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The Urban Lab of Europe !

# The Climate Shelters project Journal N° 2

*Project led by the City of Barcelona*



*Conversion of the Can Fabra school to Climate Shelter (source: Climate Shelters project)*



**CLIMATE  
ADAPTATION**



# The Climate Shelters project (GBG\_AS2C) project

The GBG\_AS2C project addresses the heat island effects in the City of Barcelona and prepares the city to face predicted increasingly high temperatures in summer, by transforming 11 pilot schools into climatic shelters.

Considering their low degree of adaptation to heat, but also their spatial distribution throughout the city as well as their great level of penetration within communities, schools are relevant spaces for adapting the city to climate change for the benefit of all. The project will implement a package of measures designed through a participatory process, introducing blue (aquatics playgrounds), green (greening playgrounds) and grey (traditional) components in schools in order to convert them into climatic shelters - not only for students, but also for summer school camps and all citizens outside of school time, as a refreshing and shaded leisure facility.

In parallel, a climate change educational project is adopted and implemented to contribute to climate change awareness, including the involvement of children and school professionals in the health assessment process.

## **Partnership**

- Barcelona City Council
- Public Health Agency of Barcelona - sectoral agency
- Barcelona Consortium of Education
- Barcelona Cycle of Water - Public Service Provider
- Barcelona Institute for Global Health - Higher Education and Research Institute
- Institute for Environmental Science and Technology UAB - Higher Education and Research Institute
- Vila Olímpica School

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# 1. EXECUTIVE SUMMARY

Barcelona being a compact city of 1.6 million inhabitants with hot and humid climate in the warm period of the year, is exposed to excessive heat burden which is expected to be enhanced in the following years due to increased frequency and intensity of heat waves, the latter being directly associated to climate change.

The **Climate Shelters** project implements an innovative adaptation approach to climate change; it has so far converted eleven schools with the use of a mix of blue (incorporation of water points of different types in the courtyards), green (more shadow spaces and greenery in the courtyards) and grey (interventions on the buildings and use of permeable materials) measures. The project is developed in the context of the Barcelona's Climate Plan, which promotes the transformation of communal spaces as a climate change tackling strategy.

The project has been based on a solid participatory process for selecting the schools, with close attention given to the spatial environmental, climatic, urban and social characteristics of the City of Barcelona.

The project has given considerable weight to the scientific assessment of the selected schools and their school yards in terms of their exposure to solar radiation and wind, the percentage of impermeable material and greenery, the prevailing thermal conditions etc. It has also given space to teachers, students, parents and local dwellers as far as the selection of solutions and related interventions for the selected schools are concerned. Finally, it employed architects for the

design of the solutions per school. To this end, a solid methodology was applied, a fact which is considered highly beneficial for the successful implementation of the project and supportive for its replication.

To support the implementation of the project and to raise awareness on climate change and its impacts, the project has implemented a multi-dimensional communication strategy, with emphasis given to the use of social media, to the exploitation of existing school and city networks and to the involvement of professional organizations.

The creation of the **Climate Shelters** enabled 1,000 square meters of natural space to be regained, with vegetation in playgrounds and the creation of 2,213 square meters of new shade using pergolas and awnings. In addition, 74 trees were planted and 26 new water sources installed. The project involved an overall investment of 5 million euros, with 80% of the cost covered through funding from the Urban Innovation Action project. The shelters will be now monitored to assess their impact in terms of health and environmental conditions.<sup>1</sup>

The journal (the 2<sup>nd</sup> for the project), is devoted to the progress and the achievements of the "Climate Shelters" project; it describes the challenges, including the ones due to the covid-19 pandemic, during its implementation up to the October 2020 and refers to the ones to be faced in the remaining period of the project. The intention of the Journal is to present the processes that led to the implementation of the activities as well as to describe the tools and methods used to overcome challenges.

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<sup>1</sup> [https://ajuntament.barcelona.cat/relacionsinternacionalsicooperacio/en/noticia/eleven-schools-turned-into-climate-shelters\\_988451](https://ajuntament.barcelona.cat/relacionsinternacionalsicooperacio/en/noticia/eleven-schools-turned-into-climate-shelters_988451)

## 2. THE OVERALL CONTEXT FOR THE PROJECT

Urban areas in southern Europe, including Barcelona, experience excessive urban heat during the summer period, due to (a) their urban form and functions and (b) the increase of air temperature and heat waves due to climate change.

