AMESS

Project Proposal

11.20.2022

The nuclear option

Problems and Solutions

Lack of relevant education in developing countries

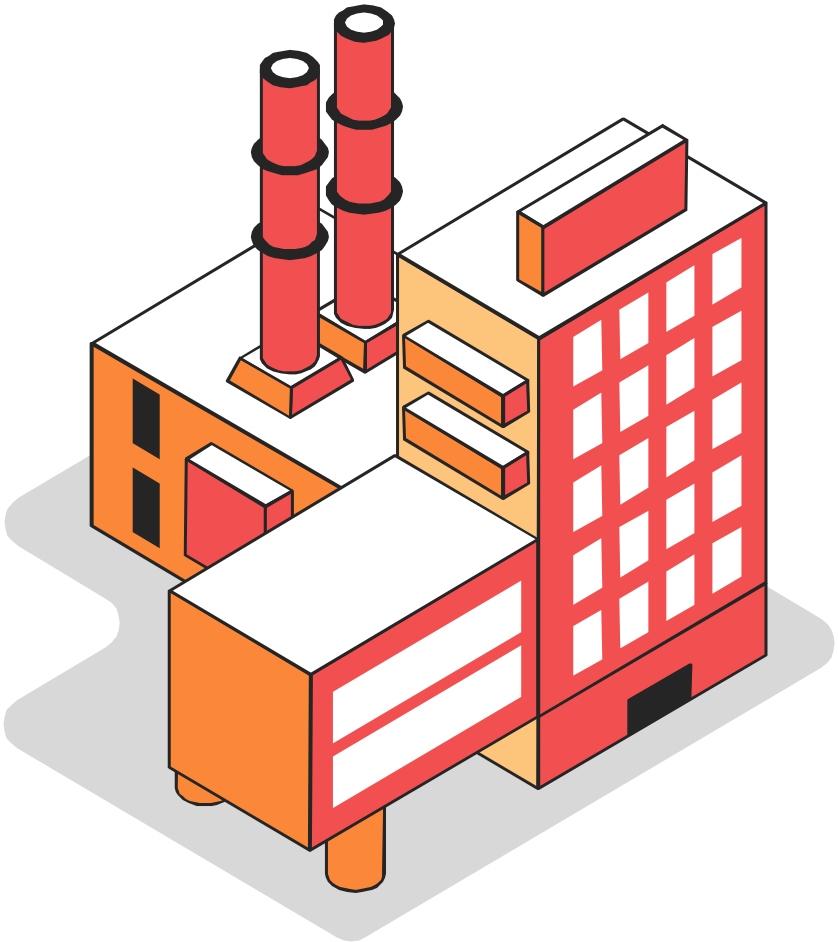
Online education in high demand industries

Inequality between developing countries and the rest of the world due to lower GDP

Provide safe jobs in a thriving economy

Little sustainable, clean, and reliable energy in African countries

Generate clean, safe, and reliable energy



The Solution

Africa is one of the biggest exporters of raw ores and metals, but they don't process any of the materials. Leads to:

- Bleeding a lot of potential profit
- Poor working conditions
- No drive for companies to provide good quality education

Solution: Refit mining plants with an all-in-one, self-powered solution that uses automation to process raw materials into higher ROI products; plant becomes the economic and power hub of underdeveloped communities

