



# DISASTER RECOVERY

and the Role  
of Air Curtain  
FireBoxes

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# Disaster Recovery and The Role of Air Curtain Fireboxes

**D**isasters can occur at any given time, at any given location, and in a myriad of ways. Although mostly of natural origin, they can, unfortunately, also be man-made. Natural disasters such as floods, hurricanes, tornadoes, and wind storms or ice storms are common and seasonal. There are also those that are not directly storm related, such as earthquakes, wildfires, mudslides from heavy rains, and floods from rising waters caused by excessive melting of snow, ice, or glaciers.

When we think of manmade disasters, terror attacks such as bio or agricultural terror often come to mind, but wildfire arson is another sad example. This typically takes the form of fires being set to woodlands willfully or by gross negligence.

There are also disasters caused by engineering errors or aging structures collapsing or causing the explosion of oil or gas pipelines. Finally, there are countless occurrences of transportation related accidents involving trains, cars, ships, or planes.

## What Most Disasters Have in Common

Most disasters result in death, injury, and displacement of people, wildlife, and livestock. In their aftermath, disasters also leave an altered environment with rubble of various kinds. Most large-scale catastrophic events that are storm or wildfire related produce a tremendous amount of wood and vegetative debris from knocked down trees, power poles, and wooden structures to partially scorched trees in woodlands. The rubble left behind by hurricanes, typhoons, ice storms, and tornadoes contains more wood waste than anything else.

## Preparing to Cope with Disasters

In general, governments prepare for disasters by ensuring emergency service preparedness for the public: fire stations, hospitals, first aid stations, the National Guard, Coast Guard, and forest fire lookout stations are typical examples. These common services train to deal with unpredictable but routine catastrophic occurrences such as accidents, while special task forces specialize for more unusual events like terror attacks.

It has been recognized that the devastating consequences of recurring large-scale disasters can be significantly mitigated by preparing for these inevitable events in order to shorten the response time to implement the first phase: the search and rescue phase. The next phase, the search and recovery phase, must be implemented immediately after the first phase is declared complete, leading into the cleanup and rebuilding phase that often times extends over many years.

## Disaster Preparedness

In the US, there are common and recurring large-scale catastrophic events that can result in extensive loss of life and billions of dollars of property damage. These include hurricanes and connected flooding, widespread wildfires incorporating populated areas, and, to a lesser extent, tornadoes, ice storms, and earthquakes in the West. Targeted preparedness for these more common events has been in place for many years and governments at various levels, right down to local municipalities, put in place prepositioned disaster recovery contracts with companies that specialize in such work.

As time is of the utmost importance for all phases of recovery after a disaster, these contracts lay out in great detail the procedures and equipment that disaster recovery operations must include. These procedures must be ready to be put into action at a moment's notice and equipment must be on hand for immediate deployment to troubled areas.

## Dealing with The Rubble

Disaster recovery operations are exactly what the term implies: recovery. This does not include the preparedness for the first phases of search and rescue nor the recovery associated with saving lives and clearing pathways for access and egress of emergency crews and their vehicles to impacted areas.

For the sake of the public's health and well-being, any storm or flood event will require the expeditious, safe, and complete cleanup of woody and other debris from wind damaged and flooded areas. Time is very much of the essence to implement vector control to clear the way for rebuilding and give the public a sense of comfort and hope for the future.

The quickest way to accomplish these goals is the strategic positioning of air curtain burner systems, which must be in the arsenal of tools required for prepositioned disaster recovery contracts for quick deployment to trouble spots. The US EPA has recognized the importance of such rapid air curtain burner positioning by providing in its regulations that air curtain burners can be used immediately upon official declaration of a disaster without any initial "red-tape" permitting requirement. The unmatched usefulness of air curtain Fire-Boxes as an important disaster recovery tool is underscored by the fact that the EPA spelled out special regulations not only for their use to eliminate wood waste on site, but also waste streams consisting of official government documents and contraband destroyed or rendered useless by the flooding of buildings.

### Why Air Curtain Burners?

Only air curtain burners, especially highly portable, above ground refractory-lined FireBoxes, totally eliminate the debris on-site.

Here are the salient points why:

- No external fuel needed
- Wood debris is the fuel for all allowed waste material  
No drying out of wood waste, including waterborne debris
- No grinding
- No concerns for foreign metal parts
- No trucking
- Leaves only a small amount of carbon ash that can be land applied
- No landfill tipping fees
- Simple to run—one loader can mind up to three FireBoxes
- Require no onsite assembly, easy to relocate onsite by dragging
- Continuous operation up to 22 hours a day possible

High temperature FireBox combustion also assures complete destruction of any pathogens and microorganisms that may have infested the storm debris from destroyed houses, boardwalks, warehouses, landfills, garbage dumpsters, broken sewer lines, etc.

