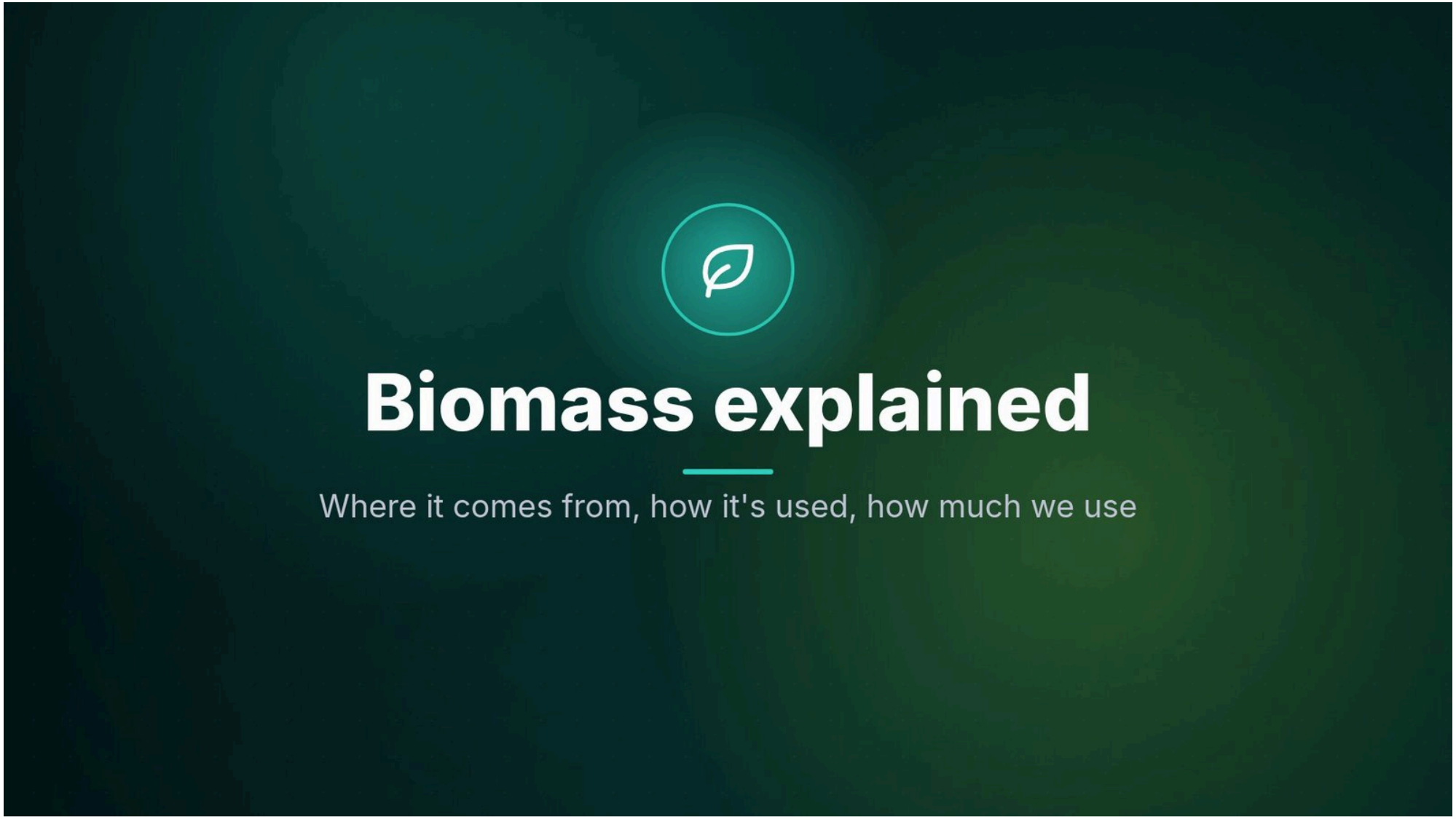
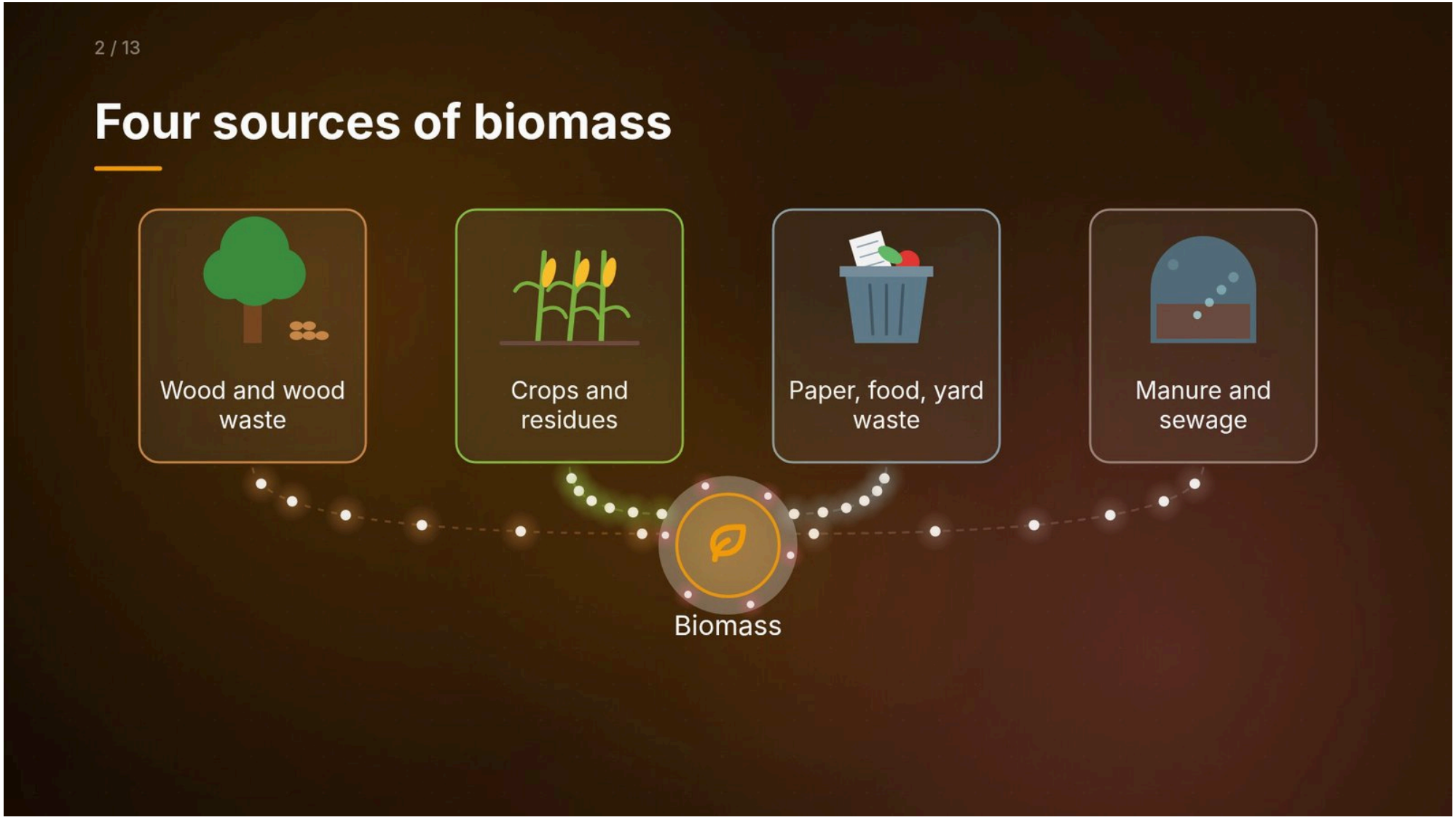


