

Press kit

Bouygues Construction, a Partner of Solar Decathlon Europe 2014

June 28 – July 14, 2014



Shaping a **Better Life**

Supporting innovation that will help develop sustainable homes for all

For several years now, Bouygues Construction has been committed to a dynamic approach to innovation with a view to inventing the sustainable city of the future. Each year, the Group devotes half of its R&D budget to innovation and sustainable construction, with the aim of developing new solutions for constructing buildings that provide occupants with comfort and well-being, consume less energy and help protect the environment. Furthermore, the environment and sustainable construction form one of the four priority areas of its sustainable development strategy designed to achieve its global ambition of shaping a better life.

It is in this context that Bouygues Construction is a partner of the Solar Decathlon Europe 2014, a competition that challenges teams from universities and engineering schools around the world to design and build a full-scale, entirely functional solar-powered house.

Solar Decathlon was created in 2002 by the American Department of Energy. The European version of the competition was launched a few years ago. The first two events were hosted by Spain in the city of Madrid, in 2010 and 2012. They were a great success, attracting close to 20,000 visitors. Solar Decathlon Europe 2014 will be hosted by France, within a huge campus set up in the grounds of the Château de Versailles, from June 28 to July 14, 2014.

Yves Gabriel, Chairman and Chief Executive Officer of Bouygues Construction, said: "Our commitment to Solar Decathlon Europe 2014 is testimony to our determination to support innovation in favour of sustainable homes for all. Inventing the sustainable town of the future is a challenge that clearly requires the mobilisation of the entire construction sector. But it also depends on the active contribution of governments, local authorities, academics, etc. Solar Decathlon is a unique opportunity to bring together all these players with a view to generating the innovative solutions that will shape the sustainable and self-sufficient towns and cities of the future."

A team in the competition sponsored by Bouygues Thai

Bouygues Construction is supporting Thailand's KMUTT team, sponsored by Bouygues Thai. Around thirty students from the School of Architecture and Design at King Mongkut's University of Technology Thonburi (KMUTT) will be competing with their Adaptive House project, which includes a concept called "Baan Chaan", which means "terrace" in Thai.



The KMUTT team is the only South-East Asian team taking part in the competition. Three other teams from Asia are competing, representing Japan, India and Taiwan.

The KMUTT team's challenge is to design a prototype that can offer genuine resistance to small earthquakes, storms and, most importantly, the permanent threat of

flooding that strikes the lowlands of Bangkok, irrigated by the Choa Phraya river and a multitude of river branches. This is a major worry for the Thai people, particularly since the catastrophic floods of 2011. The project includes an ecological amphibious transport solution which is able to use land roads and/or canals, ensuring it is fully operational during periods of flooding.



The urban complex designed by the KMUTT team is divided into groups of several homes which share a common space – which will include an energy generation plant, a water retention pond and various public services – providing the houses with communal space during natural catastrophes and allowing the sharing of resources. The project makes a meticulous choice of Green Label timber, which ensures the sustainable management of forestry resources, in order to limit the impact of the construction on Thailand's tropical forests.



The complexes of houses are linked to a central space equipped with a water treatment and recycling centre, as well as a small zone for the storage of equipment for emergencies and maintenance. The management of wastewater during times of flooding is a major health issue which the team has also addressed in the framework of the project.

Employees of Bouygues Thai, a subsidiary of Bouygues Construction, provided advice to members of the KMUTT team during the design phase. The team is also being given logistical support in France: a storage and pre-assembly area for the modules at Challenger (the head office of Bouygues Construction) and the organisation of a group of volunteers to give practical help in purchasing additional supplies and handling practical aspects of day-to-day life in France. Help has also been offered in the presentation of the strengths of the Adaptive House project (one of 10 scoring criteria for projects).

A 70 m² stand to promote R&D and innovation of Bouygues Construction

Bouygues Construction will be present at the Solar Decathlon during the two weeks of the competition, and several aspects of its R&D and innovation policy will be highlighted on its stand.

A response to the environmental challenges raised by its activities and a source of growth for the company, sustainable construction is central to its research programmes. Bouygues Construction devoted 51% of its R&D investment to sustainable construction in 2013, compared with 32% in 2009. Since 2010, it has also conducted a broad-based action plan covering these issues in the context of Actitudes, its in-house sustainable development policy. Over and above the technological implications, the plan concerns organisation, marketing and sales and worksite production methods. The aims are to develop innovative and practical solutions at every level of the company that promote sustainable construction. Bouygues Construction has set up a new Innovation and Sustainable Construction division to design and develop solutions that meet the demands of its customers and of end users. It is responsible for reviewing stakeholders' expectations and for identifying and evaluating the new technologies, materials and tools that can help protect the environment, and it seeks to forecast market trends. The Group has selected a number of issues to work on, including:

- **Energy:** reduction of consumption in both new and renovated buildings, with the introduction of diagnosis, design and measurement tools that allow a genuine commitment on energy efficiency.
- **Carbon:** the CarbonEco[®] software tool, developed in-house, measures the carbon impact of buildings and structures. Low-carbon solutions are currently under study, primarily using concrete developed with Lafarge.
- **Resources and materials:** a database of eco-friendly products is available to entities, and procedures have been introduced to reduce water consumption in buildings.
- **Biodiversity:** methodological guides on urban biodiversity have been written and work on optimizing compensatory measures continues.



