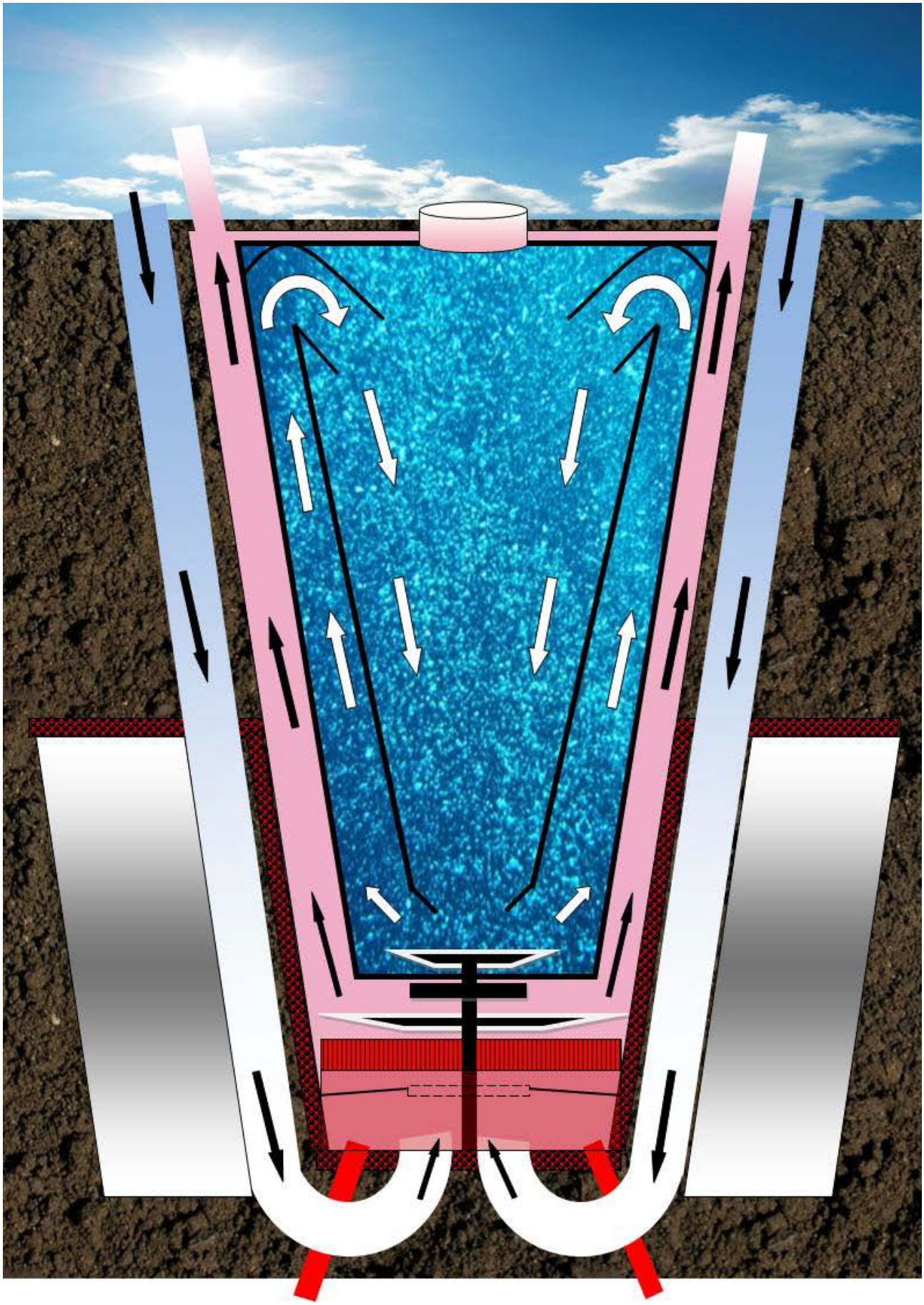
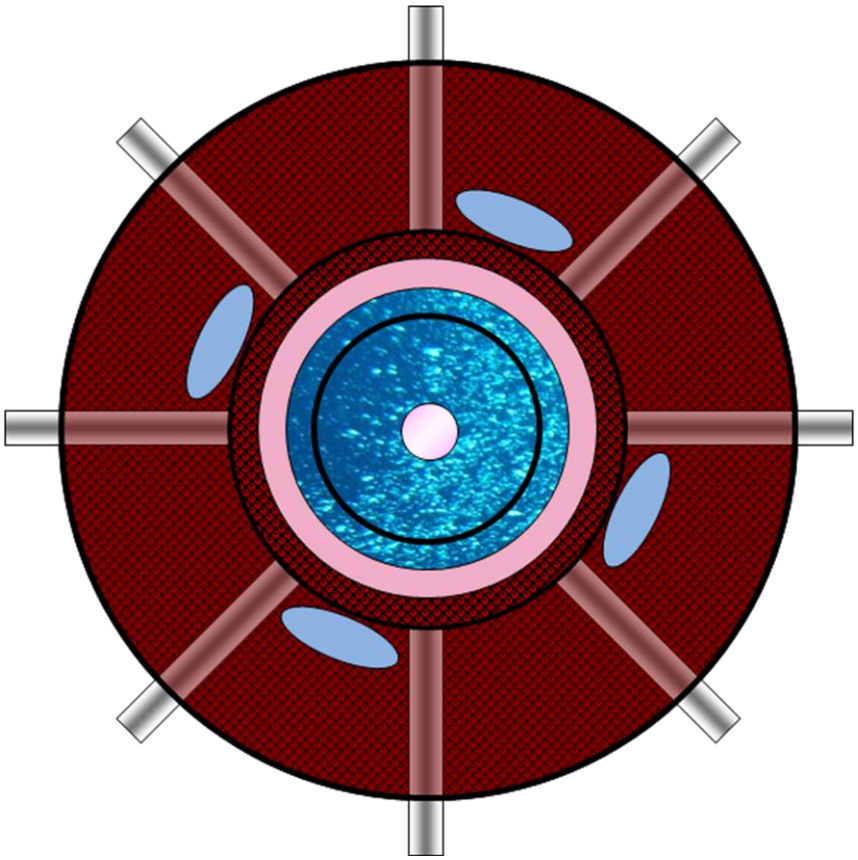
Water Tower
(brief)

