

MIYAKOJIMA Next Generation Energy Park

The Whole Island Next Generation Energy Park

2015



Miyakojima City, Okinawa Prefecture

Look Touch Learn

Miyakojima's Next Generation Energy Park

The Concept for Miyakojima's Next Generation Energy Park

One of the park's main goals is to introduce people to the existing facilities on Miyakojima. There are several renewable energy facilities scattered around the island. The range of facilities include solar and wind generated electricity plants as well as bio-ethanol production facilities, which use methane gas as a raw material. In addition other facilities were established to provide farmers with livestock manure and garbage composting which also produces a cleaner fertilizer for farmers to use. This in result helps to protect farms from contamination caused by the seepage of liquid and chemical fertilizer into underground water.



Wind Power Generation Facilities
(Karimata Wind Farm/
Sadefune Wind Farm) 1p

E3 Manufacturing Facility 3p

Bio-Ethanol Production Facilities 3p

eco park miyako
エコパーク
(Miyakojima Eco Island PR Hall) 1p

Suger Bagasse Power Generation Facilities
(Okinawa Sugar Factory, Inc., -Miyako Branch) 2p

Methane Fermentation Facility
(Taragawa, Inc) 4p

Demonstration Project

- Mico-grid demonstration project in remote islands** 6p
- Island Smart Community Demonstration Project** 7p
- Miyakojima City Entire Island EMS Demonstration Project (SumaEco-Project)** 7p
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- Miyakojima City Small Electric Car Business Model Demonstration Projects** 8p
- Highly efficient Bioethanol manufacture and circulation project** 9p
- Micro Mobility Demonstration Project** 9p

What is Next Generation Energy Park ?

New energy sources like solar, wind power, and biomass fuel are the next generation of energy production. This is a way to produce energy while still maintaining harmony with the environment. The Energy Park is committed to the environmental preservation of local areas and to helping to deepen the public's understanding of energy consumption.

Why "Eco-Island"?



Miyakojima City, not having large mountains or rivers, has relied on underground water for the water used in daily life, such as drinking water and agricultural water. The importance of water has been understood for a long time, giving rise to the term "Water of Life" and it is the main reason that Miyakojima City must face issues with the environment. In recent years, due to changing social structures and lifestyles, daily life has become more luxurious and convenient, but as signs are starting to show that the environment is being strained, such as an increase in groundwater contamination and ocean pollution, the need to maintain the precious natural environment has become apparent. Moreover, because daily life on the island depends mostly on food and energy resources from outside the island, through local production for local consumption, a system of resource circulation is needed. Furthermore, it is not only a system of environmental preservation and resource circulation, but also it is important to connect this to the revitalization of the region providing job security through industrial development. From such a situation, an "Eco-island Miyakojima Declaration" was made in Miyakojima city in 2008. Miyakojima City is advancing an original approach of a low-carbon model city, the only kind in the country taking place on an island setting. So that where we live, Miyakojima City, can be "a rich and plentiful island which will be habitable indefinitely."

Eco-island basic concept

"A rich and plentiful island which will be habitable indefinitely"

Establishing harmonization with the natural environment under the concept of an eco-island Miyakojima, we will make efforts to establish a low carbon society.



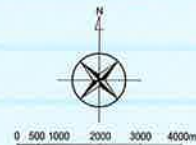
**Generated Compost Facility
(Miyakojima City Resources Recycling Center) 4p**

**Eco-House
(Urban Style/Suburban Style) 5p**

The Miyakojima City Underground Dam Museum 5p

**Miyakojima City
Mega-Solar Observatory 6p**

**Mega-solar Power Generation Facility
(Miyakojima Mega-solar Empirical Research Facility) 2p**



Declaration of Eco Island Miyakojima

We will protect our precious ground water which supports the island's life.

We will protect our beautiful coral reefs and the sea.

We will conserve our limited resources and energy by using our wisdom and creativity.

We will act individually, aiming to make Miyakojima beautiful, tidy, and earth-friendly.

We will think and act together with the peoples of the world to preserve and protect our environment and pass it on to future generations.

We will protect our forests, sea, and air and act to make an environment in which all living things can co-exist.

March 31, 2008 Miyakojima City

Miyakojima Eco Island PR Hall (nicknamed: Eco Park Miyako)



Summary

The main building presents an overview of "Eco Island Miyakojima", introduces the eco facilities that dot the island, and explains the type of island that Miyakojima is, which aims to build a low-carbon society system through initiatives. Exhibits are introduced and easily understood by using panels and videos. The information is not only for local residents, but also for visitors and school students. It is a facility that was built for promoting "Eco Island Miyakojima" to a wide range of ages and types of visitors.

What is Eco Park Miyako?

It is a Japanese-English combined phrase of the word "ecology," which aims at the coexistence of the natural environment and human beings, as "Eco," and the word "Park," which represents a location with a specific purpose. Eco Island Miyakojima is a system of base facilities that we hope will be visited and enjoyed by many people.

About the logo



It was created based on the alphabet of ecology. The middle blue is the earth, the small arrow is Miyakojima, and the circular lines represent recycling.



DATA

- 743 Uechi, Shimoji Miyakojima City, Okinawa 906-0304
- 0980-76-3979 FAX 0980-76-3979
- Open 9:00 to 17:00
- Closed on Mondays and national holidays



Eco Overview Corner



Introduction of an overview of Eco-island Miyakojima.

Eco Equipment and Facilities Corner



Introduction of current Miyakojima City eco-facilities projects.

