SMART VILLAGES
New thinking for off-grid communities worldwide

Training workshop for media professionals in South America

Workshop Report 23

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Smart Villages

We aim to provide policymakers, donors, and development agencies concerned with rural energy access with new insights on the real barriers to energy access in villages in developing countries—technological, financial and political—and how they can be overcome. We have chosen to focus on remote off-grid villages, where local solutions (home- or institution-based systems and mini-grids) are both more realistic and cheaper than national grid extension. Our concern is to ensure that energy access results in development and the creation of "smart villages" in which many of the benefits of life in modern societies are available to rural communities.

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MALAYSIAN COMMONWEALTH STUDIES CENTRE

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Introduction

A major objective of the Smart Villages Initiative is to raise public awareness of rural energy access issues, sustainable energy technologies, and entrepreneurial approaches to energy in the developing world. In line with this objective, the Smart Villages Initiative, in partnership with the Green Building Council of Paraguay, held an international media dialogue for media professionals in Asuncion, Paraguay, on 9-11 July 2016 to promote objective, informed, and balanced coverage of the issues, challenges, and opportunities in rural energy access.

The workshop featured a mixture of background briefings and case studies by local and international technical experts and media professionals, and discussions on issues arising and case studies of prototype smart villages and innovative renewable energy use in rural off-grid settings. Editors and print, broadcast, and new media journalists from countries in the region—Bolivia, Peru, Venezuela, Uruguay, Brazil, Argentina, Chile, Colombia and Ecuador.

Day 1

The Smart Villages Initiative
Claudia Canales, Smart Villages

Claudia Canales introduced the Smart Villages Initiative, whose aim is to study the ways in which universal access to sustainable energy in off-grid rural communities can be ensured. The challenge lies in that currently more than one billion people lack access to electricity worldwide, and around three billion people prepare their food using dirty and dangerous stoves. As a result, four million people die each year, most of them women and children. It is worth noting that 47% of the world population and 70% of the people living in poverty live in rural areas. Rural access to energy, therefore, cannot be ignored. Currently, many technological developments enable agricultural areas to benefit from the same opportunities as cities.

Smart Villages does not consider energy as an end in itself but as a catalyst for development in other areas, including food security, education, health services, communication, and democratic participation. At the same time, energy can promote new business opportunities in the supply and use of energy services.

Smart Villages works with stakeholders in the public and private sectors who are involved in rural electrification programmes. Through activities that include workshops, development projects, communication workshops, political interaction and impact studies, the initiative links different experiences to create more effective policies and energy access interventions. The idea is to provide the various stakeholders with new perspectives and ideas—technological, financial and political—to overcome obstacles and increase the impact of their projects.

The Smart Villages team is based at the Universities of Oxford and Cambridge in the United Kingdom and has six regional programmes in different regions: West Africa; East Africa; Southeast Asia; South Asia; and South and Central America. The initiative is funded by two non-profit organisations: the Cambridge Malaysian Education and Development Trust and the Templeton World Charity Foundation. National, regional, and international scientific academies are key partners of the initiative as well as the NGO Practical Action and The Energy and Resources Institute of India (TERI).

The importance of disseminating information about the problems caused by lack of access to energy in rural communities and the impact energy can have on other aspects of rural development was discussed during the questions session. From the perspective of energy policies, it is much easier and less expensive to promote energy projects involving large-scale infrastructure instead of financing and promoting a large number of small decentralised technical solutions, which is what is needed to supply isolated rural communities.

Who should finance the creation of smart villages? The government or the private sector? And how should communities participate? The most sustainable and effective solutions involve the communities as financers of the technologies, and this is in turn facilitated by appropriate schemes and the participation of the private sector. The problem lies in establishing appropriate business models, since although most people can pay for the amount of energy they use in a day or week, they often cannot afford to pay in one go for a system that could then provide them with free energy for three years. For this reason, it is necessary to count on the participation of an entity that can provide cash flow.

What would be the best guarantor for the development of this concept? Would it be the State or the market? Ideally, both are needed, but probably the best long-term solution involves the private sector as the main financer, with private banks that are willing to provide capital to entrepreneurs. At

the moment, however, there are very few financial institutions that are aware of the off-grid energy market. Those that are aware think that the time for the return of the investment is too long. As a general rule, banks are willing to provide loans that they can recover in one or two years, but are not willing to make five- to ten-year investments.

It is accepted, however, that the market does not regulate all goods and services, including access to energy. Does the State have the capacity to promote solutions to these structural problems that are so difficult to solve? How will we find a sustainable solution? We need the participation of both the private sector and the government because the private sector requires appropriate policies that must be established by the government.

Lastly, why should rural communities without access to electricity be prioritised? There are several reasons. Firstly, for humanitarian reasons, energy poverty affects one sixth of the world population and one of the United Nations' sustainability goals is access to energy for all. Secondly, the communities themselves have an interest in improving their quality of life, and this represents an important market for the private sector. And thirdly, rural poverty generates migration to urban centres, to seek better economic opportunities that do not always materialise, generating significant social and economic problems that affect the entire population. The lack of clean energy sources has a significant impact both from a human (health problems) and an environmental perspective. Air pollution and the consumption of natural resources caused by burning biomass affect us all, and it is for these reasons that the equitable development of rural communities benefits all mankind.

Findings of the Smart Villages study

Bernie Jones, Smart Villages

Bernie Jones presented the key messages of the first stage of the Smart Villages initiative, during which 22 national and international workshops with over 700 participants were conducted in diverse countries worldwide. The focus of this stage were issues related to energy access in rural areas.

Compliance with the targets for 2030 involving total rural electrification will require a significant increase in investment levels. Access to affordable financing, however, is a problem for many medium and small-scale businesses, insofar as banks consider rural energy as a high-risk investment area. It is important, therefore, that companies do more to develop and share their profile. By creating a database with this information, companies and financial institutions will be able to improve their knowledge of the sector and lend money at more reasonable interest rates.

Training is essential for the systems' sustainability. In rural communities it is important that users know how to install, use and maintain energy systems, and also how to encourage their productive use. "Seeing is believing" methodology is very effective. It is also very important to involve women and young people, so that they also benefit from the "energisation" of their communities.

Another key message is "do not give away things for free". Free technology is often not used or appreciated and donations distort the market and discourage private sector participation.

As for the electrification of households, there has been substantial progress in the technology used, both regarding cost reduction and increased efficiency of appliances (for example, third generation solar systems in South America). This enables new technologies to provide a useful level of productive energy, in addition to providing light at night and charging phones. Technological development, however, is still needed to improve batteries, create a greater number of "plug and play" photovoltaic systems and design more efficient appliances. The recycling of obsolete parts also deserves much more attention. The presence of low-quality and/or counterfeit products on the

market is a global problem. It is very important not only that national governments establish and enforce appropriate regulations, but that an international initiative is also established to regulate the sector.

Examples of successful cases include electrification projects using solar energy in East Africa, which have been driven by the private sector. Their success would be even greater if companies were given access to financing; the use of existing distribution networks were improved; and a knowledge base on the sector were created. Another initiative with very good results is the rural electrification programme led by the Bangladeshi government. The reasons for its success include the ownership of projects by beneficiary communities; subsidised financing; the possibility of instalment payments; efficient technical standards; and adequate after-sales support.

On the other hand, the experience with mini-networks has not been that positive. Although there have been many pilot projects, successful operations are not very common. The lack of productive processes in the network does not enable the service to become profitable, since domestic consumption is strong at night and fees would have to be very high to pay for the system. At the same time, the instability of energy policies tends to increase mini-networks' financial risks. There needs to be greater convergence of policies and practices and more flexible financial support schemes (such as partial subsidies, although these may be counterproductive for the sector in the long term if not properly designed).

Community participation and its ownership of the projects is very important if the villagers are to benefit from them, and for the sustainability of initiatives. It is essential to respect local knowledge and customs and identify "local heroes". The projects face many more social than technical challenges, and recognising this mixture is critical to success.

With regard to energy for cooking, key messages include the need to bear in mind the use and demand for technologies (such as the time of day when food is usually prepared), which may vary depending on the communities involved. Financing schemes and ways to ensure the value chain's viability are also required. The variable quality of the products on the market is also a challenge in this sector.

In order to achieve the Sustainable Development Goals, it is necessary to aim higher and to fulfil a greater integration between the different initiatives that address diverse and complementary development needs. Better coordination and exchange of information among different specialised agencies and experts in related fields are required, as well as stronger linkages between energy sector professionals and university researchers. It is very important to carry out a systematic assessment of the projects' impact, in order to learn both from their successes and failures.

