



This presentation is an introduction to the H2Orbit. Our organization, web site seek to convey the situation, challenges, issues and potential solutions needed to successfully overcome the problems we have created for ourselves. These problems did not occur over night. They started when man lit that first campfire. The good news is that since that time we grew up. We learned. Not just about the things around us, but we learned about ourselves. We learned to communicate. We learned team work. We learned how to build nations of peoples and complex societies. Indeed we even learned how to bridge those societies so we can all see the big picture. That big picture is what drives H2Orbit.

H₂O Orbit – It's About Sustainability

but what does that mean?

Sustainability:

- Is an attempt to provide the best enduring outcomes for human and natural environments
- Relates to the continuity of economic, social, institutional and environmental aspects of human society, as well as the non-human environment
- Is a means of configuring civilization and human activity in an enduring manner so that society, its members and its economies are able to meet their needs and express their greatest potential, while preserving biodiversity
- Is planning and acting for the ability to maintain these ideals over the very long term.
- Affects every level of organization, from the local neighborhood to the entire planet.

Sustainability can be defined both qualitatively in words, and quantitatively as a pair of compound exponentials - the rising one being the life of a system, the declining one leading to death if the final tipping point for intervention is irreversibly past.

The word *sustainability* (German: *Nachhaltigkeit*) was used for the first time in 1712 by the German forester and scientist [Hann Carl von Carlowitz](#) (also spelled [Hannss Carl von Carlowitz](#)) in his book *Sylvicultura Oeconomica*. French and English scientists adopted the concept of planting trees and used the term "[sustained yield forestry](#)". by Kara Taylor

The 1987 [Brundtland Report](#), defined [sustainable development](#) as development that "meets the needs of the present generation without compromising the ability of future generations to meet their own needs". This is very much like the [seventh generation](#) philosophy of the [Native American Iroquois Confederacy](#). Chiefs were charged with bearing in mind the effects of their actions on their descendants for seven generations.

The term "sustainable development" was adopted by the [Agenda 21](#) program of the [United Nations](#). The 1995 World Summit on Social Development further defined this term as "the framework for our efforts to achieve a higher quality of life for all people", in which "economic development, social development and environmental protection are interdependent and mutually reinforcing components". The 2002 World Summit on Sustainable Development expanded this definition identifying the "three overarching objectives of sustainable development" to be (1) eradicating poverty, (2) protecting natural resources, and (3) changing unsustainable production and consumption patterns.

Some people now consider the term "sustainable development" as too closely linked with continued material development, and prefer to use terms like "sustainability", "sustainable prosperity" and "sustainable genuine progress" as the umbrella terms. Despite differences, a number of common principles are embedded in most charters or action programmes to achieve sustainable development, sustainability or sustainable prosperity. These include (Hargroves & Smith 2005, see bibliography):

Dealing transparently and systemically with risk, uncertainty and [irreversibility](#).

Ensuring appropriate valuation, appreciation and [restoration](#) of nature.

Integration of environmental, social, human and economic goals in policies and activities.

Equal opportunity and [community participation/Sustainable community](#).

[Conservation](#) of [biodiversity](#) and [ecological integrity](#).

Ensuring inter-generational equity.

Recognizing the global integration of localities.

A commitment to [best practice](#).

No net loss of [human capital](#) or [natural capital](#).

The principle of [continuous improvement](#).

The need for good governance.

H₂Orbit – Vision Statement

The desired future is one that finds ample energy produced in the context of an enduring, sustainable biosphere for our planet and satisfies the requirements of not just humanity, but all life on Earth.

When you read this sentence the tendency might be to think about large cities, or even small ones. This sentence is broader and deeper than that true but superficial observation. Today humanity across the globe, just in the “civilized” areas requires amounts of energy that boggles the mind. This sentence implies that the volume of energy required must not only satisfy those numbers but an incredible array of incremental needs as well. We need energy to dig wells in remote areas that today have no power. Wells to provide clean drinking water where none exists today. Over 70% of the Earth is covered in water. Only 2% of that water is fresh but almost all of that is locked up as ice in the polar regions. Only a tiny fraction of that is available for human use. Developing countries share common wells. They have no energy to filter or pump the water. Sanitation is poor as a result. Crop irrigation is unheard of. H₂Orbit proposes to bring energy to these and other areas to resolve those situations and at the same time resolve Global Warming and satisfy the needs for civilization.