AMESS

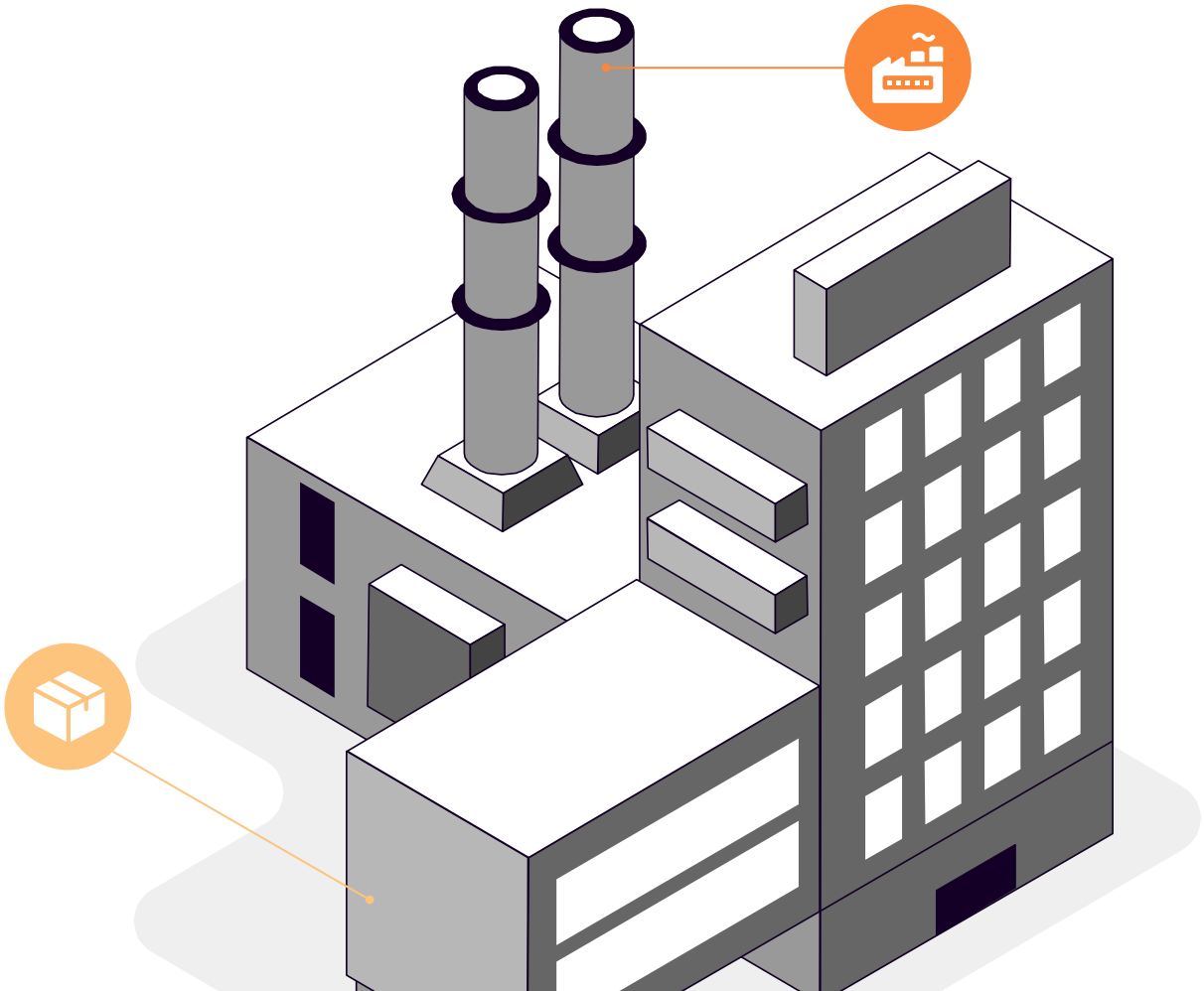
Automated

Manufacturing and

Energy

Supply

System



What AMESS is

AMESS is a self sustaining solution that retrofits mines to turn them from just raw material production to raw material production and processing. It includes:

- Semi-Automated material processing
- A solar-powered nuclear power plant
- Power regulation system via RTBESS

“AMESS is basically a manufacturing plant with a power plant inside of it”

How AMESS works

1. A pre-existing mine in a low income area gets selected by a ML algorithm to find remote communities near known mining areas

2. AMESS gets applied to said pre-existing raw-material production mine, and turns it into a production and manufacturing plant