1 / 13 · Biomass explained

Biomass is energy from living things: plants, animals, even our waste. By the end of this video, you'll know where biomass comes from, how it becomes heat, electricity and fuel, and how much of America's energy it supplies today.



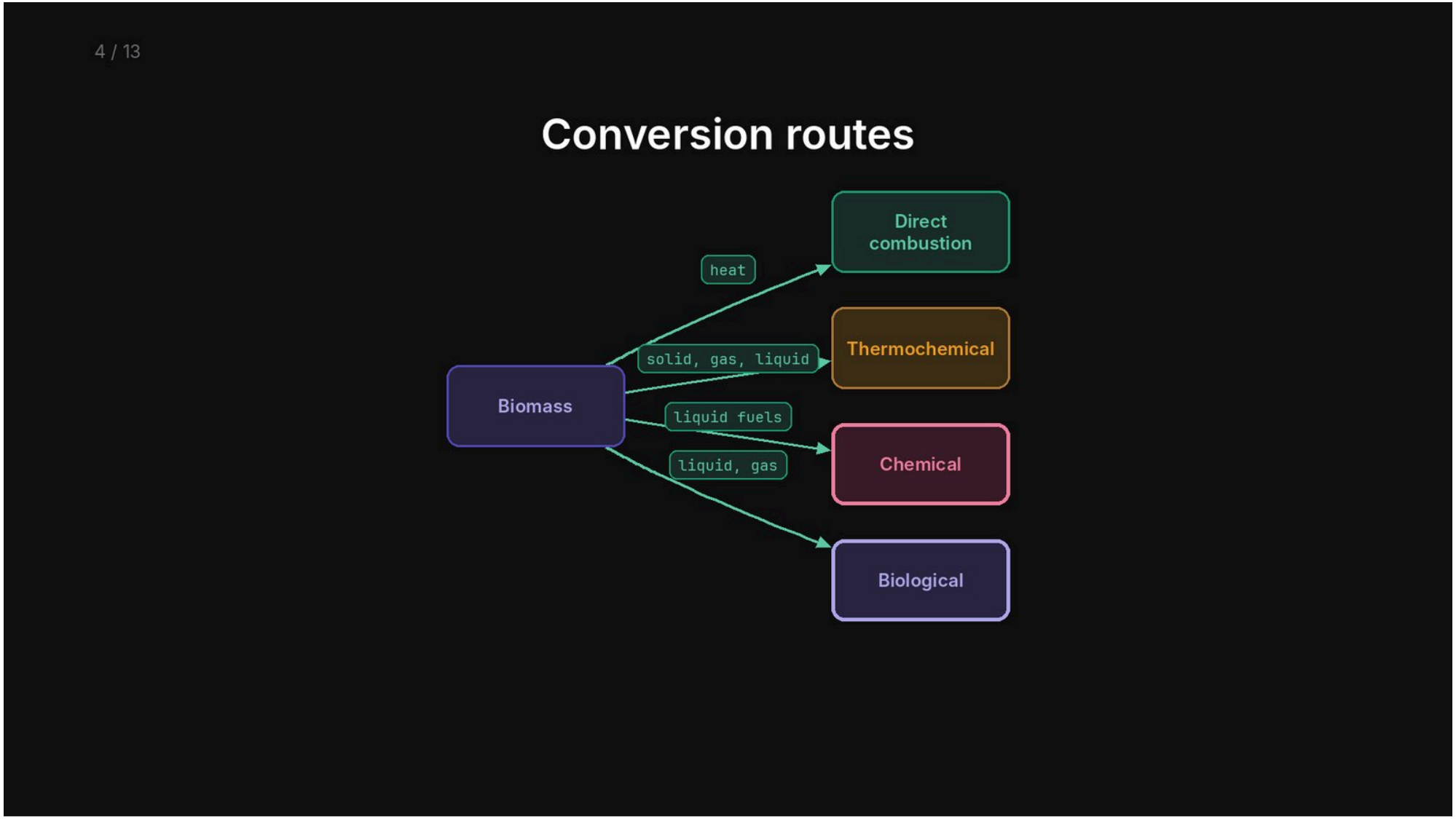
2 / 13 · Where biomass comes from

Biomass is renewable organic material from plants and animals. The first source is wood and wood waste, like firewood, pellets and sawdust. Next come farm crops and residues, such as corn, sugar cane and algae. Then there's paper, food and yard waste in our trash. Finally, animal manure and human sewage can produce biogas.



