Cuban Society For The Promotion of Renewable Energy Sources And Environmental Respect	TALLER INTERNACIONAL CUBASOLAR 2020 CIEGO DE ÁVILA XIV TALLER INTERNACIONAL cubasolar 2020

«LA TROCHA AVILEÑA OF THE RENEWABLE ENERGY SOURCES »
Delegates' journey of the Cubasolar International Workshop 2020
Scheduled date: Thursday, May 7, 2020

Introduction

«La troche avileña of renewable energy sources», is the name given to the trip offered by the **Cubasolar International Workshop 2020** to the event participants. The trip covers a distance of approximately 100 km and can done in about five hours with different interesting places: industrial and historic places, factories, ecological farms and renewable energy installations. All the bus stop points are located almost in a straight line along and on both sides of the «Trocha de Júcaro a Morón» which is a relevant historic place of our wars of independence.

What happened on the Trocha de Júcaro a Morón served as inspiration to the planned trip. In this stretch of road the Spanish colonizers built a chain of military fortifications that they considered impregnable. Its objective was to divide the Cuba´s Island into two parts. In this way, this stretch of road avoided that liberators Cuban soldiers (*mambises*) from the east joint to the forces in the west part of the country.

These «academy» military strategists did not count on the intelligence, bravery and courage of our *mambises*, who on horseback and with machetes as a weapon, managed to circumvent the so-called Trocha on several occasions.

In this site, one crossing carried out by General Antonio Maceo stands out, El Titán de Bronce, constituted the invading Army that led this war to the entire center and west of the country. This fact took place after crossing it and joining Generalísimo Máximo Gómez, nearby the Lázaro López paddocks (just in the western part of the Trocha), This historic Trocha, has been rebuilt several years ago along 1 km by the local government such as was conceived at that time. It will also be appreciated by the delegates from the buses on the route to the city of Ciego de Avila.

Point 1.- (Output 8:00 a.m.)

Hotel Playa Paraíso, in Cayo Coco, Jardines del Rey, Ciego de Avila, Cuba



Point 2

Coastal Lagoon Water Renovator (REALCO), Cayo Coco

REALCO consists of a novel system that is able to use the renewable energy from waves of the sea from a swell concentrator where these waves are amplified to reach heights that later. This allows, using the laws of gravity, incorporate this fresh and clean seawater into the lagoon system. By this way the device improves the hydrodynamics of Laguna Larga, achieving a process of rehabilitation of the ecological and recreational functions of this lagoon.



Point 3*

Parador La Silla, Cayo Coco

Autonomous photovoltaic system (Non connected to the grid) installed by Copextel in the stop and cafeteria La Silla (Vial a Cayo Coco). Their energy is supplied 100% by solar panels. In addition to the significant use of renewable energy in isolated areas of the national electric system, it is an example of the resilience of these systems due to its ranchon was completely destroyed by Irma Hurricane and again began serving 48 hours later, using non-permanent facilities as containers and a tent. By this time, the electricity was supplied only from the solar panels installed some years earlier by Copextel.

Point 4*

Lookout Tower, King's Gardens Crown

This tower, which has at its top the crown that alludes to the King´s Gardens (Jardines del Rey in Spanish), is located at the starting point of the road by the sea (*pedraplen*) that linked it to the north with the Island of Turiguanó, Ciego de Avila and other neighboring provinces with the keys. Its beauty could only be appreciated in all its splendor at times of the day, and with the mounting there on the site of an autonomous photovoltaic system (PVS) and the placement of several lamps with LED reflectors, adequate night lighting was achieved, welcoming the day and to all who visit on this important tourist hub.


Point 5*

Turiguanó Demonstrative Wind Farm

It is a small demonstrative wind farm of 450 kW. This wind farm was commissioned in June 1999. It was the first installation of its kind built in this place and in Cuba. This installation was built and put in operation by a Cubasolar project together with several European NGOs that contributed financially to its realization. The its main objective of this installation was to demonstrate that there were places in the country with wind potential sufficient to operate and achieve favorable yields of electricity deliveries to the SEN. Nowadays it continues being used as a research material for specialists in this technology and everything interested in RESs.

Point 6*

Pumping water using a hybrid wind-FV system

This system is located in the fields of the PecuariaTuriguanó Genetic Sahee Company, it is focused to the conservation and reproduction of Santa Gertrudis cattle, it is the only farm with these purposes in the country. Located next to the road leading from Cayo Coco to Ciego de Avila (city), it is a new step in the proper and sustainable use of RESs in local development.

Point 7*

Celia Sánchez Manduley population settlement (known as the Dutch village)

Located at the exit of the Island of Turiguanó towards the city of Moron, it is a very picturesque place formed by a set of local workers houses, with a Dutch style. Also it is a historic site because it wasone of the first settlement built by the Cuban Revolution in this place and under the idea and proposal of Celia Sanchez. By the years 90s it received gas for food cooking at homes from the first large-scale biogas (2000 m3) built in Cuba from a project of the disappeared National Energy Commission (CNE) with German fraternal organizations.

