A CONCEPTUAL DESIGN OF SUSTAINABLE SOLID WASTE INFRASTRUCTURE IN MANCHESTER DISTRICT, CALGARY

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CONTEXT

100,000 Residents by the year of 2060

WASTE SECTORS
- Residential (Single and Multi Family): 47%
- Industrial and Commercial: 35%
- Demolish and Construction: 18%

(2015)

WASTE COMPOSITION
- Organic/Compostable: 38%
- Residual/landfill: 34%
- Recyclable: 28%

(2015)

Waste Volume: 345kg per capita (2018)
Projected Waste Volume in 2060: 34500 tonnes

GOAL
- Zero-Waste Living
- Maintain sustainable environment

PRECEDENTS

Helsinki, Finland

The city is known for actively promoting circular economy

Lincoln Street Art Park, Detroit, MI

A public park that showcases artwork made from waste

Kamikatsu, Japan

Zero-Waste living, circular shops and art craft shops

One of the places with highest waste diversion rate

Materials Marketplace Austin, TX

50,000 feet of cubic waste diverted from landfills

$465,000 in economic values

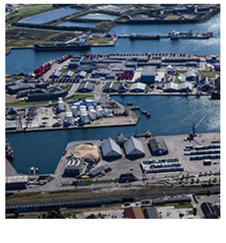
ICE House, Davos, Switzerland

Recyclable and reusable building materials

Sustane Energy Plant, Chester, NS

70,000 tonnes of solid waste per year

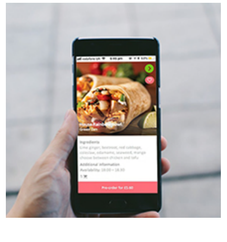
Maximize the local waste diversion to 90%



Industrial Ecosystem, Kalundborg, Denmark

Annual savings of 635,000 tons of CO_2,

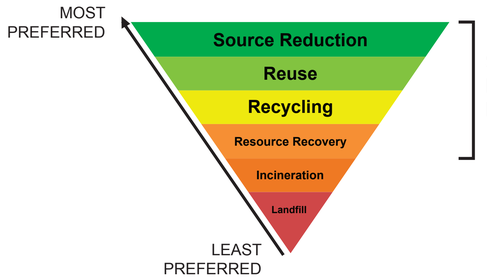
14.1 mill Euro in socioeconomic savings



Yum Now, Mobile App, London, UK

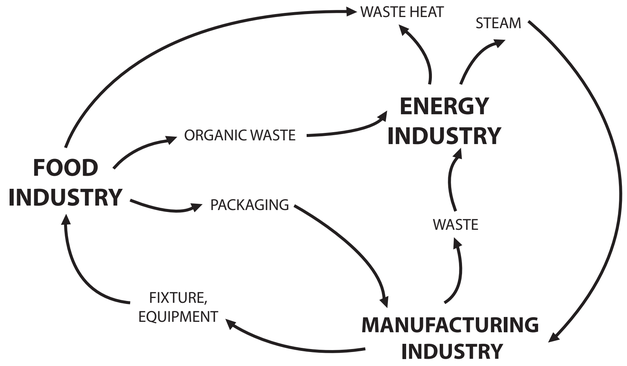
More than 100 meals listed per day

DESIGN SCHEMATIC

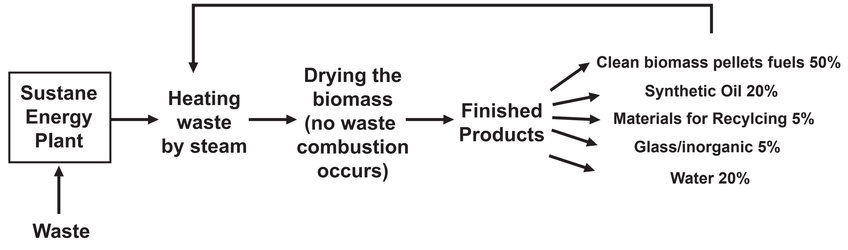


ESTABLISHING A CIRCULAR & SHARED ECONOMY
- Circular Business: Thrift Stores, Shared Tool Shops, etc
- Waste & Art Sector: Art Centres that utilize waste for crafting materials
- Zero-Waste Lifestyle: Mobile apps that facilitate repurposing of leftover food and materials
- Sustainable Industrial Ecosystem: A network for sharing residual resources among local industries (see diagram 1)

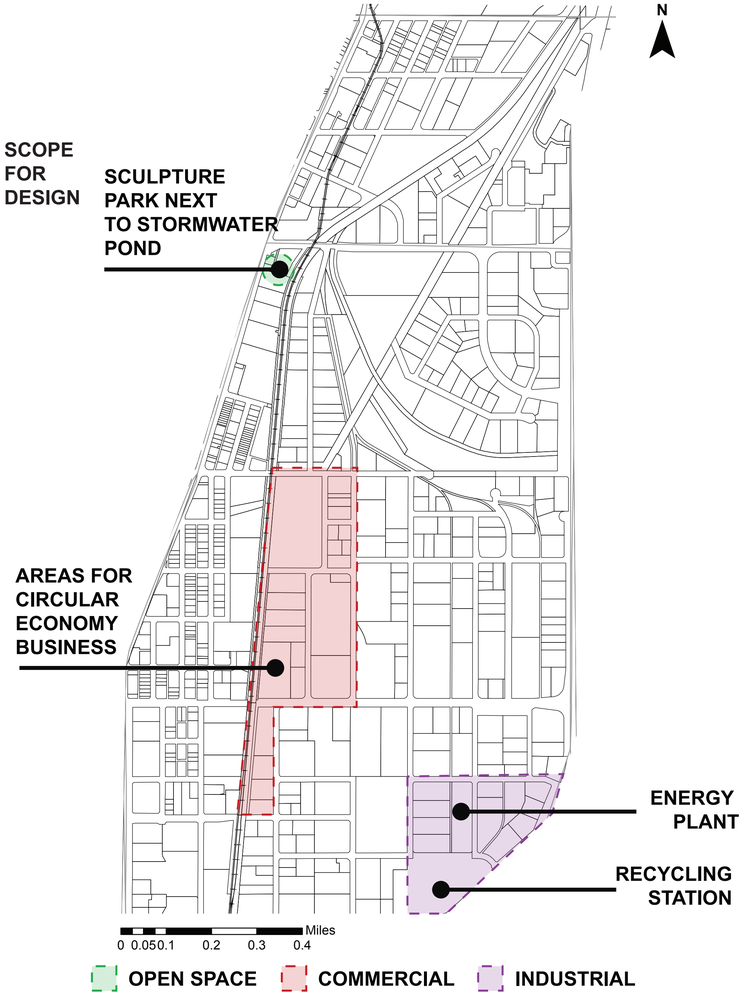
ESTABLISHING TECHNOLOGICAL INTERVENTIONS
- Waste to Energy: Sustane's technology in Chester, NS (see diagram 2)
- Sustainable Building Materials



(Diagram 1. Potential industrial ecosystem framework in the Manchester district)



(Diagram 2. Waste to Energy Process by Sustane's Energy Plant)



SYNERGIES WITH OTHER INFRASTRUCTURE SYSTEM

TRANSPORTATION
Establishing a more effective garbage pickup and resources/materials delivery network

ENERGY
Making the conversion from waste to energy more sustainable

FOOD
Reducing unnecessary consumption
Composting organic waste into nutrient soils for farming

WATER
Establishing an urban park next to the stormwater pond for public art made from waste