H₂Orbit's Mission

Promote the high frontier to improve
ecological, economic and social
conditions.

There is really only one source of energy that offers the abundance of energy in a sustainable manner. That source is our star the sun. Upon great reflection it became increasingly obvious that so many terrestrial issues can be solved through this single endeavor. H₂Orbit contends this will be the most powerful undertaking ever attempted in the history of humanity and may hold that position for several millennia to come. Civilization drove the industrial revolution that created the hydrocarbon economy which resulted in the manifestations we perceive as "climate change". Those issues though are not just in the air. No, indeed they are too in our oceans and in our soils.

The availability of abundant energy can solve so many problems it's staggering. Global warming is corrected through elimination of the hydrocarbon economy and a reduction of carbon dioxide in our biosphere. Drought, hunger, and health for millions can be improved by simply providing clean water to areas that today have little or no water available. Clean water provided by abundant energy can allow people to grow crops where none grew before. Those crops in turn help us all not just feed the hungry but clean the air we all breath.

Removing the carbon dioxide from the atmosphere placed there over the centuries is huge but so are the opportunities that represents. Later in this presentation we will show you how we can bind all that carbon dioxide into usable materials. Materials that can not only sequester the CO₂ but can be used for building and restoring the health and biodiversity of our oceans. That's quite a feat all by itself.

All of these things and more can be accomplished through the success of this mission.

H₂Orbit – Why the Mission?

- Anthropogenic activity is causing global climate change (e.g. Global Warming)
- Significantly improved technologies originally developed in the 1960's offers a way forward
- The process of solving this problem offers an opportunity to unite humanity creating a common heritage for all life on Earth
- Delivers a hopeful future
- Offers an opportunity to exercise free will and choose the path that does not lead to certain destruction

Every time you see the word “anthropogenic” – think – its our fault. That word means ‘human derived’. This is our mess and now we have to clean our own house. We just spoke of some of the things our mission will correct. People have known for centuries that if we could harness orbital space we could solve many issues facing mankind. Jules Vern wrote about such things a very long time ago. Others too to be sure.

The mission is really an opportunity for society to go to school. Individuals have done so for a very long time but rarely does society as a whole have an opportunity to bond over common objectives. Historically those objectives were driven by violence and war. Now we have a peaceful endeavor to solve something that will preserve all life on our planet. Something that can give additional meaning to those lives lost in pursuit of freedom and assure they did not die in vain. These problems are not ones that can be solved by dictators and tyrants.

What we find infinitely interesting in all of this is that the solution is:

- something that will require trust that spans generations, education, ideologies, cultures, religion, and national boundaries.
- will require unprecedented teamwork and cooperation from everyone, everywhere
- will require patience, persistence and perseverance from every individual
- will require wealthy nations to support poor nations, yet all will benefit
- something that potentially entrenched wealthy will have to recognize the situation, potentially sacrifice all they have achieved and help
- something that every person regardless of who they are or where they are can do in order to help. Small or large every little bit helps.
- something that will require faith in others
- something that requires each individual to be respected
- something that demands a pursuit of excellence
- and through this all, requires society to be driven in attaining the common [strategic vision](#)

H₂O Orbit - What caused these problems?

- The overwhelming majority of the problems have a root cause based in “energy production”
- Civilization requires immense amounts of energy to sustain basic services and grow to meet future needs
- The industrial revolution drove the creation of our hydrocarbon economy which resulted in the current situation

First we need to recognize that this situation did not start yesterday. So don't go around bad mouthing the utility companies. Only recently have we come to understand the true nature of the situation. However, now we do know and now that we do – things need to change. The web site has details on which sectors specifically drive which greenhouse gases. If you want those details – go to the web site – or research it on your own. You can find much about it on the network. The bottom line is that “energy production” is the main culprit.