During the questions session, Bernie Jones stated that Latin America is a very interesting case, because although it has one of the highest levels of electrification worldwide, it also has the lowest per capita energy use in the world. The great challenge faced by this region is that off-grid communities are very remote and isolated, and usually widely dispersed. This significantly increases the technical challenges and the cost to access to energy sources.

Renewable energy

Wendy Guerra, World Bank Bolivia

Wendy Guerra introduced the different types of renewable energy, which have three main characteristics: they have the ability to produce work in the form of movement, light or heat; they use inexhaustible sources like the sun and wind; and they are clean resources, i.e. they do not pollute the environment like fossil fuels do. Renewable energies play an important role not only in a country's energy matrix, but also to enable access

to electricity in homes and social centres that are not connected to the grid.

Renewable energies include solar, wind, hydro, geothermal, tidal and biomass. One of their main advantages is that they are more environmentally friendly; they also enable a region to be more autonomous in the development of its economy and its industrial sector. They are also easy to handle, dismantle and move, and their maintenance is not as costly as maintaining the electricity grid. They are cheaper than conventional energy both in the medium and in the long term.

Some of their disadvantages include a usually high initial investment and their diffuse nature (with diurnal or seasonal variations), so that they are not always available. It is important to choose well the kind of renewable energy that will suit a locality after a careful evaluation of the characteristics of the area. Also, because they are new technologies, taxes can be high, and some forms of energy can have an impact on the neighbouring environment. For example, hydroelectric plants and marine stations can affect the landscape and the ecosystems of the area in which they are located.

Media professionals play a very important role on the subject of energies, concluded Wendy Guerra. To facilitate the promotion and access to energy it is necessary to cover and disseminate accurate information on the subject, and this requires knowing the meaning of technical words and their proper use. It is important to highlight the participation of national governments, which must design and implement strategies to transform their energy systems, stimulate investment, create national policies and financial environments that enable changes in the market and benefit the entire population. It is also important to raise awareness so that the population becomes part of the process to develop renewable energies and thus slow down climate change.

The importance of renewable energies transcends countering climate change, it is also a matter of sustainable development, equality, safety, and social justice. In Latin America 18 countries so far have incorporated renewable energies within their energy strategies and 110 mechanisms are already being applied to promote their use.

With respect to journalism on renewable energy, Wendy invited the participants to assess the issue's importance on the national agenda, highlight governments' participation and actions to transform their energy systems, cover the subject accurately, put more effort into using appropriate technical vocabulary in journalistic products and finally, raise public awareness on issues related to universal access to energy.

The issue of introducing renewable energies to a country's energy matrix because of low oil prices (conventional energy) was discussed during the questions session. The ideal solution depends on each region, on the resources and forms of energy that are more energy efficient in each community. For example, Bolivia is developing hydroelectric systems and hybrid systems with photovoltaic panels and diesel generation that will contribute to the interconnected system. Hybrid alternatives also contribute to isolated small-scale solutions, since a photovoltaic plant's battery storage capacity does not cover 100% of energy needs.

Not every country in Latin America has reached the same level in the field of renewable energies, but several countries are already developing regulatory frameworks for their use and have begun to consider the issue of the systems' sustainability. In countries where coverage is almost total but there are very remote communities that still lack electricity (such as Argentina and Chile), the use of renewable energies is the only possible solution. In other cases, such as Paraguay, there is surplus energy, but the reliability of the system is a big problem. The country suffers from constant power cuts, even in urban areas, due to poor in-

frastructure. The importance of building medium and low voltage networks that can supply small communities was also highlighted.

The participants agreed that the major problem faced by renewable energies involves regulations. Despite their potential, some governments continue to invest in traditional energy sources, such as Paraguay, where studies are being carried out in the Chaco area to extract oil despite knowing that the deposits are not of good quality. Many countries have abundant solar energy resources that are not used. While many governments express their support for increasing the use of renewable energies, proper regulations need to be implemented and specific actions developed. A change of attitude and habits among the people is also much needed, not only so that they will start using renewable energy systems, but also so that they maintain them properly. From the government's perspective, the problem is that there is little information on the country's energy situation. The existing business models also face challenges, it is important to involve multiple actors, including the government among them.

Paraguay Green Building Council

Hugo Riveros, Executive Director of the Building Council

Hugo Riveros introduced the principle of sustainable building to the workshop participants, based on improving practices throughout a building's lifecycle: its design, construction, operation and demolition, to minimise its impact on climate change, the consumption of resources and the loss of biodiversity. Paraguay's Green Building Council was established in 2012 with the mission to reduce the negative impacts of the construction sector.

Sustainable building has several characteristics:

- The conservation of resources and the reduction of energies used in construction
- The use of renewable recyclable materials by reusing waste
- Taking into account the lifecycles of the raw materials used and their regeneration capacity
- The improvement of quality and comfort by using bioclimatic criteria
- The protection and conservation of the environment.
- The creation of a healthy environment, free of pollutants and toxic agents

Less environmental impact while operating: the aim is to reduce energy consumption by up to 50%, reduce 40% of both CO^2 emissions and the use of water, and cut 70% of solid waste. These savings translate into a significant reduction in the costs of a building.

The criteria are not only applicable in large cities, and the Paraguayan Standards for Sustainable Building are being drafted to promote this principle throughout the country.

Hugo Riveros explained during the questions session that the Paraguay Council is part of an international network that has provided assistance to develop the normative part. It is important to develop standards; Paraguay is currently enjoying a boom in the construction sector, but no laws exist to regulate it.

Case study 1: Paraguay

Ángel Rincón, Paraguayan German University (APU), National University of Asunción

Angel Rincón presented the research currently being carried out by the National University of Asunción, about how to develop the use of supercomputing for the use of wind and solar energy in Paraguay. Current energy and environmental problems are caused by the fact that technological

progress and our societies' socioeconomic foundation are based on the exploitation of non-renewable energy resources such as oil, coal and gas. But these resources have significant effects on the environment. At present, the world's greatest energy challenge is the integration of renewable sources within the infrastructure of conventional electricity supply. According to the Inter-American Development Bank, Latin America and the Caribbean have a renewable electrical potential 22 times higher than the expected demand for 2050. In Paraguay, the National University of Asunción is implementing policies for the efficient replacement of energy, such as the SELAV Itaipu project to provide energy to isolated communities in the Chaco and small military settlements.

Solar and wind energy, however, have high variability related to the geographical, meteorological and weather related conditions of each locality, resulting in intermittent power generation. It is important, therefore, to develop maps with high spatial and temporal resolution of the solar and wind energy potential of each country to reduce the uncertainty associated with these renewable energies.

Numerical models are a physical and dynamic computational representation that show an abstract simplification of the real atmosphere. Their development requires high computational resources that are provided by a supercomputer. Compared to a personal computer, which has two processors, 6 GB RAM and 750GB disk capacity, a supercomputer has 50 thousand processors, 100,800GB RAM and 2,000,000GB disk capacity. Examples of supercomputing applications include the design of wind farms, to establish the optimal position of wind turbines, to reduce costs in the operation stage, and to optimise available wind resources.

Two projects are being developed in Paraguay in this area: 1) obtaining a typical meteorological year through the high temporal and spatial resolution meteorological modelling of 20 years; 2) the meteorological modelling of Paraguay's solar resources through the computational laboratory of the Mechanics and Energy laboratory of the Engineering Faculty of the National University of Asunción (CONACYT project).

During the questions session, Ángel Rincón stated that solar energy has a huge potential in Paraguay, especially in the western Chaco area. As an answer to the question whether the potential of hydrogen generation is also being studied, Ángel Rincón commented that at Itaipu park research teams are dealing with this type of emerging energies. The problem is political, because the need to invest in renewable energies is still not recognised. Paraguay and Haiti are the only countries that do not have a Ministry of Energy. In Paraguay, the Department of Energy answers to the Ministry of Public Works, which creates bureaucratic problems. For this reason, the renewable energies law has been blocked for 11 years.

Case study 2: Renewable energy projects in Chile

Rosa Argomedo, Global Changes, Chile

Rosa Argomedo presented several case studies of rural electrification projects in Chile. The first case involves the implementation of renewable technologies in a Mapuche community with the aim of improving the material and living conditions of its population. The programme incorporated a social and community dimension through an intervention that encouraged the participation of the community's families and its organisation. A sustainable agro-ecological community was installed, respecting the Mapuche worldview, with positive results in terms of the cost-benefit of the solutions implemented.

