

Climate Tech Research Labs \$5 Million

This Joint Venture is to build a Climate Tech Lab starting with pulling hydrogen from water to fuel electrical generation. The initial project will be an Oasis Machine with a goal of 3000 gallons of water per day plus generating our own electricity to do it. A big issue is whether to pull carbon out of the air with [trees or machines](#). This venture is about developing the machines parts to do it.

The Business-was gifted electrolysis research done by Disney's retired Chief of engineering for EPCOT Kent Bingham, who died suddenly, and we inherited his work as his business manager. The lab will be located at a Business Accelerator near Denver that offers Space, collaboration with other tenants. The main activity will be to generate hydrogen and configure it to a variety of Hydrogen engine sizes. One of our team built and knows that technology. So, the main formula is to connect the Hydrogen engines to an elctroizer and measure performances and costs. When we have an operational Oasis model, we will turn our attention to capturing CO2 with a goal of 1000 tonnes per year. Both machines can go everywhere, especially operate in the wilderness off grid.

Market - Our initial market is Water Agencies that can fund Millions of dollars to help with rivers drying up all over the earth. If we can get the Oasis Machine to generate 1000 gallons (min) per day that would mean one acre foot per year. The river's problems are in the 2-to-4-million-acre feet per year. At \$10,000 per machine. It would cost \$10 Billion to deploy one million Oasis Machines. And remember new technologies get better with time so a 3-acre foot machine could be possible with mass production. Could \$10 Billion save Las Vegas and Phoenix from disaster? These types of amounts could be funded as bonds each year to blanket the countryside where water is needed. The hydrogen market is [hot](#) with multi \$Trillion potential. [Wall St is growing thirsty](#) for vanishing water in the west. A [Report](#) also shows alarming changes for global water. The warming planet is causing havoc under the strain from record heat, floods, storms and wildfires: [the toll will get worse](#)

Business Model- The project seeks \$500,000 in working capital for 10% of the company. Then the initial Mission is to market a \$5 million *Research Lab* for 40% of the company. This also includes seeking \$250,000 from the Colorado Economic Development Agency, and \$250,000 from the National Science Foundation. The objective of the \$5 million is to grow a \$50 Million sale within 3 years for 50% of the company (with dilution). How these new funds will be used is yet to be determined.

Progress to date: *Bingham's research on electrolysis *Built a hydrogen engine *Found an Incubator to join that has a stage *Organized a small team * built a Library with 400 links. * We looked at a submission to California Municipal Finance Authority for a \$20 Million Bond Issue for manufacturing but missed a June deadline. Submission is \$91,000. We have collaborators that submitted 4 other ventures. We plan another Submission before June that crafts a plan to grow an air capture industry in other States using California as a model.

Water, electricity, and carbon are focus of this Research Venture:

Water all over the world is becoming more difficult for 2 billion people to get in undeveloped countries, refugee camps, the western USA and desert countries. We plan to demonstrate a proof of concept for several technologies that have the potential to change civilization while fighting the climate crisis. Kent Bingham was an associate who passed several years ago. His work in this field has set the foundation for this technology transition and is shown in his Oasis Machine Description from 5 years ago. This is located at [projectsummary.pdf \(lloydgoff.com\)](#)



This Climate Tech company will be known as Bingham Labs. It will startup as a \$5 million Joint Venture with a capital providers getting 50% ownership and getting repaid before the management team shares in their 50% of the profits. The first \$500,000 needed to launch the company will be allocated to operating a multi-faceted company including administration, office, overhead, fund raising and reserves. One option for the capital investor is how to structure each research venture of the company for spinoffs, and profits. For example, should each research project be a separate entity such as a Special Project Vehicle (SPV) or something equivalent so that the remainder of the company is protected from any loses and future investors choose only the technology they are interested in. This would also give the company a way to expand. Or should everything be lumped together into one company?

Methodology Template: The first project will be to form a company and get a team built for research, for administration and marketing allocating an initial \$500,000. The company will have three or more projects over the first two years that will share a three-step methodology: 1. Survey the existing research industry in each field and create a database of people and technology. 2. [Purchase an AI capability](#) and feed all this info into it and start asking AI questions that lead to an engineering solutions 3. Issue RFP for two or three companies to consult and assist with a demonstration model. As the research progresses beyond demonstrations, it will be exposed to additional capital for engineering into a manufacturable machine. In this plan there are three research ventures that can contribute to the Climate Crisis. All that contribute will have access to share in the data the project generates until additional funding is added. More Climate Tech research projects can be added using the Special Project Vehicle funding arrangement as investors are found. We also plan to Compete for prize money - Elon Musk is offering \$100 million for the winner(s) of the best new carbon capture base on 3 conditions. There are others offering smaller prizes like foundations, and associations. We plan to also go after grants and DOE funding. The Federal bill passed in August will revitalize Climate Tech with Billions.

Seed Funding:

\$500,000 First few months - Set up the company, legal work for a long-term financial structure such as LLC, General Partnership, [SPV](#) or Corporation, organize the team, survey the industry, rent space, and reserves. One of the next big decisions is whether to remain only a Research Organization and Joint Venture the manufacturing or do it all in-house. The project would like assistance from funders in financial structure, legal and marketing.

