

Computer Games Development CW208

Game Design Document

Year IV

ECOSYNTH

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28/04/2024

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# 

# > Concept

## >> Tagline

Build the Future: Sustain, Innovate, Thrive.

## >> Details

Windows Only

Target age: 12-up (Mechanical skill required)

Rating: PG (non-graphic violence)

## >> Game Summary

EcoSynth invites players to architect the future by managing and expanding futuristic cities that cleverly balance technological innovations with essential ecological principles.

Set against a backdrop of a dynamically evolving world, players must construct, strategize, and adapt to maintain harmony between urban growth and environmental stewardship. From laying the foundation of energy-efficient skyscrapers to pioneering green technologies, every decision impacts the sustainability of your urban ecosystem.

## >> Game Outline

A screenshot of a computer game

Description automatically generated

* Objective: The primary objective of EcoSynth is to build and sustain a thriving city while balancing environmental impact and resource management. Players aim to increase their city’s population and prosperity by implementing innovative technologies and green initiatives.
* Gameplay Mechanics:
  + City Building: Player’s design and construct a variety of building types with unique functionalities and impacts.
  + Resource Management: Strategic management of resources such as water, energy, and materials are essential to city survival and efficiency.
  + Environmental Challenges: Players face real-world challenges like pollution and waste management, requiring innovative solutions and technologies.
  + Tech Tree: Advancement through a comprehensive tech tree that unlocks new buildings, upgrades, and technologies focused on sustainability.
  + Dynamic Weather System: Weather changes that affect city operations and resource needs, adding layers of complexity and realism.
* Modes: Single-player campaign with scalable difficulty levels and a sandbox mode for creative building without limitations.

## >> Unique Selling Points

* Sustainability Focus: Unlike traditional city builders that focus purely on expansion, EcoSynth integrates a strong environmental aspect, making sustainability a core part of city planning and resource management.
* Dynamic Ecosystems: Buildings and infrastructures directly impact the surrounding environment, influencing local wildlife, weather patterns, and the health of the city’s inhabitants.
* Adaptive Learning Tutorials: Context-sensitive tutorials not only teach game mechanics but also adapt to the player's actions and decisions, providing a tailored learning experience.
* Advanced Simulation Details: Incorporates complex simulation aspects such as pollution dispersion, energy consumption, and ecological footprints, offering a depth that appeals to seasoned strategy players.
* Community and Modding Support: Built with community engagement in mind, the game supports mods and player-generated content, extending gameplay possibilities and replay value.

## >> Similar Competitive Products

SimCity Series, Cities:Skylines

# > Gameplay

## >> Overview

EcoSynth offers a visionary leap into the future of city-building simulations, where players can build factory to get resource, build other buildings to convert resource to useful energy, then use weapon to protect their own cities.

Set against a richly detailed backdrop of a dynamic futuristic world, this game challenges players to design, build, and manage cities that are not only bastions of innovation but also paragons of ecological harmony.

As players navigate through complex resource management systems and respond to real-world environmental challenges, they are tasked with making pivotal decisions that shape the destiny of their urban environments.

EcoSynth evolves the city-building genre by emphasizing ecological impacts and sustainable practices, making it an essential experience for those passionate about shaping a sustainable future through strategic gameplay.

## >> Game Loop

A diagram of a game

Description automatically generated

# > Mechanics

## >> Movement

Player use WASD to move.

## >> Resource Farming

Player can place a building called “Factory” easily without spending any resources, once the Factory is placed, a worker will be spawned at the position of the factory.

The worker will find the closet wood resource node near the factory, once it finds the target resource node, it will move directly towards that node, after arriving at the node, he will farm the wood for 5 seconds, then it will go back to the factory and bring the resource back, but also generate the waste at the same time.

For energy, player can place a building called “Landfill” which will convert the waste into energy which will be used to function the tower.

## >> Combat

While other buildings doing their own jobs, player can control the only playable character to move around and shoot the enemies. And player can also upgrade the weapon by using the tech tree menu.

### >>> Players

The player only has a bullet gun at the start of the game, but after getting more and more resources, player can upgrade weapon by using the tech tree menu.

### >>> AI Enemies

Enemies move towards the weakest building directly but also has a ray cast to detect what is in front of them, they will rotate gradually if they detect a barrier or something else.

### >>> Health, Damage & Death

Player would lose health if enemy entered one of their buildings, and the game will end if player’s health becomes zero.

And the damage is consistent for player all the time.

Enemy will take damage directly from player’s weapon if it gets hit by any kinds of weapon.

## >> Resources

There are four kinds of resources.

* Wood: collected by workers from building “Factory”, the mandatory resources for building all the buildings.
* Waste: generated by workers as well, will be brought back with the wood resource, can be used by “Landfill” to be converted to Energy.
* Energy: the only resource to make the tower function, can be generated from “Landfill”.
* Prosperity: the resource to determine whether your city is cool or not, can be only obtained from building “House”.

# > Progression

## >> Game World

The player starts with a map of loads of wood resource nodes. And player can get a notification when some events happened.

## >> Weapon Upgrades

The player can buy weapon upgrades on tech tree menu when they met the requirements.

# > The Game World

## >> Overview

A diagram of a computer

Description automatically generated

## >> Map

The map contains wood resource node, enemy spawning and all the functional buildings.

## >> Resource Node

There is only one type of resource node which is the wood, could be used to build any buildings possible.

## >> Scale

Each tile is approximately 40 pixels in width and height, with the character being roughly the same. The map has 625 tiles in total.

# > Equipment and Upgrades

## >> Overview

Players will be able to upgrade their weapon to increase their power during the game. Players can open the tech tree menu while they are in the middle of the game.

## >> Guns

There are three weapons that player can choose to upgrade.

### >>> Gravity Gun

Gravity Gun will create a gravitational field which pull the enemy to the centre of gravity field and lose health while standing in the gravity field.

### >>> Laser Gun

Laser Gun will shoot a thin laser out from player when a key is pressed. But player will remain freeze while laser gun is still shooting.

### >>> Heavy Laser Gun

Heavy Laser Gun is the upgrade version of Laser Gun, which player could press the key as long as they want, the size of the laser will increase Exponentially.

# > Inspiration

## >> Factorial

A video game screen shot

Description automatically generated

Factorio stands as a towering inspiration for EcoSynth, with its intricate dance of industry and efficiency capturing the imagination and sparking the creation of a game where every cog and conveyor belt plays a crucial role in a larger symphony of production.

Factorio is compelling gameplay loop of resource gathering, manufacturing, and automation sets a gold standard for what engaging strategic planning can look like. It masterfully combines the satisfaction of building complex machinery with the challenge of optimizing every process to achieve a harmonious industrial operation.

Drawing from this well of innovation, EcoSynth aims to harness a similar spirit of intricate systems and expand it further into the realm of sustainable urban development, pushing players to not only master the machine but to do so with an eye toward the future of both civilization and the planet.