3. AMESS and the local community gets powered by the solar-powered nuclear power plant

4. AMESS is funded by outside investors that eventually recoup their investment by selling plant-produced items

How AMESS helps

Lack of education in underdeveloped African countries	Online education in high demand industries	Education on clean energy and how automation systems work
Inequality between 3rd world countries and the rest of the world due to lower GDP	Provide safe jobs in a thriving economy	High paying jobs in STEM inside a safe, modern environment
No sustainable, clean, and reliable energy in African countries	Generate clean, safe, and reliable energy	Use solar, nuclear, and RTBESS to reliably generate renewable energy

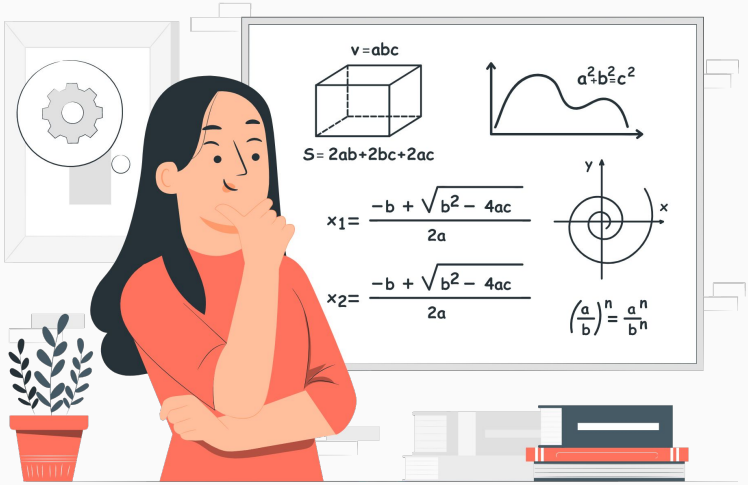
How AMESS helps: Education on clean energy and how automation systems work

In order to have safe, efficient operation of the plant, there needs to be education on clean energy and how automation systems work

Due to AMESS there is now a positive financial incentive to provide quality education on important topics

These topics transfer to other industries as well

How AMESS helps: High paying jobs in STEM inside a safe, modern environment



The AMESS facility requires trained workers to work in its safe, state of the art plant

These jobs will be higher paying and safer than most jobs in these developing communities, and closer to North American standards

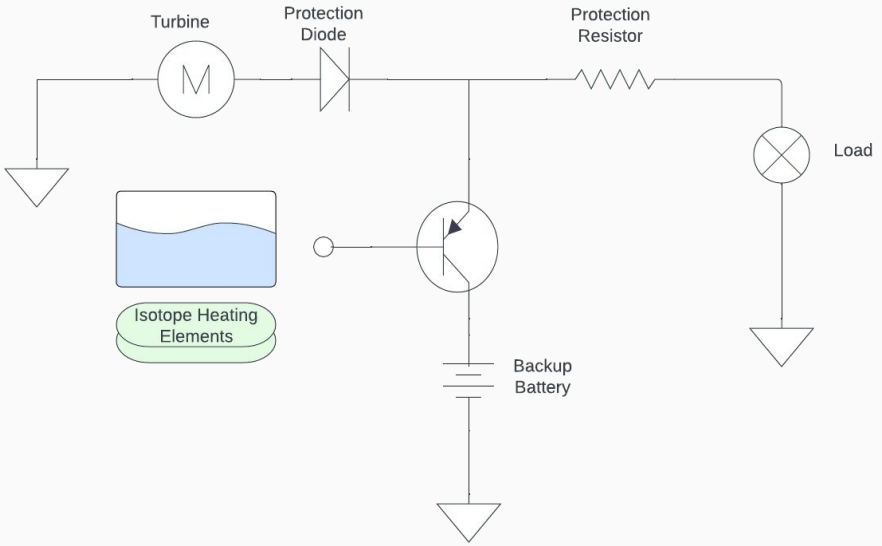
How AMESS helps: Use solar, nuclear, and RTBESS to reliably generate renewable energy

Demo on this later!