Eco Demonstration Project Corner



Introduction of each facility of the Miyakojima Demonstration Project.

Eco Future Corner



The ecological future of a rich island.

Eco Kids Corner



Education and information using characters and eco experience goodies.

Eco Training Room



Training room using large-scale screen projection.

Wind Power Generation Facilities (Karimata Wind Farm / Sadefune Wind Farm)



Summary

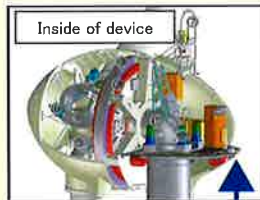
Two of the four wind turbines at Karimata were completely destroyed in 2003 by typhoon No. 14 which hit Miyako Island. Since damage was severe, the other two wind turbines were removed. At Sadefune in Gusukube, one wind turbine was destroyed outright, and one wind turbine was removed due to shuttlecock damage. Now, in Karimata, three wind turbines (2 900 kW generators belonging to Okinawa New Energy Development Co. and one 600 kW generator for Okinawa Electric Power Co.) are in operation. In Sadefune, two wind turbines, both 900 kW Okinawa New Energy Development Co. turbines, are in operation. There are currently five wind turbines in operation.

Feature

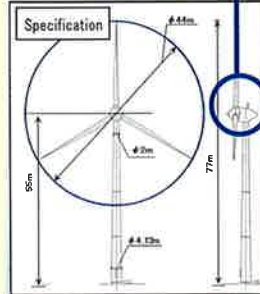
The wind turbines create kinetic energy from the turning of a wind turbine by the wind. This energy is then transmitted to a power generator. One great advantage of wind power, over other currently used methods of energy production is that wind power is a clean and renewable source of energy. A disadvantage is the unpredictability of weather conditions needed to power the turbines. However the advantages of wind power greatly outweigh the disadvantages, making it in our best interest to continue to make the best use of wind energy.

Annual electric power production

The total production of electricity of the three wind turbines at Karimata is 6.2 million kWh. The production of electricity of the two windmills at Sadefune is 4 million kWh. The wind turbines can generate an average of about 10.2 million kWh every year in total, which is equivalent to the annual amount of the electricity used for about 2800 households.



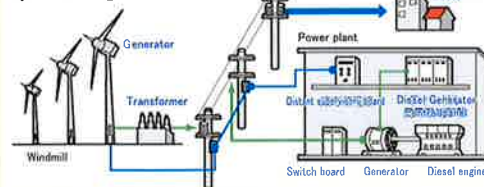
- | | |
|---|--------------------------|
| ① | Main frame |
| ② | Swing motor |
| ③ | Generator stator |
| ④ | Generator rotor |
| ⑤ | Blade adapter |
| ⑥ | Blade rotary motor |
| ⑦ | Wind vane and anemometer |
| ⑧ | Airplane warning light |



Items	Main items
1	Manufacturer: ENECORN Inc.(Germany)
2	Windmill form: Horizontal axis propeller type with yaw drive
3	Rated wind speed: 14m/s
4	Rated power: 600kW
5	Power generation start wind velocity: 2m/s
6	Power generation stop wind velocity: 25m/s
7	Yaw rotation speed: 12~24rpm
8	Height of hub: 55m
9	Blade length: 44m
10	The height of attached joint: 77m
11	Tower top diameter: 2m
12	Tower base diameter: 4.13m

Source: New Energy Development Co., Ltd.

System configuration



Source: Okinawa Electric Power Co., Ltd website.



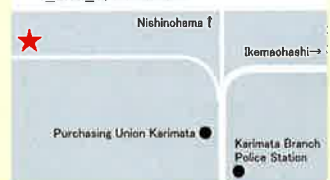
Karimata Wind Farm



Sadefune Wind Farm

DATA

- 358 Hirara, Karimata Miyakojima City, Okinawa 906-0002
- TEL 098-877-2341 FAX 098-876-8531
- The exterior of the facility can be viewed at anytime. Facilities tours: Reservation required.
- http://www.okiden.co.jp/corporate/r_and_d/wind.html



Mega-solar Power Generation Facility (Miyakojima Mega-solar Empirical Research Facility)



Summary

A study using the "Grant-in-Aid" from the Ministry of Economy, Trade and Industry (FY 2009) was conducted to examine the photovoltaic power generation of an outlying 4,000kW small-scale stand-alone system and the 4,000kW NAS battery*1. The study also analyzed the operational data of the battery's storage ability as well as the effects to the real system when large amounts of solar power is produced. There is ongoing empirical research to improve and stabilize the project.

Solar Power

The method of power generation, where direct sunlight is converted into electricity is known as solar power generation. This use of solar energy is an example of renewable energy. The amount of solar power generated relies heavily on weather conditions. Inclement weather can significantly degrade the amount of power generated. In addition solar power can only be produced during daylight hours.

Characteristics of Solar Power

- Solar power is an inexhaustible source of energy.
- It is also a form of clean energy, with zero CO₂ emissions.
- Since there are no mechanical moving parts, solar power is a simple but effective means of energy production.
- It can also be designed to meet required energy needs.



