

Danish entrepreneur is gaining international attention by up cycling old containers and transforming them into attractive, floating student housing. World-renowned Danish architect Bjarke Ingels has designed the Urban Rigger project, and with its combination of sustainability and technological innovation, Grundfos sees the unusual building project as an excellent test bed for developing housing and small communities of the future. The first Urban Rigger will moor in Copenhagen in the course of the spring.

"You can't help but be inspired by the idea," says Henrik Falck, Sales Manager for Building Services VVS and VA Entreprenør at Grundfos' Danish sales company, Grundfos DK A/S. "Urban Rigger essentially embodies the same core values of social responsibility and sustainability as Grundfos. Many of Kim Loudrup's ideas about student housing and its residents are therefore very much in keeping with those that spurred our involvement in Grundfos College in the Port of Aarhus, for example. The college is primarily home to engineering and marine engineering students who actively participate in developing the college's technology," explains Henrik Falck.

This is in line with the spirit of URBAN RIGGER, which Kim Loudrup refers to as an open source project, with version 1.0 located in Copenhagen from June this year.

An on-going need

"This is student housing, not youth housing," emphasises Kim Loudrup. "The project is not designed for young people leaving home, but rather for students of higher education. Young people who want to make something of themselves, who have clear ideas about the planet and the future, who want to live close to their friends and their place of education. In or close to the city, In other words."

However, in or close to the city means high rents, and the aim is to provide affordable student accommodation.

"While developers are queuing up to build expensive, attractive quayside housing projects, there is lots of space along the wharfs, rivers and canals of the European cities with the greatest need for student accommodation," says Kim Loudrup. "A survey from 2015 shows that we have a shortage of 20,000 student homes in Denmark, and despite ambitious building projects in many Danish cities, the figure remains unchanged, as the influx of students increases proportionally. And Denmark is only number 21 on the list of European countries with a shortage of student accommodation. In 2025, there will be a shortage of four million beds in Europe," explains the entrepreneur, who has already presented his idea in several countries.

The ingenious "Shipping container"

Kim Loudrup has always been deeply fascinated by the container, which he calls the most optimised infrastructure on the planet. "Here you have a uniform system that is used in every continent. Containers are accessible everywhere. The problem arises when the container reaches the end of its working life. Depending on global steel prices, containers are either melted down or abandoned because they are too expensive to freight. If the container is melted down, it will have consumed 8.5 megawatt in its life cycle. So instead of recycling, we are banking on up cycling. In other words, continuing the container's life cycle in a different way. It costs as little as 450 kilowatts and it does away with the approximately 1,100 tonnes of CO2 required to build a new, traditional home."

The Urban Rigger project has initially targeted seven European cities as key markets. All the markets can be reached by sea from the shipyard in Poland manufacturing the student homes, and should they run into a bridge along the way, the containers can be 'clicked off until the obstacle has been negotiated.

Floating student homes, version 1.0

Urban Rigger version 1.0 will become student homes for 12 residents in nine converted containers with green courtyards, kayak access, bicycle parking and communal roof terraces. The containers will be arranged in groups of three and six on two floors atop a 220 m2 concrete pontoon which houses a technical room, 12 depot rooms and a fully automatic communal launderette.

"When I presented my idea to Bjarke Ingels, it took him less than five minutes to grasp the 'DNA' of the project, and he and BIG have added many new dimensions to it," says the innovator, who together with a team of



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anthropologists conducted extensive preliminary analyses of modern students' housing needs. "It's a place where they must be able to sleep, cook and study. The rest is really about living in an environment that provides a positive sense of community. The students of today and tomorrow are interested in living in small 'Communities'."

Urban Rigger therefore embraces the LEGO principle, whereby several units can be arranged in exciting formations with communal rooms and coffee bars, for example, in the form of 'small floating communities'.

