

HEROES OF THE GREEN AGE

The **MEN, WOMEN** and **IDEAS**
Shaping Our Low Carbon Future – and Why
We Cannot Afford to Let Them Down

By
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7/20

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LET THE
SUNSHINE
IN



It is noon in Managua, the capital of Nicaragua. The sun shines relentlessly from a clear blue sky and the thermometer says 38 degrees in the shade. In most offices, shops, and in private homes the air condition is humming on full power, fighting an endless battle for a more bearable temperature. This is not the way in Max Lacayo's office. He is the director of the family owned company ECAMI, which produces affordable alternative energy plants. "We mainly use fans in our office. They keep the temperature down and for a couple of hours a day we switch on our air condition. Of course we supply some of the electricity with our own solar panels," Max Lacayo explains and nods towards a display of solar panels, batteries, wind turbines and water tanks. Max Lacayo and ECAMI sell renewable energy -

MAX LACAYO (1965)

Born in Nicaragua. He trained as a lawyer and specialized in company law. At the moment he is completing a master's degree in renewable energy. In 2005 he took over the daily management of the family owned company ECAMI, which his father founded in 1982, shortly after the Nicaraguan revolution. Today ECAMI sells and installs wind and solar plants in the Central American country. A substantial number of the customers are located in remote areas of the country, which are not yet on the grid. In 2009 ECAMI was awarded the prestigious Ashden Award for its support of the development in the Nicaraguan rural areas.



primarily solar energy - in a country which is particularly suited for this.

"Here in Nicaragua we are on average able to harness five hours of maximum level solar energy per day. In Germany, for instance, you have on average three hours. In Nicaragua the conditions are ideal. In the countryside, we install plants for the production of electricity. For those who already have electricity it is not a great bonus since we simply cannot produce enough to make a difference. But for those who are off the grid it is a colossal opportunity," says Max Lacayo and leans forward in the chair. Now we get to a matter close to his heart: "It is impressive how much one watt can mean to people who do not have any electricity. To 40 percent of the population in this country it would not matter if we expanded the central supply since they have no access to electricity. However, with a solar panel and a battery 100 watts can make a world of difference to them. They can watch television and listen to the radio, keep themselves informed, recharge their cell phones, call the hospital when they need to, and their children can do their homework in the evening," Max Lacayo explains. He has travelled all over Nicaragua to install the plants.

When ECAMI brings solar panels and equipment to people in remote trackless areas, they often have to undertake the journey on stony mountainsides on a donkey. Nicaragua is an impassable country and the roads do not extend very far into the country. Tall mountain ranges, enormous fertile lowlands and tropical rainforests characterize the countryside, where every fourth citizen has a dollar or less to live on per day. The solar panels are installed on the roofs of the peasants' houses and are connected to a rechargeable battery so the energy can be stored and used night

and day. The battery is automatically disconnected from the solar panel when it is fully charged, so that it does not burn out.

The ECAMI people install wires and contacts in the house so the families can get electric light, switch on the radio and television, and charge their mobile phone. "ECAMI is a private company which must make a profit. However, our plant actually also has a social purpose. I usually say that we have three results on the bottom line, when we install a solar energy plant in a farmer's house. The family will generate smaller bills for fossil fuel such as petroleum - a result with an environmental and an economic impact. However, the social consequences should also enter into the equation, since it increases their quality of life to have access to just a small amount of electricity," says Max Lacayo.

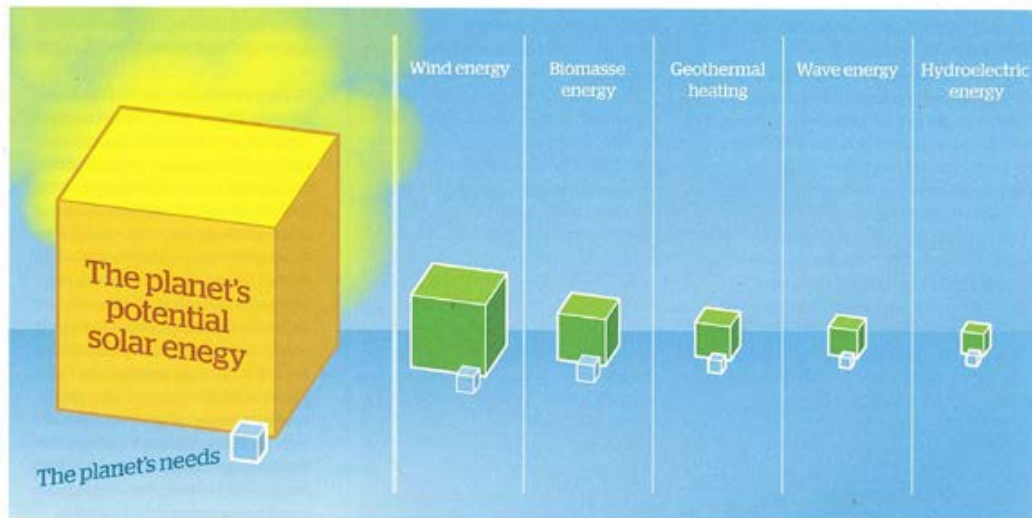
Nicaragua is one of the poorest countries in Latin America, only Haiti is poorer. There are many pressing needs and Max Lacayo is well aware that renewable energy is not a priority of the authorities. He says that ECAMI constantly fights to get the energy agenda integrated into the public debate. However, the authorities turn a deaf ear while insisting on very high taxes and import duty on the solar panels. However, this challenge is nothing compared to the conditions, which faced ECAMI when the company started up in 1982.