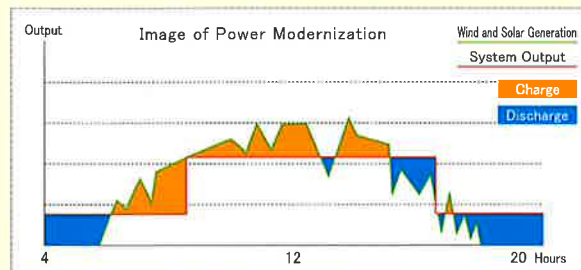
DATA

- 1878-1 Fukuzato, Gusukube Miyakojima City, Okinawa 906-0103
- TEL 098-877-2341 FAX 098-876-8531
- The exterior of the facility can be viewed at anytime. Facilities tours: Reservation required
- http://www.okiden.co.jp/corporate/r_and_d/solar.html



The Modernizing of Renewable Energy

Adjustment of the NAS battery to absorb the fluctuation of energy from wind and solar power would contribute to the stability of the system.



*1 The NAS Battery is a sodium sulfur battery with a negative sodium electrode and a positive sulfur electrode. The sulfur-sodium holds at a high temperature allowing it to remain at a liquid state. It is often used in large scale electricity storage.

Suger Bagasse Power Generation Facilities



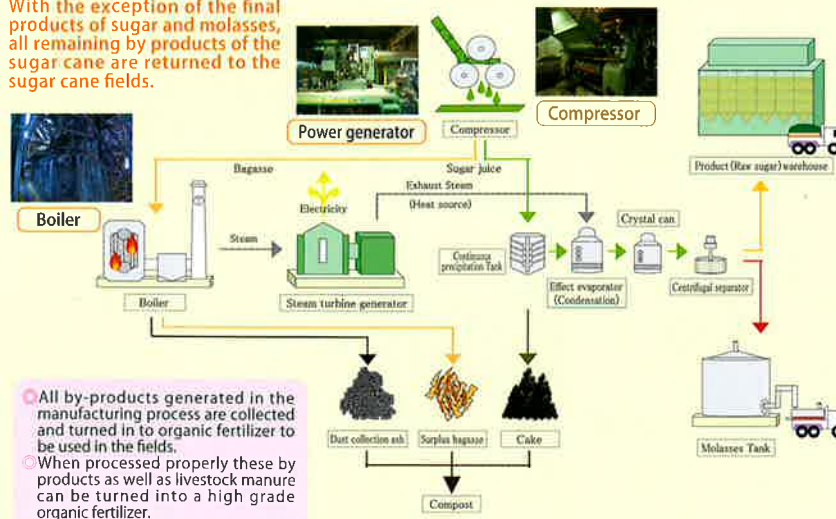
Summary(Okinawa Sugar Factory, Miyako Sugar Factory)

The process of turning sugar cane in to sugar is separated into four different procedures: "carry" "squeeze" "clean" and "crystal". During the "squeeze" portion of the process bagasse from the sugar cane is used to fuel the boiler of the steam turbine which generates power for the facility.

The utilization of recycling plants that use biomass resources are friendly to the environment.

The fibers from sugarcane can be used as fuel which allows for in-house power generation. In addition, the moisture produced from circulation and exhaust steam condensates in the boiler turning into water which evaporates leaving behind a kind of "sugar juice" which reduces the amount of water required in the process.

With the exception of the final products of sugar and molasses, all remaining by products of the sugar cane are returned to the sugar cane fields.



- All by-products generated in the manufacturing process are collected and turned in to organic fertilizer to be used in the fields.
- When processed properly these by products as well as livestock manure can be turned into a high grade organic fertilizer.



DATA

- 725 Uechi, Shimoji, Miyakojima City, Okinawa 906-0304
- TEL 0980-76-6003 FAX 0980-76-6006
- Please ask about a factory tour. Harvest Season. (Closed to Tours)



DATA

- 836 Sunagawa, Gusukube Miyakojima City, Okinawa 906-0108
- TEL 0980-77-4119 FAX 0980-774118
- Please ask about a factory tour. Harvest Season. (Closed to Tours)
- <http://www.miyako-seitou.co.jp/>



Bio-Ethanol Production Facilities

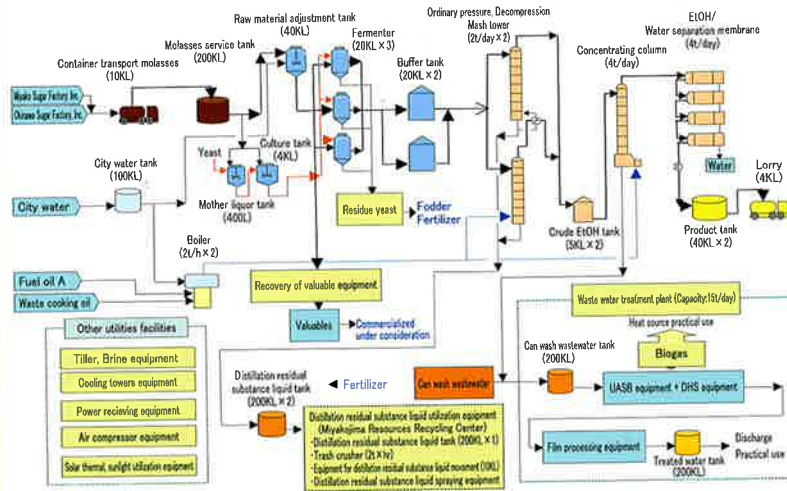


Overview of the Facilities

The facility, which generates ethanol from sugarcane - which is the main crop of Miyakojima - by using the molasses by-product created in the process by which sugar is made. Also created, in addition to E3 fuel, this by-product of the manufacturing process also yields fertilizer, yeast, and feed.