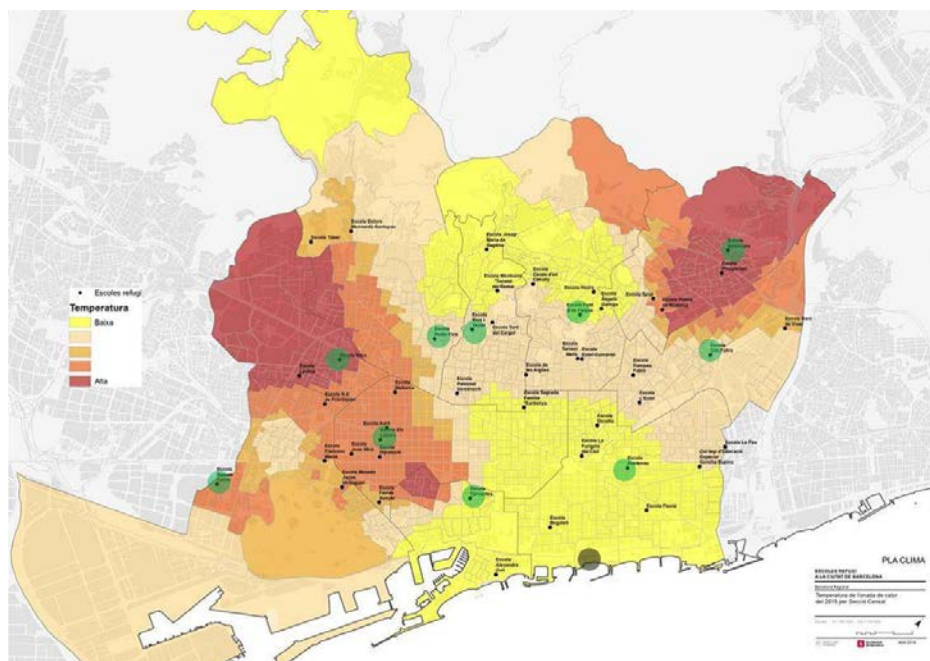
Barcelona's answer to overheating includes an innovative pilot project to adapt schools to Climate Change, with the aim to develop a network of **Climate Shelters** around the city.

The **Climate Shelters** project reflects considerable innovation as locally differentiated blue, green and grey measures are applied to eleven (11) schools. The aim is to reduce the impact of summer heat during school times as well as when activities are held in the outdoor

playgrounds and the schoolyards. The innovation of the project also refers to the application of the *Open Schooling* concept, where schools, in cooperation with other stakeholders, become an agent of community well-being.<sup>2</sup>

The project is fully aligned to the Barcelona Climate Plan<sup>3</sup> (action areas: mitigation, adaptation and resilience, climate Justice and promoting citizen action) and directly relates to the Climate Emergency Declaration of Barcelona. The project has a duration of 3 years and is supported by the Urban Innovation Actions (UIA) of the European Commission.

For further information about the Climate Shelters project, see [Web Journal 1](#).











Areas of action and targets of the Barcelona Climate Plan.

<sup>2</sup> <https://www.uia-initiative.eu/en/news/barcelonas-climate-shelters-project-challenge-communicating-unwelcome-messages-climate-change>

<sup>3</sup> <https://www.barcelona.cat/barcelona-pel-clima/en/>

Furthermore, the Barcelona City Council has issued the Climate Emergency Declaration<sup>4</sup> in an

effort to step up the actions for climate protection. The Climate Shelters project is closely tied to it.

			
<b>Mitigation</b>	<b>Adaptation and resilience</b>	<b>Climate justice</b>	<b>Promoting citizen action</b>
 -45% of GHG emissions compared to 2005 Be carbon neutral by 2050	 1m <sup>2</sup> of greenery for inhabitant 100 l/inhab./day	 0 energy poverty 100% clean funding	 1.2 M€ awarded to citizen projects

*Communication message of the Climate Emergency Declaration.*

<sup>4</sup> [https://www.barcelona.cat/emergenciadclimatica/sites/default/files/2020-07/Climate\\_Emergency\\_Declaration\\_en.pdf](https://www.barcelona.cat/emergenciadclimatica/sites/default/files/2020-07/Climate_Emergency_Declaration_en.pdf)

### 3. CURRENT STATUS OF THE PROJECT IMPLEMENTATION

The project has concluded since its initiation, a number of critical phases, namely:

- (a) the selection process (criteria and methodology) for the schools to be converted to Climate Shelters<sup>5</sup>,
- (b) the background (scientific) analysis of the selected schools as far as the exposure to solar radiation, the wind pressure on façade, the extent of greenery, etc.<sup>6</sup>,
- (c) the participatory processes (among members of the project team, architects, educators, students and parents) for the selection of the interventions per school,
- (d) the drafting of the final architectural plans and finally
- (e) the constructions works related to the interventions for the conversion of the schools to Climate Shelters (July to September 2020).

During the same period, the project has developed and deployed a communication plan

for raising climate awareness and promoting the schools' activities<sup>7</sup>. It has also organized and implemented a monitoring system for the assessment of the prevailing environmental conditions in the selected schools (outdoor and indoor) and the eventual evaluation of the performance of the interventions..Finally, some preliminary work has been made regarding the upscaling of the project.