Management:

The Research Lab will be managed by [Don Deptowicz](#), who has an extensive background in technology projects. Don Deptowicz is a Results Oriented Senior Executive with an outstanding track record in engineering, program management and quality. He excels at being an inspirational and resourceful leader. He is known for innovative and creative thinking in the areas of both product and process designs involving advanced materials and coatings. He is an exceptionally skilled communicator, with the ability to build effective and productive working relationships across all levels of the organization and the value chain. Contact Deptowicz at (970) 532-4736



Don graduated from Purdue University and began his career in 1976 at UTC's Pratt & Whitney Engine Division in West Palm Beach, Florida. Here, he led fundamental changes in both product and manufacturing process technology, covering the full life cycle of Military Aerospace Propulsion Systems. Don has over 46 years of experience in the aerospace, automotive and electronic industries. Prior to this, he was the Director of Technical Excellence for PCC Airfoils LLC, where he championed the collaborative effort across engine OEMs and casting suppliers in conjunction with the Air Force Man Tech vision of Attaining newer Agile Manufacturing.

[Lloyd Goff](#) -has more than 50 years putting projects together for Real Estate development and/or Sales. Educated in Architecture at the University of New Mexico in 1965 and was the University of Colorado's first Graduate for a 1971 master's degree in urban and Regional Planning. A design portfolio of more than 40 projects is available in his on-line Bio. Goff met Kent Bingham in 1995 and for over twenty years they collaborated on Skyways, the Oasis Machine and Pedestrian Villages until his passing in 2018. Goff was Kent's Business manager and will be responsible for the business affairs of the company included accounting, legal, staffing and marketing.

[Daren Dozier](#) is a computer information Technology Specialist. He builds web sites, works social media, and manages companies' computer networks. The Tech Industry has been his career path for over twenty years.

Phase 1 - The First Project is an Oasis Machine Demo

Mission: To change the world by providing cheap water and electricity off grid anywhere. This project will collaborate with existing companies in air capture that will explore our set of Performance Goals and build 2 to 3 scale-demonstrators to show much water we can get with our initial configurations. This has the potential to grow into a Multi-\$Billion industry.

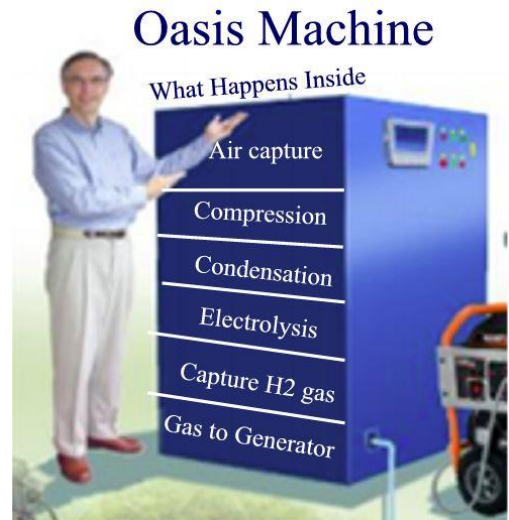
The Problem: is to avoid America from turning back into a dust bowl like the it did in the 1930s. This time the problem is much larger, and these machines need to be everywhere. Which means they need to be off grid electricity by generating our own. To solve this is a specific configurations of electrode surfaces, coatings, and additives used in the [Electrolysis](#) of water to break it down into the cleanest Hydrogen and Oxygen possible for operating a generator. Previous research showed the quality of the hydrogen from [etching](#) and coating material was overly sensitive to a successful operation. Three metals stand out [as catalysts](#) for breaking the bond of hydrogen to Oxygen. They are chromium, manganese, and iron.

[Then there are new catalysts](#) including a [Japanese one](#). Cleaner Hydrogen is the [goal](#). A new kind of [water](#): When you rapidly heat and cool water, it weakens the hydrogen bonds so it can more easily be split into Oxygen and HYDROGEN... producing LOW-COST HYDROGEN FUEL!! You may wonder how much water vapor is in the atmosphere so an estimate of the water vapor in the air Globally-[363 Trillion](#) gallons. This research will also investigate the feasibility of electrolyzing water vapor before it is condensed into water.

A solution: An Oasis Machine requires a critical part; an Electrolyzer is needed to generate both power and water. Our goal will be to generate 1 to 2 KW and/or thousands of gallons per day of water in our first machines. Electricity from the grid is too expensive to operate this machine so it is necessary to generate our own electricity off the grid using an Electrolyzer. We think this will lower the operating costs by 8-90%. In today's technology it is estimated that 1 gallon of water will produce .5 Kg of hydrogen.

(The molecular weight of water = 18g/mol, and 2g of each 18g is hydrogen atoms, then the answer is 2/18 of the total starting material. 1 imperial gallon weighs 4.54kg or so, depending upon temperature, so there are $4.54\text{kg} \times 2/18 =$ around 0.5kg of hydrogen to be had).

Our director of research Don Deptowicz has built a hydrogen engine which can be scaled down to a utility sized boot shoe box. This project will study and demonstrate how many hours of use and what size a



small hydrogen motor will need to generate 6000 watts per day. For example, here is a small hydrogen motor about the size of an old computer. Here are the [issues to deal with](#) using hydrogen as a fuel.

New [Aquarius Engine Generators](#) from Israel runs on Hydrogen and could be used to generate electricity. A new technology [Solar to hydrogen](#) also looks promising. Here is a new [Electrolyzer showing how compact they can be](#). Photocatalytic water splitting shows how [sunlight](#) can be used to split water. By many methods water-splitting can provide new energy sources for changing civilization.



Hydrogen engines to be mass produced by Hyundai by 2025

The hydrogen-powered internal combustion engine can produce a power output of 300 kW (402 HP) and a torque of 1700 NM at 2000 RPM. Fulfilling Tier 5/Stage 5/Euro7 regulation, the engine satisfies the emission requirements to be 90% decreased to the current level to meet Zero CO2 (below 1g/kwh) and Zero Impact Emission.

