

# Clean Heat Aotearoa

The Definitive Guide to  
Solid Fuel Troubleshooting

# The Invisible Threat



Inefficient burners and poor technique release PM10 and PM2.5 particulates deep into the lungs, severely impacting children, the elderly, and those with respiratory illnesses.

# The Visual Proof



A correctly operating and heated burner produces no visible smoke. Go outside and check: once underway, you should only see a shimmer of heat.



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**Dry, Seasoned Fuel:**

Wood dried for a minimum of 2 years or kiln-dried to remove internal moisture.

**Unrestricted Airflow:**

Sufficient oxygen draw to prevent smouldering and maintain combustion temperatures.

**Maintained Appliance:**

An authorized, well-sealed unit with a clean, unblocked flue.

**Clean Heat**

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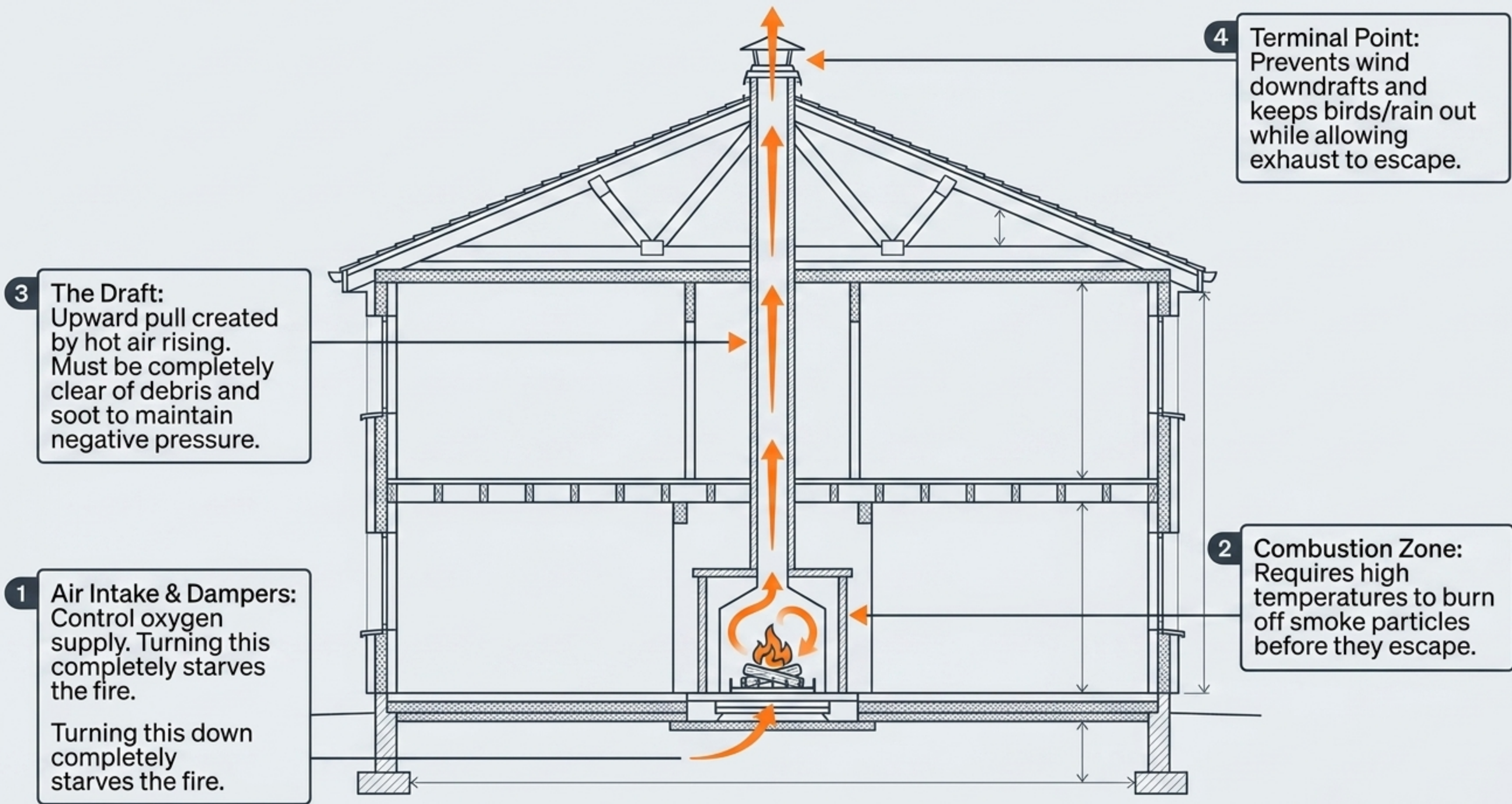
A failure in any single component results in smoke, wasted heat, and dangerous creosote buildup.