Overall, the project managed to overcome difficulties associated with the covid-19 pandemic and comply with the set schedules. Yet, the closure of schools resulted in (a) the postponement of the campaigns for recording the state of environment at the schools prior to the implementation of the interventions and b) the cancellation of the participatory events and pedagogical processes at the schools' level. To support the visibility of the project and sustain the interest of the schools and the society for the project a partial reorientation of the communication plan was made

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<sup>5</sup> <https://www.uia-initiative.eu/en/news/adapting-barcelona-climate-change-multicriteria-approach-selection-schools-be-converted>

<sup>6</sup> <https://www.uia-initiative.eu/en/news/science-city>

<sup>7</sup> <https://www.uia-initiative.eu/en/news/barcelonas-climate-shelters-project-challenge-communicating-unwelcome-messages-climate-change>



# 4. OVERVIEW OF THE OPERATIONAL CHALLENGES

The **Climate Shelters** project<sup>8</sup> reflects considerable innovation as locally differentiated blue, green and grey measures are applied to eleven (11) schools so as to reduce the impact of summer heat during school times and when activities are held in the outdoor playgrounds and the school yards. Schools will be also open to the city residents and visitors, acting as cooling

spots especially in the event of excessive heat or heat waves.

A number of operational challenges are associated with the project (see 4.1 to 4.7). For each operational challenge, a critical analysis of the project's development is provided, complemented with lessons learned from the specific challenge.

## 4.1 Leadership

The challenge of leadership is more demanding in the case of an innovative project as risks are higher. In the **Climate Shelters** project, the extensive experience of the City Council of Barcelona in urban projects (also of environmental and climatic character) was reflected in the leadership of the project. In particular, the challenge was addressed through an efficient balance of the educational, pedagogical, scientific and technical aspects of the project, the

delegation of authority to the working groups established, the commitment towards participatory processes, the alignment of all partners to the aims of the project and the employment of iterative processes among partners, stakeholders and experts for solution solving and decision making. Risks were further reduced by involving schools in the co-production process as early as the beginning of the project.

## 4.2 Public procurement

The **Climate Shelters** project gives weight to the technical (blue, green and grey) measures to be designed and implemented to schools (and their yards) in view of their adaptation to climate change. To this end, a critical challenge was the timely completion of the construction works by the end of September 2020, so as to take advantage of the schools' closure period.

steps, the time pressure for the completion of the technical interventions and the complications due to the covid-19 pandemic, the project complied with the milestones set, a fact which can be attributed to the organizational arrangements made so as to facilitate the collaboration amongst the various players. It should be mentioned that the stepwise process included:

The project applied a stepwise design and implementation process. Despite the number of

(a) the preparation of a substantial analysis of the schools (titled "Adapting schools to climate

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<sup>8</sup> <https://www.uia-initiative.eu/en/uia-cities/barcelona-call3>



change by means of green, blue and grey interventions”) by the Agencia d’ Energia de Barcelona with the support of the Societat Organica,

- (b) the preparation of a guide of green, blue and grey solutions,
- (c) the open deliberation of the project’s team with teachers, students, parents and local citizens as far as the final solutions to be selected on a school to school basis,
- (d) the preparation by the Barcelona Consortium of Education-CEB<sup>9</sup> of the technical procurement document along with the selection of the architects to finalize the plans and
- (e) the completion of construction works for the conversion of schools to Climate Shelters.

In terms of step (b), blue solutions reflecting high maintenance costs or (potentially) water quality issues were not finally considered. The need to include expert knowledge (for instance through a University team) on blue measures for urban regeneration and climate adaptation was recognized.

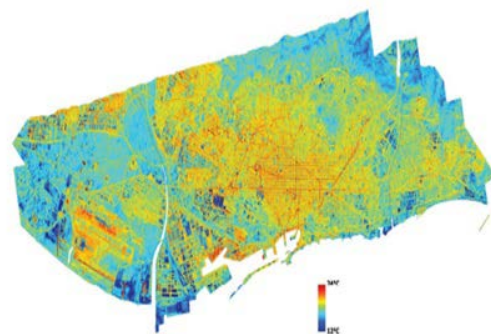
The project had promoted, *even prior to the covid-19 crisis*, procurement procedures from preselected lists of competent architects and construction companies of CEB (the lists were made by CEB on the basis of a number of criteria and are renewed every two years). To this end, the selection of the contractors was facilitated, resulting in the conclusion of all construction works in the selected schools, by September 2020. Yet, a lesson learned is that a solid and well examined contingency plan is always needed, especially in the event of project actions which require the adherence to deadlines and to EU related legislative preconditions.

**THIS IS  
NOT A  
DRILL**

CLIMATE  
EMERGENCY  
DECLARATION  
15<sup>TH</sup> JANUARY, 2020  
BARCELONA



*Green measures as designed and applied at selected schools (source: Climate Shelters project).*



*Conversion of the Can Fabra school to Climate Shelter (source: Climate Shelters project).*

<sup>9</sup> Barcelona Consortium of Education (CEB), is a Municipal entity taken having, among others, the responsibility for the construction of public schools as well as for their annual maintenance. It belongs to the Regional Government of Calalonia (60%) and to the City Council of Barcelona (40%).

**Lesson learned – 1.** Ample time needs to be given for the preparation, launch and completion of the procurements. This is particularly important in the event that the procurements reflect environmental and social innovation. However in

cases when constructions are complicated and/or the time frame for their completion, due to their nature, is restricted, the use of lists of preselected companies is considered beneficial.