It is important to implement efficient and sustainable technologies that respect the culture and the environment, thereby improving family welfare and reducing impacts on natural resources. It is essential to establish the needs of the community and how the community can contribute to the

project, in order to decide together on the most favourable technology. At the same time, working with local leaders contributes to collaboration and the complementarity of knowledge, makes it easier to manage the group and helps overcome conflicts. It is necessary to work with the community from the beginning, with the participation of sociologists and anthropologists. This stage also enables community members to get involved in the project and understand how to use and maintain the technologies, applying the "learning by doing" methodology. Generating harmony and connection between cultural identity and technology is a very important requisite for the sustainability of a project. These requirements form the basis of a participatory model.

The second case involves a 145-kilowatt mini power plant that benefits 117 homes in Llanada Grande. The mini power plant is operated as an electric cooperative with variable rates (with a flat fee of USD 3.6/month and a variable charge of USD 0.21/kWh), with no operating subsidy. The project owes it success to the fact that it arose from the community and training was provided for its members, and that it was clear from the beginning that users would have to pay a fee for the plant to be sustainable. Also necessary were public policies for access to energy with methodologies that allow to determine whether the social benefits of a project justify the government's subsidy of its negative profitability or not, and a budget has been earmarked just for that in Chile.

The third case study is the national project "Educar con Energía" (Educate with Energy) in 34 schools of the Coquimbo Region, which consisted of a photovoltaic-diesel hybrid system with an installed capacity of 77.6 kW, and an investment of 1.7 million dollars. The management scheme included training teachers on the replacement of equipment, with support from the regional and central governments.

Rosa Argomedo concluded her presentation by pointing out the role of the media in energy projects. It is important to understand the technological, sociocultural and energy-related issues and to have adequate technical knowledge to be able to report on the subject showing qualitative and quantitative results, whether negative or positive. Communication professionals should also promote respect for diverse cultures, have an interest in communicating the worldview of all citizens and what projects mean to their beneficiaries.

During the questions session Rosa Argomedo spoke about the need to convince national political leaders of the importance of improving communities' material conditions, especially in countries where no policies, budgets or methodologies have been established for this purpose. In response to the question on how to change the mindset of the people in the communities to accept new technological solutions, she said it is best to develop a joint solution which is then accepted by everyone.

Case study 3: Housing complex with renewable energy in Brazil

Marcelo Álvarez, Brazil

Marcelo Álvarez described a pilot housing project with renewable energy located in an off-grid region of extreme poverty in north-eastern Brazil. The project is located in a peri-urban area of the municipality of Juazeiro, Bahia, which is home to 220,000 people, suffers from a housing shortage that affects 7.7% of families and has a semiarid climate, with more than 2,800 hours of sunshine per year. The area's economic engine is agriculture.

The housing subsidies programme benefited one thousand low-income families, and was financed by a public-private partnership, with a government contribution of USD 2.2 million through the "Minha Casa Minha Vida" (My Home My Life) programme and the participation of Brazil Solair company with a USD 275,000 investment. The project hired the residents themselves, half of them women, to install the solar panels, generating employment and inclusion. The housing

complex has 9,144 photovoltaic panels, with a potential to produce 2.1 MW (3,900 MWh per year) and 6 wind towers with a potential to produce 24kW that illuminate the outer areas. The electricity generated can supply 3,600 family units, meaning there is a significant energy surplus. Although the sale of energy is not allowed in Brazil, in the case of this pilot project the housing complex's residents were allowed to sell their surplus energy to the Caixa Economica Federal (government-owned financial institution) to raise funds. The result is that 5,000 people were connected to the network, and 60% of the proceeds from the sale of electricity is profit for the families, 30% is invested in the condominiums, and 10% goes to their maintenance. The average value of the monthly payment is USD 20 per family.

The project was a success, especially because it managed to involve the condominium's residents in the whole process, from the decision to use renewable energies to the installation and maintenance of the systems. The challenges include the fact that the cost of solar energy is quite high, so it is not attractive to private investors. In addition, most people, especially in rural areas, still consider solar energy as something unknown and unreliable, where the impact of its use could be higher.

The government must intervene to generate demand, lower prices, create incentive policies and financing sources. The role of the media is to show these unmet needs, creating pressure on the government to get its attention, and inform and educate the population so it understands the new technologies and their benefits.

During the questions session, Marcelo Álvarez explained that although it is not permitted to sell surplus electricity in Brazil, there is a credit system for those who are connected to the grid. Users can provide electricity to the grid during the day, and the same amount is returned to them free of charge at night. Although it would be much more beneficial to be able to sell at a profit (as in the pilot project), the necessary regulations do not currently exist. The largest benefit obtained by the Brazil Solair company from this pilot was the publicity it generated.

Journalists' presentations

María Emilia Jorge, Venezuela

María Emilia Jorge described the current situation in the city of Caracas, where there are many problems of infrastructure and in the provision of social services due to the severe economic crisis the country is facing. These problems affect the drinking water system, because due to lack of maintenance 30% of the water destined for Caracas is lost in the piping system, so that some areas of the city have no water. The situation has been exacerbated by the drought caused by El Niño. Another main urban problem is garbage collection: 2,600 tons of garbage are produced daily and only 0.66% is recycled.

Sustainable energy is not only important as a means to provide energy to those who lack it, but also as a way to find more environmentally friendly solutions. A few small urban initiatives exist, but there is no large-scale national action plan and the situation in rural areas of the country is even worse. But communications in Venezuela are difficult, the average connection speed in the country, for example, is 1.9 Mbps, the second lowest in the continent.

Graciela Melgarejo and Patricia Melgarejo, Argentina

Graciela and Patricia Melgarejo presented case notes made for *Noticias Positivas (Positive News)* and highlighted the social impact of the projects. One of the initiatives involves the NGO Eco Andina, created to turn small isolated villages in the Argentinean Puna into solar villages. The area is supplied with electricity only a few hours per day and weather conditions are very harsh, especially the cold at night. Communal showers were in-

stalled in the village of San Juan y Oros, providing access to hot water. Since the villages are near Route 40, which has considerable traffic, their residents have increased their income sources by offering meals and showers to travellers.

Another case involves the implementation of efficient solar cookers, which use less wood than traditional stoves, by an NGO called Solar Inti. The cookers are manufactured by the villagers themselves.

Finally, Graciela and Patricia Melgarejo described the Ford initiative to renovate rural schools built between 1968 and 1980 in Argentina. Meeting sustainability criteria, panels are being currently installed for electricity, heating and water heating.

Laura Rocha, Argentina

Laura Rocha described several initiatives in Argentina that use renewable energy, such as the creation of several solar farms that contribute to the grid, and the creation of a small town 65 km from the capital, Cañuelas, which operates entirely on renewable energies. Another positive development is that environmental education has been incorporated into school curricula, and it includes information on new energy technologies.

Argentina held its first international congress on solar energy in the city of Buenos Aires, initiating the development of the necessary legislation for users to sell any electricity they generate at home using solar technologies to the national grid. Different models of payment are being analysed by Congress.

The press is interested in covering topics related to access to sustainable forms of energy in rural areas, but most projects are carried out by NGOs. Most of the government projects, on the contrary, tend to be large-scale. Some of the best media outlets that report on energy-related topics are online editions and social networks, concluded Laura Rocha, due to the high cost and the difficulty of obtaining space in traditional publications.

Vesna Marincovik, Bolivia

Vesna Marincovik described the magazine Energía Bolivia (Energy Bolivia), which was established to make up for the absence of a media outlet with the specific aim to cover the topic of renewable energies. It is the only magazine in the sector dedicated to this issue. Two other institutional magazines exist that have a strong bias towards hydrocarbons.

The problems faced by the magazine to cover the sector include: 1) centralised information with actors who have little time to meet the demands of the press; 2) a scarcity of institutional information material; 3) highly technical information; 4) little or no training for a better coverage of the sector by the actors involved, the media and universities; 5) little financial support, which means a greater reliance on advertising and less self-management capacity; 6) greater support and interest in the hydrocarbon sector.

Finally, Vesna Marinkovic said that the State has increased the development of solar and wind energy projects, with hybrid alternatives for rural areas, but with a persistence of hydroelectric projects. The greatest limitation for the promotion of renewable energies in the country is the low price of electricity due to the fact that gas is subsidised.

Cristina Pabón, Bolivia

Cristina Pabón introduced Scidev.net, an information portal that covers various development-related fields, energy among them. The portal has published more than 500 energy-related articles, but many of them are global and they are not always publicised in Bolivia. One of the projects taking place in Bolivia that were written about deals with the dissemination of improved cookers by the Solar Inti association, which has benefited

low-income villagers of the Bolivian altiplano and has been very successful in the Uyuni salt flats. The users benefit from a reduction in the amount of wood needed for cooking.