Goodbye to district heating

Kim Loudrup has been extremely selective in his choice of Urban Rigger partners. "The aim has been to find innovative Danish companies with an international outlook. Companies that adopt, what he calls a 'horizontal' approach to such a development project. "Who don't just look at their own product's 'vertical' position in the project, but who see common perspectives – like Grundfos, which singles out Danfoss as a partner with synergy."

For while Grundfos is responsible for the energy-saving pumps for wastewater, heating and drinking water, Danfoss is supplying the heating pumps for Urban Rigger's floor heating and domestic water.

The pontoon is made of concrete with embedded brine hoses that absorb energy from the water on the hull exterior in much the same way as with geothermal energy. The water in the hoses reaches a temperature of 70°C and is subsequently pumped through the system.

"The energy for the heat pumps is supplied by Tesla batteries mounted onto the pontoon and which are charged by 60 m2 solar cells on the roof," explains Kim Loudrup. "The heat pump uses 4.5 kW, while its output is 17.5 kW. We are the first in Europe to be allowed to use Tesla batteries for this kind of application, and if we have more room for solar cells in the next version, we will also be self-sufficient in power for LED lighting on Urban Rigger."

Kim Loudrup has also thought outside the box when it comes to insulation. "Metal containers pose a challenge in terms of heating and refrigeration. However, instead of using traditional, bulky insulation materials, we are looking at aerogel, which was developed for space travel and Aluthermo reflective insulation. It is a form of insulation consisting of thin aluminium foil made from recycled aluminium derived from beer and soda cans, for example. The foil is mounted on each side of a foam/plastic material. The end result is a material a few millimetres in thickness that reflects the temperature, which means that the total energy consumption conforms to 2020 standards. Urban Rigger thus falls outside the normal district heating regulations."

It is in the development of these new technologies, materials and userfriendly solutions, among other things, that Kim Loudrup hopes residents will become involved. "In future versions, we will implement the ideas developed by the students against the payment of royalties."

There are also other ways of financially rewarding residents. "We are including the cost of renting wharf space in our overall budget, but in one French city it appears we won't have to pay any rent at all. As our projects are fully financed from the outset, we have suggested that the savings on rent instead be paid into an account so that each resident receives EUR 15,000 for further studies when they leave the project after a number of years," says Kim Loudrup.

Partners helping to launch the project

In addition to Grundfos and Danfoss, project partners include the engineering company Niras and Bjarke Ingels and his 300-strong architectural practice in New York, BIG Architects – not to mention German Miele, who Kim Loudrup discovered had developed a special heat ventilation pump for tumble dryers, which could find application in Urban Rigger. As with Grundfos, the project found its way to Miele's executive management, who immediately came aboard as a project partner.

"I think all the partners view the project in the same light – lots of innovation and the chance to champion a cause and bring a fantastic sense of commitment and a range of unique ideas to an international audience," elaborates Henrik Falck. "Right now, the focus is student accommodation, but the possibilities are endless. Small hotels, youth hostels, educational institutions, sheltered housing for the elderly – and particularly in the current climate: housing for refugees. And the advantage with Urban Rigger is that it can be relocated if needs change," says the highly sales manager who is totally committed to the project.

Urban Rigger will make its international debut at the Venice Architecture Biennale in 2016 (28 May to 27 November), where architects from around the world will be presented with the most challenging and innovative projects on the architectural front. Urban Rigger has been selected as the official entry and is one of the most outstanding projects from Denmark right now.

Development, production and sales of Urban Rigger are handled by the company Udvikling Danmark A/S, which is also co-owned by Kim Loudrup. <u>www.urbanrigger.com</u>

For further informations

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GRUNDFOS PARTICIPATION IN URBAN RIGGER VERSION 1.0

Wastewater

Grundfos SEG 40.09.2 50B

Grundfos Multilift MMS.11.2.3

Grundfos basement drainage pump KP 250 A1

Water supply

Grundfos circulating pump CMBE 3-3 kpl

Refrigeration

Grundfos circulating pump UPM2 130.25.75

Heating

Grundfos circulating pump CRT 4-2 A-P-A-E-AUUE 400V

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