Point 8

a) Rensol Solar Water Heater Factory, Moron city

It is the only factory of its kind in Cuba, with an installed capacity of ten thousand water heaters annually. Its production aimed at the state and residential sector. The technology of these water heaters is the well-known «empty pipe» coming from Chinese technology. The goal of the investment process is to triple its production capacity per year.



b) Biofood Centre (CIBA), Morón

It is a research center belonging to Citma aimed to studies related to the production of food with animal destination using local products and in a sustainable way. They also conduct other studies related to the treatment of polluting residuals, including treatment by anaerobic digestion using biodigestors (*biogas*) with drying bed and oxidation lagoons to achieve a closed cycle, mainly in the province's swine production.

It is also the reference center of the provincial delegation of Cubasolar for biogas-related topics and the base center of the Provincial Movement of Users of these technologies (MUB).

Point 9

Ciro Redondo Bioelecrica, Pina

A bio-electric is an installation next to the sugar factory Ciro Redondo that produces electricity using residuals from the sugar factory, the well-known «bagasseй. This bio-electric has a potential capacity of 60 MW. It will reduce greenhouse gas emissions coming from the Cuban electricity system by 260,000 t/year of CO_2. In the period of sugar harvest (zafra in Spanish) it will work with the residual bagasse from this industry and in the period of time when the harvest ends it will burn other biomasses as

marabou.

Point 10*

Parque Solar FV Copextel S.A., Division C. of A. Ciego city

It is a small solar park of 15 kW connected to the National Electric System recently built in the courtyard of the offices and sales store of this Copextel entity in the territory. In addition of the benefit of supplying electricity to the grid, this installation is a demonstrative plant for all who are interested in this technology, of which Copextel is the unique entity in the country that distributes and installs them.

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Point 11*

Professional and Pedagogical Polytechnic Armando Mestre Ciego city

In this technical institute, the future teachers are formed focused to the young people of this education level who studies specialties such as electrical, agronomy, agriculture and others areas of interest for country development. In this schoolCubasolar, in conjunction with the Citma, Mined and the Center Helios de Quebec, Canada, develops a project aimed to becoming this center in a reference center for the introduction of RESs-related topics into this education level. An exchange of ideas will be held betweenteachers and students of this center of Cuban professional technical teaching and members of the circles of interest formed there.

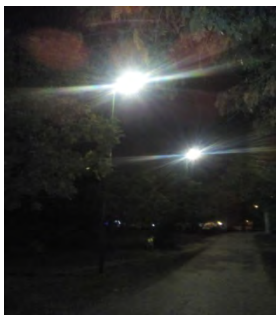
  

Point 12

City Park, Blind of Avila

It is a park located to the north of Ciego de Avila city, capital of the 'province, built in the surroundings of a small natural lake where entertainments for children and young people, traditional gastronomy and healthy recreation are combined, with the natural environment that it provides the environment, taking care not to damage its good state of environmental conservation and where night lighting has already been achieved with LED luminaires, charged by the day with solar energy.





Point 13

a) University of Ciego de AvilaMáximo Gómez Báez (Unic)

The main university headquarter belonging to the Ciego de Avila province lies here. In this university operates the Organ of Cubasolar in the province and many of its professors are associated or linked to our organization, with the common goal of studying, disseminating and promote the best results in energy efficiency and use of RESs from the local development. A master's program on energy efficiency is in operation for more than a decade.


Point 14

b) Organic farm La Trocha

This farm has begun to develop a local project that already has an initial financing, whose fundamental basis is agro ecological production aimed at permaculture, organic processing and conservation of food, etc., using systems including renewable energy as an energy source and everything related to environmental protection and care and sustainable agriculture. There is an sale point for foods produced in an ecological way.

END OF THE JOURNEY AND RETURN TO THE HOTEL SEDE OF THE EVENT

Explanatory notes:

Points marked with asterisks (*) will only be observed from inside the buses and will receive the comment and detailed description from the guide who will travel on it, This tourist guide will accompanying the participants throughout the tour. If any of these points are of great interest and taking into account the criteria of the majority, a coordinated stop can be made in advance with the guide and **will only be made on the return trip to the hotel.**

In point 8 the tour is divided into two parts (a) and (b), so each participant must have previously chosen the bus on which he will travel to visit according to his/her greatest interest. Points 13(a) and 14(b) shall also be selected, under the same conditions as set out in point 8.

ANNEX I

Map of the tour of «La trochaa vileña of renewable energy sources» in the province of Ciego de Avila, Cuba (points of the tour of the Cubasolar International Workshop 2020)