Announcement of the

Next Generation Wood Stove Design Challenge

February 28, 2012 - The Wood Stove Design Challenge seeks innovative, next generation wood stoves that substantially improve the technology so households can more easily, cleanly and efficiently heat with cord wood.

In addition to having low particulate emissions, the stove must be high efficiency and be able to put out at least 30,000 BTUs to heat a well-insulated 1,500 square foot (140 square meter) home.

The Wood Stove Decathlon

The Challenge will culminate in a Wood Stove Decathlon showcasing the finalists for the public, policymakers and the renewable energy community. At the Decathlon, the judges will give scores to each stove and select the winners. The Decathlon will be held in November 2013 on the National Mall in Washington, DC.

Eligibility

The Challenge is open to any company, university, individual or entity from any country (except for accredited wood stove test labs). Teams representing partnerships between universities and stove manufacturers are encouraged.

Prizes

The Grand Prize winner will receive a $25,000 cash prize. Between 2 and 5 second place prizes will share a $10,000 pot. Second place awards will be based primarily on one of the following attributes: Innovation, Emissions, Efficiency, Affordability and Most Consumer Friendly.

The winning stoves will receive extensive publicity, and *Popular Mechanics*, who helped design the Challenge, will cover the winning designs in its magazine and website.

Rules and Application Forms

For rules, application forms and information about judging and testing please go to: http://forgreenheat.org/stovedesign.html

Challenge Timeline

- Phase 1, 2011-Feb 2012 Planning & Outreach
- Phase 2, Feb-Dec 2012 Announce & Launch Challenge. Teams Prepare Applications.
- Phase 3, Dec 2012-Jan 2013 Judges Review Applications & Select Finalists
- Phase 4, Jan-Dec 2013 Finalists Build Prototypes
- Phase 5, Nov 2013 Wood Stove Decathlon
- Phase 6, Dec 2013-2014 Promotion & Publicity

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NEXT GENERATION Woodstove DesignChallenge

Judges

Judges will include James Meigs, Editor-in-Chief of *Popular Mechanics*, Rod Tinnemore of the Washington Department of Ecology, representatives of the EPA, the New York State Energy Research & Development Authority (NYSERDA), the Hearth, Patio & Barbecue Association (HPBA) and other key institutions. Nominations for judges may be sent to Challenge@forgreenheat.org.

Partners

Popular Mechanics

Department of Ecology State of Washington

nyserda Energy. Innovation. Solutions.

Global Alliance for Clean Cookstoves

Hearth, Patio & Barbecue Association - pending

Supporters

BTEC Biomass Thermal Energy Council

Osprey Foundation

Sunstein

Goals

The main goal of the Challenge is to focus creativity and resources on designing next generation wood stoves. The Challenge will engage an international community of combustion engineers, engineering students, inventors and stove manufacturers in a common process that may point to commercially attractive next generation stove production.

Solar, wind and geothermal renewable energy equipment are rapidly advancing, becoming more efficient, cheaper and more versatile. If wood stoves are to continue serving millions of Americans, they too have to become cleaner, more efficient, more versatile - and harder to misuse.

Scoring

A panel of expert judges will award one to ten points for a maximum of 50 points in the following categories. The design that achieves the highest number of points wins.

1. Innovation (10 points)
2. Market appeal and ease of use (10 points)
3. Affordability (10 points)
4. Emissions (10 points)
5. Efficiency (10 points)

The Challenge is designed to maximize participation and minimize cost by not requiring third party emission and efficiency testing in advance of the Decathlon. Experts from an EPA accredited wood stove test lab will conduct extensive on-site emission and efficiency testing using mixed hardwood at the Decathlon. An expert panel of judges will also inspect designs, components and construction to assess durability and the potential of innovative technological features. Features could include heat transfer systems, integration of low cost sensor technology, digital displays of combustion information, combustion or venting fans or other novel features that consumers may value.

