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SELECTIVE ANSWERS AS PART OF APPLICATION (most answers limited to 1500 words)

1. Describe your innovation. *
What kind of technology/product/service are you improving or developing? What is novel about it? Why is your solution better than others? What is your competitive advantage?

CONTEXT: PROBLEM WE ARE SOLVING

Today, waste management in developing countries is challenging, even for large cities, as populations increase, economies grow, and "disposable" consumerism marches forward. For the most part, the largest cities are aggressively tackling their waste situation by incorporating expensive modern waste collection, recycling and disposal infrastructures, but even they have waste overflow problems.

For smaller cities and islands it's a different story. Simply, the governments in these local areas cannot afford modern expensive waste management systems and modern landfills, nor do the local areas have the waste volume to justify them.

The result is a startling 40% of all municipal waste in the world is openly burned or sent to unsanitary garbage dumps and **62% of the world (3-4 billion people) has no formal waste management systems.**

As a way of life, villagers and residents of these small cities and island nations have always burned "valueless" trash out in the open, dumped it somewhere illegally, or brought it to the nearby unsanitary garbage dump.

The World Bank expects global MSW to double from 1.1B tons annually in 2012 to over 2B tons by 2025 due to population growth and our consumption society.

WHAT CURRENTLY HAPPENS IN SMALL CITIES AND ISLAND NATIONS: IT'S NOT ABOUT WASTE COLLECTION. IT'S A WASTE DISPOSAL PROBLEM – WASTE DOESN'T DISAPPEAR

Of course, a large number of local governments in these small cities do care about creating more sanitary living conditions for their residents. However, any efforts they do make to encourage waste collection and recycling are often met with indifference, set behaviors, and ineffectiveness, although there are occasional real waste collection success stories.

Our Premise as to why follows: In the developed world, waste disappears. People put out the garbage and it disappears. We may not know where it goes, nor how much is recycled or not. We just know it's not visible in our streets or piled high on the side of roads. We don't smell burning waste nor see the resulting black smoke. For us, there is an established socio-economic contract, we are taxed, waste is collected, it's out of sight, out of mind, and it disappears.

For the developing world, it's different: Waste doesn't disappear. It's in the streets, roadsides, rivers, lakes. It is usually visible in a garbage dump or via smoke/fumes from open burning, i.e. it's everywhere. There is a profound lack of cost-efficient sanitary waste disposal options. There is little disposable income available for individuals to pay for large scale waste systems. As already mentioned, modern landfills are few and far between, and very expensive to maintain and operate.

OUR SOLUTION: WE WILL MAKE THE WASTE "SANITARILY DISAPPEAR" FOR SMALL CITIES AND ISLAND NATIONS WHILE INCREASING SUSTAINABILITY OPERATIONS SUCH AS RECYLING

First, we will describe our small-scale and mobile combustor, and why it's technically superior to current mobile incinerators.

Second, we will showcase how we will use the combustor to anchor our small-scale waste processing, recycling and disposal facilities in small cities within developing countries that we named "a Starter MRF" (or "SMRF).

Third, we will show, through the competitive advantages of a SMRF, its potential for a country to create a decentralized large-scale waste management system, yet with all SMRFs operating locally and independently, to stop both the use of unsanitary garbage dumps and the open burning of waste.

[1] OUR SMALL-SCALE AND MOBILE COMBUSTOR: NOT YOUR GRANDMOTHER'S COMBUSTOR!

Without the above context, one might be tempted to view our small-scale and mobile combustor in the following way: "Ho hum. Been there, done that. There are lots of mobile incinerators in the market. Nothing too exciting. In fact, one could add: these incinerators are diesel-hogs, have limited throughput, produce lots of ash and generally aren't that environmentally clean."

Welcome to the future: Mobile, Agile, and Clean

Our mobile combustor is a revolutionary technology for residual waste disposal. This ultra-high temperature unit (small footprint of 8 by 26 feet) is configured to destroy combustible materials - that can burn with lower than 30-35% moisture content, with an optional power generation capability. About the size of semi- trailer, it can fit into an open top sea-land container for ocean transport with no disassembly, hitched, via mounted wheel base, to a semi-trailer truck, or be mounted on a rail car.

