

# Anaerobic Digestion

Food Waste to Energy

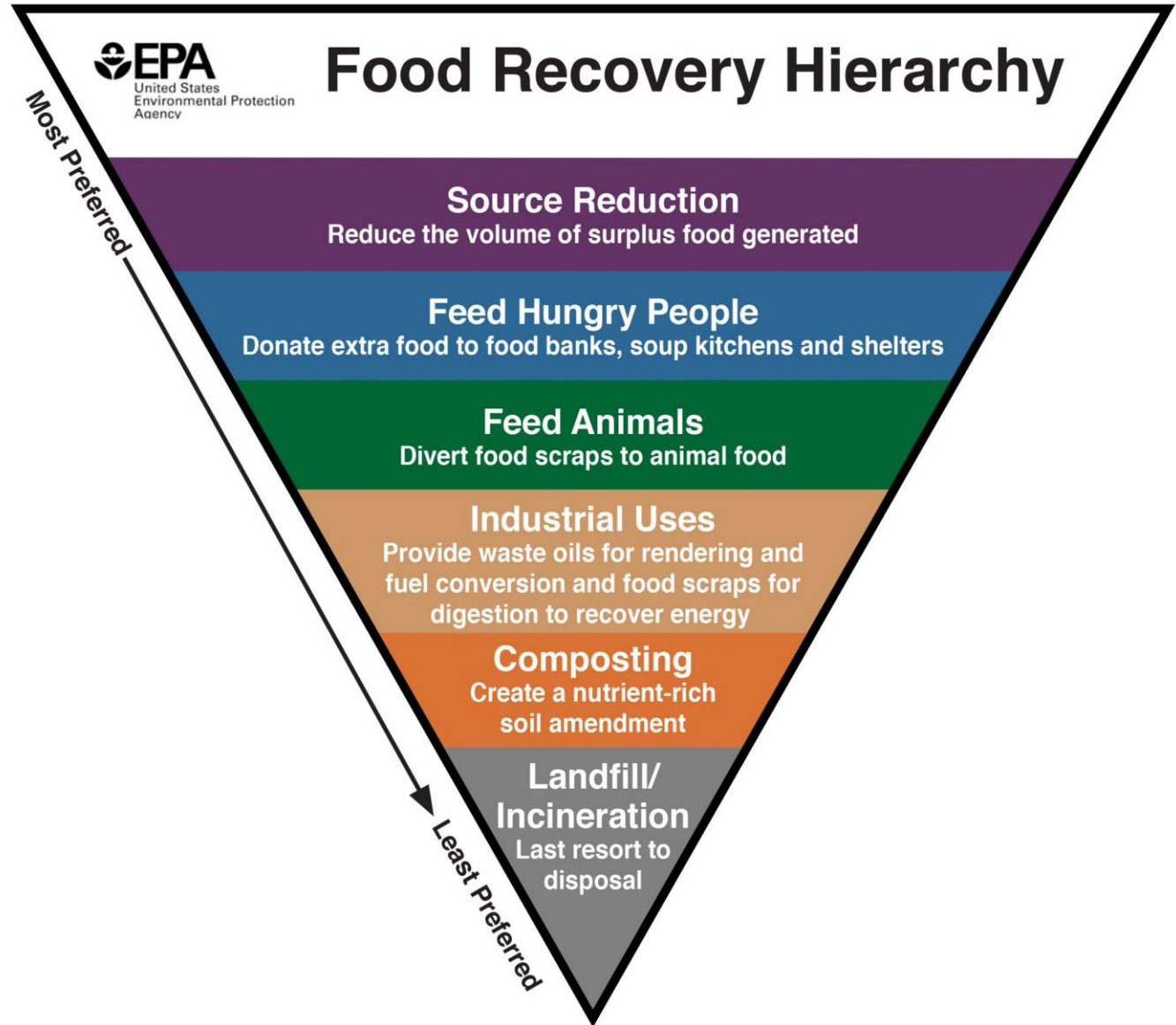
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**Dr. Vicki Foust**



# Food Waste Pyramid

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# Food Waste – What's the Problem?

- One third of all food does not make it from farm or factory to fork.
- 1.3 billion tons of food per year is wasted globally
  - Worth \$1 trillion in US dollars
- Food waste contributes 4.4 gigatons of carbon dioxide equivalent each year.
  - 8% of total anthropogenic greenhouse gas emissions
  - If food waste was a country, it would be the third-largest emitter of GHG globally (behind the US and China)
- People who need food aren't getting it.
- Wasted food is heating up the planet.

