How SunDancer Works

1. SunDancer is a hybrid system.
    a. It uses solar energy when the sun is available.
    b. It uses synthetic natural gas made from biomass or trash when it is not.
    c. If there is no trash or biomass available it will use natural gas.
2. The heat source is used to make steam in a boiler.
    a. If we are using the sun, the tubes in the solar array are the boiler. According to the graphic, a parabolic trough mirror will focus sunlight on a central tube.
    b. If the sun is not available, a traditional tube boiler fired by synthetic natural gas made from biomass or trash is used.
    c. If there is no trash or biomass available, the system switches to natural gas or propane.
3. Whatever the source, heat is used to make steam, and the steam drives a **"Ring Blade"** turbine which is coupled to a generator.
4. The exhaust from the turbine, which is a combination of both liquid and vapor, is sucked into a special re-injection pump. This pump re-injects the liquid – vapor mixture directly back into the boiler.
5. A lot of energy is lost in typical power plants in two places, the boiler and the condenser. The exit temperature of the gases coming off a typical boiler are in the 750 to 850^0F range. Those gases still have a great deal of energy in them and it just goes up the stack. In fact, almost 1/3rd of the energy contained in the fuel is lost this way. The other place where a lot of energy is lost is in the condenser. The steam exhausted from the turbine in a power plant still has a lot of energy in it, too. That energy is lost in the process of condensing the steam.
6. SunDancer operates at lower temperatures and pressures, so whenever the system is using gas, the exit temperature is about 350^0F. This means we lose a lot less energy up the stack, and this is a big deal. It makes SunDancer a lot more efficient than other systems.
7. **"Optimized Re-injection"** eliminated the condenser, and the turbine exhaust is pumped back into the boiler.
8. With a **Ring Blade** turbine and **Optimized Reinjection,** we have a system that can get about 2/3rd of the energy available in the heat source.
9. Let's move to Biomass. What gasification systems do is:
    a. remove the air
    b. dry the hydrocarbon material

c. apply enough heat to gasify the hydrocarbon material, and then collect the gas,
d. the SunDancer gasification system will do as well.
e. I**ncorporating such a system as a hybrid with a heat based solar system.**

10. In the event that the sun is not out, and there is no biomass or trash available, SunDancer can operate on natural gas. **This is what makes SunDancer a hybrid.** It can use the sun, or it can gasify solid hydrocarbons, or it can use natural gas. It *dances* between fuel sources.
11. There is one more thing I would like to say at this point. The prototype I have shown you does not include gasification or parabolic trough solar. That is what is next … combining a **Ring Blade** turbine made in an economical process, **Optimized Reinjection** technology and the low temperature and pressure design with technologies that are already well known. Our next step is building a full scale prototype incorporating all the elements of technology which we intend to use into technology that we are actually using.