### 4.3 Organizational arrangements within the urban authority (cross departmental working)

The challenge of effective organizational arrangements was worked out by setting one technical and one administrative committee, one project management team and four working groups as follows: Communication, Catalog of Solutions, Impact evaluation and Participatory and pedagogical processes.

However, the above arrangements were disrupted due to the covid-19 crisis. To overcome the resulting difficulties, virtual meetings were promoted amongst the participating organizations

as well as the schools, whereas a more flexible decision making process was established by shifting decisions to the project management team.

**Lesson learned -2.** Establish as early as possible a model for cross-departmental working. For projects with large groups of partners, an executive committee should be formed in order to expedite decisions, especially in the event of disruptions of the project due to external risks.

### 4.4 Participative approach for co-implementation

The **Climate Shelters** project took advantage of the tradition and experience of the City of Barcelona in participatory processes as developed from other projects. To this end, it gave space to the participation of all involved stakeholders, although with emphasis given to the school community (teachers, students and parents).

In Zoom #1<sup>10</sup>, the process for the selection of the 11 schools to be converted to Climate Shelters was presented. The process was based on an interactive process between the partners of the project, so as to define the methodology and the list of criteria to be applied.

Following to the selection of the schools, participatory events took place with the aim being to motivate the school community to the

project, to assess the needs of each school, to gather ideas and suggestions for the adaptation of the school and its yard(s) to climate change, to facilitate the interaction with scientists and architects and to develop ownership of the project by the school community.

During the same period, all 11 schools were studied in a process which gave space to science<sup>11</sup> so as to define the microclimatic condition of the schools, namely exposure to solar radiation, wind patterns, % of greenery, shading at the school yard, etc.

At the end, mixed groups of teachers, students, parents, architects and members of the project team selected the mix of the green-blue-grey measures which were implemented to each school.

<sup>10</sup> <https://www.uia-initiative.eu/en/news/adapting-barcelona-climate-change-multicriteria-approach-selection-schools-be-converted>

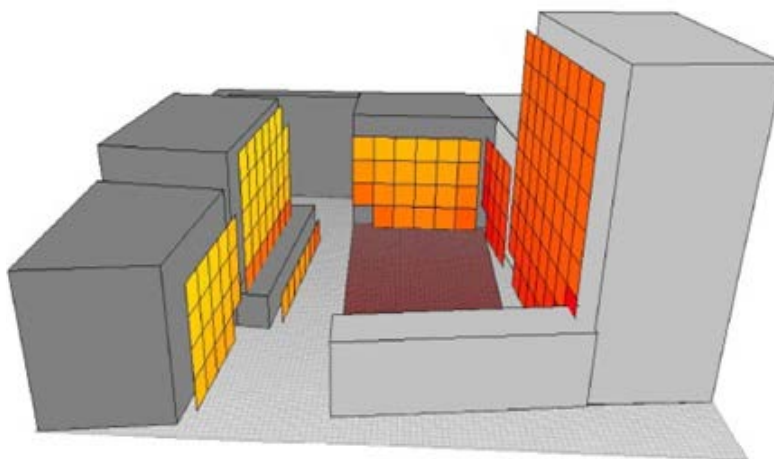
<sup>11</sup> <https://www.uia-initiative.eu/en/news/science-city>



Solar radiation at the facades of the Poeta Foix school (summer average; orange and yellow colors indicate high values above reaching 1500 and 2200 W/m<sup>2</sup> respectively). (source: Technical Procurement Document – CEB)



Conversion of the yard of the Els Llorells school (source: Climate Shelters project).