- **Health and comfort:** several interior air quality measurement campaigns have been carried out in order to reduce the level of pollutants.
- **Uses:** Bouygues Construction organises awareness-raising for users of buildings, showing them the eco-actions they can adopt in order to achieve better control of their energy consumption.
- **Eco-design:** in conjunction with the CSTB, the Group has developed Elodie[®], a multi-criteria tool that assesses the life-cycle of buildings.
- **Construction sites:** a series of innovations have been developed to improve working conditions on construction sites (a robotised sander for ceilings and a robotised formwork-cleaner, etc).

Displays on the Bouygues Construction stand

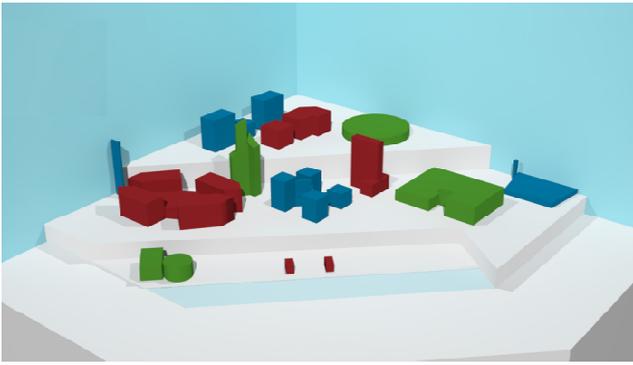
Presentation of **digital modelling** at Bouygues Construction and a demonstration of the 3D model of the KMUTT team's project sponsored by Bouygues Thai: as well as a terminal displaying Bouygues Construction's "BIM Book" and tablet, there is a touchscreen showing 3D modelling of the Thai project.



A "serious game" on the renovation of Challenger, the head office of Bouygues Construction: players become experts in renovation. By answering a series of nine questions, they

devise a combination of solutions for renovating Challenger, taking account of three criteria: performance, price and environmental impact. Their solutions are then compared with those that were actually selected for the renovation of Challenger.





A model of the sustainable construction city as designed by Bouygues Construction: it shows innovations in sustainable construction devised by Bouygues Construction thanks to the iteration of enriched content in augmented reality.

Presentations and debates on the subject of sustainable housing

Bouygues Construction and its entities have scheduled a number of presentations and debates throughout the Solar Decathlon competition on the theme of sustainable housing.

Biodiversity: focus on the BiodiverCity label and the Biositiv project.

July 1 from 3.00 to 5.00 pm, hall 3.

Speakers: *Aurélien Dupuy (Expert, Biositiv and Sustainable Development), Olivier Lemoine (Ecologist in Biodiversity).*

Timber construction: the MIX3B project, or how to make timber construction processes competitive.

July 4 from 6.30 to 7.15 pm, hall 4.

Speaker: *Rémi Thepaut (Structures skill centre).*

Digital modelling.

July 8 from 10.00 to 11.30 am, colloquium room 150.

Speakers: *Pierre Benning (Deputy Director, Studies & Techniques), Jean-Michel Dupuyds (Director, Studies & Technique).*

Innovations of the city of the future, electric mobility and energy storage.

July 8 from 6.00 to 7.30 pm, hall 3.

Speakers: *Jean-Michel Guéry (Senior Vice President, Development & Technologies), Jean-Bernard Sers (Deputy Director, R&D and Innovation), Michel Cozic (Deputy Director, Sales and Marketing).*

The ABC concept.

July 9 from 6.00 to 7.00 pm, hall 3.

Speakers: *Denis Valode (Project Architect), Philippe Van de Maele (Director of Innovation and Sustainable Construction).*

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As a global player in construction and services active in 80 countries, Bouygues Construction designs, builds and operates buildings and structures which improve the quality of people's living and working environment: public and private buildings, transport infrastructures and energy and communications networks. A leader in sustainable construction, Bouygues Construction and its 52,200 employees have a long-term commitment to helping their customers shape a better life. In 2013, Bouygues Construction generated sales of €11.1 billion.