Outline of ecofuel practical use region system proof business equipment (EtOH production capacity: 4t/day)



- DATA**
- 730-1 Uechi, Shimoji Miyakojima City, Okinawa 906-0304
 - TEL 0980-76-3977 FAX 0980-76-3978
 - Facilities tours: Reservation required
 - Tours of the facility can not be conducted while machinery is operation.
 - <http://www.bioethanol-miyakojimapj.jp/index.jsp>



E3 Manufacturing Facility



Overview of the Facilities

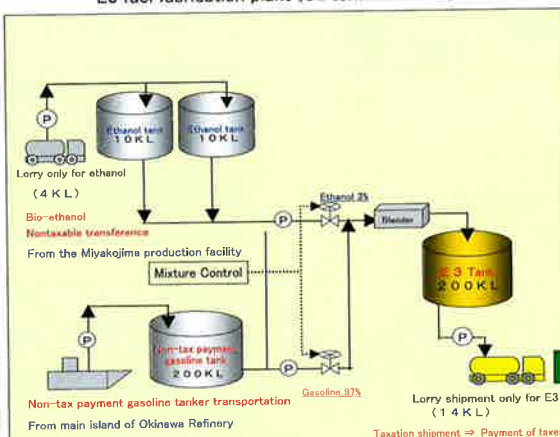
Currently bio-ethanol as well as E3 fuels are being produced on Miyakojima. The facility is inside of a Ryuseki, Inc. Miyako oil terminal. E3 fuel manufactured with this institution is delivered by the city E3 gas station.

What are E3 Fuels?

E3 fuel is fuel for cars which mixes 3% bioethanol with gasoline. From the production of bioethanol to the manufacture of E3 fuel, a complete distribution system was created by Miyakojima City in 2014.



The equipment outline of an empirical-study enterprise E3 fuel fabrication plant (Oil terminal whole)



Dedicated refueling facilities



- DATA**
- 2-40 Nishinakasone, Hirara Miyakojima City, Okinawa 906-0006
 - TEL 0980-72-3119 FAX 0980-72-8681
 - 9:00 to 12:00 13:30 to 16:30 Monday to Friday (reservations required)
 - <http://www.bioethanol-miyakojimapj.jp/detail.jsp?id=9586&pageStart=0&menuid=3540&funcid=2>



Methane Fermentation Facility (Taragawa, Inc.)



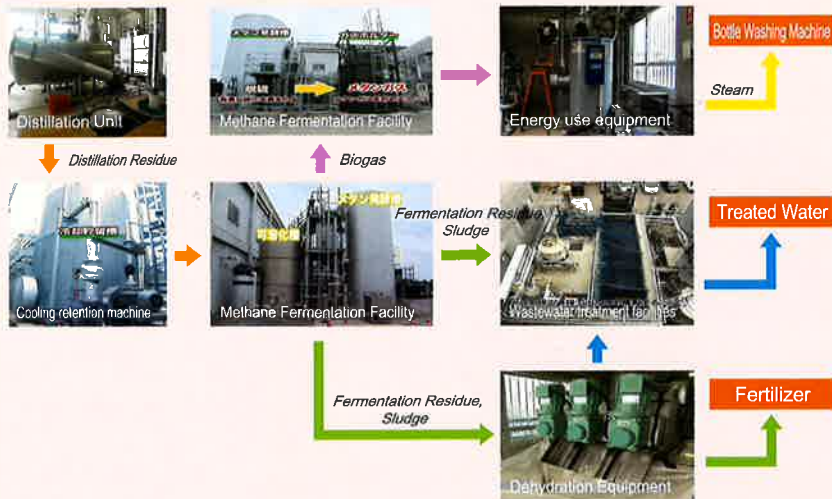
Summary

In the Awamori Plant bio-gas residue left over from the brewing procedure is pumped to the methane fermentation facility and then used as fuel for the boiler. The steam produced in the procedure is used for distillation and bottle disinfection.

Facility

6t of sake lees is produced per day. This produces 340N m³ (concentration CH₄, conversion 60%) of gas in the process. 23.7kl of CO₂ emissions and approximately 64t of fuel oil can be reduced per year. After methane fermentation, dewatered sludge can be treated and used as fertilizer.

設備フロー



DATA

- 85 Sunagawa, Gusukube Miyakojima City, Okinawa 906-0108
- TEL 0980-77-4108 FAX 0980-77-7705
- 9:00 to 16:30 Monday to Saturday
- <http://www.taragawa.co.jp/>