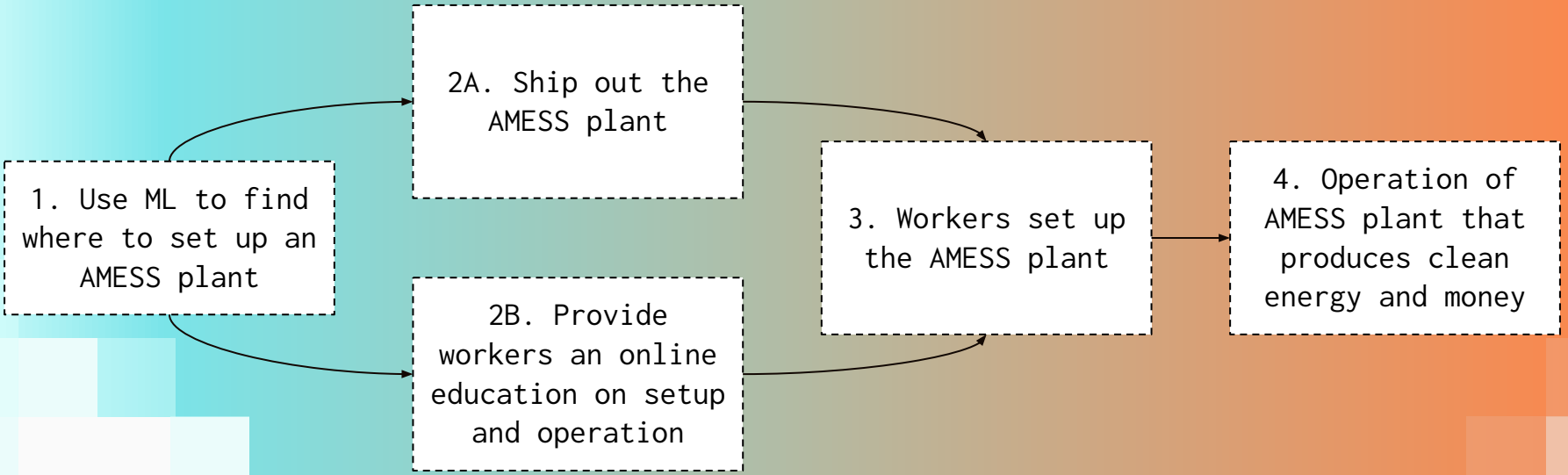
Solar Power: Powers the control and safety systems of the nuclear power plant

Nuclear Power: Generates the energy used for the manufacturing plant and surrounding community

RTBESS: Backup system to guarantee stream stream of power



The Plan


1. Use ML to find where to set up an AMESS plant
2A. Ship out the AMESS plant
2B. Provide workers an online education on setup and operation
3. Workers set up the AMESS plant
4. Operation of AMESS plant that produces clean energy and money

Step 1: Use ML to find where to set up an AMESS plant

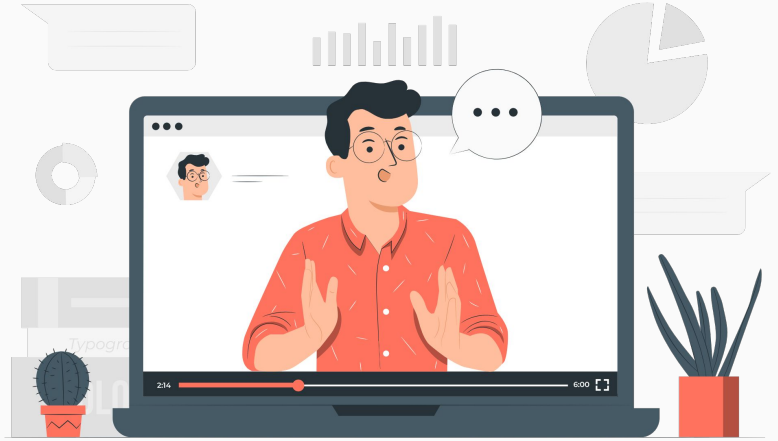
Use a premade machine learning model combined with our own model to predict best locations for AMESS plants

Use unsupervised classification model with key features to develop model

Step 2A: Ship out the AMESS plant and Step 2B: Provide workers an online education on setup and operation

These steps happen in parallel to speed up the process

While the materials and parts to build the plant are being shipped out, we will provide already hired workers with an education how to build the plant, overseen by the company, as well as training on how to run the plant.



