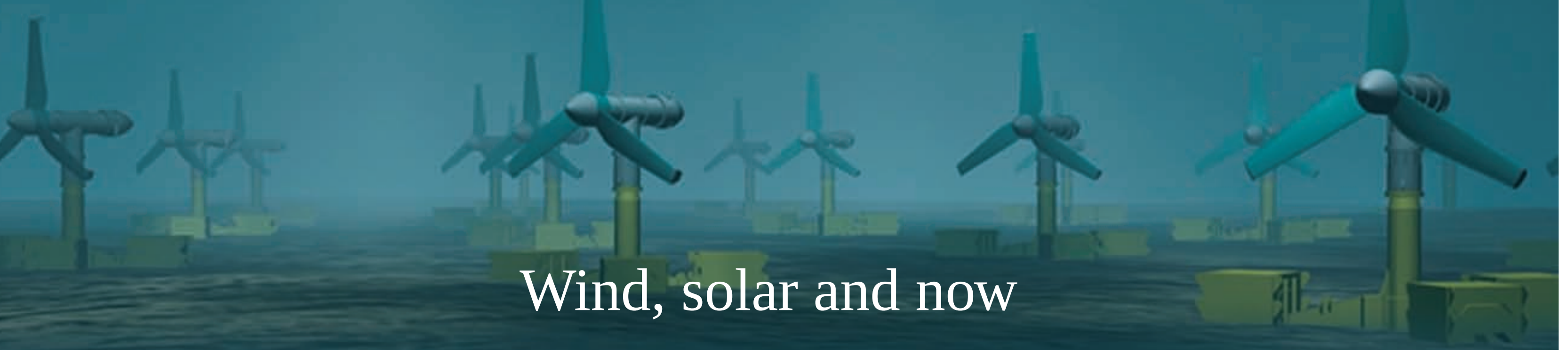
W I N D   S O L A R   M I C R O B I A L   G E O T H E R M A L



Wind, solar and now

WATERPOWER

In the pursuit of green power the US has taken us through wind power and now solar power is exploding and we're even looking at things like microbe power. However there is one thing we seem to be overlooking …the ocean or tidal power to be specific.

It is said that harnessing 0.01% of the oceans' power would supply about 5 years of the current worldwide demand for power.

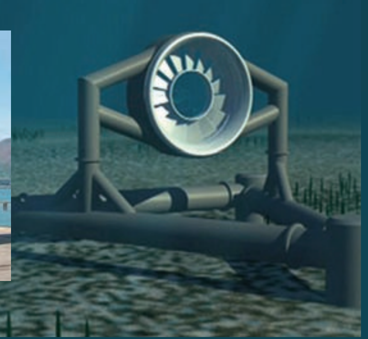
The potential power of the ocean has always been intriguing. Back in the 70's when the first gas price hikes hit the US there were all sorts of energy saving schemes around. The idea of harnessing the power in the oceans' waves to generate electric power surfaced. Soon intelligent, well meaning engineers and entrepreneurs were building floating and bobbing contraptions in the ocean, both here and on European shores. In a short time the colorful ocean generators were strewn along the shore like the remnants of a derelict seaside carnival. In the late 90's and early 2000's the interest and better technology focused on the sea as a source of power. Much of this effort has been located in Scandinavia and the British Isles. Today, these early experiments seem to be functional and productive.

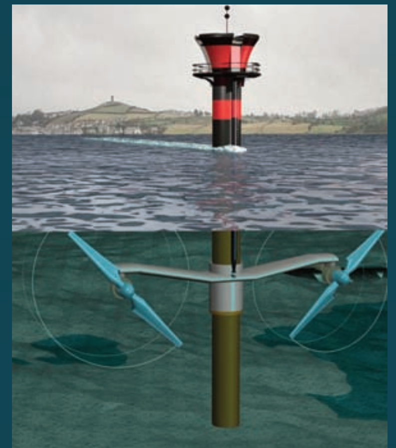
While generating power from wave action is possible, the primary efforts are tidal. The simplest approach to capturing tidal power is the formation of catch basins that fill on the high tide and then release the water on the low tide using conventional power generating equipment . Another approach is to build a barrage across an estuary allowing tidal waters to flow up and then directing their return through power generators. In this case the high tide provides a free fill up. These can be built anywhere from in the tidal water to the actual coast line or upstream of tributaries. Shore lines with extreme changes, i.e. Bay of Fundy, are the mother lode of tidal generation. Universities have already done extensive plotting of all the coast lines around the world while preparing calculations for potential tidal energy.