"The revolution was just over and the communication lines in the country were severed. My father is a radio technician and he had the idea that the peasants could communicate with walkie-talkies. But how would they charge the batteries? They used car engines, but that was too troublesome and one day he read in a magazine that they could use solar panels. At the time this was quite new in Cen-

LIGHT FOR THE PEOPLE

ECAMI was founded in 1982 for the purpose of improving the communication in the rural areas after the revolution. The peasants were not able to recharge their walkie talkies, so for this reason ECAMI began importing solar panels for electricity production. In the beginning of the 1990s ECAMI introduced thermal systems, where the solar panels heat water and since then they have added small wind turbines. ECAMI has installed around 9000 solar panels in 5000 plants in all of Nicaragua. The panels installed have a capacity of 600 kilowatt. In later years alone the capacity has increased by 200 kilowatt. ECAMI employs 35 workers. The company's customers are primarily located in remote areas of Nicaragua.

In principle a solar plant for a one family house consists of a solar panel on the roof attached to a rechargeable battery, allowing for the use of electricity night and day. ECAMI installs the plant and mounts switches in the house for light, radio, television and cell phone chargers. Furthermore, ECAMI demonstrates to the new owners of the solar panels how they should maintain and eventually carry out small repairs.



tral America and he had no knowledge about it. Still, he forged ahead and imported some plants. By the time the first plant had been installed, he realized that the solar panels could also be used to generate light," Max Lacayo explains.

Later ECAMI became aware of the opportunities represented by wind energy. In the future the company also aims to make better use of thermal solar energy applied in the heating of water. The customers are both private home owners and hotels - a hotel in the capital may supply 100 rooms with hot water via thermal solar energy alone. The environmental savings are substantial and Max Lacayo's climate consciousness is growing.

"We contribute to the CO₂ balance with substantial savings on the running of mobile radio masts in remote areas. Previously they were run by diesel generators, but with solar panels we can reduce the fossil fuel consumption for every mast with 54,000 liters of diesel per year. We also work hard to install a solar driven stove in order to reduce the deforestation in the country. So several things are happening," says Max Lacayo.

"I love my job. I meet many people and see how they live in the country far from our urban comfort. Their day ends at six p.m., when the sun goes down, so out there you really learn to appreciate energy. It is wonderful to see how that makes a difference in their

lives. In a co-operation with UNICEF we have installed solar panels on the roofs of health clinics, so they have electric light available, when servicing patients after sunset. Furthermore, the electricity enables them to run a fridge to keep the vaccines cool and children with breathing problems can be helped with oxygen masks," Lacayo explains. He also takes the energy situation on the home front seriously. "Naturally we have solar panels for electricity, as well as water heating and I would like to manage completely without the public electricity supply, but that is not possible. Not even if we use LED lighting and energy saver light bulbs," Lacayo sighs - without reason though. He is already demonstrating a much greater



**THE DRIVING FORCE BEHIND
GREEN INNOVATION ACCORDING TO
MAX LACAYO**

- The work I do creates change. Giving people access to electric light makes a difference in their lives.
- Every single watt we install contributes to the reduction of climate change.

climate consciousness than most other Nicaraguans. The country is fertile, but poor, so only a minority of the population thinks twice about the consumption of resources in the daily struggle to survive. For this reason, among others, Max Lacayo feels that it is important that people should own their own solar plants and develop an understanding of how they function technically. "This project must be sustainable. The plants we install are often located hundreds of kilometers away from the cities, so they must function well. Equipment and installation must be in order, but people should also be capable of repairing the plants, when necessary. It is no good that the plants stop because a 50 cent fuse has blown. So we always teach people how the plants function and explain the limitations of the plants, so they use the energy with care. In the beginning the children will typically play with the light or watch television for hours on end and then the battery will be flat. One must understand the limitations of the system. Otherwise the result will just be frustration," says Max Lacayo.

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**This book is not about
the climate problem. It addresses
climate solutions.**

Heroes of the Green Age tells the story of the men and women around the world who with unfailing courage and enterprise create fantastic ideas and inventions, which will enable us to tackle the climate crisis. Global warming is created by humanity and so are the solutions designed to control it.

Heroes of the Green Age is also the first book to focus on the imminent global boom in green innovation and the decisions that will be necessary to accelerate the development.

The Green Heroes are building our shared future. Our task will be to encourage and reward them.

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