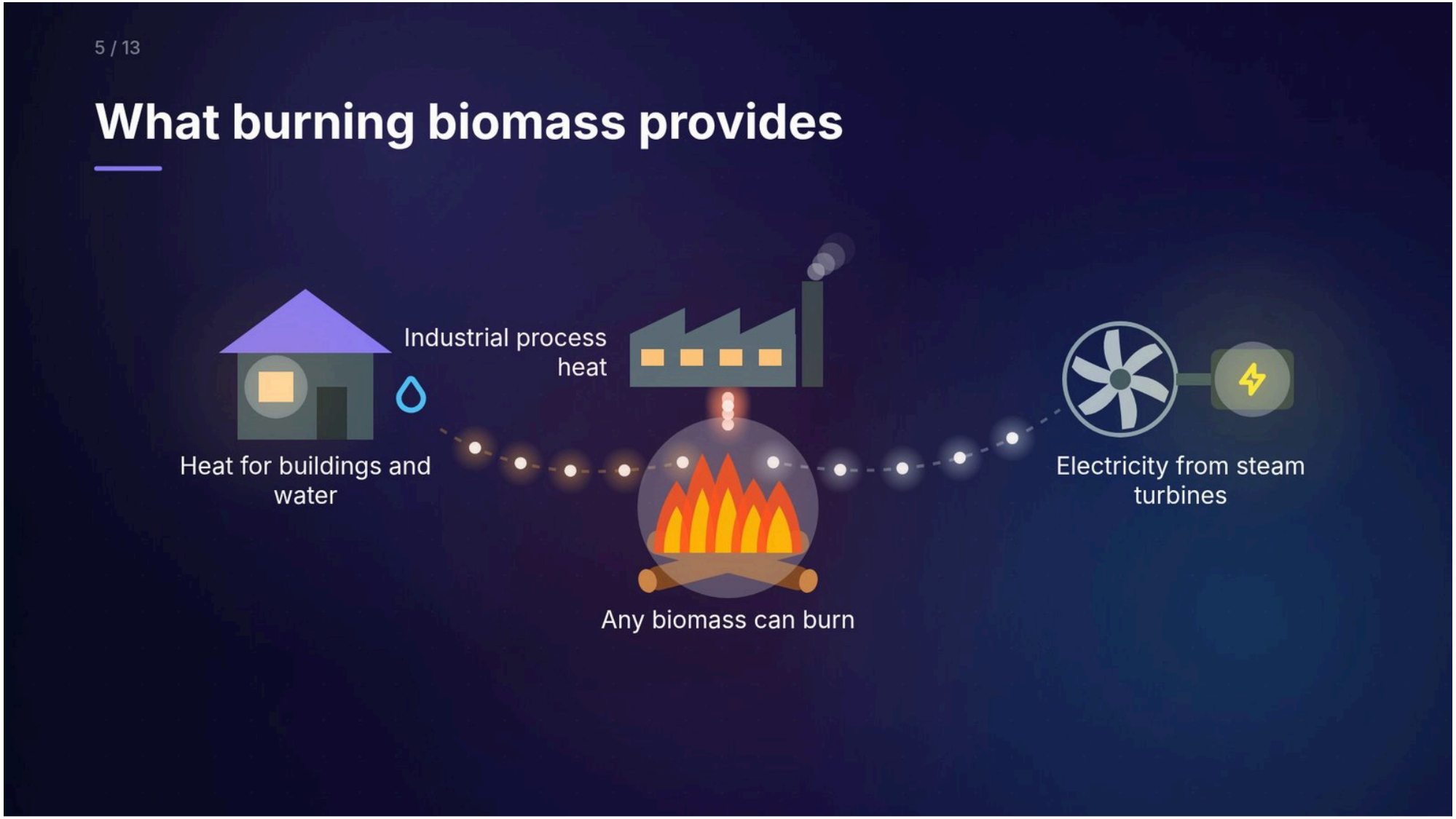
3 / 13 · From top source to a small share

Biomass isn't new. Until the mid-1800s, it was the largest source of energy Americans used each year. By 2025, it supplied about 5% of U.S. primary energy. Around the world, it's still an important fuel, especially for cooking and heating in developing countries.



