Systems Engineering in Environmental and Energie Systems HSLU, Semester 1

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September 18, 2024

Contents

Part I

Week 1

1 Waste to energy (WtE)

The waste to energy systems provide to turn our wastes to usable energy

1.1 Incineration plants

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1.1.1 Municipal solid waste

- Volume reduction of waste (90%);
- Energy production: waste has the same...

1.1.2 4-key Components of an incineration plant

1. Waste handling system:
2. Combustion chamber:
3. Air pollution control system:
4. Energy recovery system:

1.1.3 Types of wastes that can be converted into energy

- Municipal wastes;
- Wood wastes;
- Agricultural wastes;
- Industrial wastes;
- Animal wastes.

1.2 Current status of waste to energy

IMMAGINE

1.2.1 Waste production per person in CH

In Switzerland, people produce 700kg of waste per person per year.

1.3 Waste hierarchy

The hierarchy helps us rethink our relationship with waste based on five priorities ranked in terms of what is best for the environment:

1. Produc prevention;
2. Preparing for re-use;
3. Recycle;
4. Recovery;
5. Waste disposal.

1.4 Advantages and disadvantages of the Swiss system

1.4.1 Advantages

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1.4.2 Disadvantages

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2 System thinking

2.1 Benefits

Rigorous way of integrating: people, purposes, process and performance and:

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2.2 Feedback loops

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3 Case study part 1

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Part II

Week 2

4 Situation analysis and system thinking