Cristina Pabón explained that one of the challenges faced by journalists is finding information from different sources to be able to evaluate any possible negative aspects of the projects, and providing an integrated approach based on scientific data, but without presenting too many technical details. It is essential to also obtain the authorities' perspective.

Miguel Vargas, Bolivia

Miguel Vargas described his experience covering renewable energies working for Escape, a magazine of the newspaper La Razón, where he is in charge of the supplements. He said that the advantages of covering stories for a magazine rather than a newspaper are that there is more time for investigative reporting and that the features can be longer. The essential element of a good report is that "blood flows in the pages", explained Miguel Vargas, i.e. that it includes life stories, and the effects and benefits that an initiative can have on a specific person or family. It is not just a matter of covering facts, but of being present and chronicling experiences, using beautiful and precise language. It is important to have many, multiple and diverse sources and to favour multidisciplinarity. Images and photography are very powerful elements. Monitoring the projects is also essential.

Two cases were presented. The first was a solar energy project in the protected area El Palmar, in Chuquisaca, which is very isolated, and where the work was done with very low-income communities. Because it is a protected area, photovoltaic systems and improved cookers can contribute to tourist development without compromising the ecological integrity of the place. 19 families, including 70 children, benefited in Palmar from these systems, which created new economic opportunities and improved the local school.

The second case involved the Bio Centro Güembé Resort, 15 minutes from Santa Cruz. It consists of a hybrid solar and wind park that is energy self-sufficient and can supply electricity to its many tourist attractions.

Miguel Vargas concluded that it is important to improve access to information to enhance the quality of reporting on renewable energy projects and their impact on rural communities. It is important to be able to obtain timely information. The great challenge is being part of the current agenda and having first-hand information instead of just publishing converted press releases. It is important to address the issue in other sections of newspapers, such as the women or culture sections, to expand the reach of the information.

María Alejandra Collao, Bolivia

María Alejandra Collao described the production of a video that shows how the use of solar energy has been promoted in several countries in Latin America because of its abundance and low cost. In Bolivia, the largest amount of solar radiation falls in the altiplano of La Paz, Cochabamba and Oruro, and one of the most innovative projects carried out involved the capital's aerial tramway. It is a system of aerial cable transport linking the cities of La Paz and El Alto, which began operating on 30 May 2014. Since its first three lines were completed, it has been the world's longest Aerial Tramway for Urban Transport. The cabins were fitted with photovoltaic panels that provide the energy needed to light them up and maintain contact with the central station.

The video was important to educate the population about the benefits of using clean energy. The photovoltaic panels attracted the attention of many users who had not considered this kind of solution, increasing the acceptance of new technologies.

Javier Pontillo, Chile

Javier Pontillo discussed the renewable energies boom and the role of the television press. Although articles about renewable energies have significantly increased in the media, coverage of them remains low in the country. Interest on the topic is twofold: on the one hand, the country's population is more aware of the need to protect the environment, and on the other, clean energies are a solution to provide electricity to communities in remote areas. Many of the stories reported are about solar energy, but in Chile there are still about 20,000 people who live in hard to reach areas and many of those projects allow for rather interesting stories to be told.

One of the cases reported involved the village of Esquiña, in northern Chile, which today is supplied only by solar energy. Previously the village had no more than two hours of electricity per day, and the new electrical system has radically changed the lives of the 24 people who live there.

The main challenge of disseminating projects through the media, concluded Javier Pontillo, is that on one hand you need to have a good human interest story, and on the other, you are required to have good technical knowledge of the subject to properly inform the public with clear and precise language. Continuous education and training are very important.

Rosario Cárdenas, Chile

The energy sector in Chile is experiencing a unique moment in its history: it is the sector with the highest investment in the country, surpassing mining. Although the country is not rich in terms of traditional forms of energy, its potential in renewable energy resources is huge. Chile is in the third place in the global ranking that measures the attractiveness of investing in renewable energies, and some areas of the country receive the highest level of solar radiation worldwide.

One of the government's tools to promote universal access to energy is the Energy Agenda (2014-2018), which includes the Access to Energy Programme for remote areas with four lines of work:

Electrification of 10,000 energy-less households to improve the quality of life for residents of remote areas and reduce the incentives to migrate to urban areas. The goal is to reduce by 50% the amount of families without electricity before 2018. By 2015, 6,300 households already had electricity.

100% of schools and rural health posts with access to energy

Renewable energies programme for indigenous communities

Improvement of electricity supply in islands

The Ministry is tasked with disseminating information on new technologies in a way that all citizens can understand, using various mass media outlets. In addition, small-scale demonstration projects with renewable energies are being implemented that enable reporting on the technologies, while gathering information for the development of public policies and promotion tools.

Daniela Hirshfeld, Uruguay

Daniela Hirshfeld introduced herself as a representative of the Scidev.net portal for Latin America. Concerning the coverage of energy issues, the portal describes specific cases from each country, and the energy challenges faced by the region. It also publishes opinion pieces and analyses by experts at a national and regional level. Some of the titles of published articles include:

Brazil: court ruling that prevents use of controversial technology (and how this affects indigenous communities)

Costa Rica's capital city will have solar traffic lights

The formula of leading countries in renewable energy

Nicaragua: tax exemptions for renewable energies

Colombia will be built sustainably

Mexico: no energy transition law in sight

The need to find appropriate stories that are interesting to the region and to practice a scientific journalism that communicates at the same time the social and human aspects of stories have been highlighted among the challenges of reporting on the subject.

Day 2

Future technologies and productive use

Bernie Jones & Claudia Canales, Smart Villages

What is meant by the productive use of energy goes beyond the simple personal use for lighting, cooking or listening to the radio, but to creating economic benefits as well. Access to energy can help communities create small businesses. A small 200-volt solar panel in Tanzania, which costs one dollar per day to maintain, can generate for its owners an income of USD 40 per day charging mobile phones for the neighbours. A larger scale example would be the use of renewable energies to improve agricultural production by installing a new mill for the community.

High loads, such as those for a mill or a factory, are known as "Anchor Loads" and are convenient for mini electrical networks because they reduce investment risk by ensuring sufficient demand to make the project economically viable. Surplus energy can be used for social services such as education, health, drinking water and communication, which according to the values of the Smart Villages Initiative, are key activities for communities to develop in new fields.

As for technologies, several innovations exist for the personal use of energy, such as LED lamps. Innovations to promote social services and generate electricity on a larger scale, however, are still in a developmental stage, mainly in industrial laboratories or universities. Solar energy innovations include printed organic cells, which are a less efficient material than silicon cells but much cheaper and easier to access, since they can be printed on industrial printers rather than requiring a laboratory. Also, because they are lighter, flexible and semi-transparent, they are considered an attractive technology for different applications, such as for covering greenhouses.

In the field of hydraulic energy, new turbines have been developed that can generate electricity with much less power than a conventional mini-hydroelectric plant. Turbines that can be made to float, that can be put in waterfalls or in very fast-flowing rivers to generate not too large but efficient amounts of electricity. A community in Borneo, Malaysia, created a floating hydroelectric system called The Swan, consisting of a handmade turbine with two bicycle dynamos that floats in the river. The system supplies approximately 6 houses, but its biggest advantage is that it was created by the villagers themselves. For remote or very poor communities, the value of technologies is not in their efficiency. The villagers prefer solutions that they understand and can repair, rather than advanced systems that are costly and complex.

Ancient sources of energy have also been studied, such as the use of animals to run basic electrical systems, and other more futuristic sources, such as the generation of electricity using the ocean's different temperatures or obtaining energy directly from ambient heat without going through intermediate stages. The latter two are still under development, but show great potential for isolated communities.

Energy storage is a big problem for off-grid localities, so batteries and their second-life use have sparked the interest of scientists. An example of this are the batteries of electric cars, which must be replaced when at 70% of their capacity, but can be reused by off-grid electrical systems. Other research segments include flywheel systems, which can store mechanical energy as kinetic energy, and energy storage systems using biotechnology. The latter is being studied at the University of Cambridge using crops.

Much emphasis has also been placed on the development of more efficient appliances, both at the household level (television sets, refrigerators, computers, etc.) and at an industrial level (ma-

chinery). For example, LED lights are not only being investigated to improve their energy efficiency, but also so that they transmit ultraviolet light to purify water.