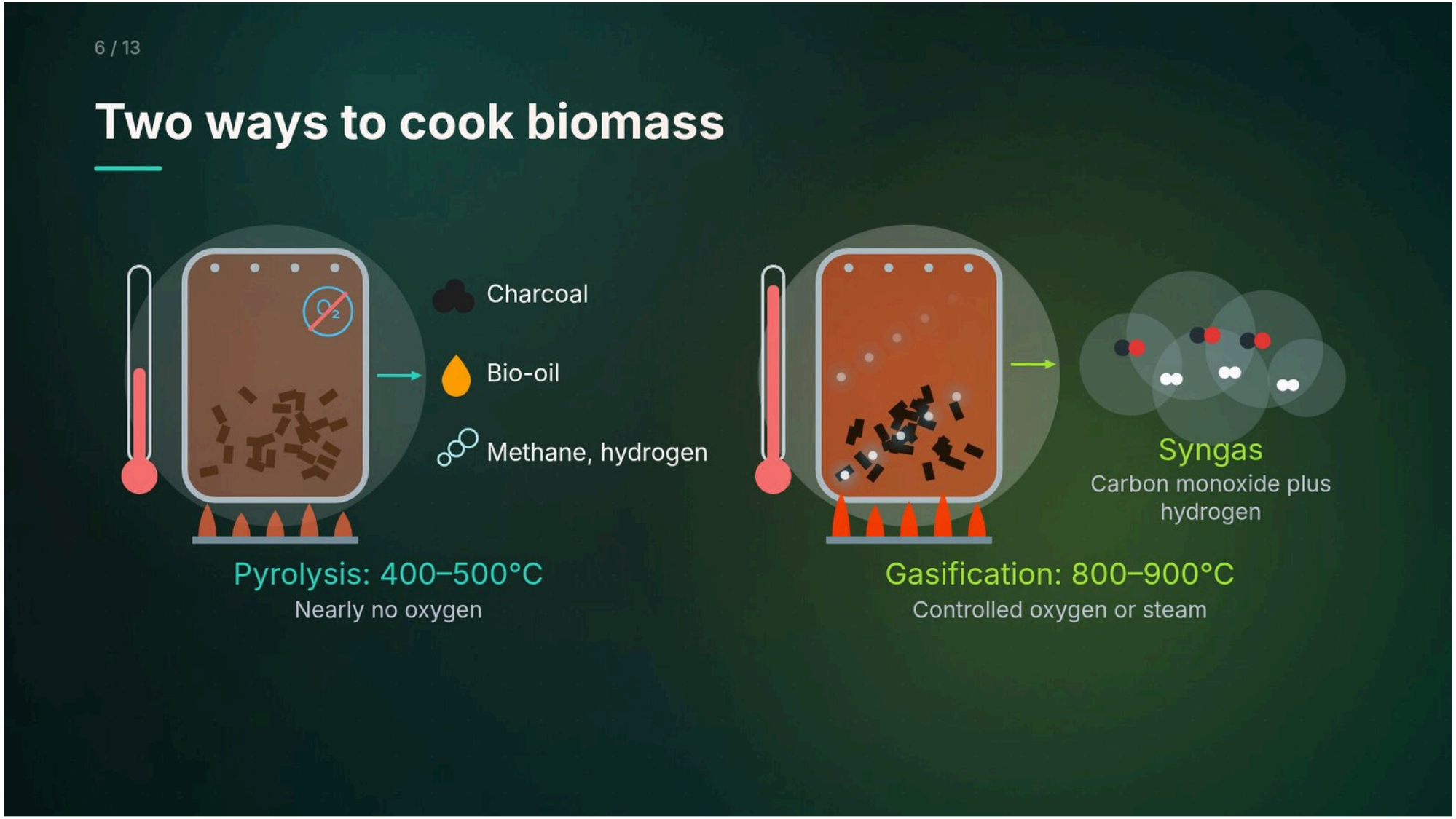
4 / 13 · Four ways to convert biomass

There are four main ways to turn biomass into energy. Direct combustion simply burns it for heat. Thermochemical conversion uses high heat to make solid, gas and liquid fuels. Chemical conversion makes liquid fuels, and biological conversion uses living processes to make liquid and gaseous fuels.



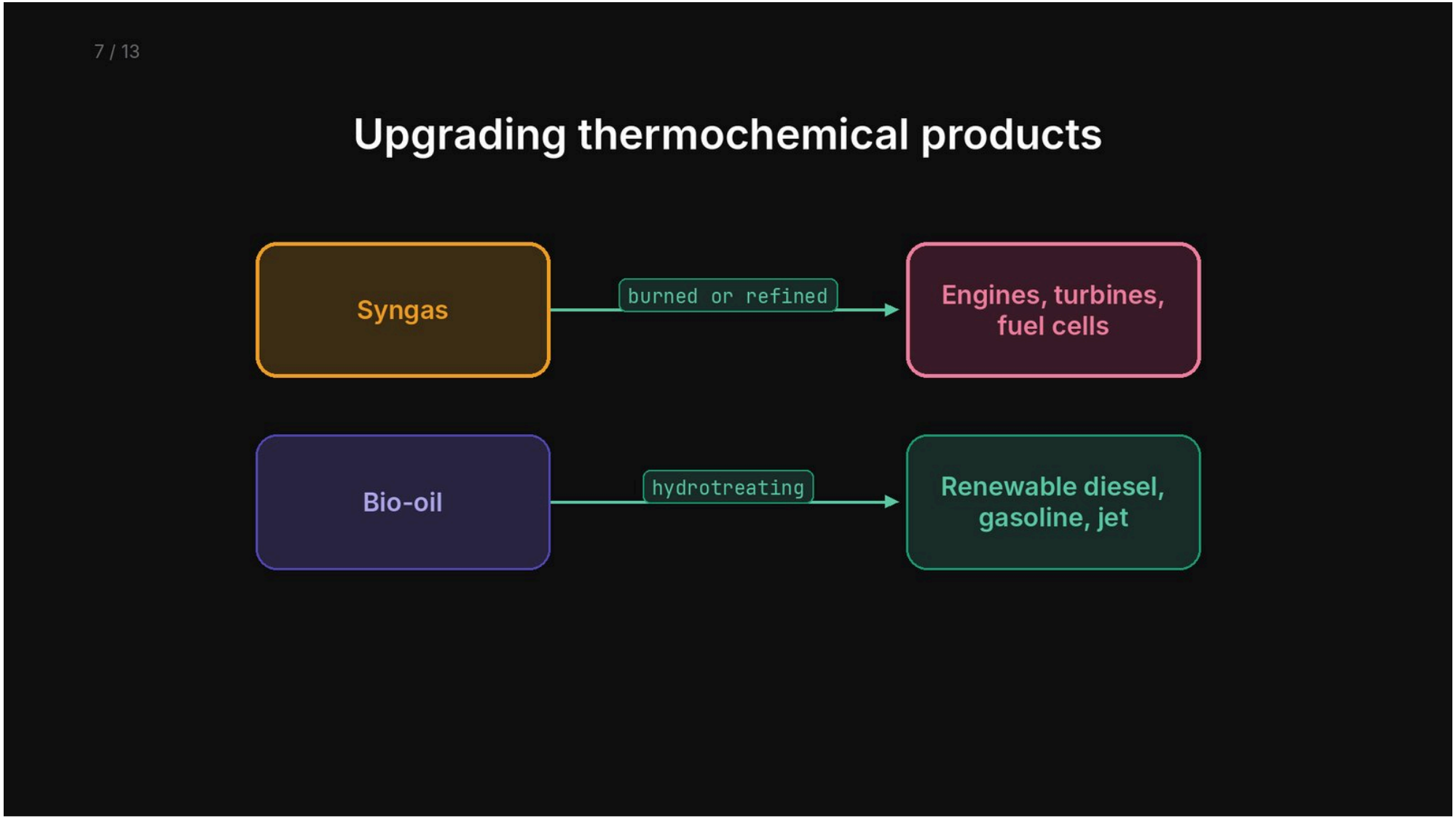
5 / 13 · Burning: the most common method

Direct combustion is the most common way to get energy from biomass, and any biomass can be burned. It heats buildings and water. It supplies heat for industrial processes. And it can make steam to spin turbines that generate electricity.