Step 3: Workers set up the AMESS plant

While the operation workers are still getting trained, newly hired construction workers will start the construction of the plant.

Step 4. Operation of AMESS plant that produces clean energy and money

The plant will be running, generating clean energy for the entire community, as well as generating revenue for the workers at the factory

Complexity and Technologies

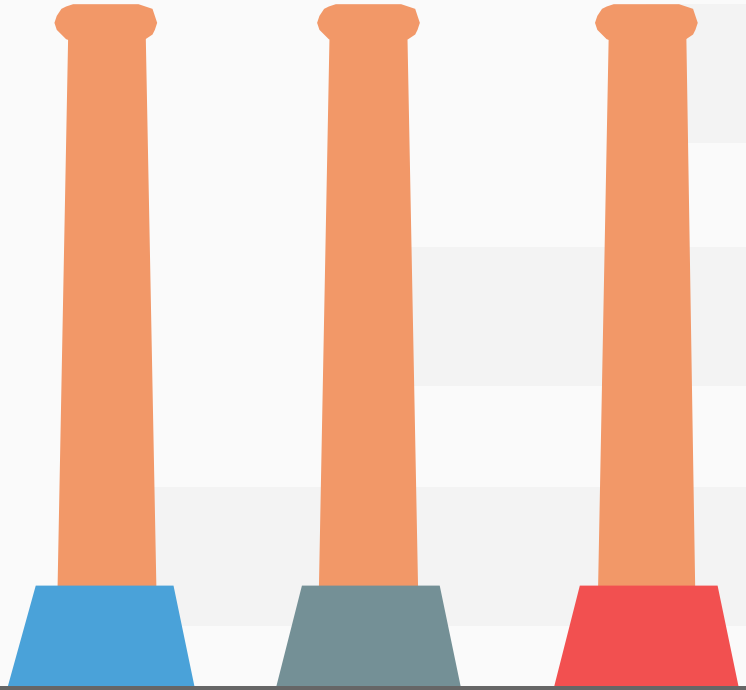
Complexity:

- The initial system design and course building will be complex as it is all engineering design work
- Initial setup of the plant will be the next more complex task
- Operation of the plant will be the simplest of the tasks, and will mainly be focused on maintenance and problem solving as the grunt work is automated away

Technologies

- The power and manufacturing plants' main systems will be based on cloud servers to reduce on-site power consumption, with emergency backups on site for safety
- Using renewable energy technologies to generate energy
- Technologies used to process raw material into a higher profit form
- Power management technologies to ensure constant, safe, and reliable energy transmission
- Fundamental engineering and design principles

Ease Of Use



Workers Are Given Training

01

All workers, both construction and operations, are given comprehensive training to ensure they have the knowledge required to safely

Key Operation Systems are Automated

02

All the very important systems, namely power generation and material processing, happens automatically through failsafe software systems

Energy Regulation happens Automatically

03

All energy regulation happens through ultrasafe electrical systems to guarantee constant power supply to the surrounding community

Demonstration

Demonstrating the power systems

- A big design flaw that we had is that if the solar panel gets blocked, the nuclear plant has to go down, or demand spikes the power becomes unreliable

- To combat this problem, we developed and prototyped RTBESS: Our **Really Tiny Battery Energy Storage System**

- It charges up a battery when demand is low and/or supply is high, and discharges a battery when demand is high and/or supply is low to compensate and provide reliable energy