Several innovations have been created to improve communication and access to information for education, health and agricultural production. For example, Google and Facebook are developing broadband systems based on balloons and satellites; QuantuMD created a device the size of a cell phone that can provide a patient's DNA sequence in 15 minutes to check if he or she has malaria or an STD, for example, and also report on the drugs needed to treat the disease; Swasthya in India, created a backpack equipped with a small solar panel, the instruments of a clinical laboratory and a tablet connected to hospitals' databases, which enables its user to carry out up to 33 different types diagnoses in a few hours, saving time and the need for doctors to travel; the Cambridge Cognition is a more controversial technology, where a device that looks like a watch can measure in real time the mental health of patients and provide advice on what medication to take; 3D printers have also attracted the attention of researchers, as they have the capacity to print parts of machinery, equipment and even prostheses for the disabled. Also, to save on import costs of 3D printing polymers, Tanzania is recycling this material from garbage.

All these technologies have in common that they are portable and, although they were not designed for off-grid situations, communities with low energy consumption levels can take advantage of them. All these examples show that technology is changing at a very fast and varied pace that it is difficult to follow, but that it constantly opens up new opportunities to have a greater impact in off-grid areas. It is important that researchers on this field are informed and alert to the different applications of new technologies.

When answering questions, Bernie Jones said that The Swan is a mobile system that can be taken out of the river if there is bad weather or major floods to avoid damage. It is a versatile system that does not generate much electricity but is a low cost solution. What is special about this innovation is that it was created by the villagers themselves, so the community feels ownership of the system and looks after it.

Asked about the transfer process of these technologies to rural areas of Latin America, Bernie replied that there is a dependency on the type of technology installed. The more advanced technologies and those in the stage of being developed would need the participation of the private sector and the government. Also, many of the innovations were not created for rural areas, but were sold in urban areas and were then adapted to work in rural areas thanks to the creativity of certain actors.

Finally, a question arose about the possibility of creating partnerships between Smart Villages and local universities, to which Bernie replied that it is in fact possible to establish relationships between them. More interesting, however, would be any contact established between universities in South America and Malaysia to share projects and experiences, which is one of the objectives of the Smart Villages workshops.

The University of Malaysia has carried out much work with indigenous communities, not only establishing micro power plants, but also using technology in innovative ways, for example creating internet centres for communities to be better connected. There is no monopoly on good ideas, there are many ideas going around in the world and the challenge both of this initiative and those who are here is to share those ideas and compare them to ensure continued progress.

Journalists' presentations

Iván Flores, Ecuador

In terms of the energy matrix, Ecuador is going through a turning point at this moment, reaping the harvest of seeds sown over the last decade. In 2001, 570 thousand gallons of diesel were spilled at the Galapagos Islands, world heritage site, putting in extreme danger the sanctuary's natural habitat. Since then, there has been much emphasis on changing the energy matrix that until the time included mainly Bunker, an oil derivatives that are even more polluting than oil itself. The percentage of hydropower in the energy matrix grew from 50% to 93% over the last decade, thanks to the inauguration of 8 new projects, with a capacity of about 1,500MW, installed in rivers of the Andes.

At the same time, in response to strong social pressure from universities and communities, the State created the National Institute of Energy Efficiency and Renewable Energies, whose aim is to seek greater efficiency and alternative energy sources. Its projects include the use of sugar surpluses to generate fuel in the San Carlos sugar factory, the installation of the Villonaco wind farm in southern Ecuador and a photovoltaic park in Pimampiro; thanks to its high volcanic activity, 16 geothermal projects are also being studied and in the Galapagos Islands, 30% of the demand for electricity is supplied by a combination of wind and solar energy.

All these large infrastructure projects, however, have created conflicts with local communities. Large hydroelectric plants have affected the water supply of farmers, but their protests were rejected by the State on the grounds of "criminal law abuse". In the province of Bolívar, a very poor area of Ecuador, the community got organised to demand small hydroelectric plants with low environmental impact instead of the megaprojects, but the State again silenced the protesters accusing them of terrorism, punishable by up to 8 years in prison.

Tania Orbe, Ecuador

Tania Orbe introduced herself as the correspondent in Ecuador for the International Network SciDev.Net. She said that there have been several emerging projects in Ecuador, but that currently every initiative must be linked to the State. This law requires universities to frame their research areas according to public policy but only public universities meet these requirements, leaving no space for private universities to do any investigations.

In 2015 the University of the Armed Forces won the first of Odebrecht prize for the construction and implementation of a tubular anaerobic biodigester, in order to obtain biol and biogas for community use in the province of Chimborazo, one of the poorest in the country. Universities have donated several of these systems in different locations, where they are managed by the community. But in some places the batteries have run down and many of the systems have fallen into disuse. Another example, built by the Army Polytechnic School of Quito, are the "Biocalefon", water heaters that work with the combustion of organic waste. Unlike the biodigesters, the biocalefon are still operational.

The Ecuadorian government controls the information of the major television and radio outlets of the country through the Organic Communications Law adopted in 2013. This law penalises many opinions, especially in traditional media. President Rafael Correa has been in power for a decade and has achieved great progress in energy related issues. His government has restructured the energy matrix, recurring blackouts are gone and energy is now exported, instead of imported.

It is necessary to be creative to communicate all this information and create an impact on the

Ecuadorian public: entertainment, scientific and technological topics are well accepted. Greater emphasis is being placed on electronic media rather than traditional media and on creating new strategies to reach the public, such as through art, literature and science fiction.

Sergio Silva, Colombia

Sergio Silva works for the newspaper El Espectador, Colombia's oldest paper. The newspaper gives a lot of space to important topics such as peace and agreements like the one recently signed between the government and the FARC in Havana. The paper's editor, however, is not afraid to publish news on environmental topics on the front page, as they are issues related to territoriality and policy. Thanks to a campaign financed by USAID, WWF, ISAGEN and EPM, a new strategy has been created to give environmental issues a space in the newspaper. This campaign allocates resources to travel and report on cases such as that of Isla Fuerte, a small island located off the coast of the department of Córdoba, with 2,000 inhabitants whose main economic activity is fishing. In 2009, two LPG plants and two solar plants were installed on the island. This enabled fans to be installed in the school and local library, as well as 15 refrigerators to improve the fishermen's production.

To open media to this kind of news it is essential to understand that there are new and more attractive communication formats such as photos and short videos, which attract the public if they are well made and enable continuing to establish the link with policies and territoriality.

Lía Barrios, Paraguay (Communications student)

Lía Barrios is a Communications student and community correspondent for the newspaper ABC Color at the same time. She began her presentation by describing how journalists have a commitment to look beyond simply what has been assigned to them. An environmental journalist has a duty to criticise projects that compromise the environment and the public. For example, the project to extend overhead power lines by La Ande on Ave. Primer Presidente in Asunción, is not taking into account the many trees there that are still growing, which will have to be cut down in the future so that they do not affect the lines. This needs to be communicated to the public. Also, the technical aspect of a project to change the energy matrix of Asunción is not attractive to the public in itself, but a headline saying that this will mean a decrease in broken traffic lights through the use of solar panels, will arouse their interest.

She concluded by saying that reporting means visiting places, talking to people and having a critical eye to see the environmental impacts that new projects or activities may have on the people of the area and its flora and fauna.

Antonia del Valle, Paraguay

Antonia del Valle introduced herself as a correspondent for the newspaper ABC Color in the interior of the country. She said that in Paraguay the issue of renewable energies is still incipient and that despite efforts, progress has been slow. Political power does not recognise the importance of new projects or of consolidating those already implemented.

The "Renewable Energies Observatory for Latin America and the Caribbean" is an initiative of the United Nations initiated in 2006 to create awareness about the importance of renewable energies. The observatory, in conjunction with Itaipu and Brazil's Power Station, studied the possibility of bringing to Paraguay the biodigesters that have been so successful in Brazil, as well as installing solar panels in some areas of the country. But after the change of government, the new establishment did not continue with the projects, no matter how beneficial they were, preferring to go back to zero again.

As a journalist it is important to show and monitor these projects, encourage politicians to make a change, and support the student movements that want to make this change happen.

Federico Gaona, Paraguay

Federico Gaona, a bachelor in institutional journalism from the Catholic University, talked about the controversy over growing soy in Paraguay. The economy is heavily dependent on this market and more than 3 million hectares of land have been given over to growing soybeans, affecting the diversity of agriculture and encouraging deforestation.

Agroindustrial Angostura (Caiasa) is the largest processor of soybeans in Paraguay. Its plant, which cost about USD 200 million, has a production capacity of 4,500 tons/day and, very interestingly, the processing plant does not use fossil fuels and generates virtually no waste. As fuel it uses pellets made from soybean husks and wood chips from certified producers who do not engage in deforestation. Bearing in mind that the population will grow to 9,000 million by 2050, Paraguay will be in an advantageous position, as soy will help meet the demand for protein and biofuels in the future.