Comparables for Atmospheric Water Generators

The sustainment of humankind requires water for agricultural production, for cellular functions which all organisms are comprised of and for many functions which make our lives more comfortable. These air to water machines already exists. In fact, there is an entire industry of Atmospheric Water Generators with dozens of manufactures. They mostly use grid power with some using solar and even wind power. but are very expensive to build due to hand labor and parts. Using solar and wind costs almost as much as the units themselves. Here is an example:

[2,500 gallons](#) per day uses solar which is about ½ the \$25,000 cost with high operating costs.

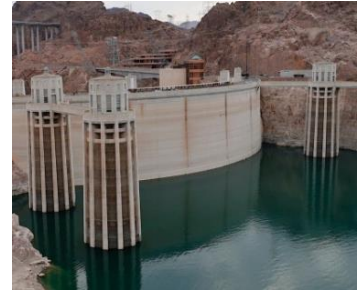
Can our design using mass production bring the cost down to \$10,000 per machine? By using hydrogen extracted from water, the building cost is still cheap and very cheap operating costs, near zero. The largest cost is expected to be maintenance. Batteries need changing every two or three years, catalysts need changing, water gets depleted, compressors will need replacement. After a few years, fans wear out, filters will need replacement. Operating 24 hours per day for long periods will require automated monitoring and reporting. Maintenance is the big unknown that the research lab will have to explore.

Water Case Studies: A new Dust Bowl? Rivers and Lakes are drying up worldwide:

[Hoover Dam](#) and Lake Meade Down 70%
Water shortage at Hoover Dam causing concern.

[40 million People](#) Rely on the Colorado River, and Now It's Drying Up. Link to a UTube Video (wait for it)

[California Farming](#) and land is sinking.



[Rio Grande River](#) Running dry.
[More on Rio Grande](#)



[Panama Canal](#) drought reduces usage

[Ogalla Aquifer](#) Kansas to Texas Running Dry



[Yangtze River](#) China's Beating Heart
<https://www.youtube.com/watch?v=PWnWE-wJljc>

Second Payment of Funding

\$2,000,000 For two years-research and development of Oasis Machine with two or three configurations using differing components. First, we will hire someone to convert our library of 350 links into a survey of the emerging industry for talent, contacts, and technology. This will become a database for "State-of-the Future". Then we will look for consultants to help us create two, maybe three demonstration models with different configurations. We will engage an experienced physicist to write the specification for a prototype, who is well known in this cottage industry of innovators. We know one who worked with Bingham, and he wrote a book: *Water The Key To New Energy*.

Research Budget for the First Year

72,000	Administration	reporting, budgeting and planning
120,000	Chief investigator	research, engineering, parts, consultants
35,750	Office manager	visitors, calendar, daily log, Services
124,000	Researchers (3)	technologies, other teams, publishing,
62,000	writers (2)	part time workers explain the technologies

44,000	Grant writer	applying for additional funds
32,900	CPA	accounting and reporting
43,500	Legal	attorney for contracts, research/reporting
48,000	Rent/Furnishings	small office for staff and technologies
5,750	Internet	various costs for team members
28,500	Web Site	team library and outside inquiry
4,500	Cell Phones (5)	latest tech in cell phones and plans
30,000	Computer Hub	equipment for our team and outside communications
45,000	Info tech manager	managing all the connections, video conferencing & data
11,250	Social media	watching what is happening elsewhere
34,500	email marketing	attracting worker and staying in touch with the industry
42,000	video production	capturing the new knowledge in a visual format
33,000	animation	visually explaining how things work
28,000	streaming video	regular discussions with the industry
37,000	conferences attend	watching other technology, meeting workers, exposure
52,500	travel	viewing other labs, meeting people, attending conferences
57,000	Procurement	finds, acquires chemicals, tools, machined parts
77,000	Spreadsheet analysis	costs to build various configurations, feasibility of operations
92,500	Hydrogen engines	builds several small utility engines
200,000	Demonstrations	physicist, components, some engineering, testing
4,450	Insurance	office and equipment liability and casualty
32,868	Fees approx. 1.5%	taxes, city business and worker fees
1,397,968	Basic Spending for first 12 months	
602,302	Reserves	There are always unpredictable expenses and exploration

At this point depending on how far along we are and how much funding is left, we have two choices for the remainder of funds: 1) continue to focus only on the Oasis Machine or 2) take on other aspects of climate Tech and start research on how to add a CO2 removal to the Oasis Machine.

Next Step Two

If we stay with #1) we prepare for engineering the Oasis Machine for manufacturing with \$1,500,000 for one year- value engineering, testing for a prototype, cost/sales projections and market feasibility. Find manufacturing solutions. This is where we bring in the Beta Testers. This may be a group of companies that can use the technology in their business, or it could be professional lab companies that test products.

Step Three

\$1,000,000 for 9 months evaluating the marketplace, marketing materials, marketing team and negotiates with federal agencies.

A Hydrogen Hub:

The Dept of Energy has opened applications with a [\\$7 Billion](#) budget to establish 10 regional Hydrogen research centers across America. Participants described the importance of public-private partnerships to reach the Energy Department's "1-1-1" goal of reducing the cost of clean hydrogen by 80% to \$1 per one kilogram in one decade. Climate Tech is a [\\$2.5 Trillion-dollar new industry](#) and new ventures will be coming from the Dept of Energy, Foundations, Venture Capital and all manner of private funding. Everyone who comes up with a product will be able to participate. Hydrogen can be used for creating electricity at any scale and for replacing gasoline. It is going to be big.