The challenge we have is that civilization is growing. More people are free. Free people want their standards of living improved. They want the same things we all want. A good, healthy and secure life. That takes energy to deliver. That fundamental need is what drove the industrial revolution.

H₂Orbit – Why Space?

- Abundant, sustainable, enduring energy from our star the sun
- Ease of distribution increases global availability beyond current power grids
- Availability can increase as civilization grows
- Creates an obvious need for knowledge which leads to improved conditions and greater societal situational awareness
- Jobs for millions
- Integration into the global economy will fuel growth the remainder of this century and beyond
- Increases global security through lower dependence on hydrocarbons and nuclear based resources
- New industries and business opportunities from manufacturing to pharmaceutical research and materials
- New resource opportunities for raw materials
- New territory to support the pursuit of freedom and happiness
- Leverages the entrepreneurial spirit in us all – it will revitalize mankind

The short answer to why space is that the abundant energy is right at our fingertips and we can implement the necessary structures within the time frame we have before major damage is done to our biosphere. There is no other strategy that can deliver us from our own shortsightedness. It's just that simple. So what else will this space strategy deliver? Here's one list and we're sure there are others.

H₂O Orbit: Binding The CO₂



This is the chemical formula for creating calcium carbonate and is prepared by passing CO₂ through a solution of calcium hydroxide: the calcium carbonate precipitates out. It can then be used for a number of projects involving solid calcium carbonate, including reducing the acidity in water and increasing marine habitat.

We need to industrialize this process to create materials for building, restoring the health of our oceans, lakes, rivers and streams. Innovative structures like Reef Balls® can help restore our coral reefs around the world and reduce ocean acidity at the same time.

The main use of calcium carbonate is in the construction industry, either as a building material in its own right (e.g. [marble](#)) or limestone aggregate for roadbuilding or as an ingredient of [cement](#) or as the starting material for the preparation of builder's lime by burning in a kiln. A common contaminant is magnesium carbonate.

Calcium carbonate is widely used as an extender in paints, in particular matte emulsion paint where typically 30% by weight of the paint is either chalk or marble.

Calcium carbonate is also widely used as a filler in plastics. Some typical examples include around 15 to 20% loading of chalk in uPVC drain pipe, 5 to 15% loading of stearate coated chalk or marble in uPVC window profile. Fine ground calcium carbonate is an essential ingredient in the microporous film used in babies [nappies](#) and some building films as the pores are nucleated around the calcium carbonate particles during the manufacture of the film by biaxial stretching.

Calcium carbonate is also used in a wide range of trade and DIY adhesives, sealants and decorating fillers. Ceramic tile adhesives typically contain 70 to 80% limestone. Decorating crack fillers contain similar levels of marble or dolomite. It is also mixed with putty in setting [Stained glass](#) windows, and as a resist to prevent glass from sticking to kiln shelves when firing glazes and paints at high temperature.

Calcium carbonate is widely used medicinally as an inexpensive dietary calcium supplement, [antacid](#), and/or [phosphate binder](#). It is also used in the pharmaceutical industry as a base material for [tablets](#) of other pharmaceuticals.

Calcium carbonate is known as *whiting* in [ceramics](#)/glazing applications, where it is used as a common ingredient for many glazes in its white powdered form. When a glaze containing this material is fired in a kiln, the whiting acts as a [flux](#) material in the glaze.

It is commonly called [chalk](#) as it has been a major component of blackboard chalk. Chalk may consist of either calcium carbonate or [gypsum](#), hydrated [calcium sulfate](#) CaSO₄·2H₂O.

In North America, calcium carbonate has begun to replace [kaolin](#) in the production of glossy paper. Europe has been practicing this as alkaline papermaking or acid-free papermaking for some decades. Carbonates are available in forms: ground calcium carbonate (GCC) or precipitated calcium carbonate (PCC). The latter has a very fine and controlled particle size, on the order of 2 micron in diameter, useful in coatings for paper.