Optimal Fuel	Inefficient Fuel	Toxic & Banned
		

Kiln-dried wood, or hard/softwoods correctly managed and seasoned for a minimum of 2 years.

Wet, unseasoned wood. Creates excessive smoke, drastically lowers heat output, and rapidly builds up chimney creosote.

Ground-treated timber (decking offcuts release arsenic), painted wood, driftwood (corrosive sea salt), and plastics. Burning these damages the burner and releases highly toxic pollutants.



**3 The Draft:**  
Upward pull created by hot air rising. Must be completely clear of debris and soot to maintain negative pressure.

**1 Air Intake & Dampers:**  
Control oxygen supply. Turning this completely starves the fire.  
Turning this down completely starves the fire.

**4 Terminal Point:**  
Prevents wind downdrafts and keeps birds/rain out while allowing exhaust to escape.

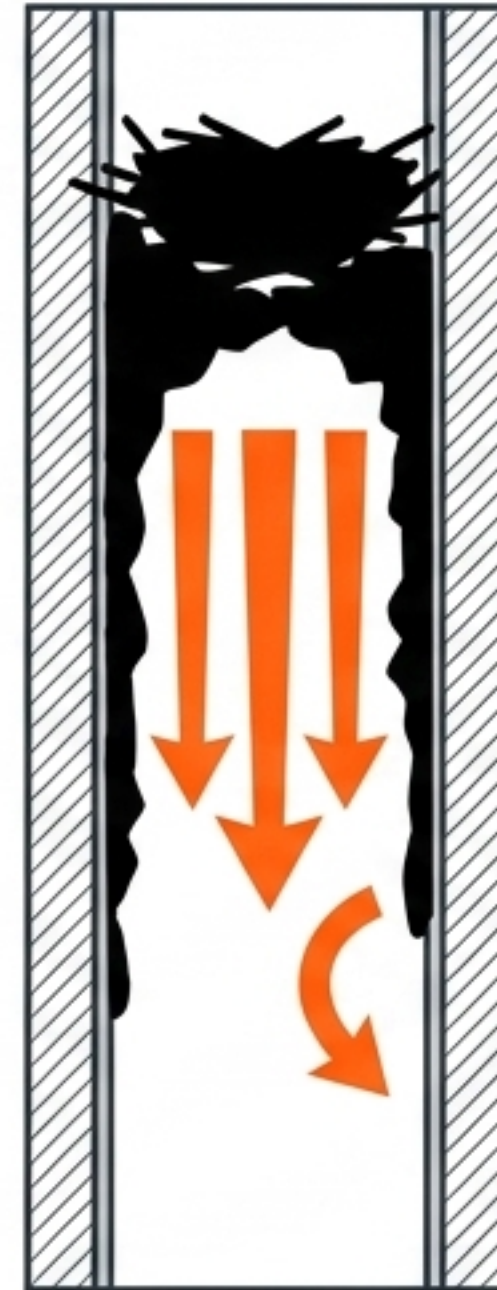
**2 Combustion Zone:**  
Requires high temperatures to burn off smoke particles before they escape.