Yes the illustrations in here are not the best you've ever seen, but they are perfectly illustrative and that's all they need to be. When you have a stick figure painter preparing such a document, then this is the best you can hope for.



Overhead Cross Section



Legend:

Thermal Mixing Chamber

Warm Air

Endothermic Reaction Chamber

Cool Air from the Surface

Water Chamber

Lower 150 Insulation

Lower 150 Insulation
Ground Heat Separators

Airflow Indicators

Waterflow Indicators

Fans

Geothermal Heat Shafts

Heat Release

Main Elements

You need to have a basic understanding of fluid dynamics, thermal currents specifically, and you need a basic understanding of geothermal gradients to realize that this will work. In other words you need to know that hot air rises and cold air sinks and that the deeper you go under the surface of the earth the hotter it gets. You need nothing else to tell you this will work.

1. The shape is a conical frustum or truncated cone, a very long one.
2. The Water Tower is 400 to 500 metres deep and up to 25 metres in diameter at the top.
3. The heat comes from the earth surrounding the Water Tower, and from the earth about 500 metres further down than the bottom of the Water Tower via heat shafts. The deep heat shafts may not be needed.
4. The airflow is drawn from fully insulated air intake shafts that draw most of the air down from the surface.
5. The air from the surface becomes heated as it enters the Thermal Mixing Chamber at the bottom of the Water Tower and continues to be heated as it rises.
6. The constant warm air in the collar shaped air tunnel transmits heat into the water chamber.
7. The water chamber has a long outer collar shaped tunnel and a standard tunnel shape inside. The water will flow up the outer tunnel and down the inner tunnel. The separator between the two tunnels inside the water chamber is insulated so that the water inside the standard tunnel can continue to cool as it is drawn down to once again be pushed up through the outer tunnel where it is again warmed.
8. Both the air and water collar shaped tunnels become narrower to concentrate the flow and subsequently provide more energy.
9. With an eye on vortices and maintaining the most efficient flow rates (both air and water), we place energy turbines liberally throughout the system. We place them throughout the water chamber and at every point where there is airflow, from the air intake shafts to the end of the cycle where it is expelled.
10. The last main element (for the time being) is something called the Lower 150 Insulation. The bottom one hundred metres of the Water Tower will be surrounded by insulation materials to prevent the heat from being drained from the surrounding earth. About one quarter of this insulation will be opened at a time to allow for the heat to make its way into the Water Tower. This element will be designed to ensure a constant supply of heat from the surrounding earth whilst providing plenty of time for the heat to replenish.

There are a few elements of the system to emphasize here: A larger body of water down the centre of the water chamber will cool down more quickly. The fans at the bottom of the Water Tower are magnetically connected and as the hot air rising causes the air fan to turn at a great rate, this will turn the water fan, which will then drive the water up the outer water tunnel with more force than it otherwise would without the fan. Correct positioning of the surface air vents will increase the speed and volume of airflow down the air intakes. As far as cooling the larger body of water down the centre is concerned, we probably need to add something that will cool it a little faster (maybe, maybe not), but if we do it will only be by a little and we **don't** need to resort to some sort of "freezing elements" down the centre (nor any other power hungry alternative); think harder if you're interested enough to think about it. And the most important point in regard to its usability is that you only need average geothermal gradients, so in other words we don't need to locate this in Iceland or Yellowstone National Park (geothermal hotspots). In other, other, words, you could locate one of these almost anywhere in Australia.

