



Project Name: 4 kW Grid Tie Research and Demonstration Photovoltaic Project

Date Completed: September 2008

Location: Casa Pueblo, Adjuntas, Puerto Rico

Project Description

The project consisted of a 4 kW photovoltaic array, installed at the roof of Casa Pueblo main building. The system is coupled to a 4 kW inverter located at the exhibition room. This photovoltaic system is fully instrumented to monitor its energy production, the facilities energy demand, as well as environmental parameters. This photovoltaic system was the first installed grid tie system in Puerto Rico under the Net Metering program. The system was used for the local power company as a test bench for their new Net Metering Program. This project is operated by Casa Pueblo and the School of Engineering of Puerto Rico, Mayaguez Campus as a research facility.

This photovoltaic system has relevance also as being the system which powered the first radio station WQAB1020 AM with solar energy. In May 2009 this project was recognized by the Engineers and Surveyors Board Association with the Outstanding Project in Electrical Engineering 2008 Award.

Performed Tasks

- Overall project assessment and planning
- Major equipment supplier
- Material procurement
- System design
- Structural engineering consulting
- Major contractor and installation supervision

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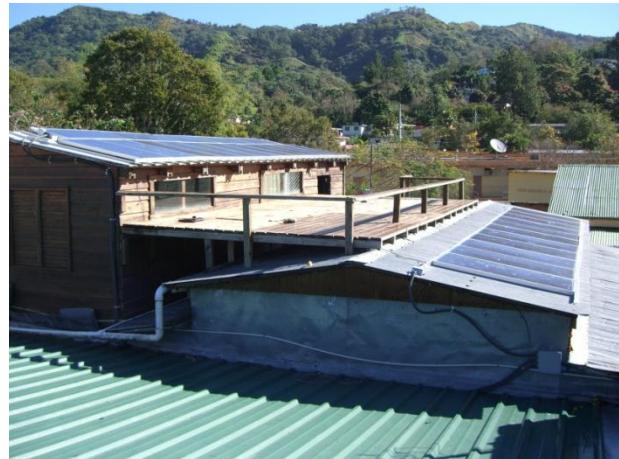
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Project Name: 150 kW Grid Tie Commercial Scale Photovoltaic Project

Date Completed: April 2009

Location: Unlimited Storage Mini Warehouse at Caguas, Puerto Rico

Project Description

The project consisted of a 150 kW photovoltaic array, distributed in three sub-arrays of 50 kW each in the roof top of three nearby facility buildings. The system is coupled with two 82 kW inverters located at a designated electrical room. This photovoltaic system is fully instrumented to monitor its energy production, the facilities energy demand, as well as environmental parameters. This photovoltaic system was the first large scale commercial grid tie system installed in Puerto Rico under the Net Metering program.

Performed Tasks

- Overall project assessment and planning
- Major equipment supplier
- Material procurement
- System design
- Structural engineering consulting
- Major contractor and installation supervision

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Project Name: 60 kW Grid Tie Photovoltaic Re-Powering Project

Date Completed: February 2010-2011

Location: Universidad Del Turabo at Gurabo, Puerto Rico

Project Description

The original system had a 100kW capacity and was installed in 1986 and operated by the local utility company until 1994. The system was then re-located to the current site in 1997. Due to vandalism at its former site and a hurricane strike during the re-location process, the PV system capacity was reduced to 80 kW. From there on the facility was used for research at Universidad del Turabo and production was low due to unstable operation of the elderly inverter. In 2010 the PV array has been reconditioned. As phase 1 as an array of 30 kW and coupled to two inverters of 15 kW each. The photovoltaic array is ground mounted on the Universidad del Turabo Campus. The two inverters are located at the photovoltaic system power conditioning room, adjacent to the photovoltaic array. This photovoltaic system is fully instrumented to monitor its energy production, the facilities energy demand, as well as environmental parameters. On 2011 as Phase 2, two more inverters were added for a total generating capacity of 60 kW AC, as more existing photovoltaic modules at the project site were restored. There are 20 kW sub-array that remain with no connection to any inverter or connection among themselves. This sub-array is reserved for smaller experimental projects and research activities.

