



Adam Retort

Project Leader

Jehan Delacroix

Organisation

Green Invest

Designed By

Chris Adam

Project Location

Senegal

Project Website

biocoal.org/3.html

Name of nominating Icsid Member organisation

Verband Deutscher Industrie Designer e.V.

Please describe the project and the challenge it intended to address

Clean charcoal production is a big challenge for mankind. 1/3 of the world population (2 billion people) cook with biomass and no environmentally friendly small to medium scale production technology was available up till now to produce charcoal. The newly designed "adam-retort" kiln fills the gap for a technology that produces charcoal in a more environmentally friendly manner. This product has the following advantages:

- The construction of the unit can be completed in any part of the world, no electricity is needed for the construction or operation of the retort kiln.
- The design of the retort kiln is done in such a way that simple metal parts can be used for its construction, in addition to bricks and cement.
- It has a clear and simple operation's technique whose design was done in a way to reduce the technical elements to their most simple.
- The technology is a low-cost installation and investment costs are around 1200€ per unit in countries with low labour costs.
- The retort can be locally built and can also be local repaired and maintained.
- The retort has a spectacular efficiency of about 35% and reduces demand for wood or other biomass to produce charcoal by up to half. Traditional carbonisation has an efficiency of about 15%.

Harmful emissions (smoke and wood gas) are reduced by up to 75% when using this retort kiln.

What are the objectives of the project and are the outcomes same as those originally intended?

The objectives are to reduce harmful emissions during charcoal production and to save trees. The retort is reducing emissions by up to approximately 75% as most of the pollutants are burnt off during production, including the harmful methane gas. About 50 million tons of charcoal are produced worldwide, primarily with indigenous traditional technology (mainly earth mount kilns) and more than 250 million tons of wood (dry mass) are needed for this. As the "adam-retort" stands out providing double that efficiency, half of these tree could be saved assuming a worldwide application!

On the project side, one retort can produce about 333kg of charcoal per batch which means about 666kg of charcoal per week (2 batches). A batch means an

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operating cycle of the retort kiln: loading biomass, carbonizing it, the cooling and off loading of charcoal.

How was the community engaged through the life cycle of the project?

The project in Senegal is already a good example of how to spread this technology and similar projects using these "adam-retorts" will be starting in Mali, South Africa, Cambodia and Costa Rica.

The "society of interest" was actively involved by participating in trainings on how to build such a retort kiln and how to operate it. These trainings were conducted either by video demonstration and an elaborate construction manual or with a technician who arrived from Kenya.

Include the society of interest and describe any other relevant stakeholders and partners that were involved or consulted.

The society of interest is small entrepreneurs, farmers, technicians, owners of agricultural plantations, forest projects, owners of saw mills, wood workshops, refugee camps, etc. The retort kiln can create jobs with each project. Apart from the successful project Green Invest in Senegal, the retort works with a project in Madagascar managed by EcoConsult/giz, in Thailand with a private perso, with Norges Geotekniske Institutt in Nepal and Indonesia, with Six Senses Resort & Spas in the Maledives, and with Lisa Brinkley, Vehotec in Australia and with Paramjit Gill in Cambodia.

In Senegal the consumption of charcoal is about 58kg/person/year (FAO). The Green Invest project with more environmentally friendly charcoal production of about 250 tons (1ton *50 weeks * 5 retort kilns) per year gives a good example of how to reduce green house gases.

Recently also the increase in demand of larger amounts of biochar (terra preta) for soil improvement suggests that such a retort would have multiple advantages.

How has this project benefited the community of interest?

This "adam-retort" can reduce wood consumption by up to half, compared to traditional wood carbonisation. At the projects in Senegal 5 retorts are already in operation. The retorts are attached to a small afforestation project at Cape Skirring which means the biomass for the project is produced sustainably. Another retort was built at Oasis Boucotte in Senegal. The society of interest benefits because the retort kiln is a tool for making charcoal in a more economic and environmentally friendly way and enables sustainable charcoal production.

What metrics are used to track the impact of the project?

The University of Zvolen in Slovakia, Faculty of Ecology and Environmental Sciences has done technical research on the retort's emission. Results confirm that the retort contributes to reducing emissions of greenhouse gases.

The findings from Zvolen confirm a 50% reduction of biomass needed for charcoal production and an even more important reduction, of greenhouse gases of about 75%.

Independent scientists also confirm the positive effects of the "adam retort" (<http://www.gtz.de/de/dokumente/gtz2008-en-charcoal-in-africa.pdf>).

The adam retort also meets the requirements to be a Clean Development Mechanisms (CDM) for implementation of the Kyoto protocols. (Ref.: www.pronature.org, CO2 Logic and http://www.agora.qc.ca/francophonie.nsf/Dossiers/Charbon_vert)

How will winning the Prize raise awareness of the project and further its impact?

The retort has gotten known and gained popularity through its homepage (www.biocoal.org) and its Youtube videos. An award will increase the confidence of potential clients and encourage them to invest in a more environmentally friendly technology. An award will also make this technology more known worldwide, as media might report about it. An Award for the "adam-retort" would have a positive effect by helping reduce the Greenhouse Effect when more people use it!

Briefly describe the challenges the project currently faces

At the moment an individual person who invests in such a retort technology is not eager to share the knowledge of such a technology with their neighbour as his neighbour may set up the same technology and might be in completion with him. The adam retort needs some government or independent project to promote this technology, irrespective of aspects of competition and jealousy.

A second challenge is developing this retort technology for further products which improve charcoal production such as mobile retorts and prefabricated retorts, which could be bought as an off the shelf product.

Please include any other relevant information you would like to share

e-mails from satisfied users of the "adam-retort":

Gill from Cambodia:The system we have in Cambodia works to our satisfaction and has been in operation daily since the commencement and all the charcoal that is produced is crushed and ploughed back into the soil as black gold...

We now built an additional 3 units which are bigger in size than your design and each unit can hold 2 times as much wood.

(gilltang@)

Mr.Anil, from Nepal: With your kind support and invaluable suggestion we were able to operate the retort successfully.

Right now everyone using the retort is delighted because of its quality product in quantity with less smoke. I must thank you for the moment that brings such joy in the community.

In the mean time, we are planning to construct another model in the southern belt of Nepal.

(aneel_maharjan@)

Michael Low from USA: We are very happy with the retort. Thank you, (hart@)

Scott Scholefield, M.Sc., R.P.F. from Canada: I have thoroughly tested the retort and feel comfortable with its construction and use.....

(scott.scholefield@)

Charlotte from Whispering Winds Bamboo Coop, Haiti: You are doing such great work.

(wwb@)

Gordon Jackson, Waste to Wealth Manager, Maldives: Thanks for a great design!

And i look forward to building a retort in this area (India) that needs this amazing system.

Mark (mc-fushi@)



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