Jhojhanni Fiorini, Paraguay

The journalist for the newspaper Última Hora, Jhojhanni Fiorini, presented a survey that was carried out to assess the relevance of environmental issues in Paraguay. The country's main media include the newspaper ABC Color (the most read), followed by the newspaper Última Hora. The results of the survey show that most people think environmental journalism is very important and that 60% of respondents believe that ABC Color is the media outlet that best presents those issues. People prefer news related to water pollution followed by news on deforestation.

Regarding knowledge of different environmental issues, Figure 1 shows that there is a tendency towards "Moderate-Poor" for soil pollution, species extinction and global warming. Regarding air pollution and deforestation, the level of knowledge improves but still remains low. There is closer monitoring of water pollution because of the water crisis faced by Paraguay. For example, the environmental tragedy suffered by the Pilcomayo river due to badly done work by the Pilcomayo National Commission, which caused the river to disappear completely leaving a high number of animals killed by dehydration.

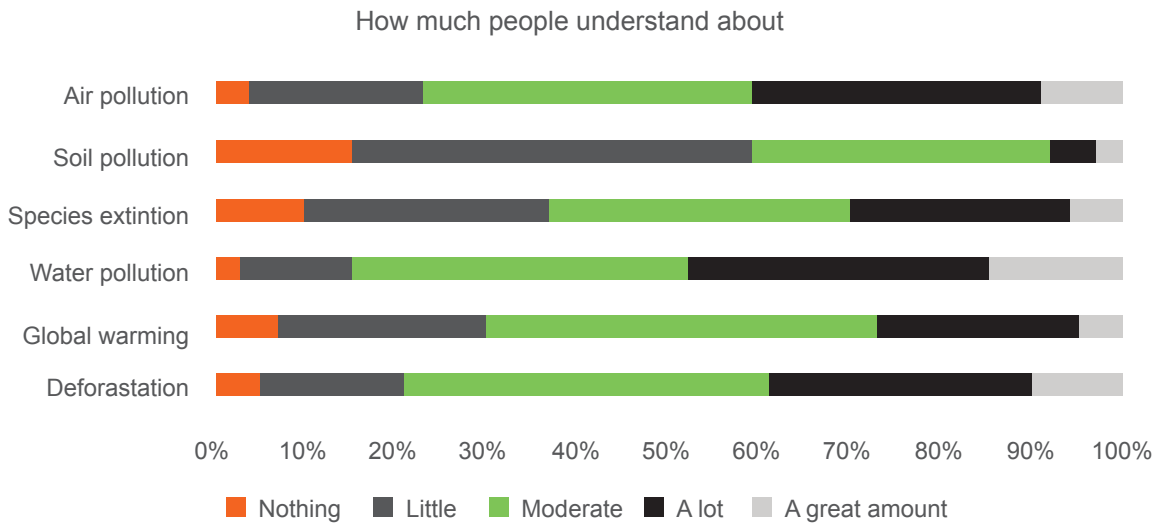

Figure 1: Answers to the question: How much do you understand about...?

Regarding the media in Paraguay, Figure 2 shows that the most visited media outlets are Facebook, websites and TV. It is clear that social networks play a very important role today. Facebook, for example, provides 50% of environmental knowledge, but Twitter does not have the same relevance in this case. The printed national newspaper is read "Often" and "Very often" by only 25% of the sample.

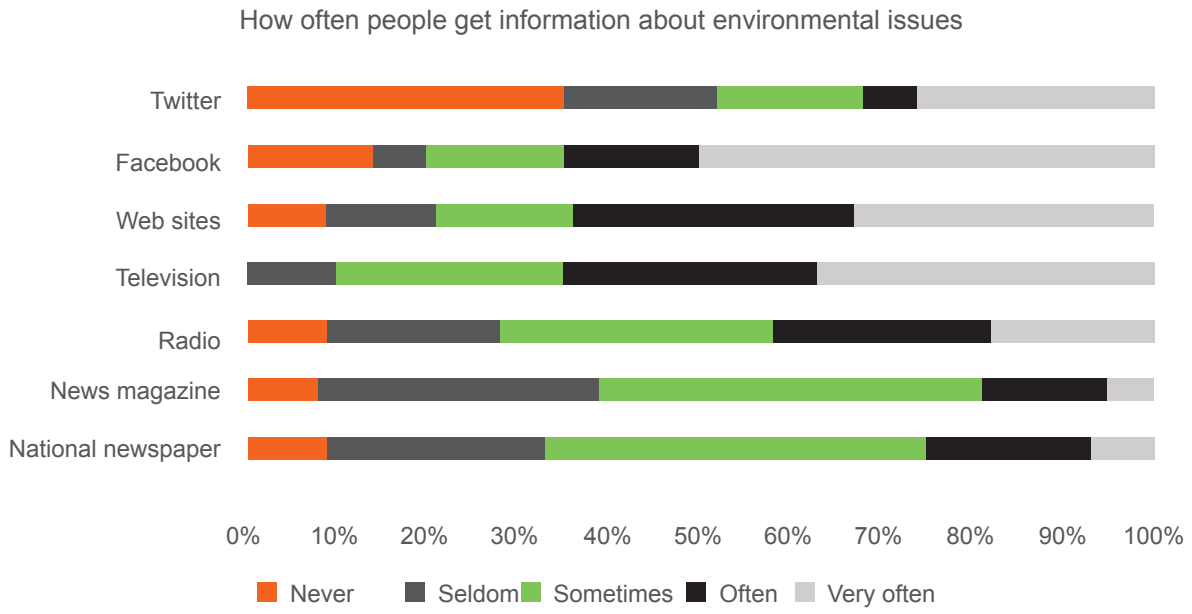

Figure 2: Answers to the question, How often do you get information about environmental issues in...?

Thanks to this survey, Última Hora decided to dig deeper into environmental issues, and to investigate the SELAC project of the Itaipu Technological Park. The project involved the construction of the first wind and solar hybrid plant in Paraguay, to provide energy security to the Armed Forces of Joel Estigarribia, in the Chaco region. The project cost approximately USD 450,000 and has 160 solar panels, 2 wind turbines, a battery bank and a backup generator. After follow-up, however, it was discovered that the system was not working as it should due to several technical problems: the inverter installed turned out to not be appropriate for military use, the solar panels were partly in the shade, the wind turbines were not operating, and the battery bank was insufficient for the barracks' demands. So one year after the system's installation, the old diesel generator was operating daily again. This investigation won the National Award for Scientific Journalism.

Paraguay does not consume even 50% of its energy production and the duty of environmental journalists is to promote renewable energies, because for many remote communities, the grid is not an economically viable option.

Teresa Godoy, Paraguay

Teresa Godoy is a journalist and host of the radio programme Onda Verde Medioambiente y Producción Sustentable (Green Wave, Environment and Sustainable Production), a programme she created more than 20 years ago. Originally it was an educational programme on the sustainable use of water. The programme was promoted by the

then Sanitary Works Corporation of Asunción because of the water issues of the time, and for this work it received commendations from the Pan American Health Organization, the WHO and SEAM (Paraguayan Environmental Agency).

According to Onda Verde journalist Luis Fernández Lagraña, the biggest problem in Paraguay is the distribution of energy and its associated high costs. A significant surplus of electricity is currently exported to neighbouring countries, but it is estimated that by 2030 Paraguay will consume the current production. Today, Paraguay remains heavily dependent on biomass. According to DGEEC (Statistics, Surveys and Censuses Agency), 93% of rural households have access to electricity, but 69% still use firewood as their main fuel for cooking.

The main problem for the development of renewable energy in Paraguay is the lack of a legal framework that covers this sector in a general and comprehensive way. This lack hinders the establishment in the country of important investments that could promote development and the use of alternative energies. There is currently a bill in Congress, submitted by public and private entities, whose legislative treatment is estimated to occur towards the end of 2016, according to declarations by members of the Paraguayan Association of Renewable Energies to Onda Verde.

Onda Verde has always promoted education about the importance of the sustainable use of the country's natural resources, which is why there is an active presence of students and teachers in the programme. It is important, however, that journalists are up to date and that they share experiences in order to publicise environmental issues more effectively.

Isabel Carreño, Peru

The journalist for the newspaper La República says that there is no specialised environmental journalism in Peru, but environmental news is usually found in some local news section. For example, La República is the second most read newspaper in the country and the Environmental section can be found within the Political section of the paper. While Peru had an active participation in COP 20, once the fever was over, environmental issues became non-existent. When COP 21 was signed, the media gave priority to side issues such as Leonardo DiCaprio's participation, focusing away from the real news. This is a clear example that journalists are not specialising and very few would want to specialise on environmental issues.

