

GLOBAL ALLIANCE FOR CLEAN COOKSTOVES

GUIDE TO COOKSTOVE TECHNOLOGIES AND FUELS

OVERVIEW

The Alliance seeks to address the impact of cooking on the environment, health, and livelihoods with cookstove technologies and fuels. Within each category of stoves and fuels, there are a range of designs and performances. This variety reflects the differing economic factors, sociocultural factors, and energy requirements relevant to users around the world.

CLEAN COOKING CATALOG

An online global database of stoves, fuels, fuel products, and test results

The screenshot displays the Clean Cooking Catalog website. At the top, there are navigation tabs for 'CLEAN COOKING CATALOG', 'STOVES', 'FUELS', 'TEST RESULTS', and 'RESOURCES', along with a 'CONTRIBUTE' button. The main content area shows a search bar with '299 STOVES SHOWN' and a 'DOWNLOAD CSV' link. Below the search bar are filter sections for 'CHARACTERISTICS' (Traditional, Institutional, Non-traditional, Household) and 'IWA TIERS OF PERFORMANCE' (Emissions, Efficiency, Indoor Emissions, Safety). The 'SUGGESTED RETAIL PRICE' is set to '\$0' to '\$100+'. The product details for 'Clean Efficient Stove' are shown, including 'IWA tiers of performance' (Emissions: 4, Efficiency: 4, Indoor Emissions: 4, Safety: 4) and 'Information for consumers' (Suitable Pots, Approximate Lifetime, Dimensions, Common Foods Cooked, Number of People Fed, Warranty, Manufactured In, Price). A world map is also visible. The 'Performance details' section lists various test protocols like Biomass Stove Safety Protocol, Uncontrolled Cooking Test, Controlled Cooking Test, Uncontrolled Field Test, Heterogeneous Test Protocol, Water Boiling Test, Kitchen Performance Test, and Other test types.

- Partner-submitted information, including design components, fuel properties, retail price, and geography
- Laboratory and field testing results available, including efficiency, fuel use, emissions, and safety
- Integrated fuels, stoves, and test results sections

<http://catalog.cleancookstoves.org/>

TYPES OF FUELS



BIOGAS A methane-rich gas produced through anaerobic (without air) digestion of organic wastes (e.g. animal dung, agricultural and kitchen wastes).



BIOMASS Refers to all organic matter derived from living or recently living organisms, plant and animal-based. Raw biomass can be burned directly in a stove or can be processed into compact, evenly sized pieces such as briquettes or pellets.



BRIQUETTES Molds of compressed biomass that can be made into a variety of shapes and sizes depending on the feedstock, level of compactness and mold used. Briquettes can be carbonized to replace charcoal or be non-carbonized and replace firewood and raw biomass.



CHARCOAL A fuel produced by partially burning wood in a low-oxygen environment. The black substance that results is made up mostly of carbon and has higher energy density than the wood.



ELECTRICITY Electric power generated from coal, gas, hydropower, nuclear, oil, solar, wind, and biomass. It is clean and efficient at point of use, though overall lifecycle cleanliness and efficiency is dependent on the source.



ETHANOL/ALCOHOL A liquid biofuel that can be made from a variety of feedstocks including sugary materials such as sugar cane, molasses; starchy materials such as cassava, potatoes, or maize; or cellulosic material such as wood, grasses, and agricultural residues.



KEROSENE A liquid product of crude oil, natural gas and/or coal that is widely used in urban households for cooking, heating and lighting. It is also referred to as paraffin in some countries.



LIQUEFIED PETROLEUM GAS A byproduct of natural gas and crude oil refining which consists of a mixture of propane and butane for standard heating and cooking uses.



PELLETS Small, compacted, short cylinders of 5-16 mm diameter and shaped by pressing loose, dry biomass through a die with many holes.



SOLAR Direct sunlight concentrated to direct thermal energy to heat and cook.



WOOD/WOODY BIOMASS In the context of cooking, 'wood fuel' refers to any energy source derived from trees or wood plants used to fuel a small fire.

TYPES OF COOKSTOVES



CHARCOAL Stoves that use less charcoal can minimize the serious environmental impacts from charcoal production. Burning charcoal releases carbon monoxide; charcoal stoves can be designed to reduce these emissions.



CHIMNEY While chimneys may not reduce total emissions, they can reduce emissions indoors. The effectiveness of chimneys depends in large part on maintenance.



ELECTRIC/INDUCTION Electric stoves have no emissions during use, but are limited to areas with access to electricity. Induction stoves, a type of electric stove, produce heat when compatible cookware is placed in the stove's magnetic field.



ETHANOL/ALCOHOL Ethanol and methanol can be used for cooking in liquid, gelled, or waxy forms. Most alcohol stoves can burn ethanol in a fuel-water ratio of 80% and above.



FAN/FORCED AIR A fan, powered by a battery, an external electricity source, or a device that captures heat from the stove, can help burn the fuel more completely.



GAS/BIOGAS/LPG Use of Liquefied Petroleum Gas (LPG), a byproduct of petroleum production, is increasing in the developing world, primarily in urban areas. Biogas, methane produced from organic waste material, is another option for gas stoves.



GASIFIER/TLUD Gasifier stoves force emissions back into the flame for a more complete burning, resulting in lower emissions. Some gasifier stoves are also known as Top Lit Updraft (TLUD) stoves because the fuel is lit from the top.



GRIDDLE/PLANCHA These stoves are designed for regions where a hot flat surface is needed to prepare meals, for example tortillas in Mexico and Central America.



ROCKET/SIDE-FEED These stoves have an insulated, L-shaped combustion chamber that improves combustion of gases and smoke, and directs the flow of hot gases to the cooking vessel.



SOLAR Solar cookers can reflect and concentrate sunlight onto food (parabolic and box-shaped cookers) or trap heat like greenhouses (vacuum tube cookers).



TRADITIONAL Traditional stoves, including rudimentary open fires (e.g. three stone fire), are constructed from stones, ceramics, clay, and bricks.

SHIFTING THE MARKET TO CLEAN AND EFFICIENT STOVES AND FUELS

People don't always have a choice of fuels, primarily due to availability and affordability. Thus, the Alliance's portfolio addresses multiple technology and fuel options, across the value chain, using a two-pronged approach to move people to clean fuels over time, while improving use of currently available fuels.

FUELS

Move people to clean fuels over time by addressing accessibility, affordability and availability



COOKSTOVES

Improve technology to optimize production and use of currently accessible fuels



FACIT - FUEL ANALYSIS, COMPARISON AND INTEGRATION TOOL

An online tool to evaluate the environmental, economic and social impacts of different fuel types, to help policy makers, enterprises, and researchers prioritize clean fuel opportunities



- Visual comparison of impacts through interactive charts and tables across feedstock production, processing, distribution and use
- Multiple criteria to filter results
- Data sources, recommendations and case studies included in a companion report

<http://cleancookstoves.org/facit>

THE OPPORTUNITY IS REAL. THE MARKET IS POISED TO SCALE. THE IMPERATIVE FOR ACTION IS OURS.