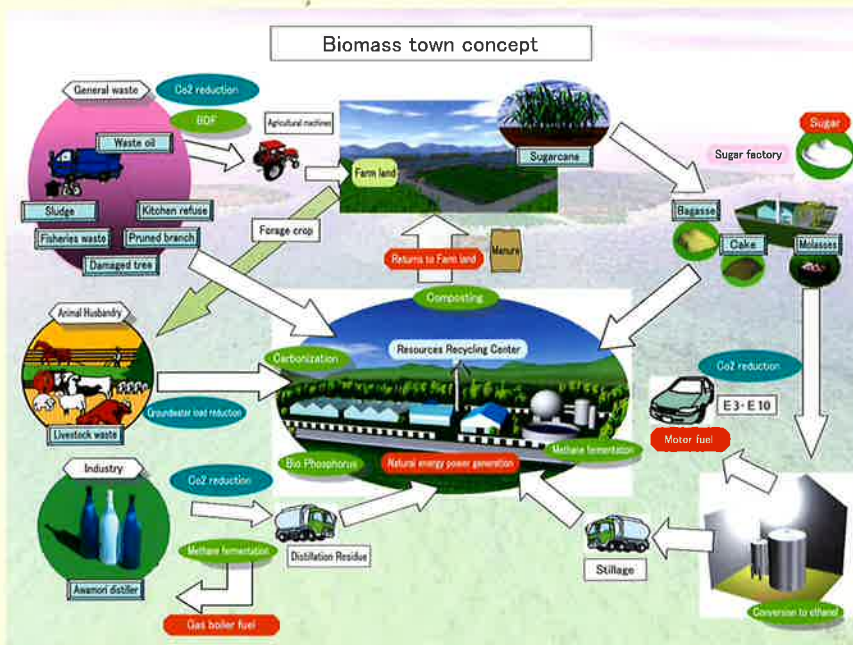


Generated Compost Facility (Miyakojima City Resources Recycling Center)



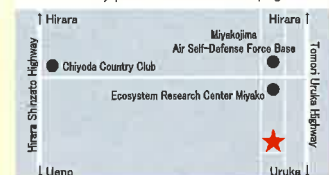
Summary

In 2003 the Ministry of Agriculture, Forestry and Fisheries established the Miyakojima Resources Recycling Center. The center was created to handle regional resource circulation management and provides services such as livestock manure and garbage composting. The center also contributes to food safety, promotes the conservation of ground water and improvement of the environment.



DATA

- 1190-212 Nobaru, Ueno Miyakojima City, Okinawa 906-0201
- TEL 0980-76-4777 FAX 0980-76-6144
- 8:50 to 17:00 Monday to Saturday (Reservations required)
- <http://www.city.miyakojima.lg.jp/site/view/content.jsp?cateid=7&id=1040&page=1>

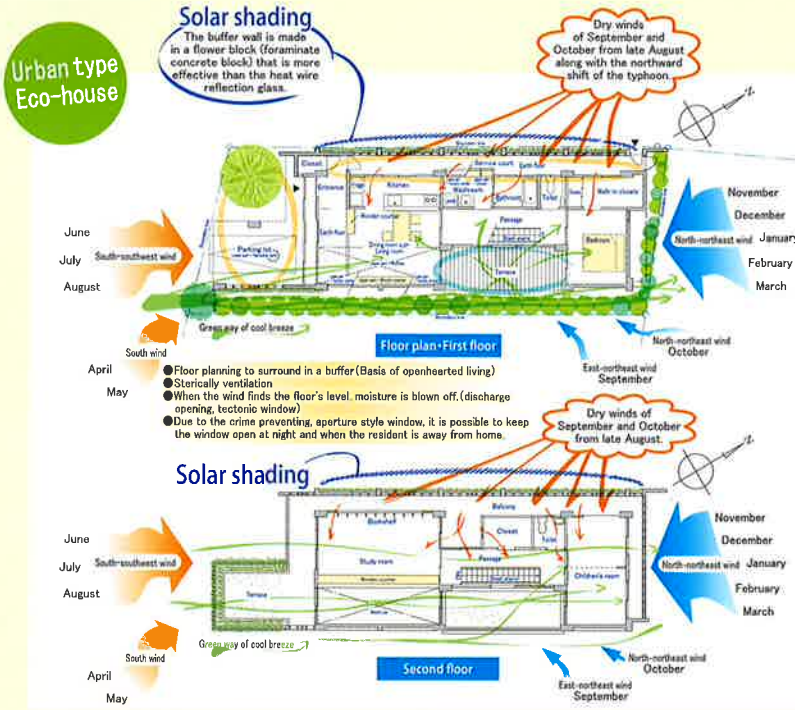


Eco-House (Urban Style/Suburban Style)



What is Eco-House?

Eco houses are houses that can be built using local and natural resources as well natural energy. The fundamentals of an Eco house are to build it with materials close at hand with the least amount of burden to the environment.



DATA

- Urban Style : 255-6 Nishizato, Hirara
- Suburban Style : 56 Tomori, Gusukube
- TEL 0980-72-3751 FAX 0980-72-3795 (Miyakojima-City eco-island promotion section)
- Please ask about use.
- <http://www.city.miyakojima.lg.jp/site/view/contview.jsp?cateid=34&id=1269&page=1>



The Miyakojima City Underground Dam Museum

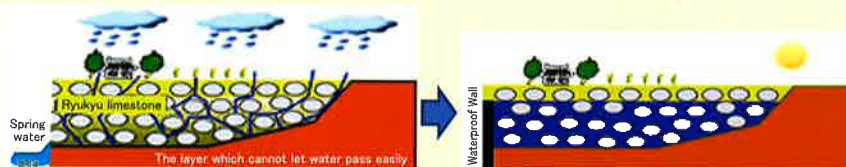


Summary

The Underground Dam on Miyakojima is the first of its kind. A narrated video explains the mechanics and technology of the structure's construction. In addition, an apparatus has been built to allow a hands on experience with lights to explain information about the dam's water. In the underground hall is a 1/10 scale reproduction of the bowling and core's real depth of 70m as well a geological cross section model of Miyako island.

What are Underground Dams?

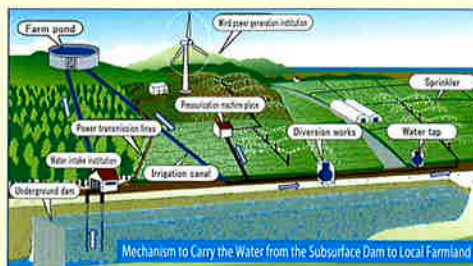
The Underground Dam is a facility created to control the flow and accumulation of ground water.



