



ABITA *lab*
REGGIO CALABRIA
Centro Interuniversitario
**Architettura Bioecologica ed
Innovazione Tecnologica per l'Ambiente**

A contribution to the dialogue on 'Global Mass- Living Mass. Beyond the Artifice the Living Materials'.

Partner of exhibition

Mediterranea University of Reggio Calabria, ABITAlab dArTe

TEAM

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Technical Sponsors

R.ed.el Srl (SME research partner)

PMopenlab Srls (ICT research partner)

Title of artifact/project _ Scientific Paper

BioSbattery: the *storage effort* for new nature

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TEXT

Introduction

BioSbattery: the storage effort for new nature is A contribution to the dialogue on 'Global Mass- Living Mass. Beyond the Artifice the Living Materials', to participate in the side event "Students as Researchers: Creative Practice and University Education" part of the 18th Venice Architecture Biennale, at the proposal of NYIT.

ABITAlab, which is a university laboratory carrying out activities since 2002 at the Mediterranean University of Reggio Calabria, is part of a network of Italian university laboratories dealing with Biological Architecture and Technological Innovation for the Environment.

The Reggio Calabria Lab, carries out frontier research and advanced education on the topics, having active design and prototyping section, with wide transfer to Architecture students and public and private entities and SMEs.

For the past five years, the Lab has been conducting national and international activities, academic courses, exhibitions, disseminations and advanced education on the topics of regenerative digital design and application of enabling and emerging technologies for decarbonization in climate change scenarios.

The participation of students as researchers in ABITAlab activities is an established practice, through internship programs for undergraduate and postgraduate theses, with projects related to funded research and theses pathways for undergraduate, doctoral, and postdoctoral studies, advanced academic researches.

Also for the BioSbattery project, the university lab was able to work with the team of researchers and students as researchers, formerly interns, proposing a project/artefact that comes from research already underway, for a demonstrator being built and tested, at the team's sponsoring SME, which concerns the realization of a green wall- Green Responsive System, for greening on the wall of hybrid buildings, with high levels of innovation for the realization of new components made by additive manufacturing and upcycling processes, also in order to test the level of storage and update of atmospheric emissions, monitoring the performativity of the system over time.

Below, for the project *BioSbattery: the storage effort for new nature*, three main focuses on the *Concept-Design Process*, *the Prototyping Process*, and *the Education Process phase*, also applied for this project/artefact proposal, are outlined.

The work team produced an in-depth research study in 15 graphic and scientific content boards, the 3D printed prototype in its components, initiated 1:1-scale prototyping with upcycling materials from R.ed.el's processing, a 1' narrative video in collaboration with PMOpenlab, an open platform on research "BioSbattery - Project and Prototyping" accessible on: www.abitalab.unirc.it

Concept-Design Process

IMAGES 1 -2

BioSbattery is a *new* concept that discovers the storage effort (of emissions in the atmosphere, captured on earth) to the most advanced performativity of anthropogenic mass in the challenge of behaving like biomass.

The 'performativity' is never equal, but depends on the materials and waste incorporated into objects, their waste. Their 'grey energy' depends on the history of their production, while a new 'green energy' will be measured by a second and third life 'in operation', converting the overload resulting from the mass of CO2 stocks into a new sensitivity capable of 'healing the changing atmosphere'.

"(...) The same atmosphere is never the same at itself". (Morton, 2009).

BioSbattery, acts on three representative scenarios of climate change phenomena and impacts in the atmosphere, in the ranges between 2020, 2050, 2080, highlighting 2037 as the cross-over point.

In the research described as a scientific position, the distribution of anthropogenic mass in terms of production for the materials of interest in the prototype project is studied, matching it with the performance of CO2 storage extracted from urban local mining on a regional and industrial quarry scale. (Calabria Region, R.ed.el site) [tables 3,4].

BioSbattery, tries to rename itself with a new identity by referring to the concept of BioS in its double meaning, as a 'living being' and as an 'electronic system' that connects hardware and software devices, providing instructions on how to perform basic or advanced interconnected functions.

In the prototype-component design of the collective installation, 'BioSbattery Prototype', it carries with it the memory of the design experimentation on research conducted for other prototypes and demonstrators, from the anthropogenic mass production of waste materials from construction and industry (concrete, plastics, aluminium, copper, asphalt), from the upcycling design processes of de-manufacturing and re-manufacturing of components for electrical installations." [table 5]

BioSbattery, strives to take the configurations and performativity of a new nature, beyond the performance of upcycling materials, proposing new material configurations of biomass, whose sensitivity transcends the very concept of wet mass and dry mass and mineralises natural components, incorporating waste, anthropogenic waste.

In the GRS demonstrator project, the BioSbattery prototype represents the hybrid device for measuring the distribution of biomass in terms of organic matter and, by identifying global vegetation carbon storage scenarios at different climate latitudes, proposes the solution of a new component, whose green energy is expressed by phytomass components hybridised with anthropogenic mass, for architecture in a temperate Mediterranean climate. [tables 6:14].

In an advanced dimension of the performativity of new prototypes and demonstrators, which have become 'regenerative devices in a new concept of extreme architecture', it will confront the new 'emerging technologies' and respond to the impacts in the atmosphere, expressing the new generative values of the increasingly fluid configurations as expressions of the capture of the mass of CO2 stocks in the atmosphere. [table 15/video].

"(...) Emerging technologies, become languages of the different converging techniques that move in the abundance of the world of images, beyond our natural imagination, in an absolutely urgent time for fluidity of innovations and flows of matter and new hybridisations." (Nava, 2023)

BioSbattery, is a product but also a process, due to its morphological and structural characteristics of being a component of a more complex system (the Green Responsive System) and to assume in the system itself a technological and environmental function, but also a monitoring hot-spot for CO2 storage with materials from upcycling processes.

BioSbattery, in its prototyping process as a final artifact, takes on a strongly declarative character, to tell the story of its making process and at the same time the story of PVCupcling research, on the issues of production chains of anthropogenic materials and their ability to trigger circular processes for new materials for Architecture without depletion.

BioSbattery, is the product of an iterative process and therefore of high technological and natural value, from its design with methods and tools of regenerative digital design to configure form, to its manufacturing with natural materials and from recycling process, in new mixtures, confirms the possibility that new artifacts are possible by hybridizing anthropogenic mass and natural mass.

Education Process

IMAGE 5

BioSbattery, is the result of an education program on advanced architecture and digital technologies applied to sustainability and decarbonization processes, carried out by ABITAlab in the last 5 years of work at the Mediterranean University of Reggio Calabria.

BioSbattery, is the work done as a team with some student interns, who carried out activities with high scientific and applied content between the design and prototyping laboratory, gaining experience from the transfer of frontier research and with the most advanced methods and tools of regenerative digital design and computational activity for additive manufacturing.

Biosbattery, in its design process and prototyping process, represents a well-established and advanced experience of the TRL - Technology Readness Level method process, which ABITAlab with its researchers and students as researchers, has long adopted to control the level of design innovation for decarbonization and the process of accounting for storage and uptake into the atmosphere. Character of performativity, beyond performance, that each artifact can take, integrated to responsive and adaptive systems for Architecture of Transition, through the use of enabling and emerging technologies, of response to global risks defined by the upcoming climate scenarios, 2035, 2050, 2080.

References

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More informations: www.abitalab.unirc.it