Judges will also assess how these new designs can improve real world use, including mitigating the emission and efficiency problems that arise when operators use cord wood that is not fully seasoned or fail to give their stove enough air. Stoves could include multiple innovative features or just one, integrate electronics requiring electricity, heat water or be used in combination with other renewable technologies.

While the inclusion of sensors, electronics, thermocouples, digital displays, etc. may be indicators of next generation stoves, judges will also be looking for simple, durable and affordable designs that also achieve significant emissions reductions and efficiency gains. Existing EPA certified stoves may be entered into the competition. The Organizers may also include EPA certified stoves and older uncertified stoves for sake of comparison.

Submissions & Deadlines

Applications must be submitted by midnight, Eastern Standard Time, Thursday, December 20, 2012.

The initial application consists of designs, photos, a narration and supporting materials. A finished stove or prototype is encouraged, but not required.

The judges will select finalists by Thursday, January 31, 2013, and invite them to bring their stove or stove prototype to the Decathlon for final judging and public display in November 2013.

In selecting up to 20 finalists, judges will consider technical innovation and design, along with evidence of each Team's ability to complete the stove or prototype and bring it to the Decathlon in Washington DC. Other factors such as geographic and technological diversity will be considered for the benefit of the program.

All entries submitted in connection with the contest shall remain the legal property of contestants. The Organizers can publish some images and materials about the stove finalists in consultation with each team. A law firm specializing in intellectual property rights is working with the Organizers to ensure the IP rights of the teams are protected. See Challenge Rules for more details.

The Problem

Smoke from wood stoves is a health risk. In many areas, particulates from wood smoke are the number one contributor to wintertime air pollution. Wood smoke can cause or aggravate health conditions in children and adults. Wood burning stoves need to be consistently cleaner and more efficient to be more fully embraced by the public and the renewable energy community.

Up to 70% of stoves in operation in the U.S. today were manufactured before 1990 and thus were not certified by the EPA to meet minimum emissions thresholds. Today's EPA certified stoves are relatively clean burning and have an excellent capacity to reduce fossil heating fuels, but there is little data about their real world emission profile over their full burn cycle. Their emissions in the real world are often far worse than in laboratory certification tests, caused by poor burn practices by the operator.

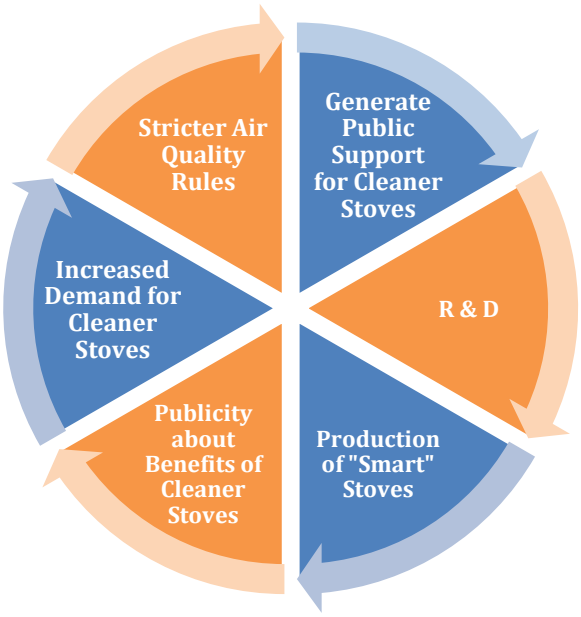
Wood stoves can be especially problematic in densely populated areas, where smoke can be a greater nuisance and health hazard for neighbors.

The Opportunity

One third of our national energy need is for heat. To achieve energy security, reduce the use of fossil fuels and provide affordable renewable energy, heating with wood has enormous potential. If wood heat can become much cleaner and more efficient, it can help millions of families in North America, Europe and elsewhere drastically reduce or eliminate use of fossil fuels for heating.