The necessity of an underground dam

Due to the lack of rivers on Miyakojima and the unreliability of rain water, the underground dam was built to collect ground water to be used for agriculture.

Conceptual Diagram of the Construction of a Subsurface Dam



DATA

- 1645-8 Fukuzato, Gusukube Miyakojima City, Okinawa 906-0103
- 0980-77-7547 (TEL & FAX)
- 9:30 to 18:15 April to September
- 8:30 to 17:15 October to March
- <http://www.city.miyakojima.lg.jp/site/view/contview.jsp?cateid=8&id=539&page=1>



Miyakojima City Mega-Solar Observatory



Summary

Miyakojima Mega-Solar Research Facility, located along the Nanamata Coast in Gusukube. The building located where the roads cross in the center of this extensive site is the Mega-Solar Observatory. The building, made of reinforced concrete, is two-stories and has a height of over 8 meters. From the second floor balcony and from the roof, a full view of the solar panels of the research facility can be seen. Moreover, an explanation board of the Mega-Solar Research Facility is set up on the rooftop so, even without pamphlets, details of the facility's equipment and research can be understood. The Mega-Solar Observatory is situated east of the road in front of the entrance to the research facility. The sign with a picture of "Mi-ya" is easy to see. Anyone can use the observatory at any time, so why not stop by whenever you please, even when you are on a drive.



DATA

- 1878-21 Fukuzato, Gusukube Miyakojima City, Okinawa 906-0304
- Use is always possible.
- TEL 0980-72-3751
FAX 0980-72-3795
(Miyakojima-City eco-island promotion section)



Demonstration Project

Mico-grid demonstration project in remote islands



<Summary>

The electric power system of Miyakojima is an independent system, not connected with mainland Okinawa or Ishigaki Island, and in the case of introducing large-scale natural energy such as solar power and wind power generation, a demonstration for the construction of a mechanism to provide a stable supply of electric power is underway. With a micro grid, the effects of fluctuations of natural energy generation easily cause problems that need to be solved. In Miyakojima, to solve this problem, large-scale storage batteries are used, the fluctuations of power generation by natural energy are controlled, and an inspection to use electric power with stability is underway.



Approximately 22,000 solar panels installed over approximately 100,000 square meters - equivalent to two Tokyo Domes - and two wind turbines (the Sadefune wind-power plant) for wind-generated electricity are installed in the Miyakojima mega solar proof research facility in Gusukube.

*A "micro-grid" in the sense of a small-scale power generation network. It connects the small-scale electric generating facilities, such as solar and wind power, biological resources, and fuel cells in the area, and attempts to correspond to local power demand.

- The projects are designed to develop the technology to support an independent low carbon social system for the island and other areas.
- It also promotes the development of the tourist industry by promoting eco-tours of the empirical research facilities.

Island Smart Community Demonstration Project



<Summary>

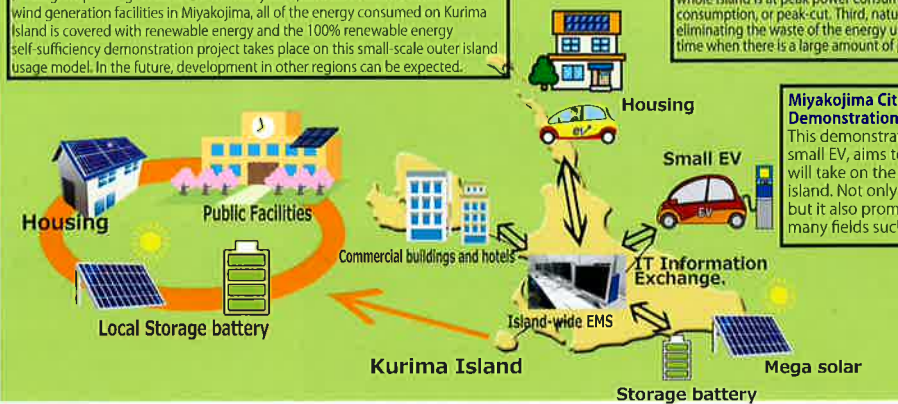
The aim is to construct an "Island Type Smart Community Project," to introduce large quantities of renewable energy such as solar power, make good use of IT, control the supply and demand of electric power on the island, and raise self sufficiency in energy, with the goal of constructing a supply and demand system for new energy. The "Entire Island EMS Demonstration Project," (also known as the Suma Eco-Project), the "Kurima Island 100% Renewable Energy Self-Sufficiency Project," and the "Small Electric Vehicle Commercialization Model Demonstration Project" are all underway as well.

A "Smart Community" is a social system that efficiently uses natural energy by making good use of IT (information technology) in the entire society, such as in homes, in offices, and in transportation.

Kurimajima 100% self-supporting renewable energy demonstration project
In this demonstration project, the system includes solar panels that are used and are set up on buildings in approximately 30 places on Kurima Island. In addition, extra power that is generated is stored in storage batteries on the island, and this power can be used at night or when the weather is unfavorable and there is a shortage in power generation. With this system, combined with the data from wind generation facilities in Miyakojima, all of the energy consumed on Kurima Island is covered with renewable energy and the 100% renewable energy self-sufficiency demonstration project takes place on this small-scale outer island usage model. In the future, development in other regions can be expected.