Lab location has several potential participants:

Lightening Motors [Lightning eMotors](#) is located in the same building as the lab location. They are a new company currently building small trucks with fuel cell motors. We will propose a Joint Venture on building hydrogen motors using our electrolysis. This will occur in their space which is only 200 feet away.



Keysight Technologies [Keysight.com](#) is a major company that owns most of the property in a campus built by Hewlett Packard. The main business is in building digital instruments for measuring. They work on futures products with the cell phone industry and have a support division for other industrial services. We plan to ask them to test our Oasis Machines and certify.

- * An outside Courtyard for warm weather
- * A Cafeteria or Café for a variety of food and beverage services
- * For our team there is a gym, locker room, showers
- * Access to the Internet for uploading and downloading

Here are photos of some of the facilities. There is also a second level below where some manufacturing opportunities can be explored.



This facility gives us a Stage that will allow our Research Lab to engage more people with conferences, small meetings, open houses, podcasts. We can hold larger conferences for getting outside participation in our lab. As we get more familiar with the participants and with the facilities, we can also raise additional funding for future activities. Since our intended research has not been done at this scale before, our research lab needs to find the leading edge that others have already created.

THE LAB LAYOUT



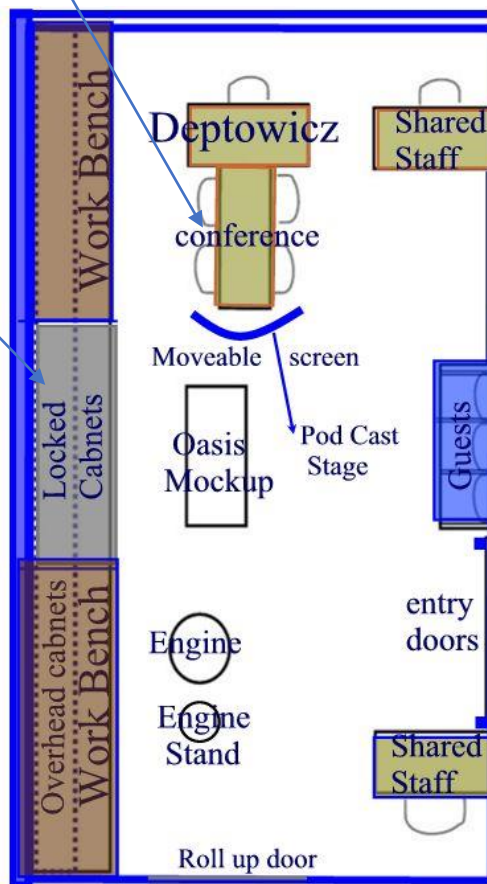
\$799.00
Asus ROG Strix ...
Amazon.com



This is a steel storage Locker with drawers for tools in the middle and adjustable shelves for larges objects on the side.



The current empty space with two entry doors and one rollup door.

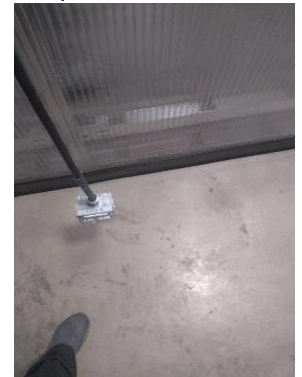


A schematic of 1,100 s.f. (22ft x 50 ft) room as shown to the left.



The Pod Cast Facility

The space has all furnishings on rollers for creating different arrangements. Teleconference screen is on rollers to support private conferences with Deptowicz and moved into position for public pod casts at the couch.



Some Water Economics

If we can get Oasis Machines to pull 3,000 gallons of water per day from the air at an average 30% humidity, this would provide 1,100,000 gallons per year per machine. One

acre foot equals 325,850 gallons. So, one machine could provide about 3-acre feet of water per year. In Colorado, an acre foot of water used to cost \$15,000 per in 2010. Now with Municipal Water Districts becoming the highest bidders over farmers, a new one time cost has soared up to [\\$58,000 per a/c foot](#). For example, the City of Greeley requires developers to buy water and donate it to the city or pay \$31,000 per acre foot. The vast majority in other states, such as California, Nevada, New Mexico and Washington, don't have this feeding frenzy yet and sales are occurring at much lower prices to farmers more like [\\$500 to \\$1,000](#) per a/c foot historically. But with everything drying up [everywhere](#), water is going to become much more expensive. If an Oasis machine earned \$5,000 per year and costs \$50,000 that would be a 10% return. If the costs were \$20,000 per machine that would be a 25% return on \$5,000 revenue per year. We think mass manufacturing could bring the cost down to \$10,000 per machine.

The cost of manufacturing is the big unknown now. For example, at \$10,000 per machine, it would cost \$100 million for 10,000 machines spread out along 1000 miles of the river. But what if the cost was \$20,000 or higher? Can these cities or rivers afford not to use this new technology in a water starved world? Once an industry is established mass manufacturing should bring existing high costs down to more affordable costs. Assuming we can get 3-acre feet per year from each Oasis Machine, the market could be huge over the next 30 years such as 5 million machines in America alone. Major competitors will jump in because it is not so complicated, and the technology will be badly needed. So, existing machines are inadequate in highly water-dependent commercial markets like agriculture and sanitation. When successful, the Oasis Machine can go anywhere, it can supply existing land uses and even start [new communities](#). The initial use we are after is a small Atmospheric Water Generator that can run anywhere off grid. Farmers use 85% of Americas water on crops and urban uses are only 15% for all the different needs. If it were bottled it could bring over \$2 million per a/f. As the world continues to dry out, water could become more expensive than gasoline and hydrogen generated water could become a big part of its replacement.