# Symptom Diagnosis: Smoke Blow-Back & Draft Issues

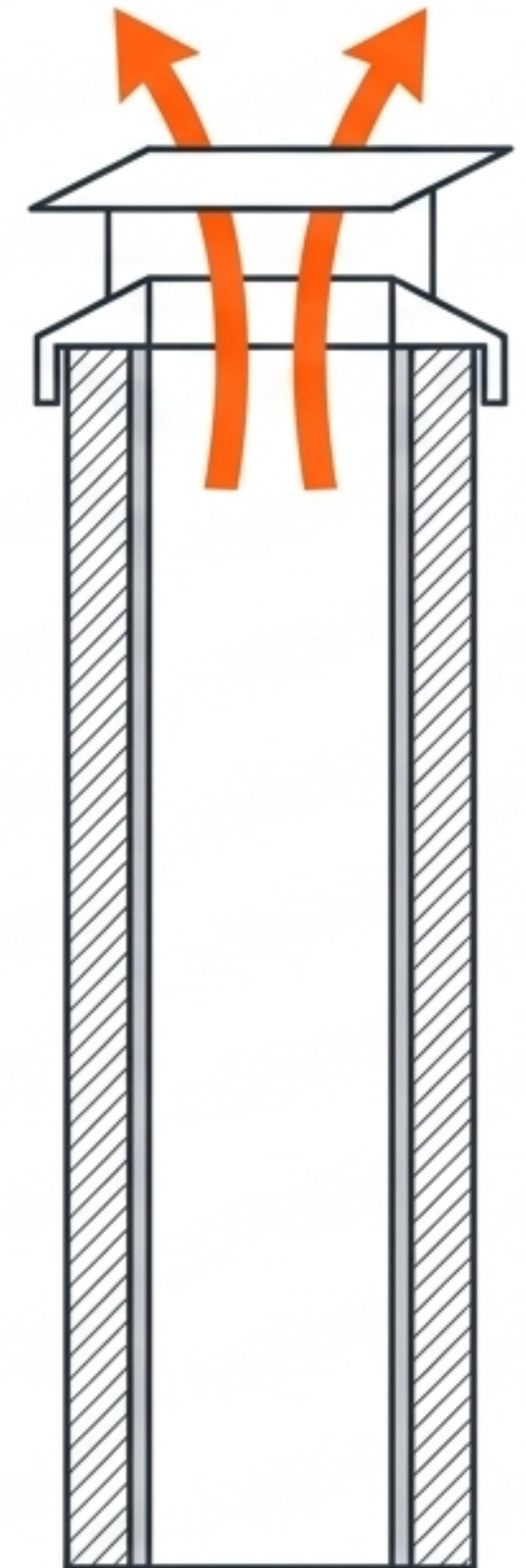
When smoke enters the room during operation or when the door is opened, the upward draft has been broken.

