

SCALING/DERISKING THE MINIGRID – WASTE AS AN UNLIKELY ALLY

IMAGINE A NUMBER OF MINIGRIDS INSTALLED IN AN AFRICAN SMALL CITY OF 100,000: • ENERGY-ACCESS ACHIEVED! • ALL HEALTHCARE FACILITIES AND CLINICS HAVE RELIABLE POWER. • SMALL CITY IS “WASTE-FREE” DUE TO INSTALL OF TWO FRONTLINE WASTE “SMRF” SYSTEMS FOR WASTE COLLECTION, RECYCLING AND DISPOSAL. • 25,000 TONS/YEAR ENTER EACH SMRF AND 0% RETURNED TO LOCAL AREA! • BETTER QUALITY AIR/SAFER WATER; • WASTE-FREE STREETS AND ROADSIDES; • HEALTHIER RESIDENTS

A YEAR LATER CITY POPULATION GROWS: • ADDED CONSUMPTION HANDLED EASILY BY WASTE OPERATOR AND SMRFs, AND HOSPITALS • INCREASED REAL ESTATE VALUES; • HIGHER PRODUCTIVITY!

Current Situation – Low Capital Investment in Minigrids:

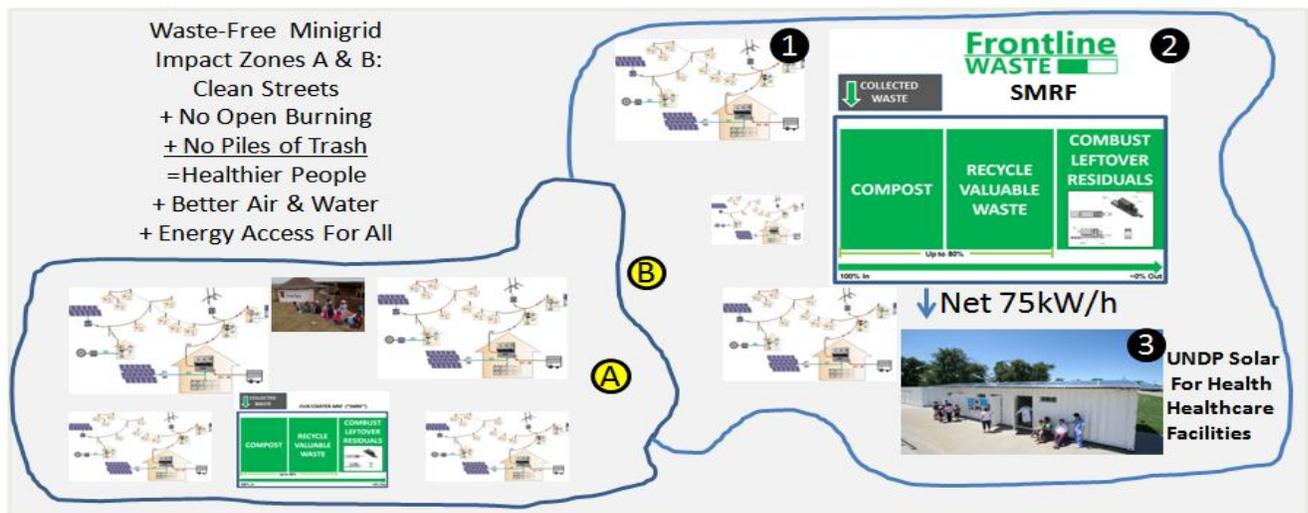
SDG #7 has the admirable goal to “ensure access to affordable, reliable, sustainable and modern energy for all” by 2030, which will positively impact over 1 Billion people, the majority of whom are in Africa and Asia. It is estimated that \$800+ Billion will be needed, which will include decentralized off-grid and minigrid systems (powered by solar & wind), solar home systems, as well as traditional utility grid distribution systems.

- Per Rocky Mountain Institute’s January 2017 “Energy Within Reach” report about minigrids in sub-Saharan Africa, minigrids have the potential to play a more important and vital role in Africa’s economic development as the least cost energy access option, especially if a minigrid’s business model offers more end-user services at lower costs. Currently, they are underperforming – less than 1% market penetration.

SDG #7 won’t be met if the power industry, NGOs, financial institutions, and governments continue “as is.”

