Reflection paper

Architectural Engineering

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Graduation plan

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My graduation studio architecture track was based on my interests in sustainable power production. Due to the fact that architectural engineering Marineterrein gave me the opportunity to explore your own fascinations and interests, I decided to choose it as my graduation studio. My research was based on the notion of an energy production plant can seemingly be designed within our future cities. Stating the question: How can renewable energy be produced in our future city and how would it change our public perception of power plants?

On this basis, I researched future trends on energy technology looking at Europe’s and Holland’s power trends in order to understand what type of effect energy would have on our future cities. The most important element of my research was my excel scenario calculator. This is a scenario calculator for Kattenburg (marine terrain) which predicts the future energy flows of the district when applying different sustainable interventions. Giving me the ability to see what sustainable interventions due to a district’s future.

I must say that my research conclusions were not totally what I expected, pivoting into another direction while searching for new technologies. My approach to research different types of sustainable technologies did not work in the beginning, due to the fact that there is an abundance of new technologies within the sustainable sector with every new technology saying that it would change the future. But after talking to my research tutor I start realizing that it doesn’t matter where the production comes from but how it will be applied within our society. This gave me the momentum to refocus my research on what truly matters, which was seeing how these technologies would change our cities, not from the technology point of view but from an urban scale point of view.

The research, therefore, gave me the tools to create an urban sustainable framework where my design could fit within. Therefore, my research gave me the knowledge of how we should look at buildings in the future and how I should think when designing my building. After presenting my research and concept at the p2 I got as feedback that I did not present my findings thoroughly, not talking about how I based my concept on the scenario builder. Therefore, after p2 I saw it as a must to use my scenario calculator as a tool to present and design. Therefore, designing the building while simultaneously correlating with my energy production and other key elements that create a better scenario for kattenburg.

I must say, due to the fact that my building has such a wide scope, it was really hard for me to balance all the different scales during my design process. Because of the fact that my researched worked on an urban scale, I had research to see what type of effects this would have on every scale and how this translates within the design without compromising one scale. This was a huge challenge for me to overcome balancing all the moving parts to produce my design.

**RELATIONSHIP BETWEEN STUDIO TOPIC AND MASTER TRACK**

My graduation topic fits right in with the world’s sustainability agenda, looking upon how new developments will change the way we look at our buildings in the future. Therefore, it tackles the current architecture agenda, seeing how future sustainable technologies fit within our designs. This is a very important topic within the architecture field as we must design new sustainable buildings, incorporating technologies seemingly within our buildings without hampering the aesthetics of our cities or diminish our design capabilities. My research gave me the opportunity to base my design on my researched energy data, thus understanding the science of power grids and what type of effects these have on our community.

**RESEARCH METHOD**

The core of my project rests on the simulation research scenarios of future renewables within our society. Thus, using the qualitative research as a stepping stone to reach the desired prognostications and future scenarios. The qualitative research looked upon new technologies, new power trends and what type of interventions are happening in the world within the sustainable energy sector. The Marineterrein architectural engineering graduation studio track focuses on how Marineterrein can become a place for innovation and future sustainable interventions. On this notion I created my simulation inquiry, to see what would happen if we apply different sustainable interventions on Marineterrein in order to create a more sustainable environment.
The simulation research gave me the opportunity to create a future sustainable scenario for marineterrein, a more sustainable masterplan where the future of marineterrein could fit within. Based on my research I realized that looking on small sustainable intervention would not help marineterrein in its totality, but creating a master sustainable plan for the area could create a more sustainable future than focusing on sustainable intervention on the desired building.

**RELEVANCY**
The project falls within the sustainability framework of our generation, focusing on a sustainable future where we produce most of our energy from renewable energy. But what differs this project from the most projects, is that it focuses on an urban scale of sustainable intervention not focusing on one building but setting a district goal that every building should aspire to reach. Meaning that every building becomes part of the equation of a sustainable district.

Therefore, my design acts as a district battery for kattenburg on marineterrein which stores the abundant renewable energy that marineterrein produces. The project is based on the water tank and hydro storage plant principle, pumping water to a 100-meter difference and releasing it when energy is needed. The design Creates a business model on itself, where a building becomes a power plant on itself, while simultaneously becoming communal building for marineterrein and kattenburg.

This intervention creates two different conundrums for the future, where we change the way we look at buildings and sustainable energy within the built environment. Asking the first question on how investments will change within the built environment as buildings become an area for production energy companies may become real estate partners in order to create an area for production within our cities.

The second question relates to my project itself, as I use water to store energy 80 meters high for the Marineterrein en Kattenburg this water tower concept could be transformed to a smaller scale, where skyscrapers store enough energy for themselves acting as a producer, consumer and a battery on itself. As the biggest problem we face within renewable energy is the storage of the produced renewable energy and using when it’s needed. These two questions were very active within my design as I played with the scales of my project to see what it would mean for Marineterrein and the future of energy production within our cities.

**PROJECT HURDLES**
One of my biggest dilemmas for this project was drawing the building itself, as the building has an organic form, I had to learn new programs in order to create a 3d design to even imagine how the building would look like and what type of drawings would be needed. This took a big portion of my time, as I had to learn new programs in order to design the building and understand what was happening within the design. This also gave me a new understanding of how organic structures can be built and on what they’re based on. Therefore, it was a back and forth on what I imagined and sketch and what it would look like in 3d and what application that has for the building itself. This was my biggest hurdle to overcome within my project, trying something new and trying to balance the different goals within my project.

One thing that I also had in the back of my head was the financial aspect of the project, as it’s a very big investment, a feasibility must be done to see if the project is even financially viable. Due to the fact that the project is based on the idea to produce energy for the public the financial side must be one of the key pillars of the project.
REFLECTION ON THE PROJECT
During my design project, I realized that I had to explain to my tutors what my design struggles were so I can get the help where I need it. This helped me through different design hurdles in order to create my vision. One of the biggest feedbacks that I translated into my work was the incorporation of ramps within my building, which created the basis of my experience of my building focusing on the views and experiences of the tower.

What I learned the most from the project is that when design such big sustainable buildings we must look differently at our buildings and our designs in order to reach our goals. Thus, understanding the different subjects at hand to produce the most out of the buildings, therefore we as architects must not forget the technology but use them to embrace them within the design.

TOWARDS P5
When thinking about my project, my biggest hurdle would be to present my very technical heavy project to different coaches and other crowds. Therefore I would like to look towards creating different types of models to explain the different type of experiences that my building gives, and also creating the right diagrams to portray my goal of the building. This would be my big hurdle in order to fit all the plans into one.