Only 5 to 8% of the water vapor falls annually as rain or snow to restore all the rivers, lakes, aquifers on earth. And the water vapor is also renewed annually. So, there is plenty of water vapor to use without damaging the atmosphere. In addition, a warmer atmosphere stores more water which makes storms more intense.

The size of the market depends on Impacts an Oasis Machine can address: Here are examples of why the market is so large. [An extreme heatwave and drought](#) was been roasting China for 70 days straight in 2022, something that “has no parallel in modern record-keeping in China, or elsewhere [around the world](#) for that matter.” “Included among these terrible events are record-breaking [heat waves in the Pacific Northwest](#) of the United States and Canada, [killing more than 100 people](#). One commentator believes

this is not just a 1200 year drought, but the beginning of permanent aridification; With examples like the early onset of [wildfires](#) in the West; [devastating droughts](#) across many parts of the United States and major rivers drying up worldwide you have to wonder. Lake Mead is near Las Vegas and supplies water to Hoover Dam. The water level has been down nearly 2/3 over the past 2 decades and if it drops by another 150 feet the electric generators will not have enough water to operate. [Hoover Dam](#) supplies over 2,000 megawatts to Los Angeles, Phoenix, and Las Vegas. This is enough to supply the needs of 8 million homes. Here is a scenario that could put a dent in the problem. This Technology already exists today, but the costs are much higher as each machine is handmade. Manufacturing of much smaller units could bring the costs down to this level. There are many unknowns that research can resolve like power requirements and maintenance, but the gist is it appears an Oasis Machine can make a sizable dent in this the earth drying up for less money. Here are some Relevant links: Lake Mead https://www.youtube.com/watch?v=NCBG_aVkv4s California is Sinking <https://www.youtube.com/watch?v=2kgLzSwL7kE> Vanishing Groundwater: <https://www.youtube.com/watch?v=RjsThobgq7Q>

Market and Customers

The rivers drying up are basically the responsibility of government: an estimated 60 million Americans living in drought-stricken areas. The demand for potable water will soon outrun the supply. The total worldwide market for this opportunity is currently over \$770 Billion and will reach \$1 Trillion in just a few years as Climate change causes disruptions. Another problem, this number could be over 2 billion people globally and estimates show that by 2030, nearly 50 percent of the world's population will live in severe water stress. Here are some major water users:

*Livestock farming: over \$160 Billion+ in the US. * Farming uses up to 83 Mil acre feet in USA. * Automotive manufacturing uses 1000 gallons per car.

Initial customers are Federal Agencies and States for large sales in the thousand at a time. For the earliest, we will need to involve them in our research and Beta Testing before arranging any sales. Within 6 or 7 years this market can use millions of Oasis Machines. Gradually agriculture, Military bases, Cities, hospital, transportation authorities, resorts, data centers and industrial are added. These sales will be smaller per buyer with more buyers. but harder to reach. Finally, the smallest users like residential, recreational vehicles, campers and backpackers can be added in with a machine designed for their smaller uses.

Marketing Option A

A 6 State Consortium: Selling Oasis packages to 6 States in 2000-unit per year per State quantities for testing the effectiveness of the Oasis Machines to generate the amounts needed. This concept focuses on the western States with the Colorado River and Rio Grande River. Apply to California, Arizona, New Mexico, Colorado, Utah and Nevada with this plan. The Research Labs makes its money by charging a \$1,000 license fee on each machine. Additionally, we can provide the State with a package of services including location planning, manufacturing, and student courseware. We are thinking about a *Public Benefit Corporation* (PBC) with each State owning 30%. This can also gradually grow both a Water Vapor Capture and a Carbon Capture industry for these State using Carbon Credits that pay down the bonds. Industrial Development Revenue Bonds are a standard in the financial industry and can be used to fund the 2,000 units purchased by each State each year. The California model is a Philanthropic one but the PBC can also accommodate profit investment. As climate conditions deteriorate, we expect this market will increase to 10 times the initial 2,000 annual quantities.

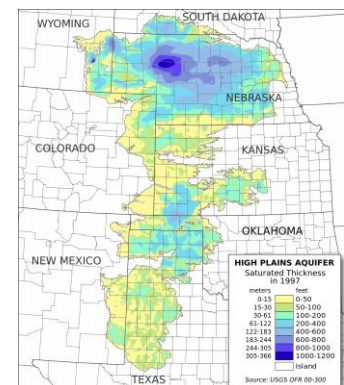
Marketing Option B

Commercial sales to farmers, data centers, Cities, and buildings will pay more than the \$10,000 costs to get this technology. Starting with farmers there is a great need for water as their rivers and aquifers are drying up. The Ogallala Aquifer is the greatest [concentration](#) of center pivot sprinklers in America as shown here. Many farms are closing because they hear a great sucking sound now like the sound you get from a straw when the soda is gone.