Wood heat can be an excellent complement to solar electricity and other renewable heating technologies like geothermal and solar thermal. Wood heating is particularly well suited to low and middle-income families because the technology and the fuel are very affordable.

The Challenge Value Proposition



This contest focuses on cord wood stoves because the great majority of consumers who use wood stoves get their own fuel and/or like the ambience. The wood pellet stove was a huge technology leap and many technological advances are being made in wood and

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pellet boilers and furnaces in Europe, the US and elsewhere. This contest is designed to foster similar technology advances for the cord wood stoves.

The wood stove is already the renewable energy workhorse of America, producing 80% of residential renewable energy, while solar produces about 15% and geothermal 5%, according to the DOE. About 2.1% of the country uses wood as a primary heating fuel and of that 2.1% probably less than 0.5% use pellets.

An EPA certified wood stove that costs $2,000 can avoid the same amount of fossil fuel as a $20,000 set of solar panels. However, the great majority of wood heat stoves in America, Europe, Eastern Europe, South America and Australia often produce too much smoke and can contribute to air quality problems.

Key Dates in Wood Stove History

- 220-Cast-iron stoves used in China
- 1500s-Masonry stoves used in Russia
- 1557-Wood-conserving stoves in Austria
- 1600s-Baffles used in stoves by Kessler
- 1744-Ben Franklin introduces improved stove
- 1767–Swedish innovators create tile stove
- 1784-Outside air tube put on masonry stoves
- 1836-Air-tight stove invented in DC
- 1859-Soapstone stove patented in NH
- 1973-Pellet stove invented in the U.S.
- 1978-Catalytic stoves invented
- 1988-EPA regulations improve stove designs
- 1995-Wash. State requires cleaner stoves
- 2011-OR has old stoves removed on sale of home

Wood Stove Competitions

The Wood Stove Design Challenge is not the first competition designed to spark creativity and technological innovation in stove design.

During a period of extreme cold in Europe, Frederick the Great held a contest for the masonry oven that could provide the most heat for the least amount of wood. Johann Paul Baumer won in 1784 with a design that used outside air for combustion and featured controllable air intake and a flue gas flap.

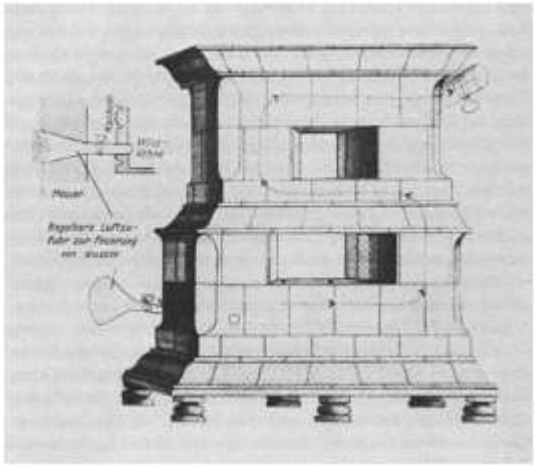

Diagram of Winning Stove in 1784 Design Competition

A fuel crisis prompted the American Philosophical Society to offer a $60 prize in 1796 for the "best construction or improvement of stoves." The Franklin Institute offered a contest for the best cook stove design of the year in 1826. Mine owners chipped in an additional $20 to the Institute's $100 prize.

In 2010, the X PRIZE Foundation teamed up with the Indian's Ministry of New and Renewable Energy and the Indian Institute of Technology Delhi to announce a major prize for clean-burning, efficient cook stoves.

Get Involved!

Manufacturers, universities and others can register their intent to participate in the contest now. Go to: http://forgreenheat.org/stovedesign.html

If you are interested in becoming an institutional Partner or Supporter of the Challenge or sponsoring one of the teams with any form of support, please call us at 301-841-7755.

Lastly, we hope you can attend the Wood Stove Decathlon in 2013. Various activities will be organized around the Decathlon. We look forward to seeing you there!

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