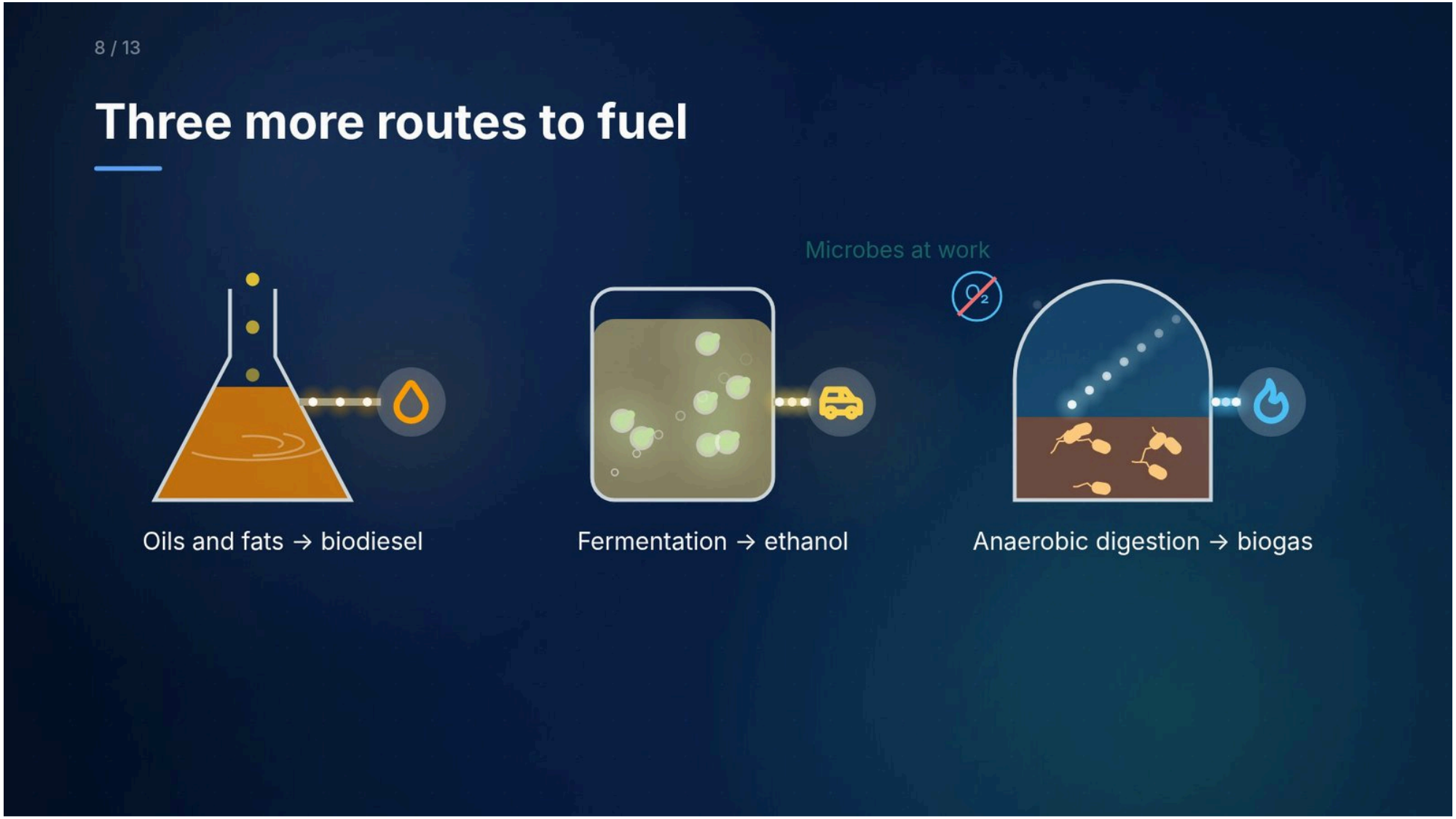
6 / 13 · Pyrolysis versus gasification

Thermochemical conversion heats biomass in sealed, pressurized vessels, and the two main methods differ in temperature and oxygen. Pyrolysis runs at 400 to 500 degrees Celsius with almost no oxygen, yielding charcoal, bio-oil, methane and hydrogen. Gasification runs hotter, 800 to 900 degrees, adding controlled oxygen or steam to make syngas, a gas rich in carbon monoxide and hydrogen.