There is a 240 megawatt generating station at the mouth of the La Rance river in northern France. This has been operational since 1966 and was to be one of many, but France decided to expand their nuclear program instead. With the recent change in attitudes towards nuclear power this type of power generation may come back.

A more sophisticated approach is the water turbines.

These are "water mills" placed in and around inlets and channels or ocean bottoms with strong tidal movement. Large blades, similar to wind tower blades, are submerged in the more active tidal areas of ports and channels; driven by the moving water. The blades, set up vertically, can be easily be adjusted to match the direction of the tides. Due to the mass of water vs. air, their generating efficiency is extremely effective. Given normal tidal speed and volume a single water turbine would generate power equal to a wind turbine in winds of 350k/h.





One design has a tower mounted to the sea floor with the blades suspended from arms that lower into the water which means the towers have to be out in the strong tidal flow. Working prototypes of this design are up and running and being evaluated. Another version holds a multi-blade rotor (i.e. jet engine fan) submerged into the tidal flow. The rotor is held vertical facing the tide and rides up and down on rails tethered to the ocean floor. Others are anchored flat to the channel floor with blades parallel to the channel floor. All of these are designed so the mechanisms can be pulled out of the water for service and repair.

The predominate design seems to be the fully submerged underwater turbines appearing as if a wind farm had sunk beneath the ocean. Some use two sets of blades to capture the tidal flow in both directions, where other uses a single blade. With tidal flows ranging from 2.0 to 4.0 meters per second plus potential wave action, a 1 MW turbine with ballast weighs about 1300 tons. The nacelles are designed to be buoyant to a certain degree enabling an extraction with in a 30 minute slack tide period. Units are then taken ashore for their service. The design with the arms raises the blades and nacelle above the water they are serviced by small water craft. Service intervals have been designed for three years, but now appear to be going much longer than wind turbines with some test units reaching 4 years.

Just like wind turbines, underwater turbines have environmental issues as well. Up top its birds and bats, underwater it is fish. In addition, the units must be completely sealed to prevent the leakage of any lubricants into the ocean. The farms are positioned in depths that removed them from shipping concerns. The single towers that are positioned in inland channels have to be more careful of shipping activity.

The pace of the European tidal generation industry is picking up. With prototypes in the water back in the early 2000's many units are now functional and beginning to be connected to the grid. Activity ranges from Norway at the Arctic Circle down to Scotland and south to the coast of France.

Now that production of commercial water turbines has been initiated, the cost per Kwh is a major topic of discussion. There as in the US subsidies are being debated. The debate is not just about water turbines, but water vs. wind…and who gets how much!

The apparent potential to generate electric power from the ocean seems enormous. However, it seems that we are trying the same conventional techniques, using contemporary engineering. Solar needed the silicon wafer and its magic to make solar energy happen. Is there a solution to ocean energy we aren't seeing that will make these recent tidal efforts look medieval?

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THE LONGO LETTER

Let there be light...and power!

Sunken wind generators?

This job was a real buss-ter

A Longo hero?

SPORTS QUIZ

1. How old was Mike Tyson when he first won a part of the World Heavyweight Championship? a.19 b.20 c.23 d.22

2. Who is the all-time leading scorer in NCAA men's basketball (Division I)? a.Pete Maravich b.Wilt Chamberlain c.Michael Jordan d. Shaquille O'Neal

3. Nolan Ryan is the well-known strikeout king of Major League Baseball with over 5700 career strikeouts - but who is second on the career list? a.Tom Seaver b.Roger Clemens c.Cy Young d.Sandy Koufax

4. Who was the first athlete to appear on a box of Wheaties cereal? a. Mary Lou Retton b.Bruce Jenner c.Bob Richards d.Michael Jordan

5. Why would anyone sing about Johnny Bench's Cabernet. Do you know who they are? a.U2 b.ZZ Top c.INXS d.UB40

1.b 2. aPistol Pete averaged an astounding 44.2 points per game en route to scoring 3667 points for Louisiana State University from 1968-1970. 3. b. 4.c Richards an ordained minister known as the 'Vaulting Vicar', was an Olympic gold medalist in 1952 and 1956. He had made over 126 vaults over 15 feet by the time he retired in 1957. 5. d

The Largest Independent Electrical-Mechanical Sales and Service Company in the Northeast

THE LONGO LETTER

VOLUME 2 ISSUE 3   Our 65th year   FALL 2011

A big summer... in more ways than one.