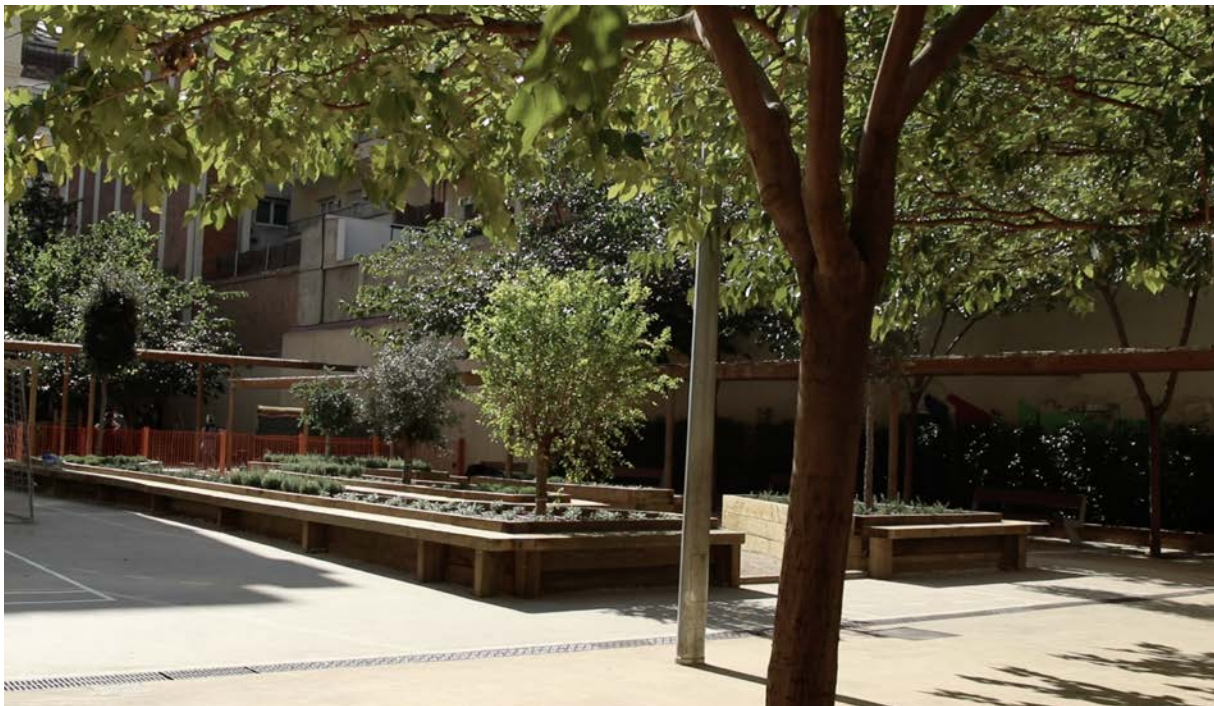
Shading device at the School Can Fabra (source: Climate Shelters project).



## Quotes from teachers

*“It was important that the project listened to the suggestions of the students, despite the fact that it was not possible to implement all suggested solutions, especially the blue ones. In this way, students felt part of the project and got pride for their school.”*

**Lesson learned-3** The Climate Shelters project introduced from its starting phase, participatory processes so as to ensure that teachers, students, parents, scientists and architects would discuss, assess and finally select the solutions to be applied per school. The approach was proven to be supportive for the development of a spirit of cooperation on the one hand and of ownership to the project on the other.



*Participatory process at School Itaca (source: Climate Shelters project).*

## 4.5 Monitoring and evaluation

The **Climate Shelters** project foresees the evaluation, by the Barcelona Institute for Global Health, the Institute of Environment Science and Technology and the Public Health Agency of Barcelona evaluation, of the impact of the blue, green and grey intervention to the 11 schools in terms of attitudes and perceptions towards the environment, health and well-being and physical activity of the users. Specific objectives of the plan are:

- to evaluate the **implementation process** of the interventions to the primary schools in Barcelona,
- to evaluate the impact of the interventions on **students** in terms of health, well-being, physical activity and awareness, attitudes and perceptions towards the environment,
- to evaluate the impact of the interventions and the possible effects perceived on the quality of life and well-being of the **school's teachers**,
- to evaluate the perceptions, potential effects, and use of open playgrounds by the **community**.

The plan originally included measurements of such parameters as CO<sub>2</sub>, temperature, humidity, Particulate Matter (PM), carbon dioxide, ozone, nitrogen dioxide and also aimed at assessing climate change awareness among students and the neighborhood. Low cost commercial sensors (90) as well precision scientific instrumentation were installed to the schools to support the monitoring needs. Furthermore, the plan introduced an innovative aspect, namely the involvement of teachers and students in the measurements' processes at their schools.

However due to the situation arising from the covid-19 pandemic and the closure of schools, all scheduled campaigns (March 2020 and May-June 2020) to collect measurements of the parameters above (termed as reference) were postponed, a fact which resulted in the lack of measurements prior to the implementation of the blue, green and gray interventions. To this end, the evaluation plan was reformed so as to the measurements campaigns to take place in the period ending June 2021, at the precondition

that the schools will stay open during the covid-19 pandemic.

All measurements will be included by the end of the project to a data repository, so as to be further exploited in the future. The maintenance and enrichment of the repository is considered necessary in the period following the completion of the Climate Shelters project.

**Lesson learned-4.** Any intervention to the natural or built environment regarding adaptation to climate change, needs to be linked to an evaluation plan so as to define the actual contribution of the intervention. Criteria for the evaluation need to be mostly quantitative, for instance decrease of air temperature due to the intervention, improvement of thermal comfort, increase of greenery, etc. Saying the above, it is strongly recommended that evaluation is considered as an integral part of any future expansion of the Climate Shelters project with additional schools.

## 4.6 Communication and evaluation

The project gave considerable weight to communication so as to pass the message that Climate Shelters can be supportive for the adaptation of Barcelona to climate change. The communication plan included:

- updating of the project website and links to other city projects,
- communication of the project in municipal newsletters (OBRA: Observatori rehabilitació, Escoles + Sostenibles, Districts),
- monitoring the work and activities in schools,
- collection of this material for social media networks and the internet,

- school transformation communication,
- promotion of the project by the schools (banners in schools, news and social networks, leaflets, roll-ups),
- press conference and presentation of the contribution of the Climate Shelters project for ameliorating the impact of heat waves.