The Ministry of Energy and Mines is responsible for promoting these issues, but the information it delivers is only statistical, it does not provide any analysis or interpretations, so the news appears in the Economy section, reaching only specialised readers on the subject. There is much to communicate in Peru about nationwide solar and wind energy programmes, but because they are being carried out in the interior of the country, they are not covered by the large media in the capital.

Attempts are being made to encourage recycling in Lima, and some districts, such as San Isidro, have collection boxes for plastic, glass and cardboard with clear instructions about how to recycle. But other districts, such as Los Olivos, only deliver different coloured bags with no prior instructions on how to use them, so that all the waste ends up in the same bag.

It is necessary to tell the stories behind the cold data. In the Peruvian rainforest, for example, a community is roasting its coffee beans using a solar roaster called "Intikallana" invented by the Catholic University of Peru. In Huaraz there is much concern about the melting glaciers that could potentially flood the city, so the locals, with the support of the German environmental NGO Germanwatch, filed a demand against the RWE energy company to ensure measures are taken to protect the area. Finally, Peruvian news editors

should understand that this kind of news does deserve to be investigated and published, and given the same importance as any other.

Case study 4: World Bank Bolivia

Wendy Guerra

3 million people have no access to energy in Bolivia, approximately 600,000 households with high levels of unsatisfied basic needs. These are scattered and isolated communities, which obtain energy through batteries, candles, kerosene, gas and others.

In 2003, with support from the World Bank and the coordination and implementation of the Ministry of Hydrocarbons and Energy (MHE), Stage I of the Decentralised Infrastructure for Rural Transformation project (IDTR I), was initiated, bringing electricity to more than 30 thousand of these families. Work is currently underway on IDTR Stage II, which aims to fulfil the government's patriotic agenda of eradicating extreme poverty through the universalisation of basic services by 2025. During this stage, the aim is to bring electricity to 200 thousand families in the departments of Chuquisaca and Potosí. The project's objective is to deliver light and basic services such as radio, television and the capacity to charge cell phones. It seeks for solutions at affordable prices with modern and sustainable equipment, and also to strengthen local capacities.

The World Bank approved financing of USD 50 million and the amount available is expected to increase to USD 59 million thanks to the contributions of local beneficiaries and the Municipalities of Potosí and Chuquisaca. The project relies on three components to achieve universal access:

Component 1: Electrical services for neglected areas (USD 43 million). 14,600 beneficiaries through grid densification, 12,600 beneficiaries through domestic photovoltaic systems and 138 schools and health centres that will benefit from social photovoltaic systems.

Component 2: Strategies for access to clean energy. Pilot project with third generation photovoltaic systems that will benefit 3,000 people (USD 2 million).

Component 3: Project management (USD 5 million)

The choice of the departments of Potosí and Chuquisaca was based on three criteria: the rates of unmet basic needs, the percentage of people without access to electricity services, and the communities' capacity to repay loans to the government. The 2012 Census revealed that in Potosí 30% of households have no access to the grid, 1% use solar panels and another 1% use other energy sources. On the other hand, in Chuquisaca 31% of households have no energy, 3% of them use solar panels and 1% use other energy sources.

The project's implementation model included the government and municipalities as managers, a contractor to install the panels and electricity distribution companies for their maintenance. Current regulation establishes that the latter are in charge of handling the distribution and maintenance of electrical networks, and the new law on renewable energies to be adopted in Bolivia will extend this responsibility to photovoltaic systems too. To ensure the viability of the project, it was agreed that in order to pay the distribution company, the beneficiaries would have to pay a monthly fee and the municipality will subsidise the remainder. And as the system will be owned by the municipality, if a beneficiary fails to pay the system will simply be transferred to someone else who can.

The project has an internal communication strategy to ensure that users have a clear grasp of it, so that they understand their rights and obligations. They are informed about the benefits of accessing energy, they receive training on handling the technology, and they are informed of the risks and safety measures needed when using electrical appliances. Regarding information about the

project to the rest of the country, those in charge are working closely with the media to show a good image and the impact and progress of the project, promoting the use of renewable energies.

When answering to questions, Wendy Guerra said that the pressure the World Bank can impose on government agencies is a complicated issue, because the organisation asks to promote projects that are not known, are not understood, and have not been monitored. This is why the Bank carries out its own studies with its own funds and funds from international cooperation. In that way monitoring is made sustainable to carry out follow-ups lasting between 5 to 10 years. The Ministry of Hydrocarbons and Energy has all these databases and can provide this information to interested journalists.

Regarding questions about how to monitor and follow-up these projects independently, Wendy replied that thanks to the experience gained in previous projects, this time a specialist on communications was hired who is responsible for both internal and external communications on the project. This person has the obligation to make known all the World Bank's ongoing projects and deliver any information that the media may need.

Case study 5: Acciona Microenergía: New financing models

Jessica Olivares, Peru

Jessica Olivares presented some financing methods for off-grid projects. In Peru what must be done and what is needed is still not clear. Some years ago the government started working on a renewable energy policy and determined that 500 thousand families had no other option but to use solar panels for energy. For this reason, they called for tender for photovoltaic systems for isolated rural electrification. The terms of the tender had several shortcomings resulting in that only one application met all the requirements and the 500 thousand systems were awarded to that company. At this point, at least 50% of the systems should be installed, however so far only 0.4% of them are in place.

Acciona Microenergía Perú was born as an initiative of the Spanish foundation Acciona Microenergía. Acciona Perú is a non-profit organisation that works with international funding and since 2009 has been implementing the project "Luz en Casa" (Light at Home), an electrification programme for rural communities with photovoltaic systems. The pilot was carried out in the region of Cajamarca, the only region that has failed to emerge from extreme poverty, has the lowest rate of electric coverage and is characterised by having widely dispersed and very difficult to access communities.

Raising awareness and training are important aspects of the project. Local technicians receive specific training, as they are responsible for the installation and maintenance of the systems. Installations and commissionings are always supervised by Acciona staff. Through a social compensation fund, users pay around USD 3 per month for the service, including maintenance and the replacement of certain system components. This system has benefited 3,900 families, more than 16 thousand beneficiaries and 40 trained technicians. In addition, a group of these technicians also received entrepreneurship training.

Service provision consists on an innovative multi-actor model, where users pay a monthly fee (currently S/. 10) whose maximum limit is established by the regulatory authority OSINERGMIN. Users benefit from a cross-subsidy that does not depend on the public treasury, but on all Peruvians who have access to networks and consume over 100 kWh per month. The latter must pay a surcharge fee of less than 2% for their excess consumption, an amount that is partly used for projects like this one.

The impact assessment carried out by the Inter-American Development Bank (IDB) in 2013, showed significant benefits for the communi-

ties, but thanks to this evaluation a high level of idle installed capacity was detected, because the systems were being used for lighting only. This excess provided the opportunity to create micro franchises in the communities, where local people were trained on entrepreneurship-related topics. Now they have small consignment shops to sell appliances such as televisions, DVD players and tablets loaded with educational information.

The measures of satisfaction of both projects are very high and there has been less than 1% default on payments. The next step is to initiate the Luz en Casa project in the Amazon. There the project will be based on the Napo River basin and it will be necessary to rethink the management model, as the area can only be accessed by river and it takes 6 hours to get there. Third generation technologies that are more portable and have different maintenance conditions will have to be used in this case, but the idea is to keep the S/. 10 fee.

When answering questions, Jessica Olivares stated that the communities are chosen based on those families not covered by the government's grid extension programme, as it is very expensive to install equipment that the government may later uninstall. For this reason, on the run to verify the conditions of the area, isolated places are chosen where there is no way they can be reached by the grid.

Journalist presentations: Writing for the international press

Toby Stirling Hill, United Kingdom

Toby Stirling is a journalist for Global Development at The Guardian in the UK and he spoke about the challenges and opportunities of international journalism. Toby explained that there is a crisis in journalism caused by financing problems, because to cover climate change issues in the world and attract public attention it is necessary to travel to different countries. But this crisis has provided an opportunity for independent journalists. Before, there used to be one correspondent for all Latin America who wrote an article every 5 years, but there are many more now and only between 2015 and 2016 more than 10 reports were published about Paraguay. This shows that there is a hunger for stories about Latin America and environmental issues that traditional media cannot satisfy.