There are over
150,000
Central Pivots
in USA



[maps of
Ogallala Aquifer](#)

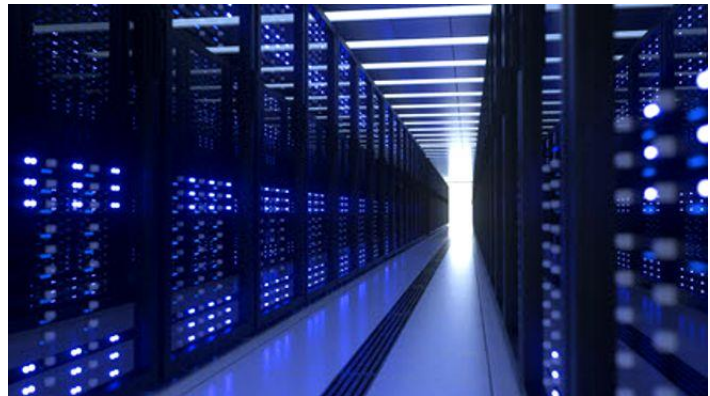


The Oasis machine can improve farmers' irrigation in several ways. It is cheaper to operate because central pivot farms don't have electricity, so they use [Diesel gas](#) to run their pumps. The Oasis Machine generates its own electricity estimated at under 4 cents per KW hour while supplying water and this would be many times cheaper than Diesel. We think the Oasis Machine can be configured to provide 3,000 gallons of water per day and someday even more. This is more than enough to grow several pivot sprinkler farms.

“Standard 40-acre system with end gun, installed at a cost of \$38,000 with a well and power source cost of \$30,000.” The amortized cost over 10 years will be low enough to keep these farms in business and grow many more. More access to water can also increase the harvest. There are other concentrated irrigation areas in the Americas such as Imperial Valley in California and the Motto Grosse in Brazil. This is an area the size of Texas where forests are being removed for farming. It is only about 25% developed but is expected to become the breadbasket to the world as this farming development continues.

Data Centers Use of Water

Total water consumption in the USA in 2015 was 1218 billion liters (3.75 liters = one gallon) per day, of which thermoelectric power used 503 billion liters, irrigation used 446 billion liters and 147 billion liters per day went to supply 87% of the US population with potable water. See [consumption figures](#).



Data centers consume water across two main categories: indirectly through electricity generation (traditionally thermoelectric power) and directly through cooling. In 2014, a total of 626 billion liters of water use was attributable to US data centers. This is a small proportion in the context of such high national figures; however, data centers compete with other users for access to local resources. A medium-sized data center (15 megawatts (MW)) uses as much water as three average-sized hospitals, or more than two 18-hole golf courses. Some progress has been made with using recycled and non-potable water, but from the limited figures available some data center operators are drawing more than half of their water from potable sources. This has been the source of considerable controversy in areas of water stress and highlights the importance of understanding how data centers use water.

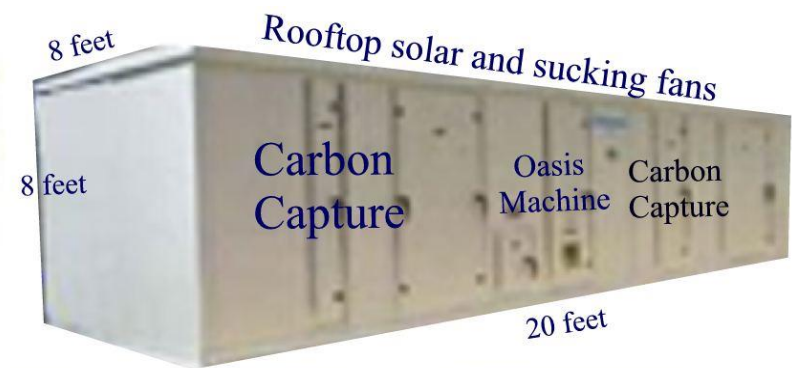
Cities

There are 275 cities in America larger than 100,000 population. Most of them have water problems from old, rusted clay pipes and even more modern copper pipes. This water is not only dirty, but also unsafe as evidenced by the growing bottled water phenomenon. Who would have thought 50 years ago that would be paying for clean water by the

bottle. An acre foot of water equivalent to 1000 gallons per day produced by the Oasis Machine can be bottled for over \$2 million in revenue. Cities are hot zones, and they can be cooled by more trees and bushes. Climate crisis predictions are that cities will become so hot it will become unbearable to live in most cities in the south. This new landscaping in turn will absorb more CO2 and that can be sold for carbon credits. Many cities can't supply enough new water for growth. Phoenix is an example where the governor just announced, *"developers that are seeking to build new construction will have to demonstrate they can provide an "assured water supply for 100 years using water from a source that is not local groundwater."* This [limits Phoenix home builders](#).