In terms of the schools, the Communication Plan included communication activities by the schools themselves.



*Communication of the Climate Shelters project by the Cervantes School (source: Climate Shelters project)*

The communication plan for the Climate Shelters project was also aligned to the Barcelona for Climate Program, in an obvious effort to

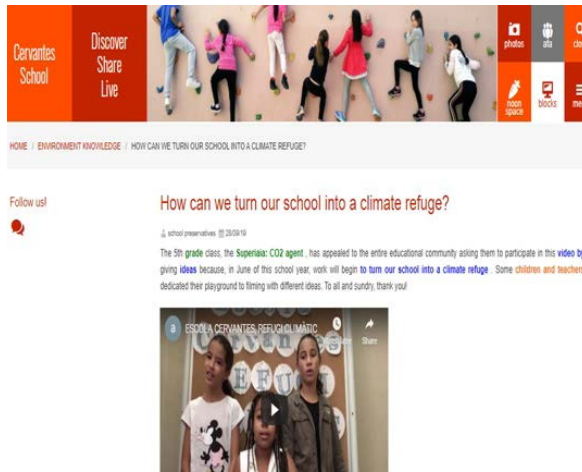
demonstrate that climate change is addressed in an integrated manner.



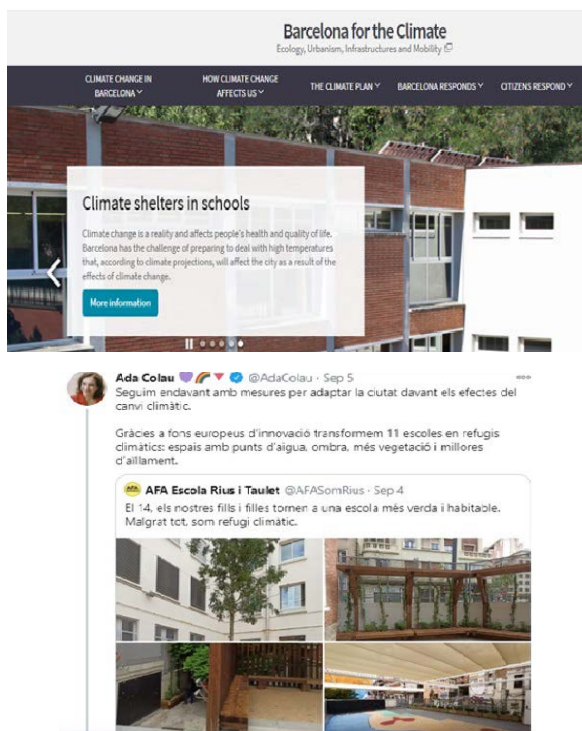
*Presentation of the Climate Shelters project in the Barcelona for the Climate web site (source: <https://ajuntament.barcelona.cat/>)*



Furthermore, the communication plan was supported by the Mayor of Barcelona Ada Colau, through messages regarding the Climate Shelters project in Twitter.



Finally, emphasis was given to the dissemination of the project's messages in the local press as well as in locally organized events of professional organizations, e.g. the conference on renaturation of educational spaces (a meeting point for professionals in the fields of education and pedagogy, architecture, culture and the environment).<sup>12</sup>



**Lesson learned-5.** A well prepared communication plan is a critical precondition for the success of a project; messages need to be distinct, yet linked to overall strategy of the organization and its partners. It is important that messages are disseminated as early as the start of the project and thereafter promoted in a consistent manner and through a mix of communication means, including social media, so as to capture the maximum possible share of the targeted audience, especially young ages.

It should be mentioned that the communication plan was influenced by the covid-19 crisis. In particular, a number of actions were postponed namely (a) the meeting and follow-up with the communication managers of the project partners (b) the meeting of the 11 schools participating in the project to share proposals and activities regarding climate change and shelter schools (the meeting was originally scheduled for 7 May 2020) and (c) the follow-up with the local communities regarding the school transformation (e.g. open days for the public to visit the schools transformations).

To support the communication plan of the Climate Shelters project, several publications were made in the web site of the project as well as in other related sites such as the one of Sustainable Schools, whereas a publication was prepared to inform the public that "The Climate Shelter project does not stop"<sup>13</sup>.