Now I did say that you only need a basic understanding of fluid dynamics and geothermal gradients to be able to realize this will work, and that is correct, but to understand specifically **how well** this will work you will need an engineer's understanding of these things, and you need to have an understanding of the strength and thermal conductivity of building materials as well.

Options

In literal terms the Water Tower is only about three-quarters of the way to being as good as it can be and if we were to proceed down the path of the Water Tower there would be several other options and additions by the time we get to the first installation. I have developed a lot of technology and so I can tell that this has plenty of development to go before it gets to as good as it can be. These are the main additions possible at the moment.

1. There is an Endothermic Reaction Chamber that can be added at the bottom for little cost. Some form of decaying biomass is the most common reaction we could use. Even if there was no heat coming from the surrounding earth or under it then we could use an Endothermic Reaction Chamber to provide all the heat (although we'd probably need some of the elements below if we did). Of course to add the ERC is to add a consumables requirement so it is an option that utilities could decide against if they can get away without it. The smaller the power plant the

more likely an ERC will be preferred, and it is only a very low cost consumables requirement, negligible in fact. To the pedants out there, yes it is thermodynamically exothermic but I was thinking in terms of the bacteria when I named it, and whatever we call it, the fact of it is not going to be any different.

2. The water chamber inside the Water Tower may be completely enclosed or it may be partially open at the top. There are advantages to both and if it is completely enclosed additional elements to regulate the flow and heat will be required. If it is completely enclosed the water is going to get very hot, much hotter than the surrounding earth, and the Lower 150 Insulation would not be required.
3. Putting the water under enormous pressure could put a lot more force behind the flow, and although any way I can think of doing would be very power hungry, the additional energy we get out of the system is off the charts. There are trade-offs and we need to investigate this as an option. This had only just occurred to me at the time of writing this document, but it looks good.
4. Another design option is to almost completely enclose the air chamber of the Water Tower. The air intakes would be much smaller and most of the air would circulate like the water rather than being expelled. There would be a fundamental internal design alteration if this option were used.

All of these options and more is what would facilitate its scalability downwards, albeit inside some very big numbers. My preliminary estimate is that it is scalable from about 200 megawatts commercially, up to 2000, 20,000 gigawatts theoretically. The Water Tower may be able to beat coal and natural gas from about 500 megawatts, and the bigger the power plant the further fossil fuels would fall behind.

Commercialisation

We're not going to build a Water Tower because we never need to build a Water Tower. The Water Tower was created specifically so that I had something to throw out into the open to say, look, there are options, so we don't need fossil fuels for our base load energy generation. There is something better than Water Tower inside the Eden is Burning book, and by throwing Water Tower out into the open it alleviates the need to reveal that something better any earlier than I had planned in the schedule (about two years after H3 commences operations). If you agree that the Water Tower is probably going to work, then you can have some confidence about that part of Eden is Burning.

There are two major elements in the commercialisation strategy for the Advanced Energy Suite (that's what I call it in Eden). One of them is

the Advanced Natural Selection Reform or ANSR, and you can find the details of this inside the **Climate Change discussion paper**. It's the thing that guarantees the fossil fuels industry will be **genuinely** on our side in making fossil fuels redundant. Sound impossible????? Read it! The other is corporate in nature and will ensure that the corporation developed to commercialise this new technology (if it is as I say, better than Water Tower) will start its life with about a trillion dollars in projects contracted. The correct response here is not to knee-jerk at the mention of a trillion dollars. If the Advanced Energy Suite is what I say it is then the correct response is "why only a trillion dollars"?

And finally, the money side of it:

A great deal of money is required to seed the H3 operation, and a very small part of that is going to be directed towards building prototypes. There will be no joint ventures for this or any other technology inside H3. People will come on board and help seed the H3 operation because of what the H3 operation is, and these prototypes (remember, **not** Water Tower) will be built and unveiled as one of hundreds of things we need to do to get the H3 operation up and running over the course of five or six years. When you know the seed requirement for H3 is about $400 million, and I'm just a little Joe Nobody sitting over here in a corner working all of this out in poverty (and it IS a deal-breaker to give away even one percent of this technology at this early stage), sounds impossible right????? We'll see.

Look into it.

Sean Gallacher
0424 529 885
International: 61 424 529 885
abc@h3hq.org
www.h3hq.org