Performed Tasks

- Overall project assessment and planning
- Major equipment supplier
- Material procurement
- System design
- Structural engineering consulting
- Major contractor and installation supervision

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Project Name: 23 kW Stand Alone Photovoltaic Project

Date Completed: June 1996

Location: Sardinera Camp At Mona Island, Puerto Rico

Project Description

Consisted of a 23 kW stand alone photovoltaic project, distributed in seven independent systems. The systems are used for security systems, navigational aids, communications, refrigeration , water pumping and purification, as well as general lighting and appliances. All systems work independently from each other and use batteries, except the direct drive water pumping system. This photovoltaic project it's the solely natural reserve island , source of electricity. All the systems operates 24/7 and entirely replaced a diesel engine generator which was on duty 14 hours per day .

Performed Tasks

- Overall project assessment and planning
- Material procurement
- System design
- Structural engineering consulting
- Installation supervision

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Project Name: 125 kW Grid Tie Commercial Scale Photovoltaic Project

Date Completed: June 2009

Location: Unlimited Storage Mini Warehouse at Carolina, Puerto Rico

Project Description

The project consisted of a 125 kW photovoltaic array, installed flat on a building roof. The system is coupled to three set of six inverters each for a total of 18 inverters which are located at a designated electrical room. This photovoltaic system is fully instrumented to monitor its energy production, the facilities energy demand, as well as environmental parameters.



Performed Tasks

- Overall project assessment and planning
- System design
- Equipment selection consulting
- Subcontractor qualifier
- Structural engineering consulting
- Major contractor and installation supervision



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Project Name: 1.8 kW Grid Tie Photovoltaic Project at Ecological Pre-Fab Home

Date Completed: June 2009

Location: Universidad del Turabo at Gurabo, Puerto Rico

Project Description

The project consisted of a 1.8 kW direct roof mounted photovoltaic array designed and installed at a special accordingly designed ecological home. The system is coupled with a 1.8 kW inverter located at a designated electrical room. This photovoltaic system is fully instrumented to monitor its energy production, the home energy demand, as well as environmental parameters. This photovoltaic system along with the house is called Solaria and is a commercially available pre design model developed for the go green minded customer. This particular home is inside Turabo University Campus and its part of their research and development labs.

Performed Tasks

- Overall project assessment and planning
- Major equipment supplier
- Material procurement
- System design
- Structural engineering consulting
- Major contractor and installation supervision

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Project Name: Casa Ausente Stand Alone Photovoltaic and Wind Project

Date Completed: February 2001

Location: Casa Ausente , Hacienda El Molino, Vega Alta, Puerto Rico

Project Description

The project consisted originally as a 1.3 kW photovoltaic array, installed directly at the roof of a special ecological home. The system is coupled to a 4 kW inverters located at a designated electrical room, along with an industrial grade battery bank. Later, a wind turbine was added to the system and the photovoltaic system was expanded for a total capacity of 4.4 kW. This home were recognized by the Puerto Rico Architects Board Association with 2001 award for outstanding architecture project. The home has been featured at different TV programs including Extreme Homes. This home is a on going test bench for new green technologies suitable for residential applications.

Performed Tasks

- Overall project assessment and planning
- Major equipment supplier
- Material procurement
- System design
- Structural engineering consulting
- Major contractor and installation supervision

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Project Name: 225 kW Grid Tie Commercial Scale Photovoltaic Project

Date Completed: September 2009

Location: Unlimited Storage Miniwarehouse at Carolina, Puerto Rico

Project Description

The project consisted of a 225 kW photovoltaic array, distributed in three sub-arrays of 75 kW each in the roof top of the main facility building. The system is coupled with two inverters of 125 and 75 kW respectively, located at a designated electrical room. This photovoltaic system is fully instrumented to monitor its energy production, the facilities energy demand, as well as environmental parameters.