<sup>12</sup> <https://elglobusvermell.org/4as-jornadas-renaturalizacion-de-espacios-educativos-2/>

<sup>13</sup> <https://www.barcelona.cat/barcelonasostenible/ca/escoles-sostenibles/bulleti/583/el-projecte-de-refugis-climatics-no-satura>

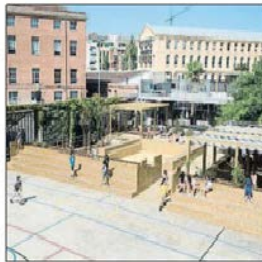


# Barcelona converteix escoles en refugis climàtics

L'Ajuntament millora els exteriors d'onze centres amb actuacions relacionades amb l'aigua, la vegetació i l'aïllament tèrmic

**OSCAR MONZÓ**  
Barcelona

Onze escoles de Barcelona s'han convertit en refugis climàtics per millorar el confort dels alumnes davant les altes temperatures i per respondre més bé a la crisi del clima. Per això s'han transformat els espais exteriors amb actuacions relacionades amb l'aigua, la vegetació i l'aïllament tèrmic. Els patis s'obriran als veïns a partir de l'estiu



Ahora al pati de l'escola Can Fabra, a Sant Andreu

que ve, quan hi hagi onades de calor. Les actuacions, finançades per l'Ajuntament amb ajuts europeus, s'emmarquen en un paquet d'intervencions de millora en 50 centres educatius relacionades amb l'eficiència climàtica dutes a terme aquest estiu -algunes estan a punt d'acabar- per valor de 3,7 milions d'euros.

A les onze escoles, repartides pels dos districtes, s'ha intervingut en tres àmbits després d'un procés en què han participat les entitats, a més dels mateixos centres i els alumnes. Un àmbit és el blau, amb la incorporació de fonts o espais de joc i manipulació de l'aigua; un altre, el verd, que pretén incrementar la vegetació i generar zones d'ombra amb murs verds, més espai per a jardins, arbres i pergolats vegetals; i el secor, el gris, amb

obres als edificis per millorar-ne l'aïllament, cobertes, tendals i proteccions sobre façanes o ventilació creuada. Està previst que l'Agència de Salut Pública, amb la col·laboració de l'IDEGlobal, analitzi els resultats. En aquests equipaments s'hi han instal·lat sensors que permetran fer un seguiment de diferents paràmetres (temperatura, humitat, ventilació, qualitat de l'aire...). Aquestes intervencions han permès guanyar un miler de metres quadrats de superfície que ha substituït la terra-o el formigó, com

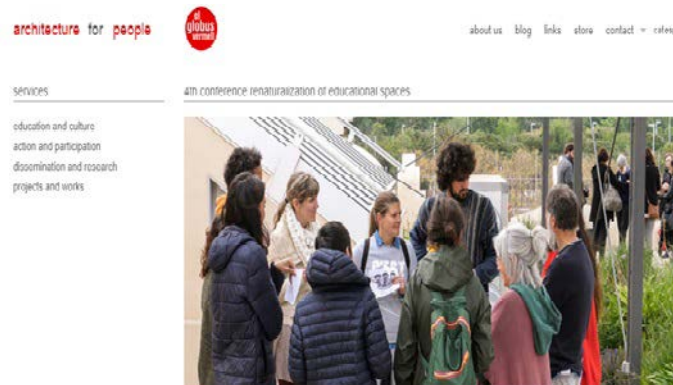
**El projecte preveu que els patis s'obriran als veïns quan hi hagi onades de calor a partir de l'estiu que ve**

també 2.233 metres quadrats d'ombres. S'hi han plantat 74 arbres -com dues illes senceres de l'exemple- i s'hi han instal·lat 26 nous punts d'aigua. Aquestes intervencions formen part del projecte Urban Innovation Action de la Comissió Europea, en què també participa París.

*The climate shelter project does not stop*

The introductory message in the publication was strong and to the point: **“Despite the closure of schools due to Covid-19, the European project has continued its course with new participatory sessions and the drafting of executive projects to adapt the eleven participating schools to climate change”**. The publication also provided specific details on the actions promoted during the covid-19 crisis (March – May) as well as on those to follow in the next months, so as to keep the target audiences alert and sustain their interest.

Furthermore, emphasis was given to the use of social media; in particular twitter reached the widest public, instagram was found to be more suitable for the young ages, a fact which may be exploited in the course of the Climate Shelters project, while e-mail was beneficial for direct contact to people interested on the topic. On the contrary, facebook was not as supportive as expected (source: Climate Shelters project).



*Source: Climate Shelters project*

**Lesson learned -6:** A strong communication plan is the one that manages to deliver its messages to the public, even during periods when attention has been diverted (as is the case for the covid-19 crisis), as well as to sustain the interest of the target audiences.

In terms of the post covid-19 period, it may be needed to re-adjust the communication plan so as to capture any changes to the perceptions of the people. An important finding to this direction comes from a world-wide survey<sup>14</sup> which explores the perceptions of 28,039 people (ages 16-74)

<sup>14</sup> IPSOS-MORI, 16-19/4/2020

from 14 countries on the links between covid-19 and climate change.

It is interesting to note that 73% of the respondents from Spain agree that that in the long term, climate change is a crisis as serious as Covid-19, whereas 62% consider that it is important that government actions prioritize climate change in the economic recovery after Covid-19.

## 4.7 Upscaling

The project has demonstrated its potential through the conversion of the eleven (11) pilot schools to Climate Shelters. To this end, and taking note of the innovative character of the project, its successful implementation as far as the conversion of the schools is concerned and the reasonably anticipated environmental and climate benefits, upscaling seems promising.

