

SOLAR DECATHLON AFRICA.

Proposal of the UPF/EPF Team

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Project title: PLUG & LIVE

Objectives of the project: The chosen strategy of our team is to suggest an « eco-reponsible » housing, economic, adaptable to its geographical localization and its cultural background. This strategy leans on three main objectives:

- Creating a local « eco-responsible » architecture adapted to material and cultural conditions of its environment. This adaptability throughout its inhabitants' life becomes the basis of our modular concept. Modularity must allow easily any module addition or removal, any interior or exterior space redefinition;
- Creating an energy low-impact architecture by minimizing the building resources and operation's needs, but also by minimizing the impact of the construction site;
- Reducing the building costs in order to create self-sufficient solar housing with affordable costs for most people, and for that, betting on an organization that reduces construction site duration and profiting from varied and complementary production tools.

Description of the project: Our project offers to combine industrialization and self-building until a complete house is built out of modules and prefabricated elements. The goal is to transfer all or parts of the intelligence, skills, and qualifications of the building process, within modules designed with intelligence for self-assembly, following a similar process than the one in IKEA with furniture. This concept must allow us to assemble industrialized elements on site, as well as to move them and assemble them differently as in the LEGO; We then named our project « PLUG & LIVE ». Our project considers a principle based on a technical module (e.g. kitchenette + bathroom + laundry + switchboard, etc.) around which noble rooms are being connected (living room, bedroom, etc.). This principle leads to a production rationalization of the house making the construction costs minimization possible. The preponderant part of the final construction cost being linked to the workforce cost, the maximum cost saving is being made thanks to the assembly time reduction on the construction site. Otherwise, the goals of the passive strategies introduced in this project are to minimize the heating and cooling needs accordingly with seasons. It is about implementing a thought-about bioclimatic architecture. The modules will have a very insulating and waterproof skin avoiding all kinds of losses, and also blinding devices for sun protection or, to the contrary, sunray uptaking according to the needs (summer/winter). Each module is shaped as a rigid box, open on the South and North sides, and shut on the East and West sides. The walls will be filled with a compacted straw insulator in order to obtain a better summer comfort thanks to the induced phase by the material inertia.

