



Every Fire Is Also a Water Source: Understanding Combustion Moisture from Wood

Global Energy LLC

[TEL] 608-238-6001

[Email] greg@globalmicroturbine.com

<https://globalmicroturbine.com/direct-fired-wood-and-water-after-combustion-by-globalmicroturbine.html>

How burning wood silently generates hundreds of pounds
of water vapor — and why it matters



This webpage QR code

PDF Version of the webpage (maximum 10 pages)

How burning wood silently generates hundreds of pounds of water vapor — and why it matters

Introduction

When most people think about what comes out of a fire, they picture smoke, ash, carbon dioxide, and heat. Water is rarely on the list. Yet combustion chemistry tells a different story: burning wood is simultaneously a dehydration event and a water-generation event. For every pound of wood you burn, the chemical reaction alone produces roughly half a pound of water vapor — and with typical real-world firewood, that figure climbs even higher.

This is not a curiosity. Understanding combustion-derived water has practical implications for home heating efficiency, wood stove and chimney design, industrial biomass energy, wildfire behavior, and even emerging applications in atmospheric water harvesting and flue gas recovery.

The Chemistry: Where Does the Water Come From?

Wood is an organic material composed primarily of cellulose, hemicellulose, and lignin. On an elemental basis, dry wood is approximately:

- 50% Carbon (C)
- 6% Hydrogen (H)
- 44% Oxygen (O)

When wood burns in the presence of atmospheric oxygen, the hydrogen content oxidizes