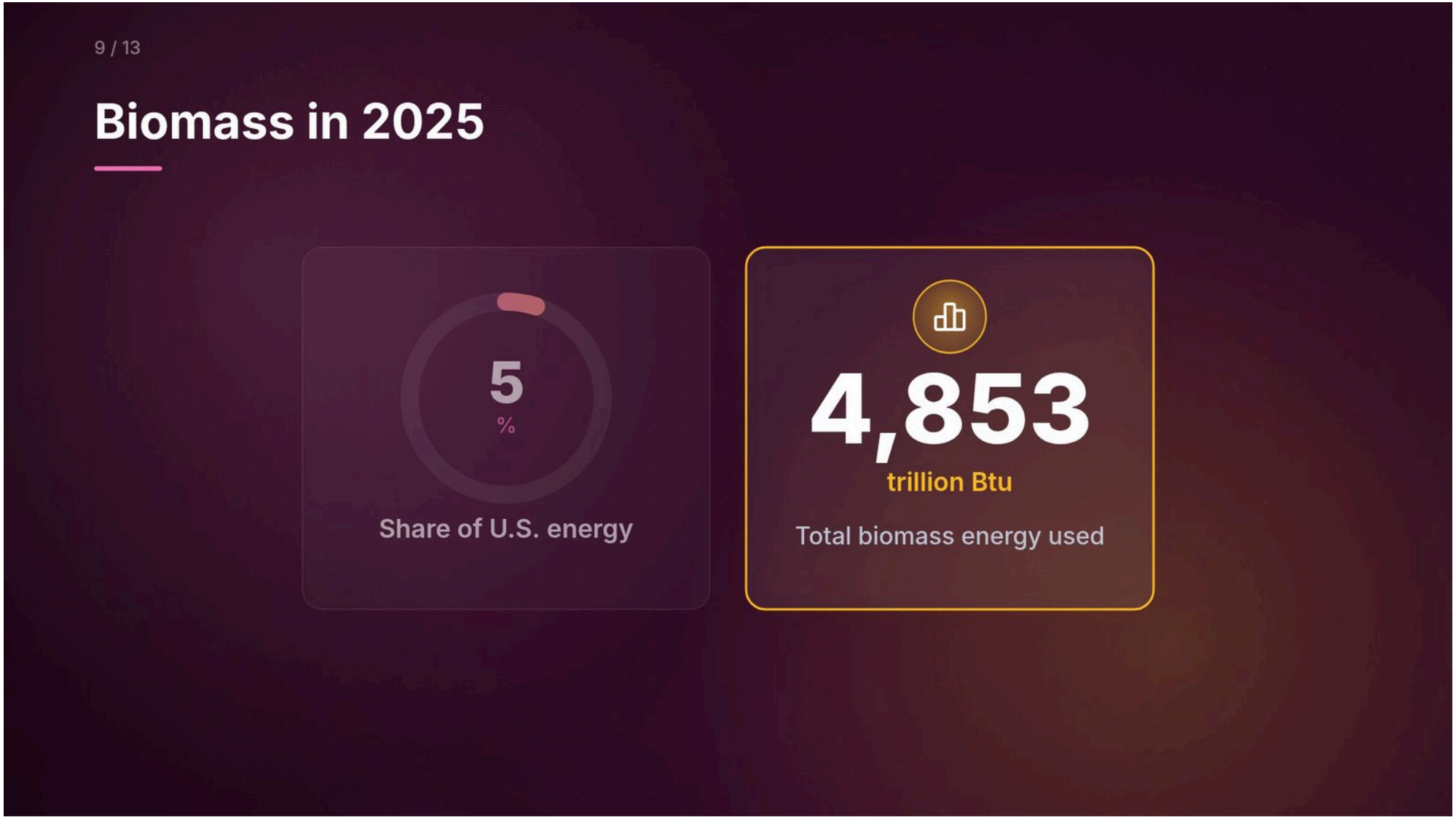
7 / 13 · From these gases to fuels

These products can go further. Bio-oil can be treated with hydrogen and a catalyst to make renewable diesel, gasoline and jet fuel. Syngas can power diesel engines and gas turbines, feed fuel cells, or be turned into liquid fuels through the Fischer–Tropsch process.



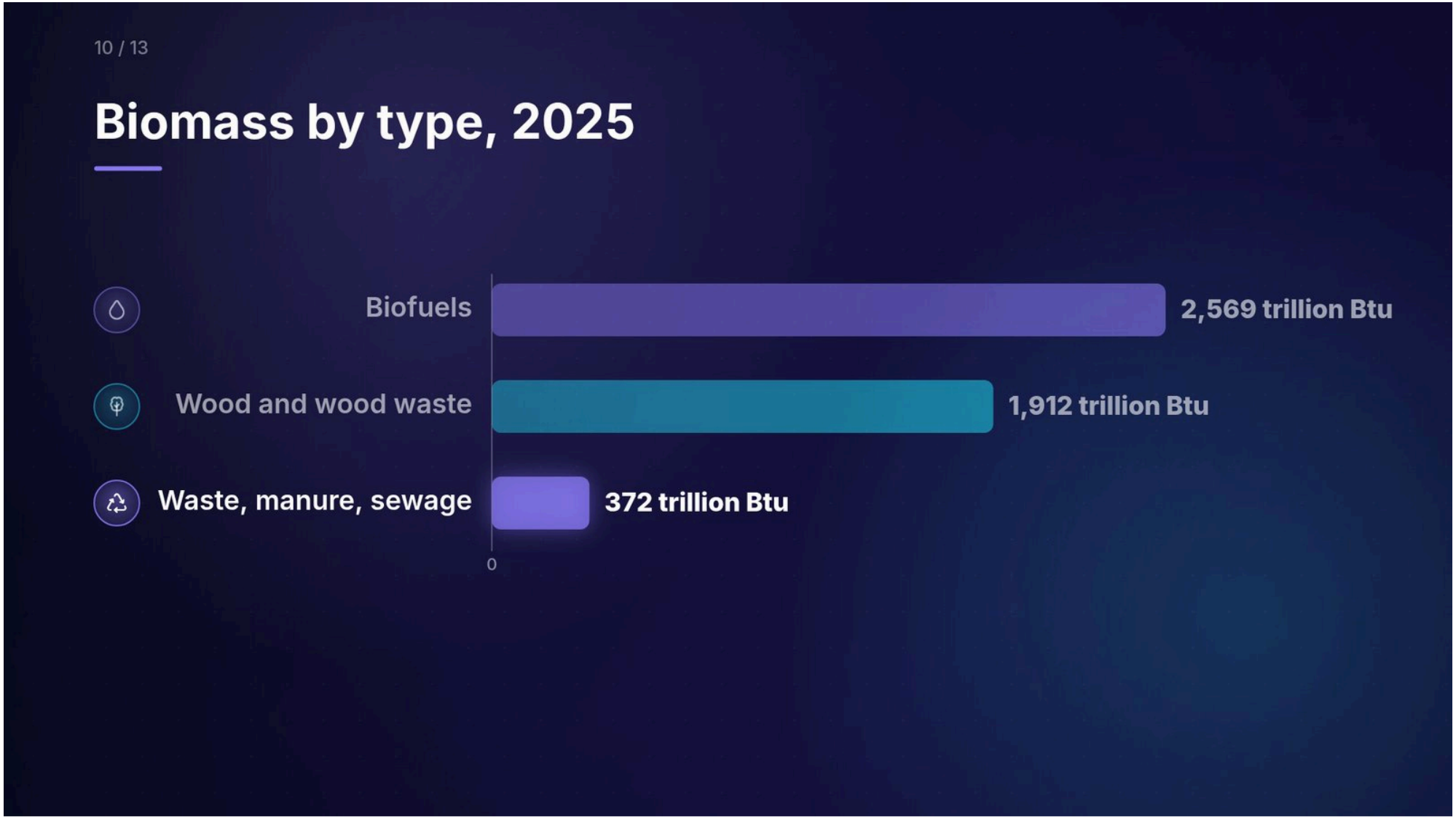
8 / 13 · Chemical and biological conversion

Chemical conversion uses a process called transesterification to turn vegetable oils, animal fats and greases into biodiesel. Biological conversion relies on microbes. Fermentation makes ethanol, a vehicle fuel. Anaerobic digestion, breaking down waste without oxygen, makes biogas, or renewable natural gas, at sewage plants, farms and landfills.