As a [food additive](#), it is used in some [soy milk](#) products as a source of dietary calcium.

In 1989, Dr. Simmons introduced CaCO₃ into the Whetstone Brook in Massachusetts. His hope was that the calcium carbonate would counter the acid in the stream from acid rain and save the trout that had ceased to spawn. Although his experiment was a success, it did increase the amounts of aluminum ions in the area of the brook that was not treated with the limestone. This shows that CaCO₃ can be added to neutralize the effects of acid rain in [river](#) ecosystems. Nowadays, calcium carbonate is used to neutralise acidic conditions in both soil and water.

We can build on these experiments and use the calcium carbonate to build reef balls which are then used to build artificial reef systems. These help reduce acidity in the water, create habitats for the marine life which increases biodiversity and restores the health of our oceans.

H2Orbit – Our Approach

- Increase societal situational awareness through direct and indirect communications
- Foster programs to facilitate behavior resulting in an increased chance of the mission's success
- Drive initiatives resulting in pervasive action
- Connect society to resolving the problem – not specific governments, not specific individuals
- Facilitate leadership, entrepreneurialism, freedom, innovation and the drive to get it done

H2Orbit is a change agent. We are a catalyst. We are but a few people trying to get the masses to act. It is after all going to take us all in one manner or another to achieve success. Failure is not something anyone wants to contemplate.

H2Orbit Strategy

1. Reduce greenhouse gas levels to pre-industrial revolution levels
2. Implement a method to deliver green sustainable energy that not only meets existing needs and demands growth required by civilization but for all life on Earth
3. Manage 1 & 2 along a timeline that prevents significant damage to the biosphere*

* This requires a cogent understanding of biosphere derived metrics that determine the collective 'sense of urgency'.

One of the problems with almost every discussion about climate change and or global warming is either the subject is insufficiently discussed or there is no solution offered. Often when various presenters are asked their thoughts about that their reply is that "it's too complex", "nobody has an answer", "we just need to conserve". The H2Orbit strategy recognizes several points:

- The amount of CO₂ in the biosphere is already too high and it must be lowered; otherwise significant reservoirs of greenhouse gases contained in gas hydrates and in the permafrost might be released. Should that occur prior to some of the strategic elements be implemented the problems may cascade way past any ability to correct them.
- Civilization requires energy. In fact all life on Earth requires energy if only to use it to reduce the volume of carbon dioxide. However it's not enough to say that civilization needs energy. Civilization is not static. It grows. Civilization itself is a living thing. Dynamic in its needs. Diverse as the cultures around the world. As the standards of living increases around the world so too do the demands for more energy. Any solution implemented must not only recognize those energy demands but must be able to satisfy them.
- The third element to the strategy is recognition of our collective situation. Coral Reefs are dying. In fact some 20% are already dead based on the most recent global reports published in 2005. Those reefs are more than just pretty to look at. They are at the bottom of the ocean food chain. The world bank places about 50% of Earth's population within 60 kilometers of the coast. That's 3.4 billion people. Earth is a marine habitat. Many of those peoples sustenance depends on that ocean food chain to survive. Commercial fish populations are estimated to be wiped out by 2048. 120 species of frogs have gone extinct in the last three decades. There are many other examples that could be cited but the bottom line is that these issues are conspiring together to create an implementation time line which cannot be ignored.

The real challenge we all have is that the solution will take about 40-50 years to get implemented in any real fashion. The question is can we mitigate enough of the problem to reduce or eliminate the risk posed by climate change and global warming to avert disaster. H2Orbit believes we can >> IF << we (collective we) roll our sleeves up and get busy.

