



This autumn, team Odooproject of Budapest University of Technology and Economics (BME) has a chance to build their very own, self-designed solar house in Madrid, and to get in the ring with the other nineteen student teams of prestigious European universities that got into the final round.

The contest

The Solar Decathlon is an international innovation contest between universities. It has been organized by the U.S. Department of Energy in every other year, since 2002. During the competition, the teams have to design and build an energy-effective, eco-friendly, light-structured residential building which only uses solar energy. The main objectives of the contest are to introduce the students to renewable energies and energy-effective means and solutions, to generate support for green technologies social- and marketwise, and to integrate solar technologies into building structures in an aesthetic and organic way. By this day, the competition had outgrown itself so much, that it is hosted by three cities, Washington and Madrid and Datong, China. The next competition will be held in Paris, in two years time.

The team

Almost every faculty of BME represents itself in Odooproject, however, the creation of a house being designed in the spirit of sustainability requires a new kind of teamwork: a work method which allows architects, engineers, electric engineers and the communication team work together from the very first moment of the designing process as long as when the gears finally piece together. Our team was selected based on our application, in which we had to convince the organizers that our project was viable. We had to prove our worth in four topics: Planning and Innovation, Finance, Project-integration and Project-management. During the contest though, as the name suggests (Decathlon) we will be evaluated based on ten aspects: architecture, building structure, energy balance, building operation, comfort, communication and social responsibility, industrialization, innovation and sustainability.

We formed ourselves on the summer of 2010, and we are ready to represent our country in the most complex way possible. Hungarian innovation, cultural elements, our way of thinking and our existing values will all



be presented during the project. Odooproject doesn't only design a house, but, through its concept, it also wants to take part in advancing and accelerating the process of collective interiorization of the sustainable and energy efficient lifestyle. In addition - because it was a fundamental goal to create a viable, innovative product marketable in Hungary - we found it indispensable to optimize the house to Hungarian circumstances; it is our long time goal to penetrate the Hungarian market after participating at the contest with the help of supporters and sponsors. However, we have many tasks ahead of us before the competition starts in Madrid, in the last two months we are in great need of - among others - supporters and sponsors, so that in the end, every piece would fall into its place.

The Odoo (in Hungarian, the word 'Odú' means burrow) house

We have the relation of the individual and their outer environment stands in the focus of our house's concept. If one can relate in many different ways and aspects to their environment, they'll always be able to find the most optimal connection between them and the outer world, so that they can live in harmony with nature in some sort of peaceful, mild way. Our team imagined a house that reinterprets the relation of the exterior and the interior.

Right at the beginning of the designing process, we ran into a piece of data that says: in first world countries, people spend 95% of their time in closed, air-conditioned areas. These areas have to be built, cooled, heated and lit, which requires massive amounts of energy. The Sun doesn't shine upon our heads, the wind doesn't blow our hair, we don't hear the birds singing and we don't smell scents. We shut nature out of our lives, but sustainability has to be about living in harmony with nature. That is why the basic concept of Odooproject is to create a house where we can spend 50% of our time inside, and 50% of it outside, replanting natural stimuli into our lives, and doing all that energy effectively. Because of that reason, our house is made up by two main units, equal in size: a house and a courtyard, which is basically a terrace, bordered by a wall. In this way, the building constitutes a whole, like yin and yang.

The central piece of the house is the summer wall. The placement of this wall creates the terrace, giving us the possibility to spend 50% of our time in open air, and also lets us to use the Sun's energy in the most



optimal way possible. With this solution, the number of functional zones - which determine the places we can spend our time at - is doubled. With the development of the summer wall and the terrace, we could create exterior zones for cooking, entertainment and leisure, activities that otherwise would bound us to the interior of the house.

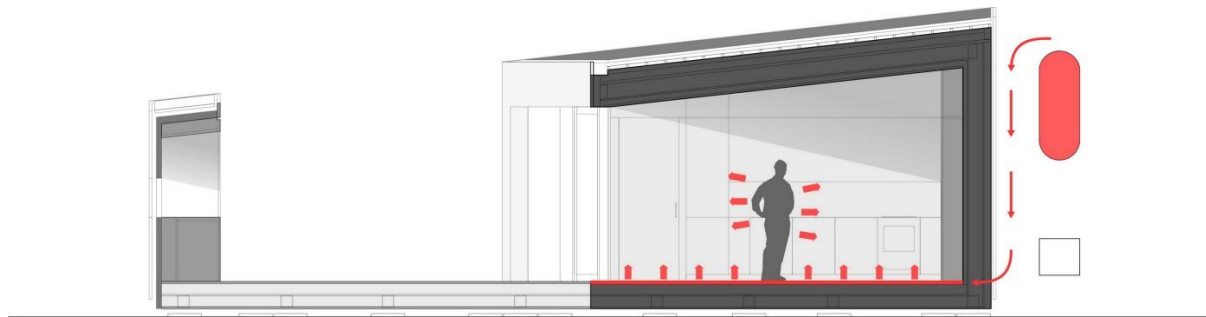
Thanks to the design of the house, we can live by the rhythm of the Sun, slightly differently in every season. The Sun doesn't only determine the rhythm of life; it also determines the operation of the house, because we get our electricity, heat, hot water and light from it. We use solar panels for these purposes, which, during the designing process eventually became the coverage of the roof and the wall, characteristically defining the appearance of the house.