Such pathogens and microorganisms may cause serious long-lasting public health issues if not eradicated quickly or if the exposed wood waste is chipped or ground into mulch for “recycling”, which requires further handling, transportation and ultimate disposal.

### Is it a good idea to grind the storm and flood debris and "recycle"?

No, absolutely not.

Woody disaster recovery debris usually contains all sorts of nasty foreign objects (other than pathogens). This can include metal parts, nails, rocks, or glass that make the grindings or mulch unfit or undesirable for recycling as ground cover for roadways and parks, for home use in yards and gardens, at playgrounds, or for electric power generation at biomass cogeneration plants.

Disaster debris is sometimes ground into mulch to facilitate transportation of the debris; once ground into dense mulch, more can fit into a truck. But this mulch will often end up in our (precious and limited) landfills anyway, because once ground into mulch, the storm debris can no longer be eliminated in an air curtain burner. Also, grinding and trucking causes unnecessary pollution, wastes fuel, and, if merely piled up, mulch is subject to spontaneous combustion resulting in a new dilemma; mulch piles often smolder and pollute the air and possibly ground water for many months.

### Can there ever be a place to recycle woody disaster debris?

Yes, certainly.

It is noteworthy that there are instances where clean wood waste from a storm disaster and forest fire can be prudently recycled. If large areas of trees in forests have been leveled by a storm or scorched by fire, a portable biomass power system can be deployed called the PGFireBox. This system harnesses energy from the wood waste combustion process and converts it into electric and thermal energy. The electricity produced powers the PGFireBox itself and makes power available for many other uses at the disaster site. Some of the damaged wood can be sawn into usable lumber with portable electric saw mills. The lumber can also be kiln-dried onsite using the waste heat from the power generator. In addition, flood lighting, charging stations, and temporary cell towers can be powered.

Considering that public power lines to the stricken area are usually down for some time, being able to generate electricity and at the same time eliminate disaster waste is a significant advantage.

The PGFireBox machine replaces temporary hydrocarbon fuel-driven generator sets, thereby reducing the need to haul in more fuel to the disaster zone while reducing the release of greenhouse gases. In areas with prevailing cold climates, the thermal energy can heat temporary buildings and it can even be engineered to purify water if clean water is scarce or water sources are contaminated.

### Air Curtain Fireboxes at Landfills

No matter how much wood waste from a disaster is eliminated onsite at debris staging areas, there will be a heavy burden on area landfills. Smaller operators and home owners will dump their debris at landfills, and collections from curb-side pickups will be a multiple of what the landfill is used to handling. Many landfills are prepared for that challenge, because they have installed a FireBox to deal with their routine biomass waste collections. Keeping wood out of the precious landfill extends its life, thereby saving money and eliminating air pollution from biomass decomposition, such as the release of methane, a very bad climate change forcing agent. The residual ash from the FireBox combustion can be used as a deacidifier to be mixed into the daily landfill cover, as the ash is inert and is highly alkaline. Landfills with a steady stream of wood waste coming in throughout the year are perfect candidates for the PGFireBox system. It could power most electrically driven machinery at the landfill and additionally avail the landfill operator of landfill diversion credits in many jurisdictions. Not only would the landfill be publicly perceived as progressively recycling, but the financial impact would directly hit the bottom line in a positive way.



### Air Curtain Burners for Disaster Recovery: Highlights

- Portable FireBox systems are affordable, easy, and inexpensive to operate and they have a long, useful life.
- Mass reduction is 95–98% and the residue is a clean carbon ash.
- FireBoxes meet or exceed applicable US EPA Regulations.
- FireBoxes can be put to work immediately without any cumbersome paperwork in declared disaster areas, as regulated by the US EPA.
- Depending on local circumstances, the proper air curtain burner should be selected. For massive onsite wood debris elimination, the large FireBoxes should be used, optimally with several side-by-side to be loaded by a single operator. In situations where a FireBox must be moved frequently to eliminate multiple accumulated wood rubble piles, Roll-off Fire Boxes are very useful. They can be swiftly deployed and moved from place to place by standard roll-off trucks that are used to carry dumpsters.

For many final “mop-up” wood waste reduction jobs, the Burn-Boss can be quite handy. It is trailer mounted and hauled by a pickup truck and can be hand-loaded, simplifying matters further for small operators.

Air curtain Fireboxes are so vital for a well-conceived disaster recovery plan, that the DHS/FEMA listed the machines in the lineup of obligatory equipment to be available by chosen contractors for prepositioned disaster recovery contracts. The US EPA has carved out special regulations for the unencumbered deployment and immediate operation at declared disaster sites as soon as appropriate, based on the status of initial disaster search, rescue, and recovery phases. Because the air curtain machines are so useful throughout the time periods between disaster occurrences, many government agencies have included them in their own equipment lineup for use at roadways, parks, landfills, and more.

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