The project team has taken good note of the need for the early scheduling of the upscaling process and has planned the 1<sup>st</sup> phase of upscaling by means of the gradual conversion of twenty nine (29) more schools to Climate Shelters by the year 2023. These schools originate from the forty five (45) schools which had initially expressed interest to the project, a fact which shortens the time needed for the upscaling of the project as far as the schools selection process is concerned. On the other hand, schools which have not expressed any interest to the project, may seem to be left behind; this a fact which needs to be taken care in the second phase, after 2023, of the upscaling of the project.

Furthermore, the upscaling of the project has been linked to the Climate Plan of the City of Barcelona, a fact which demonstrates the political will of the local administration to expand the area of application of the project. It is important to note that the Province of Barcelona has also

The above reflect a positive indication for the re-iteration of the communication plan, closely aligned to its original goals with emphasis given to the perception of people that climate change is a major crisis.

Finally, it is important to note that the collaboration between Barcelona and Paris on their UIA projects has advanced, despite the covid-19 complications.

recognized the potential of the project and has been promoting the conversion of two schools in small cities in the region, to Climate Shelters. Although this seems as a replication of limited scale, a momentum may be built, especially at the precondition that the Climate Shelters project communicates actively its achievements, also outside the boundaries of the City of Barcelona.

Open issues to be dealt refer to the need for expanding the list of potential solutions so as to include photovoltaic installations and a wider range of blue measures, whereas a strong recommendation is to give more emphasis to energy related solutions as well as to integrate greenery/garden experts in the design teams.

Finally, the City of Barcelona is examining potential sources for the funding of the upscaling of the project, mostly with respect to the commitment of European funding. To this end, a rapid analysis of the prospects of the EU Recovery Funds as well as the Structural Funds is required in view of the eligibility of the upscaling needs of the project. Alternatively, the City of Barcelona may need to commit municipal funding so as to gradually integrate a number of schools per year to the Climate Shelters network, even if in this case the original plan for 40 schools by 2023 may need to be extended timewise or if the applied solutions for the conversion of the

schools to Climate Shelters may be downscaled so as to achieve economies of scale. The assessment of the potential of the private sector to fund the project on a school to school basis or in clusters, needs to be also considered, especially taken the demonstrated success of public to private partnerships.

In general terms, upscaling needs not to be done after the end of a project; on the contrary, it has to be taken care as early as possible through early

assessments and in conjunction with such preconditions as: resources available, generalized upscale or upscale on a cluster per cluster basis, competent authorities to take part, etc. Close interaction to the political leadership is needed so as decisions to be taken proactively, especially with respect to securing the needed funding.

## 5. SUMMING UP THE MAIN ASPECTS

**Climate Shelters** reflects an innovative project aiming at the development of a network of 11 Schools adapted to the Climate change (in particular urban heat) with the goal to replicate the project to all schools in the city.

The project has concluded with success a critical phase, namely the design of the plans for the conversion of the schools to Climate Shelters as well as, and more importantly, the completion of the respective interventions and technical works. In practical terms, it has developed a solid multi-step methodology regarding the selection process of the schools, the scientific criteria for the assessment of their environmental and climatic state, the development of catalogs for the green, blue and grey measures and the participative approach for the selection of the mix of measures per schools.

The project has also continued the implementation of a multi-dimensional communication plan with solid results, despite the cancelation of social events and public meetings due to the covid-19 pandemic. To circumvent the covid-19 related difficulties, more emphasis was rightfully given to the use of social media so as to keep the message of the project alive, to demonstrate the successful completion of the schools' conversion

to Climate Shelters as well as to overall maintain the interest of schools and of the general public to climate change.

The project has initiated its upscaling process so as by the year 2030 the total number of Climate Shelters to reach the number of forty (40); to this end, efforts should be undertaken for the allocation of the needed funding. On the contrary, the covid-19 pandemic resulted in the postponement of an elegantly designed evaluation plan; the plan has been reformed in view of its implementation during the school year 2020-21.

Finally, the next steps of the project are (a) the implementation of the reformed evaluation plan in order to assess the capacity of the project to improve the health conditions of students and teachers as well as the environmental conditions at the schools and their neighborhoods (b) the continuation of the communication plan, with emphasis given to the promotion of the Climate Shelters for the adaptation of Barcelona to climate change as well as to the positive role of the school community to this direction and (c) the continuation of the upscaling process in support of the project's replication potential.

Urban Innovative Actions (UIA) is an Initiative of the European Union that provides urban areas throughout Europe with resources to test new and unproven solutions to address urban challenges. Based on article 8 of ERDF, the Initiative has a total ERDF budget of EUR 372 million for 2014-2020.

UIA projects will produce a wealth of knowledge stemming from the implementation of the innovative solutions for sustainable urban development that are of interest for city practitioners and stakeholders across the EU. This journal is a paper written by a UIA Expert that captures and disseminates the lessons learnt from the project implementation and the good practices identified. The journals will be structured around the main challenges of implementation identified and faced at local level by UIA projects. They will be published on a regular basis on the UIA website.



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