H2Orbit Pro / Con

- Pros
 - Clean sustainable biosphere
 - Green sustainable abundant energy in perpetuity also in ample supply
 - World hunger addressed through increased crop yields delivered by irrigation of arid lands
 - Many diseases eliminated through the availability of clean water
 - Global security increased through reduction in the need for nuclear power
 - Millions of Jobs are created, many in sectors that never existed prior to this endeavor
 - New territories are opened up in orbit, on the moon and elsewhere in the solar system allowing people increased opportunity to pursue their dreams
 - Civilization has increased manufacturing capabilities
 - Pharmaceutical and materials research can leverage the weightless environments to deliver products unavailable from Earth
- Cons
 - Massive effort required to implement the strategy
 - Geopolitical complexities are immense
 - New legislation is required across many sectors to accommodate shifts in tax revenue sources to support green energy
 - Economic shift in political power from sector to sector creates significant inhibitors to progress
 - Some sectors of the economy will require retraining and education to maintain competitiveness
 - Political power shifts within nationalistic frameworks will spill out to global issues
 - Individuals and corporations failing to “see the big picture” will do everything in their power to prevent implementation of the solution
 - Public companies deliver ROI to shareholders strictly based on financial returns that are independent of biosphere impact in many cases as mandated by law

You can read these as well as I can. The point is that we have to weigh all the wants and needs // pros and cons // with the requirements of having a sustainable biosphere. Ask your self how much something will be worth if the Earth's biosphere fails. Will your bank account really matter much if that happens? H2Orbit doesn't think so and we don't think you will either. The challenge really is in believing that the biosphere can in fact fail. If we build the planned 850 new power plants; which will dump an incremental 2.7 billion tons of CO2 into the atmosphere. Oh – all the Kyoto countries combined only plan to reduce their CO2 emissions by 483 million tons. So those power plants will dump five times more CO2 into the biosphere than Kyoto reduces. And that's only from three countries. So much for Kyoto.

So all that carbon dioxide mankind produces is dumped into the atmosphere. Oooops... the permafrost lets loose it's greenhouse gases totaling 2/3rds the volume already in the biosphere. Then the gas hydrates let loose and nobody knows how much they have because we don't even know where all the reservoirs are. We do know that the ones we do know about hold more than what's already there. Let's see what's already in the atmosphere is killing the oceans, creating deserts, moving the jet stream, and melting the polar caps. What do you think will happen if we double or triple that volume of greenhouse gases? The real answer is no one knows, but it will be bad. Very, very bad. It will be hell on Earth.

The Earth has never – in it's entire history – had such levels of greenhouse gases in the biosphere. Ever. If that cascade continued the heat would continue to build. The oceans would boil off and Earth would start to look a lot like Venus does today. With a surface temperature hot enough to melt lead. That is all complete speculation and has no scientific basis but is mentioned simply to illustrate a point. The point is we don't know how bad it will get but we do know it will be worse than anything any life has ever experienced on our planet. That's bad enough. It's all the motivation H2Orbit needed to build the site and try to tackle this problem. We need your help.

H2Orbit Thought Experiment

- **Cyclical Weather**
 - Biosphere CO2 levels continue to build
 - Conservation efforts
 - Alternatives slowly introduced as business can afford the market shifts based on public perception of the problems
- **Linear Climate Change**
 - Public “gets” Global Warming
 - Embraces H2Orbit 3 pronged strategy
 - Races to assure sustainability of Earth’s biosphere

Add whatever you would like to list whatever you like under each of these columns. Then ask yourself:

“What happens if the model represented by that column fails? Where would mankind be then? What would the Earth look like if that model failed?”

H2Orbit thinks the answer might just be the same. The only difference is that only one of these scenarios offers a chance for salvation. The other only offers assured destruction. Which would you choose? We choose to try to solve the problem before it’s too late.

Cover the bottom half of this slide if using overheads. The point of this slide is to get people to think about the other side of their respective coins. If the cyclical weather model is wrong that means that the other column was right but now it’s too late to do anything about it and we’re all toast. If we begin working on the H2Orbit strategy and fail outright we are just as toast but at least we went down fighting. If we begin working on the H2Orbit strategy and find that we didn’t need to be working on it at all because the cyclical column was right then the only damage done is that we have a cleaner Earth on which to live. It is also more conducive to all life forms.