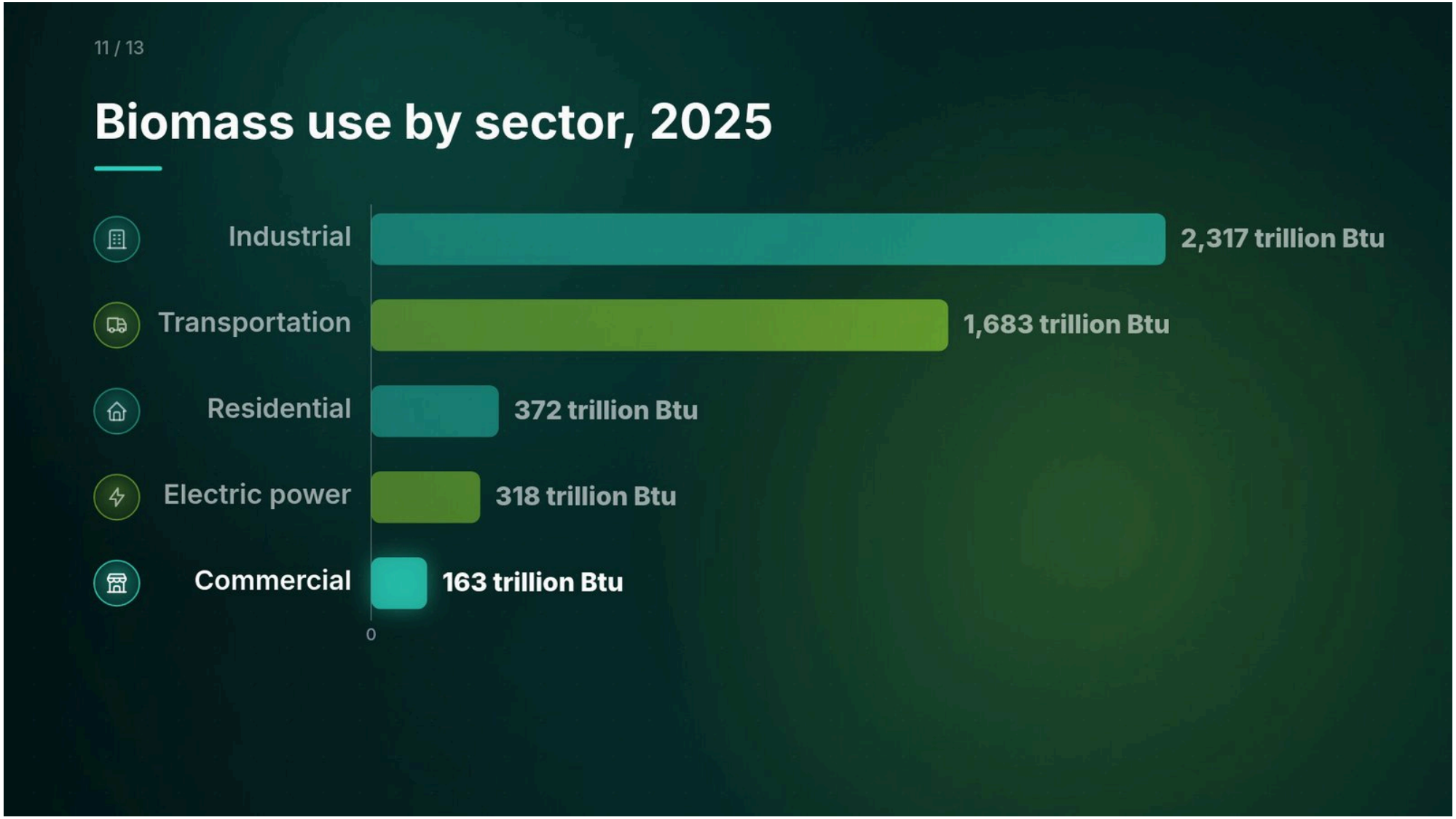
9 / 13 · Biomass in U.S. energy, 2025

So how much biomass does America use? In 2025, biomass provided about 5% of U.S. energy. That's roughly 4,853 trillion British thermal units, a standard measure of energy content.



