

# Biomass Explained

## Biomass Defined

- Living or recently dead organisms and any byproducts of those organisms

## Biomass Energy

- Energy generated or produced by living or once-living organisms

## Biomass sources for energy include:

- **Wood and wood processing wastes**
  - Firewood, wood pellets, & wood chips, lumber & furniture mill sawdust & waste, and black liquor from pulp & paper mills
- **Agricultural crops and waste materials**
  - Corn, soybeans, sugar cane, switchgrass, woody plants, & algae, and crop & food processing residues
- **Biogenic materials in municipal solid waste**
  - Paper, cotton, & wool products, and food, yard, & wood wastes
- **Animal manure and human sewage**

# Methods for Generating Biomass Energy

## Burning directly

- Heat generated used directly or to generate electricity
  - Trees grown for power generation (primary source)
  - Wood scraps

## Conversion of solid to a gas

- Gasification: Anaerobic decomposition (decomposition without oxygen)
  - Process cleans water in waste water treatment plants
  - Occurs naturally in sealed landfills
- Pyrolysis: decomposition using high temperatures

## Conversion of solid to liquid

- Fermentation:
  - Sugars in crops (corn in US) generate **biofuels**
  - In US corn fermented for ethanol

# Biomass Energy Generation

## *Environmental Friend or Foe? It Depends*

### Signs of environmentally beneficial biomass use

- Prevents greenhouse gas (GHG) emissions
- Reduces consumption of materials or fuels
- Provides a useful product



### Capturing methane from landfills & waste water plants

- **Prevents release** of potent **greenhouse gas** into atmosphere
- Gas used for heat or to generate electricity



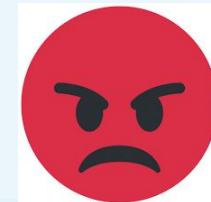
### Burning wood residues or trash to generate electricity

- **Prevents CO<sub>2</sub> & methane release** from decomposition
- Generates reliable power replacing fossil fuels



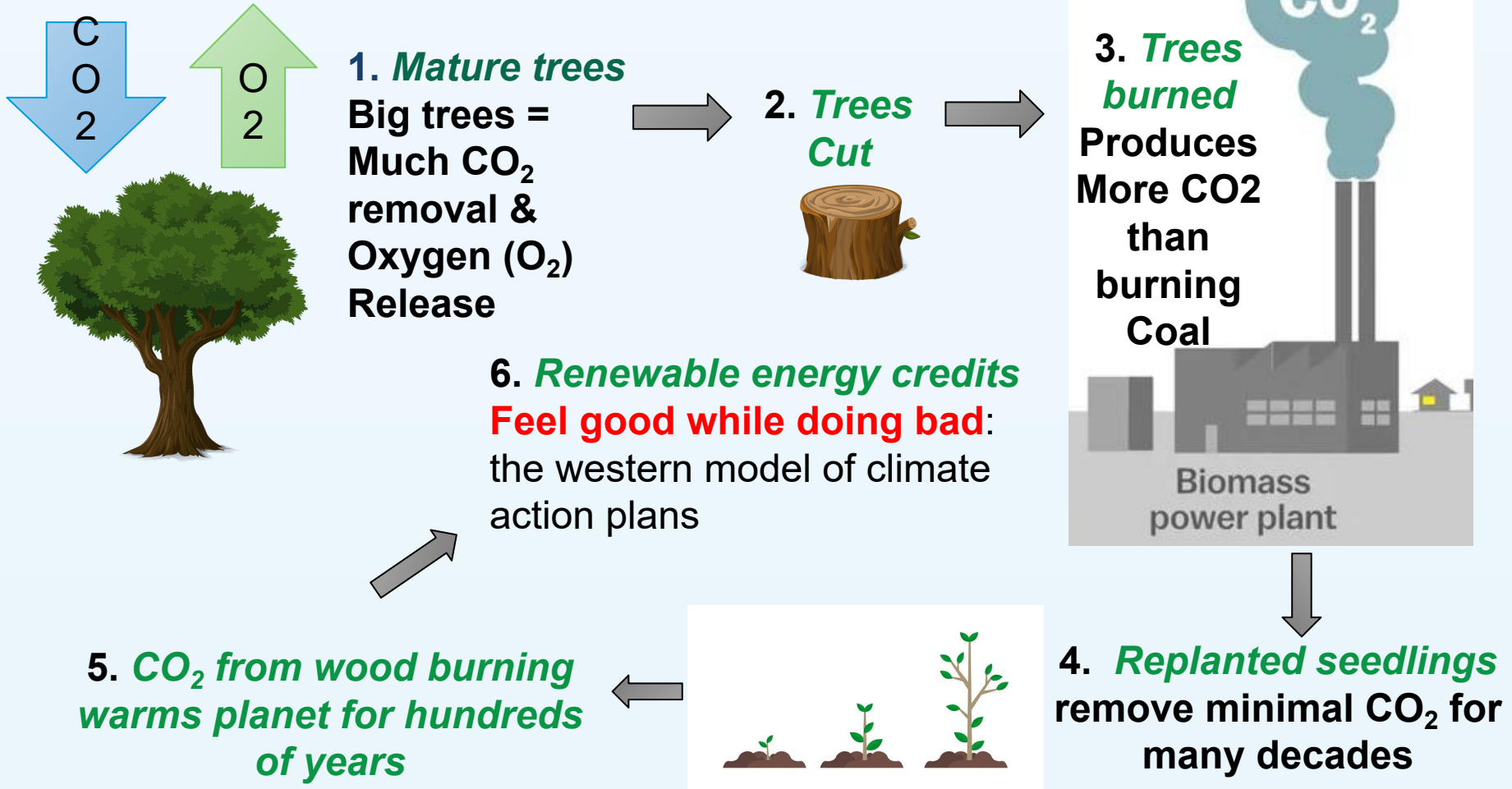
### Harvesting Trees to burn: How to feel good while doing bad!

- Generates **more greenhouse gases than burning coal**
- Stops CO<sub>2</sub> removal from the atmosphere
- Destroys nature



# Growing Wood to Generate Power Accelerating Global Warming for Green Credits

## Using Biomass to virtue signal green



# Biomass Accounting Trickery to Appear Green *CO<sub>2</sub> Generated in Burning Wood*

**Pollutionwatch** Pollution

## **Pollutionwatch: wood burning is not climate friendly**

Burning wood releases more CO<sub>2</sub> than gas, oil and even coal for

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## **Revealed: The renewable energy scam making global warming worse**

The largest source of "clean" energy is not reducing carbon emissions by as much as official figures claim – and it is causing immense harm to the poor and to wildlife

Fuller, Gary. "Pollutionwatch: Wood Burning Is Not Climate Friendly." *The Guardian*, 1 Mar. 2018, [www.theguardian.com/environment/2018/mar/01/pollutionwatch-wood-burning-is-not-climate-friendly](http://www.theguardian.com/environment/2018/mar/01/pollutionwatch-wood-burning-is-not-climate-friendly).

Le Page, Michael. "Revealed: The Renewable Energy Scam Making Global Warming Worse." *New Scientist*, 21 Sept. 2016, [www.newscientist.com/article/mg23130922-600-revealed-the-renewable-energy-scam-making-global-warming-worse/](http://www.newscientist.com/article/mg23130922-600-revealed-the-renewable-energy-scam-making-global-warming-worse/).