Miyakojima City Entire Island EMS Demonstration Project (Suma Eco-Project)
The "Miyakojima City Entire Island EMS Demonstration Project" also known as the Suma Eco-Project, aims for "smart living for the suma (island)", and has homes, offices and pump stations for the underground dam to do more than understand the electric power usage. First, there is the ability to see what is called the "visualization of electricity," eliminating the waste of electricity and promoting energy conservation. Second, when the whole island is at peak power consumption, everyone can co-operate to reduce consumption, or peak-cut. Third, natural energy is efficiently used to its maximum while eliminating the waste of the energy used on the island by shifting consumption to the time when there is a large amount of power generation of renewable energy.

Miyakojima City Small Electric Car Business Model Demonstration Project
This demonstration project, involving production of a small EV, aims to promote the talent and technology that will take on the "manufacturing" within the island. Not only does it promote manufacturing, but it also promotes the use of the small EV in many fields such as sightseeing and education.



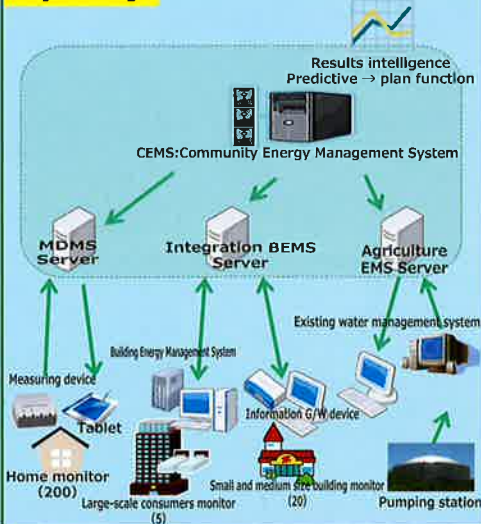
Miyakojima City Entire Island EMS Demonstration Project (Suma Eco-Project)



<Summary>

The "Miyakojima City Entire Island EMS Demonstration Project," also known as the Suma Eco-Project, aims for "smart living for the suma (island)", and has homes, offices and pump stations for the underground dam to do more than understand the electric power usage. First, there is the ability to see what is called the "visualization of electricity," eliminating the waste of electricity and promoting energy conservation. Second, when the whole island is at peak power consumption, everyone can co-operate to reduce consumption, or peak-cut. Third, natural energy is efficiently used to its maximum while eliminating the waste of the energy used on the island by shifting consumption to the time when there is a large amount of power generation of renewable energy.

Project image



200 households.
A measuring device and a tablet are installed in this project, and the collection of data and "electric visualization" are possible via the Internet by information technology. 25 commercial businesses and 19 agricultural pump locations.
A measuring device collects data and "electric visualization" with PC, etc.
A measuring device collects data and provides "electric visualization" using computer software. In the project, the simulation of power consumption of the whole island is carried out based on the collected data. It is a system which encourages citizens to avoid electric use at peak hours of electric usage. An energy management system aims to optimize power consumption.

Community Energy Management System (CEMS)
This system checks the total amount of electricity used on the island, and requires power-saving cooperation from homeowners and business owners.
Meter Data Management System (MDMS)
This system manages data collected by measurement and "electric visualization" is carried out.
Integration of Building Energy Management System (BEMS)
This is a system which mainly manages the electric power energy of large institutions. Some buildings are unified and managed through the Internet in Miyakojima City.
Agriculture Energy Management System (Agriculture EMS)
The agricultural storage pump runs whenever the water level of the underground dam falls, so energy use cannot be restricted to specific times. So this would be used to "visualize" energy use, and perform a timely use of solar power generation and power peak shift / cuts, so as to reduce the electricity peak consumption of Miyakojima as a whole.

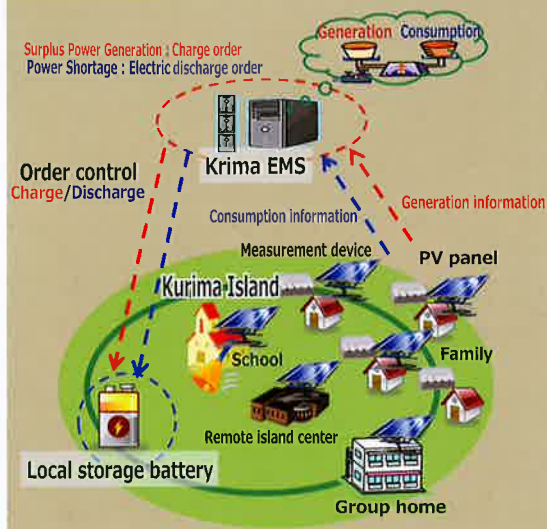
Kurimajima 100% self-supporting renewable energy demonstration project



<Summary>

In this demonstration project, the system includes solar panels that are used and are set up on buildings in approximately 30 places on Kurima Island. Also, extra power that is generated is stored in storage batteries on the island, and this power can be used at night or when the weather is unfavorable and there is a shortage in power generation. With this system, combined with the data from wind generation facilities in Miyakojima, all of the energy consumed on Kurima Island is covered with renewable energy and the 100% renewable energy self-sufficiency demonstration project takes places in this small-scale outer island usage model. In the future, development in other regions can be expected.

Project image



The outline of the Kurima Island

Location : Southwest of Miyako island, about 1.5 km.
(It is connected by bridge to Miyako island.)

Population : About 200 persons

Arie : About 2.84 k m²

*One village along with agricultural areas, such as sugarcane fields and fruit orchards, are located on Kurima island.



