



An Eco-Systemic Approach to Designing a Net Zero House (ORA House)



Shameel Muhammed

Assistant Professor, Architecture
School of Energy, Geoscience, Infrastructure and Society
Heriot-Watt University-Dubai Campus
Dubai, UAE
s.muhammed@hw.ac.uk

Summary

In November 2018, Dubai Electricity and Water Authority in collaboration with U.S Department of Energy hosted the first-ever Solar Decathlon event in the Middle East. Fifteen teams participated in the two-year-long design, build and demonstrate – competition. Heriot-Watt University's with its innovative net-zero house, The ORA house, successfully participated in this challenging contest.

ORA is an acronym of Organic, Resilient and Adaptable which identifies three ecosystems around which the house is designed. All of the passive design strategies and systems came under the Organic ecosystem. The resilient ecosystem catered to active design solutions. Adaptable ecosystem addresses the behaviour of the house, similar to how a plant grows to adapt to light, space and nutrients. The innovative design approach helped the team to propose a truly integrated design solution, improving energy efficiency and sustainability.

The design and build were led by a multidisciplinary team of students and faculty from Architecture, Architecture Engineering, Interior Design, Civil Engineering, Electrical Engineering, Mechanical Engineering, Renewable Energy Engineering and Computer Systems. During the contest period, the team engaged with various leading industry partners. The project was sponsored and supported by our industry partners - Diamond Developers of The Sustainable City, Daikin Middle East, LG Middle East, Trox, Trane Home Automation, Kingspan Insulations, ITC-Hansgrohe, Ras-al-Nakheel Landscape and Pureti.

ORA House secured fourth place in 'Sustainability', fourth place in 'Innovations in Architecture' and fourth place in 'Innovation in Engineering and Constructions' contests.

Project Lead: Shameel Muhammed, Assistant Professor, EGIS

Project Student Team: Sarah Asif, Amro Mansy, Leander Joseph, Asidha Siddik, Muskan Mardia, Noor ul-Ain, Shreya Sathanadhan, Antony Vighin, Karim Fahmy, Devasri Jaganathan, Faisal Razzak, Rinku David, Akshaya Sankaran, Lue Xiong, HariKrishnan Thangamani, Ibrahim Mousleh.

Faculty Team: Prof Mary Jane Rooney, Dr Harpreet Seth, Dr Mustafa Batikha, Linsey Thomson, Dr Hassam Chaudhry, Dr Jun Han, Dr Hind Zantout, Talal Sheikh, Dr Mehdi Nazarinia, Mohammed Al – Musleh, Dr Mutasim Nour

Project Media

Introducing ORA House

<https://www.youtube.com/watch?v=teNDYUK3-D0>

Earlier concept video

https://www.youtube.com/watch?v=Bwbele5yShU&feature=emb_logo

ORA House during the build

<https://www.youtube.com/watch?v=QbaRWkCWXq0&list=PL6u5PkWz18WVAKNOvAFIvAdnOjPeKoDsX&index=3>

ORA House during contest period

<https://www.youtube.com/watch?v=6hYnonIfHq0&list=PL6u5PkWz18WVAKNOvAFIvAdnOjPeKoDsX&index=2>