# Food Waste – What's the Problem?

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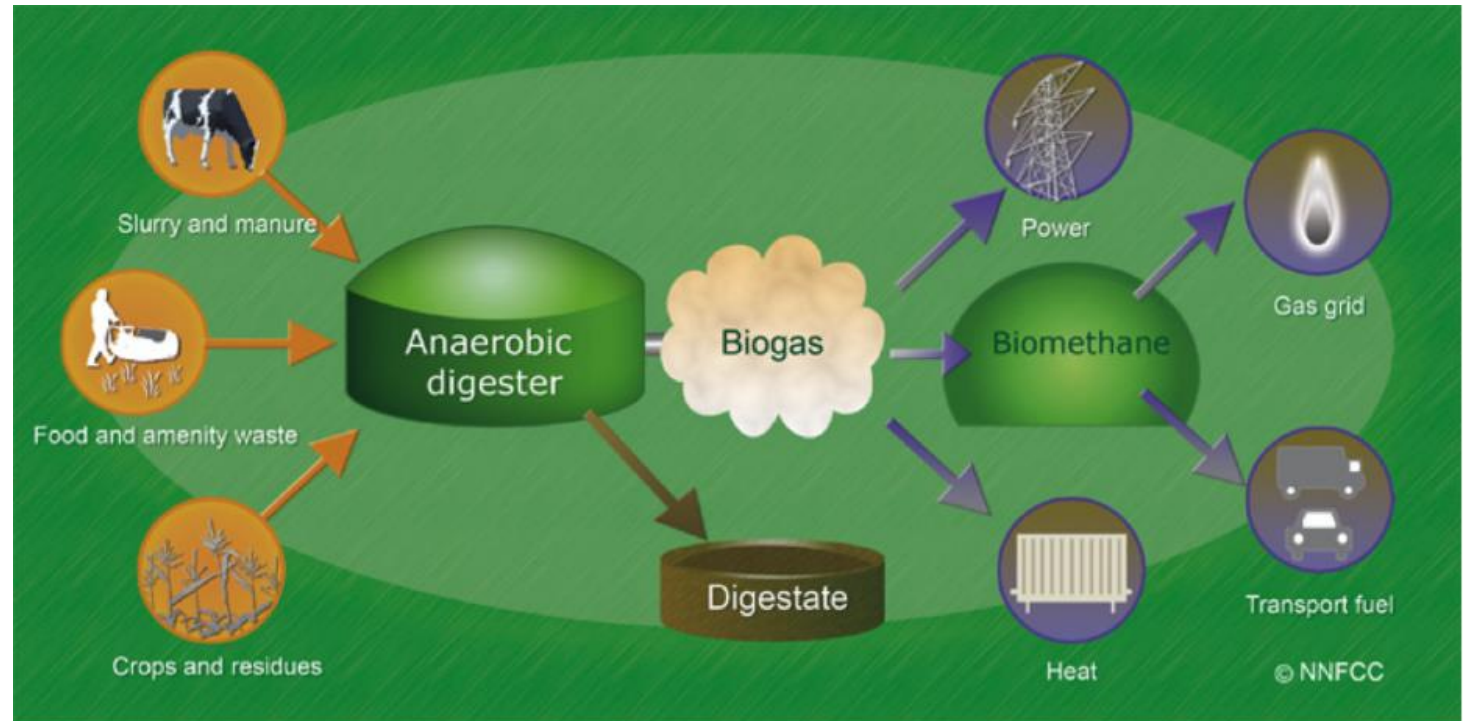
- Locally, approximately 1/3 of all landfilled waste is food waste.
- Waste is transported 70 miles to the landfill in a truck using diesel fuel
- Food waste is heavy and transportation costs to the landfill are based on weight
- Food waste breaks down in the landfill and produces methane
  - Methane leaks into the atmosphere and contributes to GHG emissions
    - Methane is 28 times more potent GHG than carbon
  - Methane is captured, flared, and burned
  - Methane is captured and used to generate electricity or natural gas





# Anaerobic Digestion as a Solution

Anaerobic digestion is a process through which bacteria break down organic matter—such as animal manure, wastewater biosolids, and food wastes—in the absence of oxygen.