## Root Causes

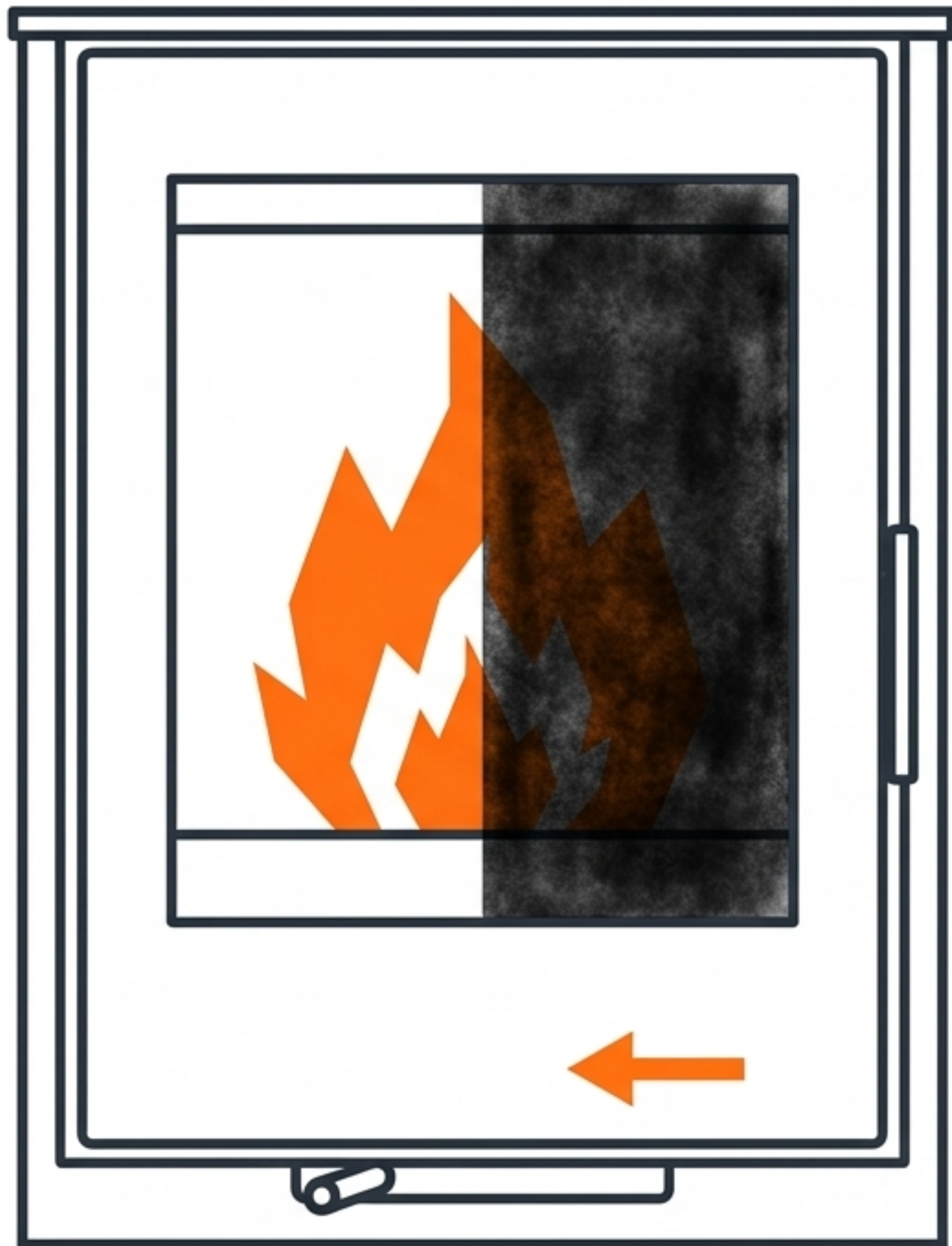
- ⚠ Blocked or dirty flues (heavy creosote, bird nests, debris).
- ⚠ Negative air pressure in the home (ventilation systems pulling air down the chimney).
- ⚠ External downdrafts due to missing or damaged chimney cowls.
- ⚠ Worn-out door seals or faulty dampers letting cold air interrupt the draft.



The Failure



The Ideal



# Symptom Diagnosis: Smouldering & Dirty Glass

Blackened glass and large unburnt pieces of wood are direct indicators of an incomplete, low-temperature burn.

1

## The 'Overnight Burn' Fallacy:

Damping the fire down completely to keep it alive overnight starves the fire of oxygen, causing severe smouldering. Modern compliant units are designed to prevent this.

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## High Moisture Fuel:

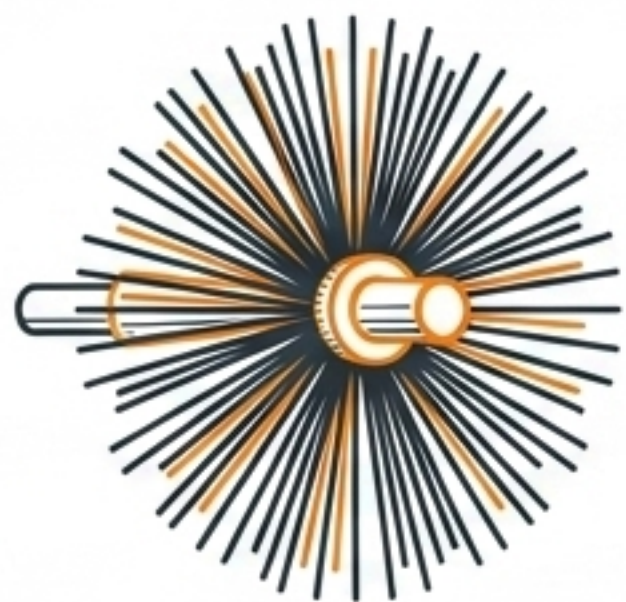
Wet wood consumes energy just to evaporate its own water content, preventing the firebox from reaching the required heat for clean combustion.

