of the project has consisted in placing drinking fountains in its Rome headquarters, contributing to a drastic reduction in the use of plastic bottles.

### **5.5 Lifecycle**

Ensure that equipment is used for longer, and that when it arrives at end-of-life to recycle it appropriately and replace it with energy saving equipment that is easily recyclable. Try to move from linear consumption to a more circular use of equipment, e.g. try to repair as much as possible instead of throwing away. This concept has been introduced into the BBC.