Phase 2 The Next Research Project is in Carbon Capture

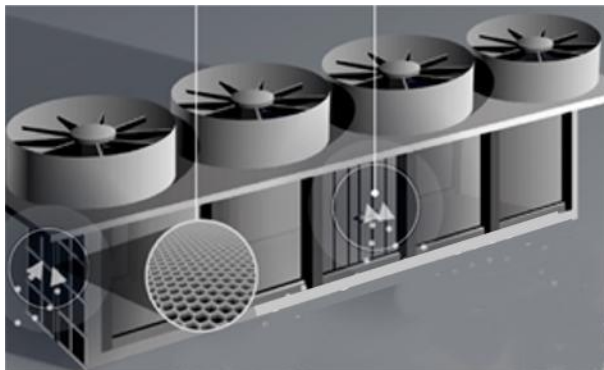
If we respond to new funding number 2) becomes possible. This is a bigger problem and could attract a lot more funding. Both will use the Electrolyzer technology developed in the early research. When we have a demonstration model Oasis Machine, we will start looking at Carbon Capture using the technology from the Oasis Machine. Direct air capture is in its infancy, and current versions of the technology are [extremely energy intensive](#) and that is why we must do the hydrogen from water technology first. It may require additional funding, if the original \$5 Million is used up. A Carbon Capture Machine is a companion project that is dependent on the Oasis Technology for electricity and perhaps water. It is expected to be about a 20' size like a shipping container. When we have a demonstration model Oasis Machine, we will start looking for the [Carbon Capture technology](#). Goal within 3 years is 1,000 tonnes per year per machine. See the [5 Best Ways](#) to pull carbon from the air. There are emerging [New technologies](#) that can make air capture more feasible. The air passes over a [sorbent filter](#) that traps the carbon dioxide and heats up the filter to 212 degrees, which releases the trapped carbon dioxide. Here is an M.I.T. [Solution](#) and the [US vision](#) for carbon Capture. Most Carbon capture today is focused on smokestacks where the carbon is very dense in one place. But that is expensive at \$50 million or so per site and the plant doesn't remove the ambient carbon dispersed all over America in less density. Below is the industrial size for removing 1000 tonnes p/y. Is [collaboration](#) possible? Berkley Labs is working on a Carbon Capture [absorbent](#). New materials are announced regularly like this [textile filter](#) that absorbs carbon.



Why Research Is Needed:

This research venture will follow the same template as the Oasis Machine with a survey of the industry and then an RFP among the industry to find the consulting talent the project needs. [Building public confidence](#) in air capture is a must. There's an increasing need for gas separation [membranes](#). Some say with existing technologies, we would need to treat 1.25 million cubic meters of air to capture one tonne of CO2 per year. [Better technology is needed](#). And that is the purpose of this research. Currently Carbon Capture is energy intensive when using the grid, that is why the oasis machine must come first to supply cheaper energy. If we could afford 5 million units placed along all our Interstate Highways, and if we can get to 1,000 tons per year each, then the goal of 5 billion tonnes per year of carbon could be attainable. Here is some computer modeling of [Climate warming](#) showing the need for such air capture. Even if we could stop all future emissions, there is still an estimated 400 billion tonnes over America that has accumulated for the past 125 years. Once diluted by atmosphere to 420 ppm, the volume of CO2 equivalent to a layer over the entire US land surface 1.8 m thick. This is the driver of today's climate change, and it must come out over the coming decades. It will cost \$trillions but can investors make money on the technologies? This study will look into how. There are many [new technologies](#) for air capture. Here is a new sponge like [material](#) to capture the CO2. Here is one called [mechanical trees](#). The [Department of Energy](#) is offering funds and [resources](#) on Carbon Capture research. The US government has allocated [\\$12 Billion](#) for research and development in establishing a carbon industry. [The big cash behind Carbon Removal](#). DOE also published the [Carbon Negative Shot](#)

The estimates online for CO2 in the American atmosphere is 400 billion metric tonnes. Thus, the need for [massive CO2 removal](#). If each machine could capture 1000 tonnes per year, it would take 10 million of them spread out along the highways, farmlands, forests, and urban areas to generate 10 billion tonnes per year of carbon removal. By manufacturing small machines like this, the price can be reduced from the huge \$50 million costs at power plants. Today's carbon price varies but the lowest is about \$20 per tonne but estimates for the next 10 years go up to \$100 per tonne. The research will also investigate the feasibility for revenues and costs to operate. Other questions like: How much energy does the machine require? How it stacks up against the [competition](#) will be investigated?



Can we engage the competition to collaborate on Climate Tech as a national enterprise? [Global Thermostat](#) in Brighton, Co. has an air capture machine shown left here that is very far along and similar to what we envision.

Elon Musk's \$100 Million competition is for a machine with a minimum of 1000 tonne removal py. So, the industry thinks this size is possible. [Iowa State](#) announced a 1000 tonne Carbon Removal per year entry. The changes just keep coming. A Use of Funds Budget will be crafted when more information is available.

Two centuries of CO2 has toxified the atmosphere, if we don't get the CO2 out of the air sooner than 30 years, mankind could be facing climate collapse. The bipartisan infrastructure bill President Biden signed into [law recently provides \\$3.5 billion](#) to create four regional direct air capture hubs with the capacity to capture and sequester at least 1 million tons of carbon annually. It also sets aside \$100 million for a commercial direct air capture technology prize and \$15 million for a pre-commercial competition.

Phase 3 The Third Project Is \$1,000,000 CO2 Utilization: Following the format of the other two research ventures, the initial effort will be to survey the industry to find the "State of the Future" for Carbon Storage. "Where to put the carbon emissions is the big issue: Taking CO2 out of the air and [using it to help plants](#) grow could be THE GREENING OF AMERICA. Carbon Dioxide can be used for crops, forests, and urban landscaping. For example, assume one tree absorbs one tonne of CO2 over 40 years. How much can an acre of corn or vegetables absorb?

Higher concentrations of carbon dioxide make plants more productive because photosynthesis relies on using the sun's energy to synthesize sugar out of carbon dioxide and water. Plants and ecosystems use sugar both as an energy source and as the basic building block for growth. When the concentration of carbon dioxide in the air outside a plant leaf goes up, it can be taken up faster, super-charging the rate of photosynthesis." Link to a [Soils Science](#) Revolution. [Companies](#) can calculate this. How does the carbon get into [soil](#)? Most of the CO2 still has to be collected for processing. [Precision Agriculture](#) is coming. New technology is promising with indoor farming, 1,500 times more yield but at a high price for electricity.