Performed Tasks

- Overall project assessment and planning
- System design
- Structural engineering consulting
- Equipment selection consulting
- Contractor qualifier consultant
- Installation supervision

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Project Name: 2 kW Grid Tie Commercial Scale Photovoltaic Project

Date Completed: October 2008

Location: New Progressive Party Headquarter, Hato Rey, Puerto Rico

Project Description

The project consisted of a 2 kW BIPV or Building Integrated Photovoltaic project. The array was installed as awnings at the building facade. The system is coupled with a 4 kW inverter located at a computing room. This photovoltaic system was intended for demonstration purposes.

Performed Tasks

- Overall project assessment and planning
- Major equipment supplier
- Material procurement
- System design
- Structural engineering consulting
- Major contractor and installation supervision

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Project Name: 5 kW Grid Tie Commercial Scale Photovoltaic Project

Date Completed: August 2009

Location: Caguas City Hall at Caguas, Puerto Rico

Project Description

The project consisted of a 5 kW photovoltaic array, installed at Caguas new City Hall building. The system is coupled with a 6 kW bimodal inverter with a battery bank, located at a designated electrical room. This photovoltaic system beside of being a demonstration projects, it provide back-up power for general lighting and appliances at the Mayor office .

Performed Tasks

- Major equipment supplier
- Material procurement
- Major contractor consulting and installation supervision

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Project Name: 1 kW Grid Tie/ Stand Alone Research Lab Photovoltaic Project

Date Completed: April 2001

Location: Centro de Investigacion y Desarrollo (CID) at University of Puerto Rico, Mayaguez Campus, Mayaguez, Puerto Rico

Project Description

The project consisted of a 1 kW photovoltaic array, installed at the roof top of the CID building. The system is coupled with a custom made selectable board to provide multiple configurations using either a bimodal inverter with its battery bank or /and a grid only inverter without batteries. This photovoltaic system was installed primary as part of the power research lab . Therefore this is no a typical commercial or residential installation.

Performed Tasks

- Overall project assessment and planning
- Major equipment supplier
- Material procurement
- System design
- Structural engineering consulting
- Major contractor and installation supervision

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Project Name: 1.4 kW BIPV Grid Tie Research and Demonstration Photovoltaic Project
Date Completed: September 2009
Location: Casa Pueblo, Adjuntas, Puerto Rico

Project Description

The project consisted of a 1.4 kW BIPV or Building Integrated Photovoltaic project. The array was installed as awnings at the building facade of Casa Pueblo Main building. The system is coupled to a 3 kW inverter located at the exhibition room. The system is an expansion of the original project back in 2008. Therefore as the original system this is fully instrumented to monitor its energy production, the facilities energy demand, as well as environmental parameters.



Performed Tasks

- Overall project assessment and planning
- Major equipment supplier
- Material procurement
- System design
- Structural engineering consulting
- Major contractor and installation supervision

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Project Name: 2 kW Grid Tie Commercial - Residential Photovoltaic Project

Date Completed: November 2008

Location: Villas Mi Antojo at Arecibo, Puerto Rico

Project Description

The project consisted of a roof mounted 2 kW photovoltaic array. The system is coupled with a 4 kW inverter located at the home laundry. This photovoltaic system is a model and demonstration project as an option for all the pre-design homes line models of Villas Mi Antojo business.



