

TECHNICAL ASSISTANCE REQUEST

For the Ready round, I need to start with building a small manual prototype of the chemical and mechanical processes that are necessary to transform the solar waste. That will require a smaller toolset than the real thing. And small quantities of **chemicals**.

At full scale, the glass and aluminum need to be heated and the glass panes pulled apart with suction. The chemicals then need to be scraped from the panels and/or then dissolved off the glass in an **acid bath**.

One more rinse and the glass is ready to reuse. The aluminum can be pulverized into a dust that can be reused. These are relatively clean processes and they recycle the bulk of each panel. There are some companies that simply crush everything into dust or crystals but that forces them to use a different process for recovery of our CHCs. Except of course that they don't recovery anything. That waste goes into the landfills or gets shipped to 3rd World countries. I'll need an arrangement with a **shipping company** to return all the glass to be reused. Same for the aluminum. If I am smart, I can arrange for our own truck to **deliver** the glass and pick up more for the **return trip** along with whatever chemicals we need.

Already you can see we are going to need approved equipment and processes to capture the acid containing the CHCs and to extract these chemicals from the acid. These processes will use combinations of **heat, light, electricity and more chemicals**. This is where I will need a chemist and chemical engineer and probably a **mechanical engineer** to create the automated processes for extracting CHCs. I am already working with Rockwell on another project and they specialize in automation using magnetic LSMs instead of conveyer belts and gears. No motor, no moving parts, no friction. Just magnets.

I will need a source for the **chemicals** used in the reprocessing. And I will need the partners who want to **buy the recovered chemicals**. In an ideal scenario, no chemicals will end up in the ground or water nor anywhere but in a new process at some other manufacturing process.

Remember that it will take about 1000 panels to get a volume worthy of recycling. That's why we will need to collect **payment in advance** at the time of sale and to allow for a **trade-in value** or a financial reward for returning each panel. I don't know the exact process yet and I don't know the **exact costs** yet, but that has to be one objective of the Ready round.

That volume raises another ugly face of recycling solar waste. It costs a fortune to ship bulk solar panels long distances. Ideally I can set up a D2D (Dust to Dust processing center) in more and more states to capture a majority of solar panel waste.

I need to identify with a **connector** or company which is familiar with **chemistry and chemicals and chemical safety**. I am very concerned with safety considering the toxicity of some of these chemicals. Even silica can be poisonous

I need to identify a company or engineer to design the **automation** needed to take in a shipment of panels and run it though the series of steps we define for as near complete a process as possible.

For IT I'll need standard **laptops** and **software** for managing database of chemicals, acquisition and deposition dates, times and sources and other business transaction. I don't yet know if the

responsibility for tracking panels over their lifespan will be part of the legislation covering Recycling of solar waste. That reminds me, I may already have found my lobbyist. She is scientifically oriented and has a successful track record in getting bills passed.

Since Goodwill doesn't have used **chemicals and flasks** sitting around, I'll need to source those items. I may be able to tap into some local knowledge from Idexx and similar companies on automation and chemicals. And safety.

A chemist or chemical company should have most of the knowledge of chemicals:

- Identify different mfg. panels and contents;
- Identify chemicals in each type of panel;
- Identify which chemicals are dangerous or toxic at what concentrations;
- Identify process to recycle each chemical or compound that is toxic;
- Develop logical processes for efficiently recycling - may differ based on panel brands;
- Adapt database as new models are manufactured;
- Whom will buy the recycled materials?
- Where can I get the chemicals and catalysts needs in the recycle process

At this stage of the competition, a workspace, a chemist, some lab containers, a Bunsen burner, some torches, some chemicals and a long translated discussion with the two entities in Europe that claim to have had success with full recycling - these **things I need**.

The fancier stuff, the bigger equipment and all that jazz can be the focus of the Set! Round.

Ideally, I'd like to be transitioning to a full scale process well before the end of Ready.