Transforming Carbon Dioxide Into [Industrially Useful Materials](#). There are many uses for carbon that could turn CO₂ into a tradable beneficial asset that can make money. Here are the [top 10](#) with estimated pricing. Below are some more detailed examples to storing the carbon dioxide such as:

1. CO₂ batteries [New CO₂ batteries](#) promise to store energy effectively
2. Soils sequestration [farming](#), large rocks, oil wells
3. Cement [made with CO₂](#) can be permanently stored in concrete ([video](#))
4. Diamonds - [Turning CO₂ into diamonds](#)
5. Fuels - CO₂ can be sequestered in [fuels](#).
6. Microprocessors - New carbon prospects for [electronics](#)
7. Vodka- Carbon can be used to make [Vodka](#) and other Spirits
8. Materials- there are many building materials which can use CO₂ like [drywall](#)
9. Other Materials- CO₂ can use many other materials which, [here are 10](#)
10. Spreading [rock dust](#) on farms: a tantalizing climate solution

This study will focus first on soils, which is the largest storage option and [calculate](#) the best way to get crops and landscaping to absorb carbon dioxide. [Vertical farming](#) is a leading candidate as it can produce many more crops per year than outdoor farming and it is not subject to the outdoor heat from climate change. However, it consumes a lot of electricity. Soil carbon sequestration can not only store CO₂ in the soil but [also enhance agricultural](#) yields. [The One Trillion Tree Initiative](#). Smaller projects can be [home gardens](#). What could 5 million home garden sized landscaping sites do for sequestration? As in the other two research projects a collaboration is planned, but this time among 3 universities to set up carbon crop labs and each one receives a \$100,000 stimulus to establish a lab for measuring the amounts of carbon dioxide various plants can absorb. [Composting](#) can help forests grow. The single most expensive part of growing a field crop is the fertilizer which has become very expensive. Someday farmers may be able to replace fertilizers with carbon that could be cheaper. This will require some pipeline to deliver it. [“There are over 5,000](#) miles of existing CO₂ pipelines already in the U.S. that are owned by 29 companies” [See Maps](#). There will be a big business in building pipelines to collect the CO₂ for processing. The industry with the most experience in pipelines is the Oil Industry. Exxon is getting into R&D with a [\\$15 billion](#) pledge. Companies are coming up with ways to calculate the [carbon footprint](#) of buildings.

Future Research Project: Fiber Optic Transmission/Media:

The fourth research venture will be “Fiber and Media Demonstrations”- This research will follow the same template used on the other ventures for \$1,000,000. Underneath the guideway there is room to hang 5 to 6 pipes about 3” in diameter. These pipes can carry

fiber optic cables with 72 strands in each. The carrying capacity of some strands can be multiplexed equivalent to 5 to 10 single fiber optic strands. Thus, the combined number of channels could grow into the thousands. Fiber optic cables solves a massive problem by removing congestion over the wireless networks. Research shows that 90% of all the digital information in use today has been created in the past 10 years. This means that the cables will fill up no matter what is put on them. But our idea is to introduce the newer media. This [growing](#) capacity will allow for all the existing forms of media plus new ones like Virtual Reality, Augmented Reality, [Apple fi](#) and 5G which is 60 times faster than 4G and even Spatial computing Holograms. Thus, creating huge new economic growth. ATT is marketing [fiber connections](#) for \$110 for residential up to \$190 per month for commercial depending on the speed. This tells us today's market.

In urban areas the fiber will go into a vault for connections, testing and access. These vaults will be about 8' by 10' and located at columns nearest to stations. A simpler system will be to hand off the final mile to existing telecoms in the area and let them use their networks or add wireless to the destination. In this scenario the local Telcos will be the customer and they will provide the electronics such as coders and decoders that change the photons used in the fiber into digital signals for transmission on their networks.

Another scenario is to build out the full technology and go for retail users. Along the guideways wireless transmitters can distribute and collect cell phone signals to an audience of user's livings within miles of each side. The end user will have control of this media through his cell phone. The cell phone can navigate this use of his traveling schedules, reservations, and deliveries. The fiber media construction cost (for the 50,000 miles Interstate backbone + another 50,000 miles in the cities) could include \$500 Billion of the \$3 Trillion Economic Model. In this scenario fiber will support 50,000 to 100,000 publishers in video, virtual reality and even holograms paying a higher fee to an audience of millions using their cell phones for access. New VR applications in sports, education, engineering, medical, entertainment, architecture and travel will create huge new revenues. They have not been calculated yet but are thought to double the amounts of other profits.

Grants

After we have been funded, one of the early positions we will fill is a Grants officer. There are hundreds of public and private foundations plus the Federal agencies who would like to see an air to water technology grow.

Examples:

[Natural resource conservation nonprofits | Cause IQ](#)
<https://www.causeiq.com/organizations/american-rivers,237305963/>

<https://www.causeiq.com/organizations/treepeople,237314838/>

<https://www.causeiq.com/organizations/american-farmland-trust,521190211/>

California seems to be the leader in progressive thinking on current issues. We will continue to explore ways of submitting proposals to CA that can be models for other States that share the CA water predicament. If we win an award, a similar technique will be used in Arizona New Mexico, Colorado, Utah and Nevada to form a coalition of States wanting to build Oasis Machine manufacturing centers in their State. These states can then act in unison to provide more water to their Rivers and farms. Over the next 5 to 10 years, it is feasible to consider manufacturing one million Oasis Machines delivering up to 3 million acres feet of water from the atmosphere in these 6 States.

“The number one tool the U.S. has to speed the energy transition around the world is Innovation”