Closing the Waste-2-Energy-2-Food loop:
Integrating waste management, communities & circular farming

Zero3:
Urban Farming Company:
Growing Healthy Communities...
Massive structural waste in our food system:
Field-to-fork: dysfunctional, sensitive and resource hungry...

1/3 of cultivated food wasted
7-10 calories of fossil fuel to cultivate 1 calorie of food
Around 88 million tonnes of food are wasted annually in the EU
4-in-10 consumers have food anxieties (contamination & GMO)

annually lose and waste 1.3 billion tons of food – enough to feed 3 billion people (Food and Agriculture Organization of the United Nations (FAO))
14% of the world’s CO$_2$ emissions are caused by food waste
Food loss/waste accounts for 4.4 gigatonnes of GHG pa. - if food loss/waste were its own country, it would be the world’s 1/3 largest GHG emitter – surpassed only by China and US
Food losses and waste amounts to roughly US$ 680 billion in industrialized countries and US$ 310 billion in developing countries
Around 88 million tonnes of food are wasted annually in the EU, with associated costs estimated at 143 billion Euros
Ecosystem Services: a new urban solution to close the loop:

Waste-2-Energy-2-Food: A shift to a circular economy by bridging disconnections within the food-energy-waste loop

One industrial process becomes a valuable input into other industrial processes

Economies-of-Scope
Zero waste
Zero carbon
Zero miles...

Zero$^3$

Industrial symbiosis:
Circular resource flows:
Drawing inspiration from living systems to create a decentralised management solution for the valorisation of urban food waste
Zero$^3$: Economies-of-Scope
A Waste-Energy-Food bio-refinery

Circular economy waste management:
Converting organic food waste to:
- Bio-energy (a micro-scale energy plant)
- High-value crops and mushrooms
- Organic compost (sequestered carbon)
- Liquid soil bio-stimulator

* kitchen trim, post-consumer dining room food scraps, oil, all edible liquids, dairy products, starch, sugar, fruit, vegetable, soiled paper products, napkins, tissue, paper towels, waxed paper, grass clippings, leaves, small sticks, lightweight wood tableware (stir sticks, toothpicks, spoons, knives, forks), fats, fryer oil, grease trap waste, beverages, alcohol, soup, eggshells, glycerine,...
Waste as a resource...
Income generation, job creation, school integration, vocational training

As-a-Service ownership model:
Low-management solution driven by clear commercial returns

Local anchoring:
Small and easy to deploy decentralised ecosystem

Future-ready innovation:
Bio-refinery (waste-as-a-resource)

Desirability:
Social offering
- Community sharing
- Employment
- Local food culture

Viability:
Commercial
- Extracting energy & nutrients from waste
- Multiple revenues
- Embedded market

Feasibility:
Technology
- Micro-scale AD digester
- Hydroponic horticulture
- DiGePonics

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Business model: economically viable, socially desirable and technically feasible

Supply infrastructure:
- System template
- Energy/control system
- Thermal infrastructure
- Hardware
- Software (operations)
- Strategic partnerships
- Management

Product:
Turn-key Micro AD energy eco-system:
- Renewable energy infrastructure
- Maintenance/service contract

Service:
Branded community entrepreneur food hub:
- Investment tools and structures
- Urban Farming Company brand values

Customer demand:
- User convenience
- Land enhancement
- Food provenance
- Income generation
- Food provenance
- Independence
- Community enhancing
Reasons to believe: linking ownable technology to communities...

First-to-market: As-a-Service: waste-2-energy-2-food urban ecosystem
Decentralised: No matter how efficient cities are, there’ll always be an inevitable amount of waste to tap into
Economies-of-Scope: Co-location of small food/drink business facilitates with shared resources (brewery)
Circular Economy: Low-cost extraction of energy & nutrients from urban waste
Return on Investment: Cost-benefit not purely financial: low carbon, employment, community enhancement
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