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## Restricted Airflow:

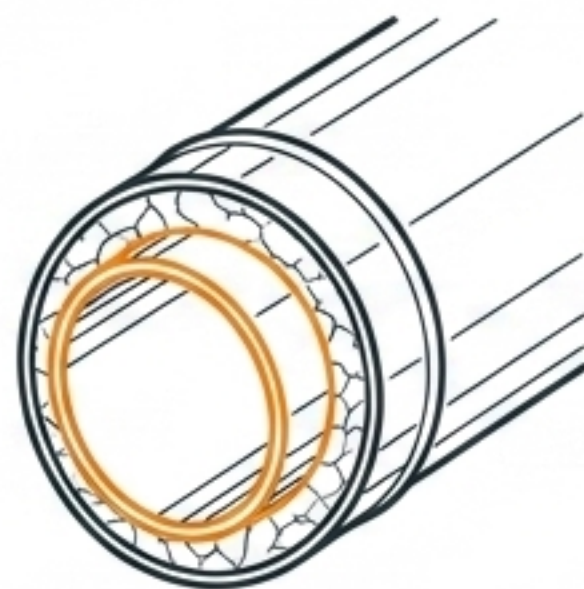
Turning down the airflow when the fire is too hot, causing an immediate smokey chimney.  
(Solution: burn smaller loads of wood rather than choking a large load).

Symptom	Probable Root Cause	Immediate User Action	Professional Fix
Smoke in room when door opened	Flue blockage or negative home pressure	Check home ventilation systems	Flue sweep & relining
Black, sooty glass	Wet wood or damped-down airflow	Use 2-year seasoned seasoned wood; open air intake	Firebox & baffle inspection
Unburnt chunks of wood left	Insufficient heat/oxygen during burn	Build smaller, hotter fires	Damper/seal repair
Constant smoke from chimney	Burning treated timber, plastics, or wet fuel	Switch to approved, dry hard/softwoods	Chimney sweeping (creosote removal)



## Sweeping & Debris Removal

Mechanical removal of highly flammable creosote buildup, soot, and structural blockages like bird nests to restore optimal internal airflow.



## Flue Repair & Relining

Sealing cracks and installing new internal flue liners to ensure the system is perfectly airtight and insulates the rising exhaust gases.



## Cowls & Ventilation Tuning

Installing specialized cowls to block wind-induced downdrafts and tuning internal dampers for precision draft control.

# Annual

# 5 Years

# 15 Years



## **The Maintenance Sweep**

Professional inspection and sweeping of the firebox and flue before winter begins. Ensures ongoing safety and efficiency.

## **Freestanding Durability**

The minimum legal durability requirement (Building Code B2) for freestanding appliance elements that are easily accessible and replaceable.

## **Inbuilt & Flue Lifespan**

The legal durability threshold for inbuilt appliances and concealed flues. Reaching this milestone requires professional assessment to ensure safe continued operation.

# 1.5 g/kg

## Maximum Emission Limit

Under the National Environmental Standards (NES), new solid fuel heaters must emit no more than 1.5 grams of particles per kilogram of wood burnt.

# 65%

## Minimum Thermal Efficiency

The burner must convert at least 65% of the fuel's energy into usable heat for the home, as measured by AS/NZS 4012.

# 2 Hectares

## The Urban Airshed Rule

The strict NES standards apply to any property with a lot size of 2 hectares or less (20,000 m<sup>2</sup>). Some regions prohibit new open fires entirely in these zones.