Joseph M. Longo
President

Team Longo-Another first
Twenty-two years ago, when quality programs were not the hot buzzword or paradigm shift in business, we established a goal-to achieve ISO 9001 certification. No company in our industry in North America had accomplished this feat.

In August 1995 Longo became the first Electrical Apparatus Service (EASA) Company to be certified for the ISO 9001 quality standard.

Today we are again taking the lead as our Wharton Servicenter becomes the first and only EASA member in North America to operate completely on solar power. We are proud to say we are 100% green. Plans are underway to expand our solar independence by installing a solar system on our Linden Servicenter in early 2012.

Good Ol' Sol
With a quarter of a year of sunshine behind us, our solar system at our Wharton Servicenter is working out extremely well. How many times in this day and age do we run across things that meet our expectations, let alone surpass them...this is one of those times! I won't go into specifics as to what we are saving and earning, other than to say when I log on to our system in the morning and see those lovely solar credits (SREC's) being generated it sure is a nice way to start the day.

Running as fast as we can...
With budgets still tight on capital projects, our Field Service teams have been quite busy. Of particular interest is the installation of VFDs. I know we have been beating the drum on the savings these units can bring, now companies are finally pulling the trigger. With hard figures to support the decision, it really is a "no brainer". It is easy to finally get a signature, but it can be another story when it comes to the actual installation. Our techs have become quite proficient at all the nuances to make these projects work seamlessly from the initial layout to the final programming.

We have been fortunate enough to buck the trend and actually added personnel to meet our commitments. Like many of you, we would not have done this if we thought the demand was just short term. Hopefully things will continue to improve.

Too Quiet
Inspite of the all the heat this summer it seems that most of the utilities and power generators made it through unscathed. It would be disingenuous to say we don't look at the summer heat as a "service opportunity." On the other hand, I guess all our good work is showing its merit. As such, we are looking forward to the fall outage season.

This display in our Wharton Servicenter monitors our solar activity in real time as well as measuring our accumulated savings.

BUSSTED




Throwing out 13 stories of buss duct is one thing. Replacing it with floor specific cable setup is quite another...in 21 days!

An early August day, we received an emergency call from a distressed facility manager for an office complex in Bergen County. The building in question was one of three typical glass box office buildings from the 70's. The power distribution system, a 13 story buss duct arrangement, had failed and the fire department had responded to the failure by spraying the entire length of buss with chemicals, destroying it. All the tenants needed to be relocated so time was of the essence. A decision was made to completely replace the power wiring with conduit and cable since the replacement buss duct was no longer available.

Instead of each floor tapping into the one buss running from the basement to the 13th floor, each floor would now receive its power via cable from the basement power distribution center. Demolition of the buss and its components was simple, installing new conduit and running 15,000 feet of cable was the tough part.

Due to the configuration of the building, the switchgear locations, etc. a mass assault by technicians would not work initially. A more efficient use of manpower was setup with smaller teams of 15-20 technicians rotated on 12 hour shifts, 24/7. This arrangement also kept the technicians fresh since this type of work is a lot more physical than a simple motor installation or programming VFDs.

First, we needed to install all the necessary conduits to run the new cables. Overall we ran 5,000 feet of new metal conduit. It is easy to look at clean schematic on a screen and another to find yourself in 6'x 8' closet staring at a maze of electrical and mechanical equipment that beat you to the punch. Our techs seem to have xray vision at times understanding exactly where to place conduit to match up with runs and chases in the next room or next floor. Pulling cable is one of the more unpleasant assignments. The cable weighs about a pound a foot, which doesn't seem so bad unless you are hoisting it 13 stories in the air. Winches take care of the long hauls, but it is still a hands on job. With the conduits in and the cable finally run to each floor, there still remains the job of fire stopping all the penetrations. Longo's team arranged for the contractor responsible for this work to insure a timely completion.

From the day we stepped onto the premises, it took us 3 weeks to complete the assignment. Once again it was a combination of logistics and installation experience that made this project run smoothly and on time. Planning and execution versus a bonsai approach paid off.