



*With a vision to address the sustainable needs of the future, the MOR team is representing Delft Technical University in the Solar Decathlon Europe 2019. MOR stands for modular office renovation with a goal to renovate vacant offices into net positive housing. The modularity is a flexible solution that will enhance the possibility to renovate the office easily into housing but also easily back to offices or other future use.*

*The MOR-team is a diverse group of people with 12 different nationalities and from 8 different academic departments. Faculty advisors from these departments also support the team throughout the project. This mix of people gives us the power to tackle all the different challenges the SDE organisation gives us.*

In the Netherlands there are a large number of vacant office buildings. Currently, it is estimated that around 8 million square meters of office space is left vacant, which is equivalent to 764 football fields. This vacancy phenomenon is mainly present in larger cities such as Rotterdam, The Hague and Amsterdam in which 26%, 25% and 27% of the total office space is left vacant.<sup>1</sup>

A second challenge in the Netherlands is the rapidly increasing housing prices and the fact that the supply does not meet the demand, which is most notable in the big cities. This shortage of availability can be attributed to the trend of decreasing number of residents per household.<sup>2</sup>

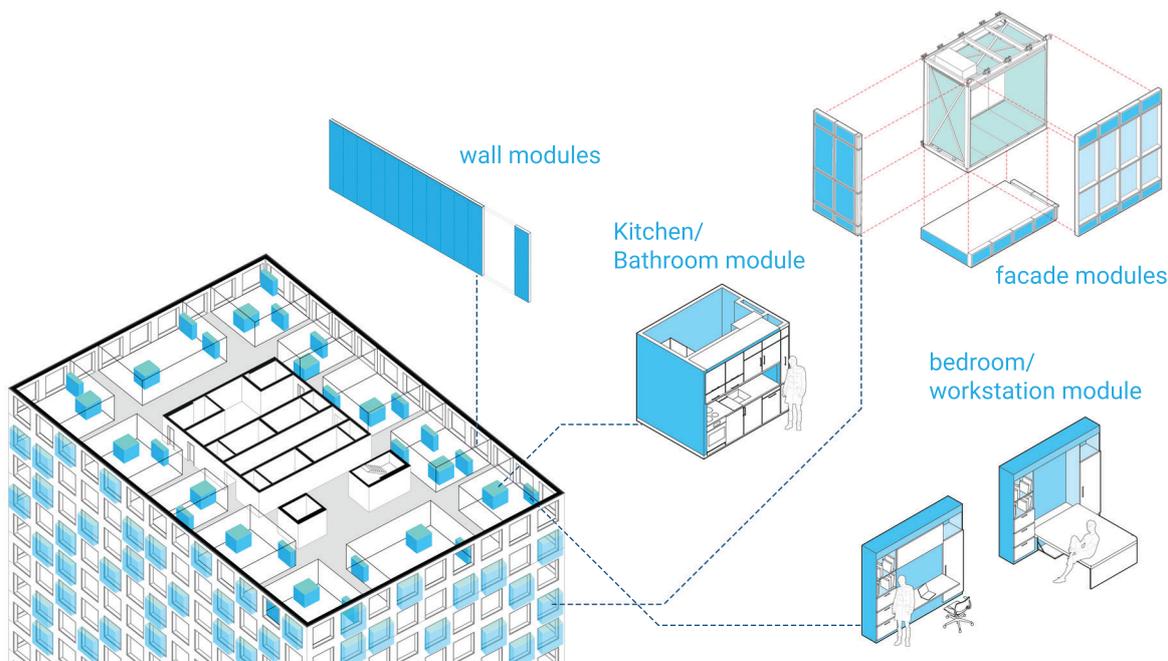
Therefore, with our project, we aim to tackle these two challenges by working towards the renovation of vacant office buildings into net positive and affordable housing. The location of the building we chose as a case study is in Rotterdam, one of the cities with the highest vacancy

rates and the second largest city in the Netherlands. Rotterdam is a popular location for starters. These young adults come to the city to pursue their dreams or recent graduates that are entering the city in search for jobs, thus making an entrance into the housing market.<sup>3</sup> Looking at the surroundings of our case study, we see that it is located in the Merwe-Vierhavens (M4H) area. The municipality has a masterplan for this area to develop this old harbour into a "Makers District". The idea is to establish a new making industry whose innovations and products will turn this area into the centre for technological and economic development. The Makers District requires a program for small and medium sized business premises with common facilities such as labs and co-working spaces as well as spaces for living.<sup>4</sup> The presence of vacant office buildings in the area and the vision of the M4H district master plan, provides a fertile ground for the implementation of our proposal.

The Europoint complex stands out, as it marks the entrance to the district with its three 90 meter high towers. These office towers, designed by the famous firm SOM in the '70s in their famous American style embody the fate this building typology is facing in the Netherlands. We hold a firm belief that these towers can become the heart of the district and therefore require a more complex programme, which not only includes housing, but also spaces where the community from the area can fully immerse themselves in what the makers district has to offer. This includes exhibition spaces, co-working spaces, makerspaces, fab-labs, but also commercial spaces and

services together with those meant for recreation.

To achieve our goal, we will introduce a modular system for net-positive affordable apartments that consists for four types of modules; façade module, wall modules, kitchen/bathroom module and bedroom/workstation module. These modules can be arranged in any possible way in the three different sized apartments. The housing units of 25, 50 and 75 square meters have been designed in order to meet the spatial requirements of different types of starters, but also to accommodate for different financial capabilities of this target group.



## TOGETHER WE CAN DO MOR

To achieve the net positivity of our proposal will focus on five aspects: energy, water, biomass, air and materials. To achieve a positive output, we start by reducing the demand of these five aspects and then solve the remaining deficit through sustainable methods. After which, the focus will be on the following: generating more energy than the building itself needs, the treatment of greywater and harvesting rainwater, improving air quality and upcycle materials. Additionally, we are integrating food production into our proposal, which enables the inhabitants to interact with each other and learn about urban agriculture.

1. Geurs, D.K., Koster, H., de Visser, G. (2013). Kantoren-leegetand en OV- Knoopontontwikkeling in de Zuidelijke Randstad.
2. Centraal Bureau voor de Statistiek. (2016). Private households by composition and size
3. Linde, M.A.J., Dieleman, F.M. and Clark, W.A.V (1986), Starters in the Dutch Housing Market.
4. 12Stadshavens Rotterdam (2015). From Port Industry to Skill City. Summary of the development strategy for Merwe Vierhavens, Rotterdam.



Energy +



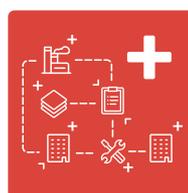
Water +



Air +



Biomass +



Materials +



MOR info?