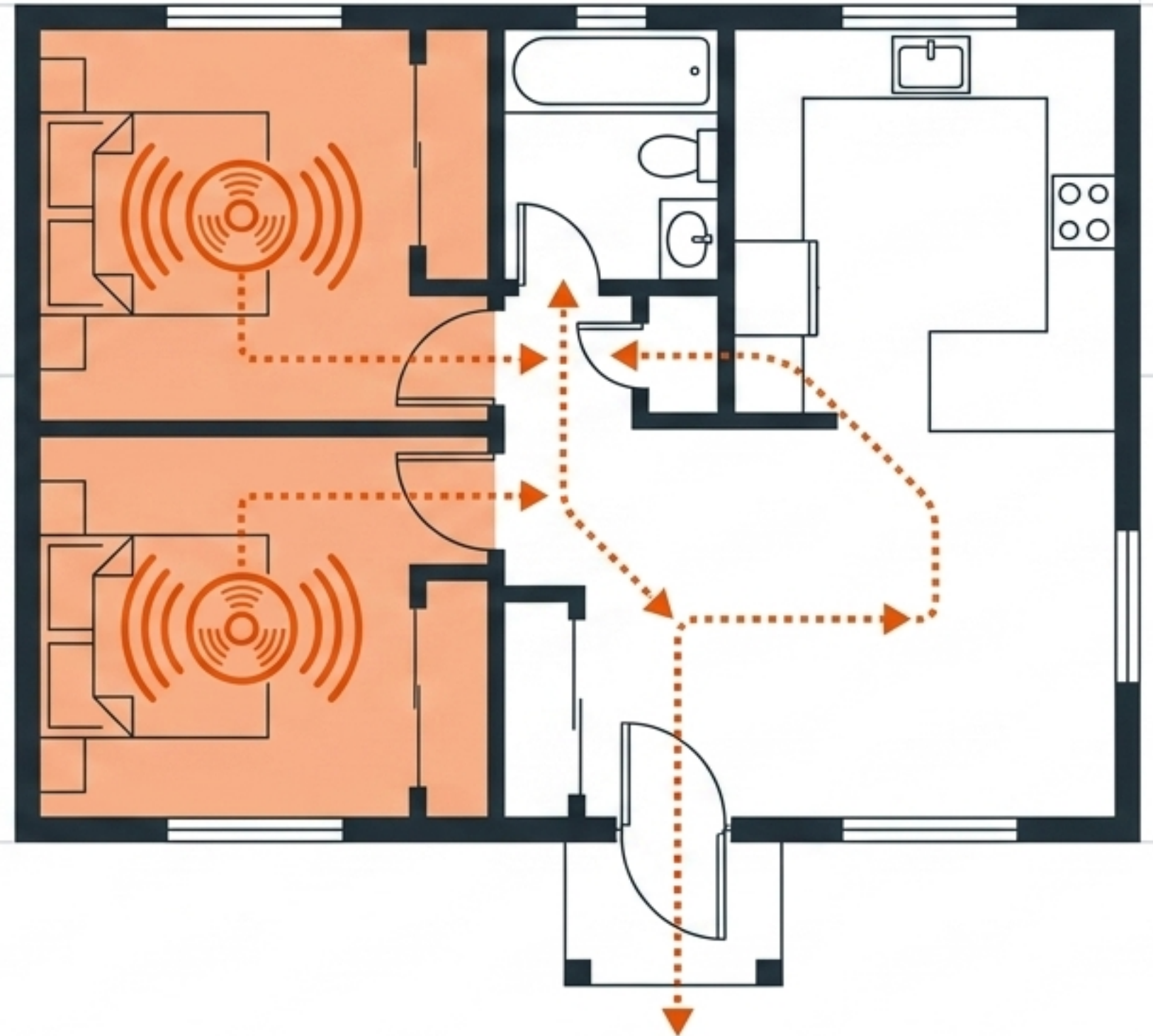
# Emergency Preparedness: The FENZ Mandate

## The Warning System

Install smoke alarms where you sleep. You are four times more likely to survive a house fire with working, correctly placed alarms. Winter brings unique fire dangers—early detection is critical.

## The 3-Step Escape Plan

1. Plan your primary and alternate escape routes.
2. Keep keys in deadlocks and pathways perfectly clear.
3. Establish a safe meeting place outside the home.





## Fuel Verification

- Ensure all wood is seasoned for 2 years or kiln-dried.
- Strictly ban treated wood, driftwood, and plastics.



## Operational Technique

- Maintain high airflow; never damp down for an 'overnight burn'.
- Check chimney outside: aim for a shimmer of heat, not visible smoke.



## Annual Maintenance

- Book a professional sweep to remove creosote and bird nests before winter.
- Check door seals and the external cowl condition.



## Life Safety

- Verify smoke alarms are installed and operational where you sleep.
- Review your household 3-step escape plan.

**A well-maintained burner provides clean, efficient, and safe heat for your home and community.**