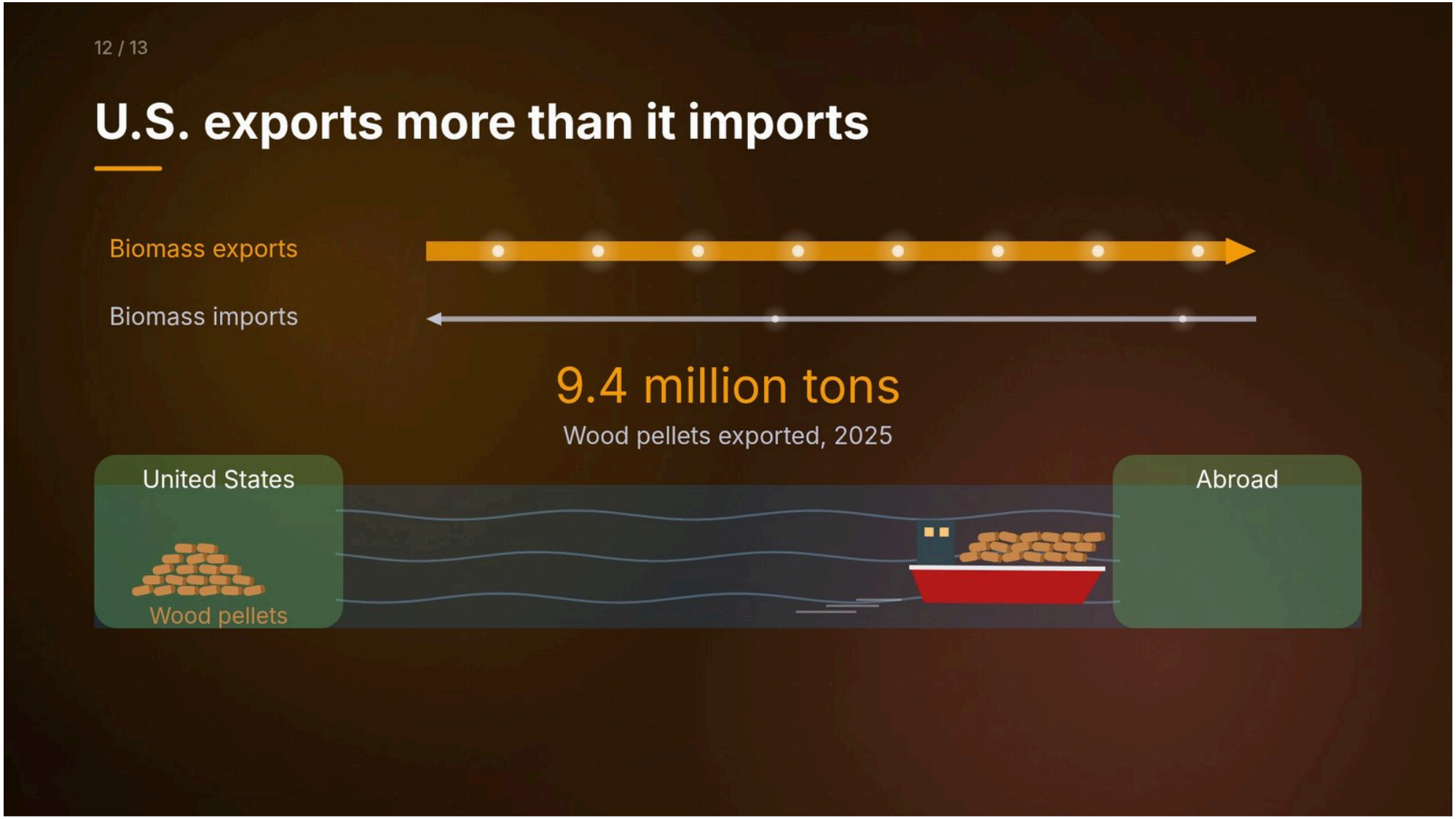
10 / 13 · Which kinds of biomass

Biofuels made up the biggest slice, about 53% of biomass energy. Wood and wood waste followed at 39%. Trash, manure and sewage together added the last 8%.



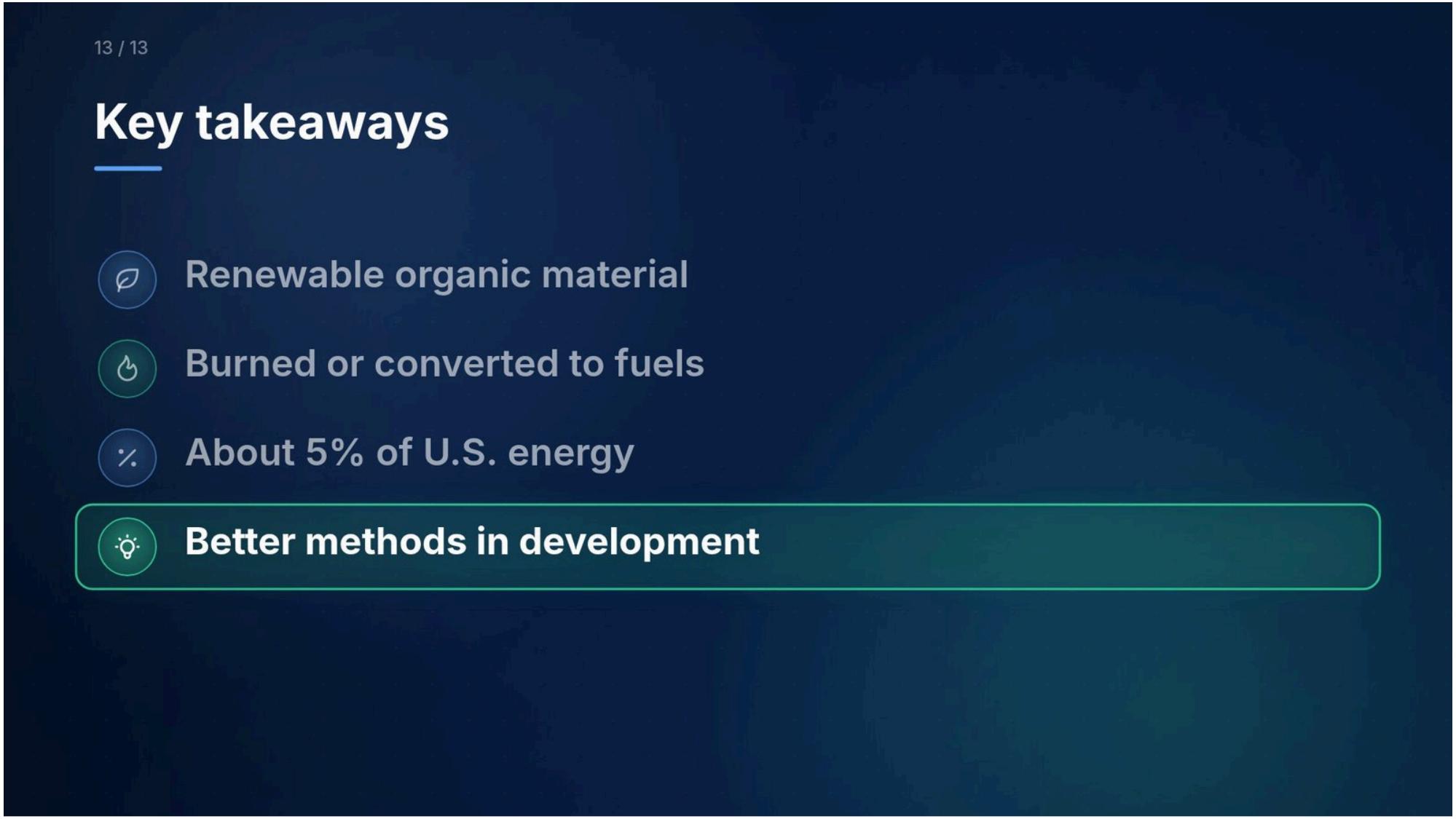
11 / 13 · Who uses biomass

Industry is the biggest user, at 48%, as wood and paper mills burn leftovers for heat and their own power. Transportation is next at 35%, mostly as biofuels. Homes use 8% for heating with firewood and pellets. Power plants use 7%, and commercial buildings use 3%.



12 / 13 · A net exporter

The United States sends more biomass energy abroad than it brings in. Compressed wood pellets have become a real export product in recent years. In 2025, the country shipped about 9.4 million tons of them.



13 / 13 · Recap

Let's recap. Biomass is renewable material from plants, animals and waste. It's burned for heat or converted into liquid and gas fuels. It supplies about 5% of U.S. energy, mostly used by industry and transportation. And researchers keep working on better ways to use more of it.