THE SOLUTION

THE SMRF/HEALTHCARE/MINIGRID WASTE-FREE IMPACT ZONES [WFIZ] FOR SMALL CITIES UNDER 200,000



Small-Cities <200K populations: Multiple decentralized minigrids & SMRFs. 25,000 tons of waste/year/SMRF
-Meeting Increased Demand Generation, Consumption and Additional Waste Treatment-

Premises:

- Economic growth cannot occur when a small city cannot handle its waste (currently open burning and unsanitary dump), let alone when all the buildings and houses are connected to power, and people start to consume and create even more waste. A small city has to address its waste issues to sustainably grow.
- Economic growth is also difficult to sustain when a small city cannot adequately provide reliable electricity to its healthcare facilities and clinics. A small city will first make sure its healthcare facilities and clinics have reliable 24/7/365 power. Then, it can expand its energy access via minigrids and off-grid solutions.

THEREFORE: A small city in Africa to experience both exponential economic and population growth must be able to find a way to cost-effectively get rid of its waste as 100% energy access occurs, and, at the same time, find a way to completely power its healthcare facilities and clinics. In sum, a city, a region, a country without waste problems, with excellent healthcare, reliable power and better air/water will ATTRACT GROWTH!

Feature	Description/Importance
Minigrid ①	A small city's population is split into minigrids (500+ households each for scale) based on population density and where people are located. Minigrids should be added, one at a time, based on appropriate anchor loads, population density, and set up with room to grow.
SMRF ②	A SMRF is a small-scale waste processing, recycling and disposal facility waste (up to 25,000 tons/year) within a defined waste collection area. 100% waste enters a SMRF and 0% returns from it!
Waste-Free Impact Zone (WFIZ) ① ②	By definition, the WFIZ is the physical waste collection boundary area for each SMRF. It will contain a number of minigrids and a growing population (30K to 70k depending on waste per capita of population) that consumes power/creates waste. The WFIZ's local waste operator is held accountable for daily/weekly waste collection, clean streets, no open burning or waste piles. There could be multiple WFIZ within a city, especially for cities greater than 100,000.
Healthcare Facilities within a WFIZ ③	When combined with UNDP's Solar For Health initiative, every healthcare facility within a WFIZ would receive energy access technology. If possible and economically feasible, the main hospital could incorporate the power from a SMRF's WTE power generator, i.e. net 75kW/h.
Community & Household Incentives/Rewards within a WFIZ	To ensure waste collection compliance, individual households could receive points to buy energy-efficient household appliances at discounts in return for waste collected, especially for certain recyclable valuable waste. Additionally, every household may receive "free or highly discounted" service(s) if entire community meets waste collection milestones/metrics.

WHY THIS IS THE BETTER WAY!

- Small cities, with SMRFs and minigrids within WFIZ's, can now handle new businesses, people moving there for new jobs, higher consumption and wealth. In sum: Demand generation is met with increased ability of the local government to handle more consumption via waste collection, recycling and disposal. No market distortions are expected to occur, either.

Positive Ripple effect: energy access & waste-free through WFIZ's → healthier people → consume more → more energy used → more jobs, greater economic development and increased productivity = The small city that smartly grows without the healthcare and waste problems that plague similar small cities.

- As minigrids and SMRF are both decentralized and standalone systems, the success or failure of one or more WFIZ in a city is localized, with 100% accountability to funders and the community. If waste isn't picked up or power not generated as promised, the community's incentive rewards will be in jeopardy.
- Waste becomes an asset ("trash to treasury") in the electrification of these small cities that do not have formal waste management. Waste spawns new business creation, and innovators.
- Over time, local health should improve in each WFIZ. As a result, healthcare facilities can increase scope of programs as hospitals can reallocate supplies and personnel due to better air and water within the WFIZ. If tracked and recorded correctly, these improved healthcare metrics and cost-savings become an important part of the overall WFIZ ROI impact.
- The upside for minigrid providers is huge once they do get a toehold into an area. Eventually, they may fund the SMRFs once our Minigrid/Waste-Free solution is proven. With growing customer bases, they expect to reap long-term rewards as these small cities and rural areas electrify, grow in population, and consume more and more goods and services. In fact, these energy providers will own the customer and could be the entry point and payment platform for all types of future household "pay as you go" additional services related to banking, insurance, appliances, and phone.