Reflection

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aE Intecture
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1. the relationship between research and design:

The research first looks at the general picture about people's relationship with food waste in the Netherlands, where one thirds of the food production goes to waste yet most residents or consumers have underestimated this appalling number. Therefore, the design theme is based on this finding to aim at recycling and reusing the food waste on the one hand, and on the other hand potentially reducing the waste by breaking the barrier that hinders people to have a conscious awareness towards the food waste when they consume.

Besides, the research investigates into the food waste situation and flow in the context of Amsterdam, in order to take a clear stand in embedding the architectural project within the Marineterrein district in the design process. Under the current circumstances in Amsterdam, the food waste is mostly categorized and processed as the general residue, and there is not yet any official food waste management in the central district including the Marineterrein. Meanwhile, what have been emerging are several neighborhood-scale projects that adopt a couple of current techniques to tackle the food waste issue. These reference projects encourages me to explore the potential of a small-scale intervention to influence the large picture, as well as the possibility of to duplicate and grow based on one neighborhood-scale prototype.

Plus, the analysis into the current techniques and practices (food circular, compost, biogas and biofuel conversion) helps me with a critical understanding of the technologies already applied and other innovative opportunities to be integrated in the project potentially. Therefore, my design project applies an integral of the techniques, so that the food waste generated by restaurants can be recycled to provide biogas for the stoves in the kitchen, to generate electricity to power the on-site equipment for the building and the greenhouse, and to leave fertilizer and compost for the plants in the greenhouse.

Further research is continuously carried on during the design process of the architectural project, especially in the aspects of structural design and material selection. For instance, in order to meet the circularity agenda of the building itself, research into bio-based materials, reclaimed building elements and demountable structure system is necessary.

2. the relationship between your graduation (project) topic, the studio topic (if applicable), your master track, and your master programme:

The overall topic of the AE graduation studio, 'INTECTURE', aims to explore the innovative technologies in architecture that and how architecture intersects with the transformative material culture and sustainable practices, so that the student starts with a technical fascination and translate it into an architectural concept. In my case, my research starts with the food waste and energy flows in a general picture and the potential techniques to close the loop, and this fascination has gradually developed into my program brief and spatial strategies.

3. research method and approach chosen by the student in relation to the graduation studio methodical line of inquiry:

The research topic of my graduation project is part of the 'Flow' track, addressing the material/energy flow in the built environment. Following the methodology of this track, my research starts with the 'pain points' in Amsterdam: expanding consuming culture in food industry, money and energy loss due to food waste, lack of efficient waste management and long distances for waste transfer.

The data and statistics collected can be then illustrated as MFA (material flow analysis) / Sankey diagrams to reveal the major transfers and material flow behind the existing food industry in Amsterdam, as well as how it can be possibly optimized through technological interventions. In this way, this method is quite helpful in locating the dominant contributions to the overall flow within my defined system boundary, so that in my design process I can still constantly refer back to the research results and use the findings to support my argument, to carefully select and position the programs, to calculate the amount of energy saved, and to examine the influence and contribution to the existing flow.

4. the relationship between the graduation project and the wider social, professional and scientific framework, touching upon the transferability of the project results:

Wasting food is not only an ethical or economic issue but also depletes the environment of very limited natural resources. In recent years, the European Commission is taking cautious attention on tackling the food waste so as to save money and lower the environmental impact from food production and food consumption. The optimization of

food waste flow is an integral part of the Commission's new Circular Economy Package (2015) to stimulate Europe's transition towards a circular economy. The city of Amsterdam, too, issued a report titled Circular Amsterdam (2016), investigating the potential of a transition towards a circular economy, in which food waste flow is one of the important streams addressed. In this case, the investigation into a new system for waste management is quite necessary, and this is the fundamental guiding theme for my research and design project.

My proposal is a neighbourhood-scale modular prototype that closes the loop of food waste and energy consumption within its own system. Constructed with an independent and demountable structure, it can be potentially applied to other neighbourhoods and easily duplicate according to the growing demands.

Plus, the structure and building elements are designed to be easily disassembled to possibly fit varied uses in the future, and other parts of the building materials are bio-degradable so that they can be digested by its own system to reduce construction waste and environmental contamination.

5. the ethical issues and dilemmas you may have encountered in (i) doing the research, (ii, if applicable) elaborating the design and (iii) potential applications of the results in practice:

The dilemma of my project is to rethink the relationship between people and the waste. 'Waste', unfortunately, is constantly considered as a negative word, with implications such as dirty, ugly, smelling, useless, unwelcomed, etc. While doing the research, I realize that consumers in most cases are only exposed to the 'front of the house' in food industry – fashionable restaurants, beautiful dining areas. The 'back of the house' is usually hidden, simply because it's not a pleasant experience to view the ugly side when the food is in another form as food waste.

However, the waste will not disappear or reduce by hiding it. Turning our back to the 'ugly side' makes us ignorant of how much we waste and how much we can actually harvest from the waste. Encouraging the consumers to get exposed to the waste may be against their instinctive will, which is quite a challenge for my project. Therefore, besides carefully managing the smell with technological approaches, it is also crucial to exhibit the potential beauty of the waste in the practice, and in my case a delightful environment provided by the greenhouse, which has benefited from the food waste, is an example of guiding consumers to give a new look to the food waste.