Thanks to the placement of the summer wall, the southern side has a considerably large surface that generates energy, and at the same time we can still design large areas on the house that could serve as window surfaces through which light can pour in freely. Solar energy is produced by the roof panels during the summer, when the altitude of the Sun is high, and it is produced by the wall during the winter or morning hours, when the altitude of the Sun is lower. Ultimately, owing to this system, the house generates twice as much energy in Hungarian conditions and three times as much in Madrid as the house itself spends. In the latter case, this amount is able to serve two other house's needs, or provide a 70 kilometre long travel distance - daily - for an electric car.

For heating or cooling, the most sustainable method we can use is the one that doesn't utilize electricity, but the energy of the Sun. Because the Odoo can protect itself from sunbeams extremely well, there is very little heat that gets inside the inner area. The amount that does however, is channelled out in passive and semi-passive ways. The system is able to work in reverse, meaning that what cools in the summer, also heats in the winter. During wintertime, we simply let the sunshine in, trap heat energy with heat-storing mass integrated in the structure of the building, and then rechannel it with a single pump. This way, the heat stored by the aforementioned semi-passive system can be used when there's no sunlight (late afternoon, night).

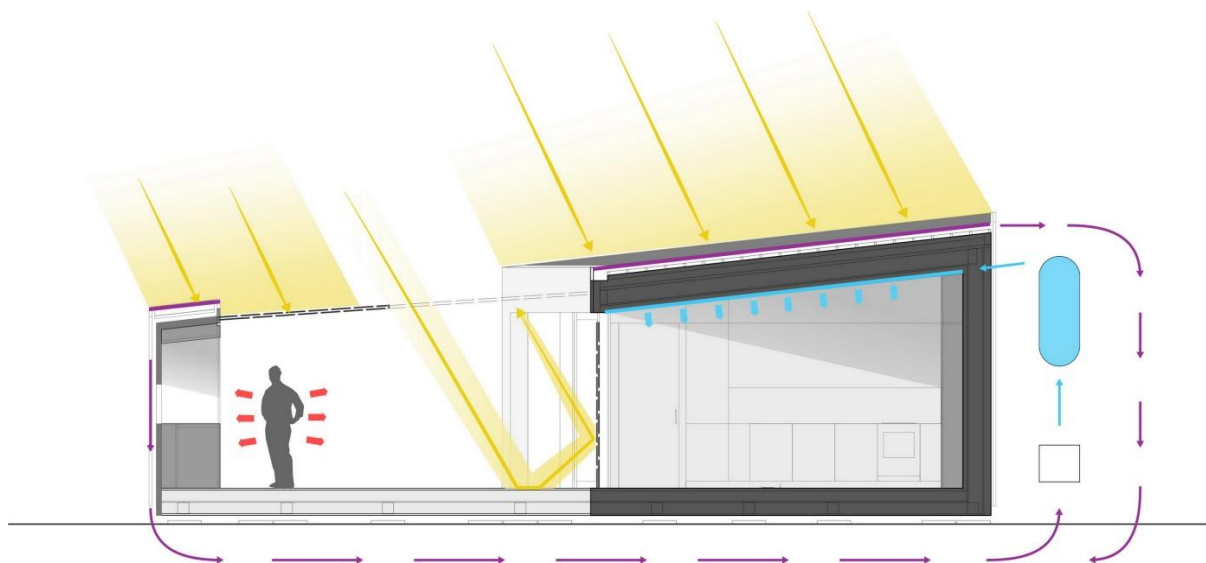


Daytime during winter



Nighttime during winter

During the summer, when there's need for cooling in the house, we cool the living area through the ceiling, and we are also able to channel out the heat surplus from the room.



During summer



Because the house produces twice as much energy as it needs to operate its systems in a yearly scale, we can solve the heating with a slight additional boost during autumn and spring. Although we can only obtain electric energy required to heat the house from the network during the winter, we produce multiple amounts of that energy during the summer.

Integrating energy efficient technologies is also one of the tasks of sustainable architecture. In Odooproject, we use means and methods that work on their own, but can also be built into residential houses in their current or improved forms. We concentrated on easy variability, cheap, easy industrial implementation procedure and securing the possibility of free adaptation to unique needs during the planning process. We designed a building structure system that makes a clear unit with its straightforward shapes and lines, a system that provides variability and easy implementation.

The main goal of our team is to present: the utilization of solar energy can be aesthetic, comfortable and affordable. We hope that the process Odooproject started will continue on both in university circles and the dynamics of Hungarian architecture and society.

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