Student Challenge Urban Greenhouse



Assignment UGC`2



SPARK THE FUTURE, JOIN THE CHALLENGE!

We are looking for a new, iconic and circular "urban greenhouse" for the city of Guangdong that:

- → Produces safe and healthy food for the local neighbourhood and commercial markets
- → Stimulates healthy and sustainable diets and lifestyles through interactions with city dwellers
- ightarrow Embodies the circular economy through design, material choice and resource management

We interpret "urban greenhouse" broadly as a vertical agro-food complex. It may also include e.g. vertical farming and integrated growing systems such as aquaponics.

The Challenge entries should be interdisciplinary and integrate food production with social ambitions: stimulating a healthy lifestyle and interactions with consumers in circular environment with a convincing business plan.





Deliverables UGC`2

1st Milestone: 6 January 2020

CONTEXT ANALYSIS

- → Analysis of the broader socio-economic & environmental context
- → Analysis of the site & client

PROGRAM

- → Main starting points for the concept
- → Main functions of the building and information on how they interact with local environment (physical and social- economic)

BUILDING CONCEPT

- → Concept plans and elevations
- → Impression of the facade & interior of the building in its direct surrounding (collages, sketches, renderings, etc.)
- → Description of the core elements of the concept (choices) with references to existing practice regarding:
 - basic structural construction system
 - food production system (selection of the cultivation system(s) with relation to crop type and main purpose; sustainability, food safety and health considerations)
 - circularity (use of sustainable sources/ renewables; circular management of resources)
 - business model
 - social interactions (use of the infrastructure by the users; impact of the the urban greenhouse on the wider community; contribution to community building)

The first milestone entries are public and copyright is with the team.

2nd Milestone: 17 May 2020

CONTEXT ANALYSIS

- → Deepened analysis of the broader socio-economic & environmental context
- → Deepened analysis of the site & client

PROGRAM

- → Main starting points for the concept
- → Main functions of the building and information on how they interact with the surroundings (physical and social- economic aspects)

BUILDING CONCEPT

- → Scaled plans and elevations
- → Scaled sections of the building
- → Impression of the facade and interior of the building in its direct surrounding (collages, sketches, renderings, etc.)

The Context Analysis, Program and Building Concept part of the are public and copyright is with the team.

DETAILED DESIGN

- → Explanation of the construction of the building including:
 - proposed structural systems
 - principle details

→ Explanation of the food production system including:

- Description and technical scheme of the cultivation system(s) and corresponding crop-choice list including aim of selected system(s), crop(s) and planning of each system.
- study and plan to minimize the negative environment impact by food production systems including resource use efficiency evaluation and daily waste.
- food safety considerations and measures to promote healthier lifestyle

→ Explanation of the circularity aspects including:

- diagrams, mass balances and descriptions for energy, water, nutrients (and organic matter if applicable), with description of treatment and reuse
- use of circular/renewable/low impact construction materials
- discussion on environmental and public safety

→ Explanation of the business model including:

- Business Model Canvas
- captial expense for set-up (CapEx)
- basic revenue and cost sheet (OpEx)
- references to alike projects with similar technology

→ Explanation of the social impact including:

- description of how people interact with urban greenhouse food environment using story-board telling
- interventions that aim at stimulating healthy and sustainable diets and lifestyles
- connections with the urban food system and local food culture
- interventions directed towards social inclusion, equity and food justice in the context of gentrification and neighbourhood solidification
- interventions that aim to (re-)establish trust/confidence in food and the food system
- social construction of the local UGH environment beyond bricks-and-mortar (on-line presence)

INNOVATION

- an elaborated solution that falls into **social domain** (business model or social impact)
- an elaborated solution that falls into technical domain (architecture, food production system or circularity aspects)

that are original, creative, well-researched, developed beyond minimum requirements and preferably tested.

The Detailed Design and Innovation part of the entries are Intelectual Property of the teams

Criteria UGC`2

FOOD PRODUCTION

- → All food production systems and technologies are properly selected and designed fit corresponding aims well;
- → Maximized input resources use efficiency (defined by yourself) and minimized negative impact by waste from food production system;
- → Strong considerations on stimulating healthy and sustainable diets and lifestyles;
- → Interaction with other aspects, like circularity, social impact and/or business plan

CIRCULARITY

- → The plant- & food production systems are as much as possible (preferably 100%) circular in terms of energy, water and nutrients and minimized waste flows
- \rightarrow The food production systems and the building add to the circularity of the area
- → The building itself is circular in terms of material use and construction (recyclability)

ARCHITECTURE

- → Architecture that induces pride amongst the metropole's inhabitants and adds value to the spatial environment of the building and the Greater Bay area
- → Architecture that stimulates healthy and sustainable lifestyles of users and visitors.

ECONOMIC ASPECTS

- → Mix of incomes from food production for commercial and niche markets as well as services related to food and healthy lifestyles
- → At least part of the production should be distributed locally
- → Convincing business plan underpinned by market research

SOCIAL ASPECTS

- → The concept enables interactions of the consumers with the production and consumption of healthy and sustainable food (e.g. via food court, market, restaurants, cooking workshops)
- → The concept stimulates interest in food production in the cities and consumer trust
- \rightarrow The concept invites and enables a more healthy and sustainable lifestyle of the users
- → Services and products are affordable for people with a range of incomes (low, middle, high)

INNOVATION

- → Originality: the solution is ground-breaking
- → Scalability: the solution can be brought to scale
- → Feasibility: the implementation/use of the solution is technically and socially feasible
- → Impact: putting the solution to use has significant positive social & environmental consequences

Will you bring urban farming to the next level? www.wur.eu/GreenhouseChallenge