The “do nothing” crowd cannot sit in the wings on this one. Everyone must see that in-action is as bad as doing the wrong thing. Therefore any action that looks like it’s going to help is better than doing nothing. Everyone can help because there’s something for everyone to do and we’ll cover them on a later slide.

H2Orbit – Every Life On Earth:

- Depends on what you do next
- Requires your action in some form right now
- Educates every other life about our biosphere
- Acquires its right to exist at birth
- Means something to everything else
- Spirits innovation to endure

The name of the game is “Synergy” What’s that?

Synergy or **synergism** (from the [Greek](#) *synergos*, *συνεργός* meaning working together, *circa* [1660](#)) refers to the phenomenon in which two or more discrete influences or agents acting together create an effect greater than that predicted by knowing only the separate effects of the individual agents. It is originally a scientific term. Often (but not always, see Toxicologic synergy) the prediction is the sum of the effects each is able to create independently. The opposite of synergy is [antagonism](#), the phenomenon where two agents in combination have an overall effect which is less than that predicted from their individual effects. *Synergism* stems from the 1657 theological doctrine that humans will cooperate with the divine grace in regeneration. The term began to be used in the broader, non-theological, sense by 1925. Synergy can also mean:

A mutually advantageous conjunction where the whole is greater than the sum of the parts.

Acronym: Semi-Yearly New Energy, Registered and Generated by Youth.

A dynamic state in which combined action is favored over the sum of individual component actions.

Behavior of whole systems unpredicted by the behavior of their parts taken separately. More accurately known as [emergent behavior](#)[1]

H₂Orbit – Individual Actions

- Plant plants
- Join a club or association
- Take a class then apply what you learned
- Engage your elected officials to affect supportive policies and legislation
- Participate in efforts with local schools to help our children understand
- Visit & support local museums
- Encourage experimentation
- Use green energy sources
- Correspond with friends, colleagues, peers, family and your sphere of influence
- Pursue a hobby that also supports our (collective our – as in us all) mission objective
- Teach others
- Start or join a project !
- Travel and / or communicate and engage with others around the world !
- Empower others
- Make books & videos available to others, especially children
- Learn about hydrogen technologies & apply them if you can
- Deliver presentations like this one to any audience that will listen

These are just a few things that anyone of any age, regardless of where they are can do to help. Everyone can help. It doesn't matter what country you are in. It doesn't matter what your social standing is. It doesn't matter what your religion is or your ideology. There is so much that anyone can do to help that none of us should be lacking for something to do – if you are inclined to help. If not – then sit back and be prepared to be “helped along” by those that are, and in the most appropriate manner your conscience and lethargy demand.

The person delivering this presentation can do it – so can anyone in the audience. Encourage them to take the presentation and deliver it to others.

H₂Orbit – It's About Sustainability

- We have some daunting challenges ahead
- Social issues we can work together to solve
- Ecological problems we can surmount through innovation and persistence of the human spirit
- Economical hurdles we can apply our entrepreneurial enterprise in creating new ways to integrate solutions into our economy
- In short – we can solve these problems

Sitting on the sidelines is being part of the problem. Be part of the solution. We must all act together. We need to marshal our personal efforts to drive effective action that delivers tangible results.

The good news is that there is light at the end of the tunnel. We can do this. Everyone needs everyone else. There is no one we don't need.

H2Orbit – It's About Sustainability



- It's our only home
- Every one else lives here too
- In the grand scheme of things it's a pretty small place
- From out here you can't see borders – just where we live
- Our ancestors expected us to take care of their legacy
- What legacy will freedom leave Earth's progeny?

Thank you for your time.

We hope this has been enlightening and engaging.

We hope it stirs you to action

Closing remarks and express appreciation to the audience for their time in listening to the presentation. Q&A if you like – send people to the website.
<http://www.H2Orbit.com> – It's about sustainability.