Performed Tasks

- Overall project assessment and planning
- Major equipment supplier
- Material procurement
- System design
- Structural engineering consulting
- Major contractor and installation supervision



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Project Name: 200 kW Grid Tie Commercial Scale Photovoltaic Project

Date Completed: July 2009

Location: Unlimited Storage Miniwarehouse at Toa Baja, Puerto Rico

Project Description

The project consisted of a 200 kW photovoltaic array, distributed in four sub-arrays of 50 kW each in the roof top of the facility building. The system is coupled with four inverters of 50 kW, located at a designated electrical room. This photovoltaic system is fully instrumented to monitor its energy production, the facilities energy demand, as well as environmental parameters.

Performed Tasks

- Overall project assessment and planning
- System design
- Structural engineering consulting
- Equipment selection consulting
- Contractor qualifier Consulting
- Installation supervision



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Project Name: 12kW Grid Tie Commercial Scale Photovoltaic Project

Date Completed: April 2011

Location: University of Puerto Rico, Utuado Campus, Puerto Rico

Project Description

The project consisted of a 12 kW roof-top photovoltaic array, at the Utuado Campus Library building. The system is coupled with two grid tie 6 kW inverters located at a designated electrical room. This photovoltaic system is fully instrumented to monitor its energy production,



Performed Tasks

- Overall project assessment and planning
- Major equipment supplier
- Material procurement
- System design
- Structural engineering consulting
- Major contractor and installation supervision

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Project Name: 150 kW Grid Tie Commercial Scale Photovoltaic Project

Date Completed: April 2009

Location: Unlimited Storage Miniwarehouse at Caguas, Puerto Rico

Project Description

The project consisted of a 13 kW roof-top photovoltaic array, at the Agricultural Experimental Station of the University of Puerto Rico at Adjuntas. The system is coupled with two grid tie 6 kW inverters located at a designated electrical room.



Performed Tasks

- Overall project assessment and planning
- Major equipment supplier
- Material procurement
- System design
- Structural engineering consulting
- Major contractor and installation supervision



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Project Name: 40 kW Grid Tie , With Battery Back-Up Commercial Scale Photovoltaic Project
Date Completed: April 2006
Location: Ecological Elementary School, Culebra, Puerto Rico



Project Description

The project consisted of a distributed photovoltaic array of 40 kW through the school buildings. The system is coupled with seven 5.5 kW bimodal inverters located at designated electrical rooms. This photovoltaic system was the first large scale commercial system interconnected to the local utility grid..

Performed Tasks

- Assisted at overall project assessment and planning
- System design

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Project Name: 65 kW Grid Tie Commercial Scale Photovoltaic Project

Date Completed: May, 2012

Location: Ecological School, Dorado, Puerto Rico



Project Description

The project consisted of a distributed array of 65 kW through the school buildings. The system is coupled with thirteen 5 kW grid-tie inverters located at designated electrical rooms.

Performed Tasks

- Assisted at overall project assessment and planning
- System design

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Project Name: 36 kW Grid Tie Commercial Scale Photovoltaic Project

Date Completed: May, 2012

Location: Academia San Ignacio de Loyola, San Juan, Puerto Rico

Project Description

The project consisted of a distributed array of 36 kW in three buildings. The system is coupled with nine 4 kW grid-tie inverters located at each class room of the hosted buildings . The project was designed to expose students, faculty, and community to photovoltaic systems as all the equipment is made easily visible .



Performed Tasks

- Assisted at overall project assessment and planning
- System design

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Project Name: 80 kW Grid Tie Commercial Scale Photovoltaic Project

Date Completed: January, 2011

Location: Ron de Lugo Federal Building, Saint Thomas

Project Description

The project consisted of a roof-top distributed array of 80 kW in three building roof sections. The system is coupled with twelve 7 kW grid-tie inverters located at the building roof. The project is the first commercial installation to be grid-tie under the Saint Thomas Net Metering Program.