One unit can "cleanly" dispose up to 7000 tons per year of a wide variety of solid waste streams (intake of 1000-2000 lbs/hour or 450-900 Kg/hour). Installation of appropriate pollution abatement equipment, as required, will ensure that emissions will be clean "hot exhaust air" and, based on a previous prototype, we believe it'll meet U.S. EPA standards. By adding a separate off-the-shelf power generator, the unit can operate 24/7 and produce about net 75 kW/h of grid or off-grid energy.

Why Our Small-Scale and Mobile Combustor Is Novel!

The vast majority of competing small-scale and mobile combustors use grate-firing technology. The benefit that grate combustors offer is that they are easily scalable, which is why they are widespread. They, however, have many liabilities, including the need to almost continuously use external diesel fuel to keep furnace temperatures high enough (picture coal being fed into the furnace of an early 1900's coal-powered train or boat – same principal here). These mobile incinerators also create a large amount of ash, which reduces their performance, too.

Our Combustor has a number of novel technology achievements, features and benefits when compared to grate combustors (further explained in Question #4): it is self-fueling, has significantly lower ash and emissions outputs, and much lower operating expenses.

[2] OUR COMBUSTOR ANCHORS AND ENABLES OUR SMRF TO CLEANLY PROCESS, RECYCLE AND DISPOSE OF WASTE (MAKE IT DISAPPEAR)

A Starter Material Recovery Facility ("SMRF") will be a centralized waste processing facility (i.e. system) that local waste operators and local governments can use to process, we project, up to 25,000 tons/year of waste. Most importantly, Almost 100% of the collected waste enters the SMRF and never leaves. For each ton of waste we process through the SMRF, it's one less ton of waste that is not sent into the local unsanitary dump or being burned by a local resident or business within this local community collection area.

Here's how a SMRF makes the waste disappear:

(1) Daily, waste collectors scour the same collection area, including streets and side areas, to pick up waste – to create a "waste-free" collection area 365 days per year. This MSW is collected and brought to our facility where up to 70-80% is either recycled or composted, using proven technology and labor intensive solutions and methodologies. First, organics are separated out, mostly for composting and turned into fertilizer that can be sold. Then, valuable recyclables, such as metals and plastics are further sorted, bundled and sold.

(2) The leftover inorganic "valueless residual waste" (up to 7,000 tons/year) is chopped up and sent into our self-fueling combustor where it is destroyed on-site within the SMRF – with exhaust heat as the output.

[3] SMRFs OPERATE INDEPENDENTLY, YET CAN BE REPLICATED AND SCALED TO CREATE EVEN GREATER SOCIETAL BENEFITS - THIS IS OUR COMPETITIVE ADVANTAGE

[a] Our small-scale and mobile combustor is the sole reason that a SMRF can effectively make waste disappear – it destroys the residual waste that usually winds up in unsanitary dumps or is openly burned. It acts as a landfill substitute.

[b] Until a SMRF, 100% of waste would wind up in a dump or burned. Now, 70-80% is captured for composting and recycling, and the rest is sent to the combustor. Now, nearly 100% of the waste becomes "out of sight and out of mind" for local people and businesses.

[c] It is a stand-alone operation within a defined (yet small) localized collections area. Each SMRF can process up to 25,000 tons per year.

[d] The waste operator and local government are both held accountable.

[e] It incorporates understood, proven composting/recycling MRF methodologies that capture about 70- 80% of the processed waste

f) It enables low cost “just in time” investment by local municipality compared to big waste processing centers and modern landfills that require, for breakeven, far more waste than what is locally generated.

g) Collected waste is treated “just in time” which reduces risk of fire, smell, and other environmental hazards

h) Once proven in one location, authorities can set up SMRFs throughout a local region to effectively collect, recycle and process waste as a region grows

i) Operating a SMRF and corresponding waste collection efforts require many people – it becomes a major job creator.

j) SMRFs can grow and process waste as fast as waste is collected, and can also be expanded to collect more than 25,000 tons per year by adding an extra combustor to handle the additional residual waste.

AND MOST IMPORTANT:

k) SMRFs can be replicated and scaled into a distributed, de-centralized network as each SMRF operates independently yet all of them can be situated to fully cover all populated small cities and surrounding communities.