



## Case Study: Aquatic Farm

### Taiwanese Aquatic Farm Prevents Asset Loss with Billion Smart Energy Management Solution

In the suburban areas of Taiwan, the owners of aquatic farms invest hundreds of millions of dollars in the development of high economical aquaculture. It is crucial for paddle aerators, pump motors, and automatic culture devices to always operate under the great condition and run 24/7 to inject enough oxygen and food to keep valuable aquatic assets alive. One unexpected power disconnection can result in fatal suffocation and immediate death of marine creatures, such as fishes, shrimps, and clams. To solve this problem, the owner of aquatic farm adapted Billion Smart Energy Management Solution as a reliable monitoring solution to ensure the efficient operation of paddle aerators and other farming facilities, as well as repair out-of-order devices to prevent asset damages in real-time.

Location: Taiwan

Date: 2015

#### Challenges

To aquatic farm owners, every piece of marine creature is accountable for dollars of money. Providing sufficient amounts of oxygen and nutrients is vital for the survival of fishes and shrimps. In Yunlin County, Taiwan, owner of one of the largest aquatic farms used to experience painful loss of assets due to the dysfunctional paddle aerators and feeding facilities. These farming types of equipment were in charge of pumping the fresh water, oxygen, and food into aquatic pools and kept marine creatures alive. Fish farm owners also faced the threat

of professional thieves who stole electrical cables and resold the inside coppers to earn unlawful money. Without the electricity supplied to paddle aerators, pump motors, and automatic culture devices, fishes, shrimps, clams would die immediately from the deprivation of oxygen and nutrients. The solution to these problems was to hire labors to physically inspect the surrounding of aquatic farms on an hourly basis, even in cold weathers, early morning, or middle-of-night. This regular labor inspection added significant inconvenience onto the substantial investment made by the aquatic owner.

## Our Solutions

Billion Smart Energy Management Solution provides as a comprehensive monitoring system to oversee the operation of aquaculture equipment. Billion installed five three-phase power meters and an internet gateway in total; meters were separately installed at three different paddle aerators, one automatic culture device and one pumper motor on an aquatic trail site. The site was approximately half of a soccer field large. These meters collected the power consumption of individual devices and sent the information to the cloud-computing platform. The administrator was able to sit back, access and monitor the power status of different equipment at anytime, anywhere. When the power consumption of one of the facilities was going abnormally low, the meter detected the data and delivered signals to the internet gateway. The internet gateway then sent out an immediate notice indicating unusual occurrences of power usage to administrators. At the same time, Billion Smart Energy Management Solution also sent alarms through SMS that notified the on-site manager to inspect the aquatic farm and check to see whether the facilities were operating in good condition. Billion rented the smart metering and gateway devices to the aquatic farm by charging a monthly rental fee of USD 100 dollar. The aquatic farm owner was able to monitor remotely the power status, energy consumption, temperature, luminaries, and humidity levels of three different marine farming facilities on the BEsmart Energy Management APP.

### Description:

Three Billion's smart meters and internet gateway were closely installed inside the power cabinet of paddle aerators to detect power consumption data. Smart meters delivered power consumption data to the internet gateway via Wi-Fi or 3G to assure a consistent information update. Energy Cloud Smartphone APP. The user could also set preferred system settling and easily turn equipment power on or off at only one finger tip away.

Throughout seven months of cooperation with the aquatic farm owner, Billion Smart Energy Management Solution

- Reduced manpower spent on regular, physical on-site inspection
- 24/7 remotely monitored the power consumption of three different types of marine farming facilities to make sure seamless operation.
- Detected unusual electrical activities, off-line devices and sent out instant alarms to administrator's Smartphone to notify the occurrence of thieves
- Prevented the death of high commercial aquaculture and protected valuable assets by intelligent managing the electricity supplied to aquatic farming equipment

## Benefits

Billion Smart Energy Management Solution successfully prevented significant loss of profits by protecting the aquaculture from thieving and unexpected equipment breakdowns. The owner wanted to reduce the overall energy consumption of his aquatic farm by controlling the electricity distributed to farming devices. The main purposes of paddle aerators and pump motors are to inject fresh water into the marine site, remove algae fuel and to reduce ammonia toxicity. In the next few months, an aquatic owner will integrate sensors to detect the ammonia and oxygen levels. Therefore, the sensors and Billion Smart Energy Management Solution can internally communicate to stop paddle aerators and pump motors when ammonia and oxygen levels have not reached a certain degree that would require water flows. The integration of software and hardware can also start the facilities when levels have been achieved. By this way, the aquatic farm can go completely automatic by reducing the electricity supplied for excessive fresh water flowing.

*" Billion Smart Energy Management Solution offered us a totally new, small platform to ease the status monitoring of different farming equipment. My family live 3 miles away from the aquatic farm, and it was inconvenient for us to physically inspect the site once every three hours. We are happy that Billion utilized this cloud-computing technology to reduce the labors we spent on equipment checking and efficiently prevent thieves from stealing our electrical cables. Billion and I are working on the technical integrations of IP-cameras and LED lights to complete a whole automation system with increased security and sightsee."*