# Anaerobic Digestion Uses

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- Food and other organic waste
- Animal manure from dairy and chicken operations
- Hog lagoons
- Wastewater treatment plants



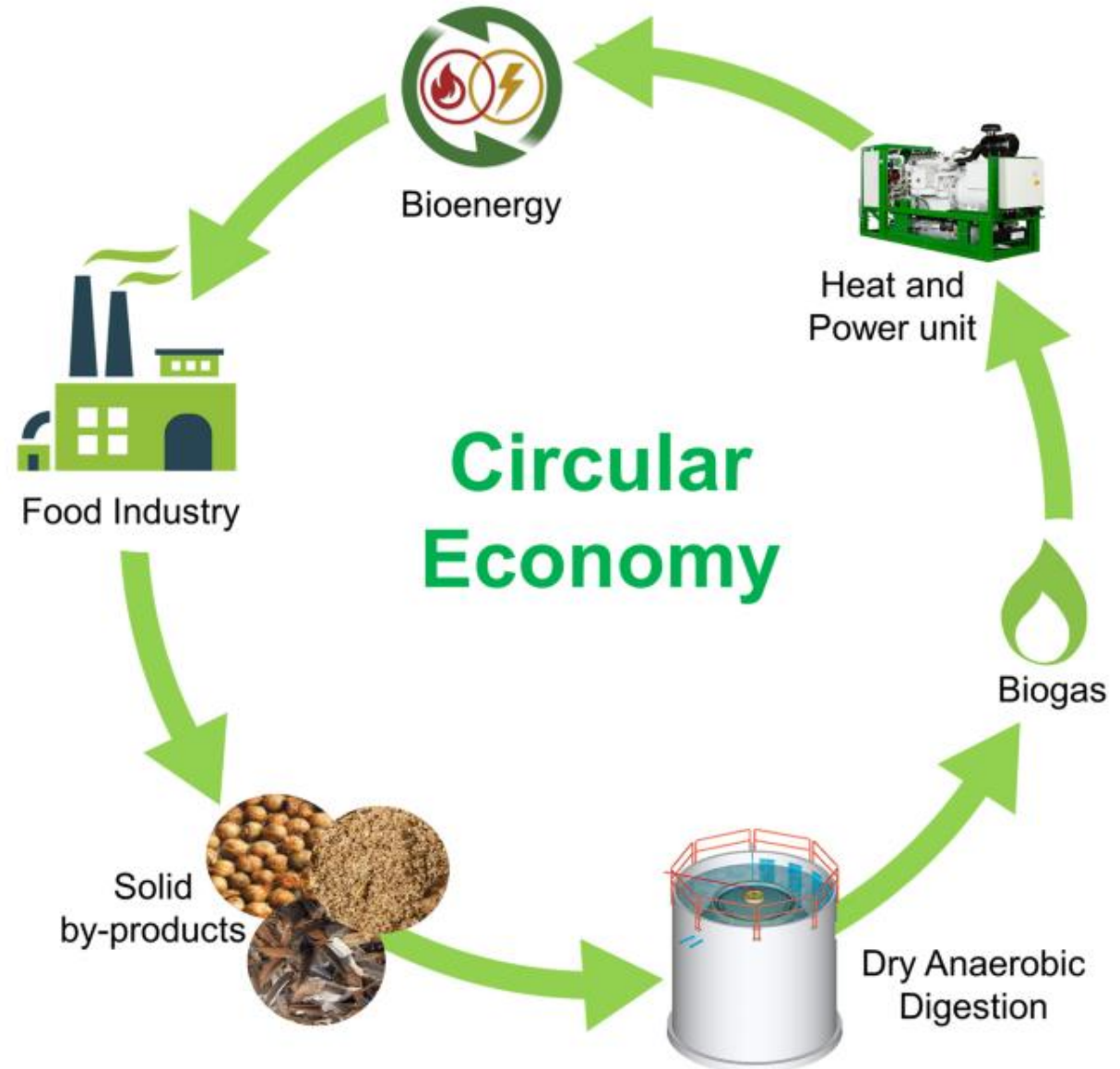
# How Anaerobic Digestion Works

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# Anaerobic Digestion of Food Waste Creates a Circular Economy

- Reduces food waste in the landfill
- Generates electricity or heat
- Creates a nitrogen and phosphorus rich soil amendment used to grow more food





# Anaerobic Digestion vs Capture of Landfill Gas

	Anaerobic Digestion	Landfill Gas Capture
Ensures methane is not released into the atmosphere	yes	yes
Provides energy source (bio-gas) which can be injected into the natural gas pipeline or used to generate electricity	yes	Yes
Provides a revenue source for the landfill owner/local government	yes	Yes
Third party (owner) provides capital and operating costs	yes	Yes
Eliminates food waste from the landfill	yes	No
Produces digestate (soil amendment) which can be sold	yes	No
Creates a Circular Economy	yes	No

# Anaerobic Digester Technology



A close-up photograph of a large pile of food waste, including apple cores, orange peels, and vegetable scraps, set against a dark background. The text is overlaid on the top half of the image.

Remember...

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Waste isn't waste until you waste it!