Miyakojima City Small Electric Car Business Model Demonstration Projects



<Summary>

Locally servicing and maintaining electric cars, which do not emit CO₂, via island-wide cooperation and training will aid in the development of human resources and technologies on the island, including metal processing and the related field of automobile maintenance. The aim of this is to achieve the promotion of industry.

<Participating parties>

General corporation by the Miyakojima Work Club; Miyakojima Chamber of Commerce; Miyakojima Tourist Agency; Miyakojima Junior Chamber of Commerce; and Okinawa Prefecture Automobile Maintenance Promotion Association, Miyako branch.

<Cooperative organization>

Okinawa Prefecture Mold Technology Research Center, Institute of Manufacturing Network Okinawa.

Project image



Since an electric vehicle (EV) has a completely different structure from a vehicle with an internal combustion engine, the promotion of EV use is essential for environmental improvement.
By having various island organizations work together on achieving the development of human resources and technology, we aim to put to practical use experience within various fields.



Highly efficient Bioethanol manufacture and circulation project



<Summary>

Miyakojima city builds the recycling society by "cascade use" of the basic crop of sugarcane, and it is undertaking the business aiming at industrialization of bioethanol from Okinawa.

*Cascade use = resources are used for their energy potential; such secondary use of resources may have lower initial efficiency, but multiple use ensures greater resource value.

High efficiency bioethanol production.

The goal is improvement in the efficiency of bioethanol manufacturing and the reduction of costs by the further refinement of the yeast developed along with the Ministry of the Environment.

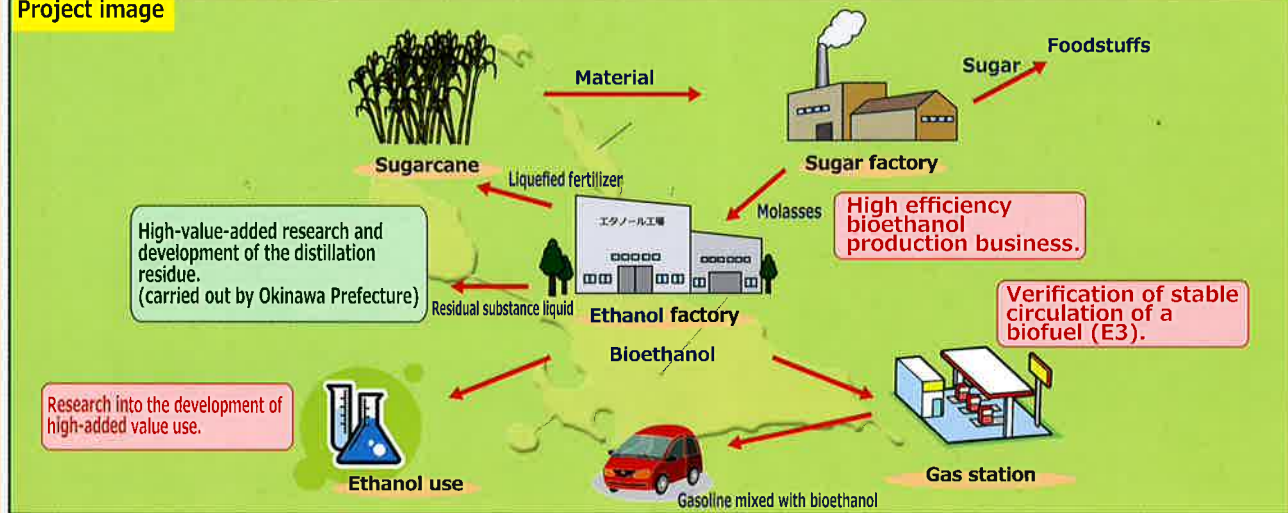
Verification of stable circulation of a biofuel (E3).

Goals are verification of a stable distribution system configuration of biofuel (E3) on an island, and the expansion of biofuel use.

Investigation into the development of high-value bioethanol.

For improvement in the economical efficiency of bioethanol, a practical use policy with ethanol developing a higher value than other fuels is being developed.

Project image



Micro Mobility Demonstration Project



<Summary>

Miyakojima City proposes a micro EV usage model that is appropriate for the environment of remote islands and works on the "Micro Mobility Demonstration Project". In keeping the vehicle miniature, the weight is minimized and environmental efficiency is high, and negative environmental impacts are reduced. In the demonstration project, the charging stations are powered using solar panels, which lead to a decrease in running costs by reducing the electric power fee. In the demonstration project of Miyakojima City, there is an expectation to not only reduce carbon dioxide, but also to link the effect with the promotion of overcoming problems associated with solitary islands.

About micro mobility

- Rated output 8 kW or less. (Or 125 cc or less)
- Capacity of one or two people. (Capacity of three or less people which attached auxiliary equipment for children.)
- Prohibited for highway use.



Project image

Charging station with solar power. (The use of renewable energy.)



Charge

Micro mobility



Vehicles used as a power source

Use in events such as typhoons.



Challenges unique to islands of Okinawa.

- High automobile fuel cost.
- Small environmental capacity.
- High risk of blackouts caused by typhoons.

Employment of micro mobility by renewable energy.

- Reduction of run cost.
- Reduction of power usage fee.
- Preparing for a power outage.
- Anxiety over soaring gasoline prices.

Expected Effects:

Tourism due to brand promotion of Eco-Island Miyakojima.

Promotion of a self-sufficient island through the use of a practical EV model.

Charge stations equipped with solar power panels, resulting in reduction of carbon dioxide emissions and the growth of micro mobility.