Performed Tasks

- Assisted at overall project assessment and planning
- System design

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Some Pictures of Done Small Residential Photovoltaic Projects on the 2000's Decade



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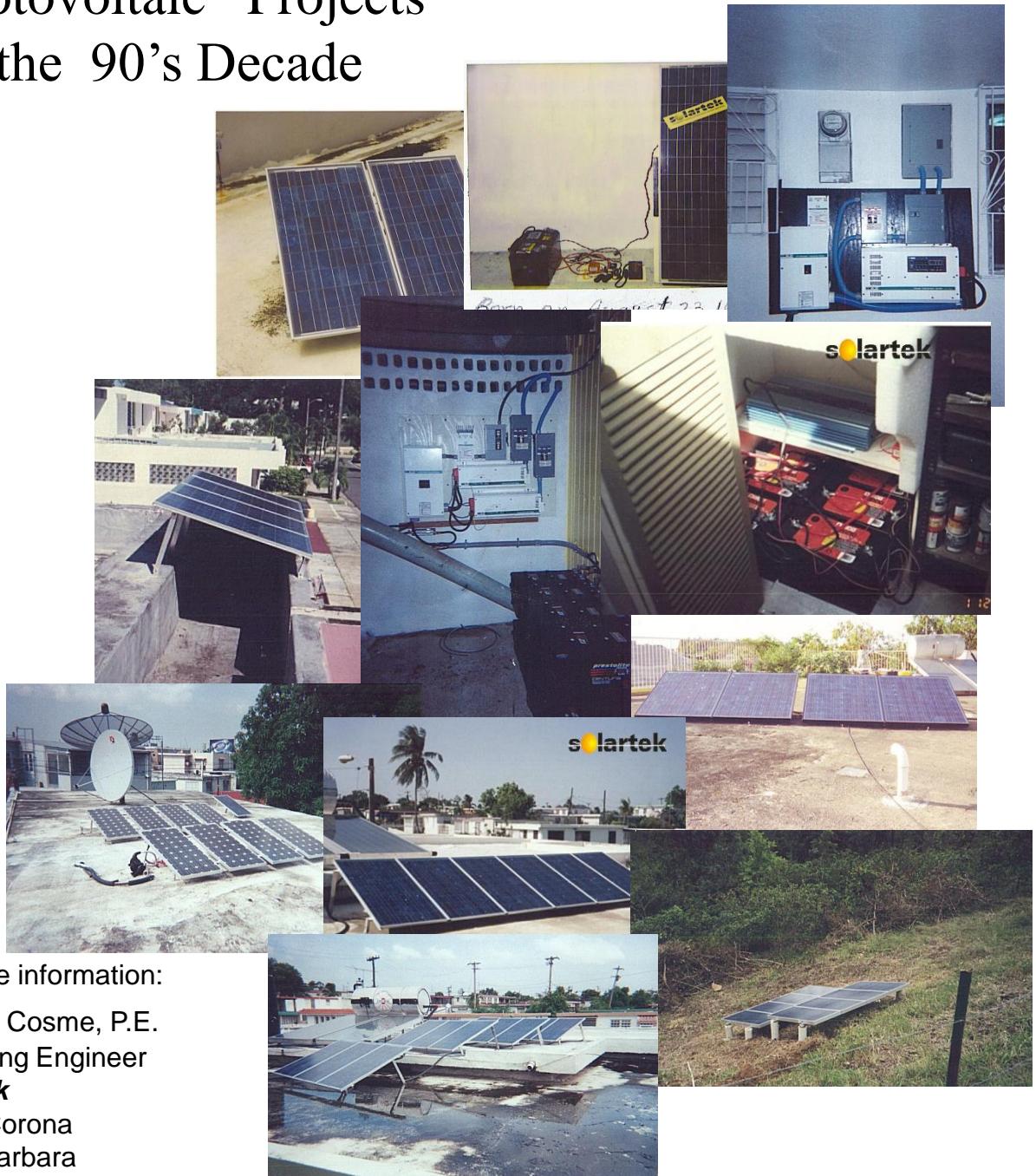
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Some Pictures of Done Small Residential Photovoltaic Projects on the 90's Decade



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