Scientific issues are a real challenge in Paraguay and Bolivia. It is important to delve into the culture and find strong characters to create something noteworthy. For example, a contradiction exists in Bolivia between the extraction of resources such as oil and gas, and the autonomy of indigenous lands. Once oil is involved, there is a great clash between these two interests. The media showed the conflict as a struggle between neo-liberalism and socialism, but a visit to the assemblies of the Guaraní people showed a completely different outlook. The community's real struggle is for control of its lands and some people have even risked their lives fighting against the estate owners. In Paraguay people are also engaged in a struggle for land; there is a well-known story of a man who fought all his life for his land, he even went to jail for this, but now he is tired. He currently writes protest songs telling about his experience in this struggle.

As journalists it is important to inform the public about the culture and the context of what is being described to generate more interest in an article. It is also important to bear in mind that there are many international pages with a keen interest in environmental issues and local journalists should seize that opportunity.

Fabiola Ortiz, Brazil

Fabiola Ortiz is a freelance journalist. She spoke about the challenges and opportunities she has experienced in her professional career as a freelance journalist and also writing for international media. A freelancer does not have one boss, but several, each with his/her own peculiarities. Chal-

lenges can include the language, or how to *pitch* a story to foreign media and convince the editors that the report is good. Being an independent journalist is an art and being free of ties has its own cost. It requires greater responsibility because it entails an inherent instability and sometimes a great dose of vulnerability.

The media market and journalism are changing rapidly, with more flexible working relations and increased competition. As a freelancer, one must find a way to stand out by having better sources, more exclusive contacts and more accurate information, to ensure a place in the job market. When working without ties, it is necessary to find sources of financing, which usually are very precarious and risky. Thanks to a scholarship project for issues related to poverty and access to energy, a portal called Power Struggle was created, where journalists can sell their stories and talk about their experiences. Selling stories is an everyday job, and one must be constantly looking for the angle that will interest editors.

Fabiola concluded her presentation by explaining the energy situation in Brazil, where 2.7 million people remain without electricity and 2.3 million of them live in rural areas.

Group discussion session

The workshop participants were asked to form two groups with the aim of systematising ideas in terms of what the Latin American press should do to expand the area assigned to sustainable energy in the media. The various topics discussed are presented below.

Access to information

To obtain good quality information there must be official energy information from the main actors, which in this case would be governments. Chile has a transparency law that forces the State to provide information permanently and publicly, which helps to have answers when needed. Bolivia has the same law, but it is not enforced as it should, so the government is out of reach as a source of information. In Argentina, the Casa Rosada also provides information, but getting it can take about 3 months and it is necessary to insist. The Ministry of Energy of Argentina enabled a telephone line and an email address for the press, but still the information needs to be tracked and it is not ideal. The same thing happens in Peru, where information is provided but it is completely outdated, to the point that it is no longer useful. Private companies are also reluctant to share information for fear that the press will misrepresent it.

Barriers for journalism

It happens on occasion that governments invalidate relevant news, such as the lack of water in the Pilcomayo River, when a government delegation stated that this was a misrepresentation by the press and that the river's fauna was not at risk. They also hide behind delaying information to the most important and most read media, which is what they did when Barrick Gold suffered an oil spill in Argentina. In this case, the amount of oil spilled reported by the company in question was about half of what was actually spilled.

On the other hand, stories are often repeated, which angers the readers leading them to lose interest in reading. It is important to educate and raise awareness among media directors about the need to diversify news and reports. At times, the owner of a newspaper is the same owner of a TV station, limiting two important media outlets to publish only the information chosen by that person. It was also said that scientific academies can be a very good channel of communication, but in Latin America it is difficult to get a response from them.

Increase the impact of sustainable development news

Journalism is in crisis; information is being released by third parties without many details. Work needs to be done on the capacity for advocacy and that takes talent and mixed sources. To achieve greater impact, journalists must experience the issues they are covering, obtaining first-hand information. New coverage strategies need to be created to ensure continuity and follow-up on the news. For example, the periodicity of results could be managed in stages; monitoring the evolution of an event every three months and showing the results in a clear way, seeking advice if necessary, generating thus more interest, especially among the scientific audience.

It is also necessary to distribute information to multiple media outlets, using videos for example, and delivering different approaches with cultural and social perspectives. It is important to work in conjunction with project managers, establish good communication between both parties, and change technical vocabulary for easier-to-understands language so that the news can reach a more diverse audience.

Rural communities must be empowered with communication tools so that they become involved, including educational talks to communicate the importance of renewable energies. The message to be delivered is not that renewable energies are a solution to specific problems. Their potential must be shown factually, stating that they are a comprehensive solution and that they can contribute to the development of isolated communities.

Another interesting fact is that every day less newspapers are being bought in Argentina, and the format of news is changing. During the week short and precise pieces are published and on the weekends, when people have more time, the whole story is told. Another thing mentioned was that competition and comparisons between fellow journalists inspires them to improve the quality of reports and news articles.

Communication platforms

Reports many times stay on paper and are not publicised, greatly damaging projects and initiatives on environmental issues. For example, without dissemination it is harder to get financing and there is less support. Tools like Facebook or Google Plus can help spread stories about projects and at the same time they work very well to create groups of journalists and exchange ideas and interesting publications. Rural energy platforms exist that are social networks to which one can subscribe to receive and write articles about what is happening in different Latin American countries and the projects that are being carried out. *Interciencia* is a magazine financed by the IDB that was created for the dissemination of the Latin American community's scientific news and in August 2016 Noticias Positivas of Argentina will launch a new platform for clean energies with a subcategory called *Comunidad*, opening a new distribution platform. International cooperation agencies also provide very good information. These agencies work to achieve development goals in the different countries in which they operate and both the government and NGOs must report to them.

Conclusions

To conclude, each group presented the main issues discussed at the working roundtables. They began by explaining that it is necessary to position renewable energies in a way that generates impact. To achieve this, it is important to use multiple media, including social networks such as Facebook, Twitter, YouTube, etc. Emphasis was placed on the content of the news, where the approach should capture the public's attention. In order to express themselves correctly journalists must obtain first-hand information and have an in-depth understanding of the issues they write about. It is necessary to present the same news

from different perspectives to involve all kinds of pubic, but being careful about being repetitive. The participants were advised to comprehensively study newspaper reports on environmental and energy projects, highlighting the personal stories used to illustrate them. Networks play an important role and the participants were recommended not only to create journalists' networks but to also include the entities involved.

Annex 1: Programme

Training workshop for media professionals

9–10 July 2016

Resort Yacht and Golf Club Hotel, Asunción, Paraguay

PROGRAMME

DAY 1

09:00 Welcome and workshop presentation (in English)
Richard Hayhurst, Smart Villages

09:20 The Smart Villages Initiative
Claudia Canales, Smart Villages

09:35 Findings of the Smart Villages Study (in English)
Bernie Jones, Smart Villages

09:50 Renewable energies
Wendy Guerra, World Bank Bolivia

10:10 Paraguay Green Building Council
Hugo Riveros

10:30 Coffee break

11:00 Case study 1: Paraguay
Ángel Rincón, Paraguayan German University (UPA), National University of Asuncion

11:20 Creative session: "*Living without access to energy*"

13:00 Lunch

14:00 Case study 2: *Rosa Argomedo, Global Changes, Chile*

14:20 Journalists presentations (5 min each)

15:30 Coffee break

16:00 Case study 3: *Marcelo Álvarez, Brazil*

16:20 Discussion session

17:00 Closing session

DAY 2

09:00 Future technologies/ productive use
Bernie Jones & Claudia Canales, Smart Villages

9:20 Journalists' presentations

10:30 Coffee break

11:00 Case study 4: Bolivia
Wendy Guerra, World Bank

11:20 Case study 5: New financing models
Jessica Olivares, Acciona Microenergía Perú

11:40 Group discussion session

13:00 Lunch break

14:00 Creative session: "smart villages" in the media

15:30 Coffee break

16:00 Writing for the international press
Toby Stirling Hill and Fabiola Ortiz

16:30 Workshop summary, next steps and workshop closing session

Annex 2: List of participants

Cristina Pabón	Bolivia	FreeLancer
Marcelo Álvarez	Brasil	Brasil Solair
Fabiola Ortiz	Brasil/US	Inter Press/Guardian
Rosario Cárdenas de la Torre	Chile	Prensa Energía- Ministry for Energy
Javier Pontillo	Chile	MEGA Canal 9
Rosa Argomedo	Chile	Global Changes
Sergio Silva Numa	Colombia	El Espectador
Iván Flores	Ecuador	FreeLancer
Tania Orbe	Ecuador	AquaIdeas
Hugo Riveros	Paraguay	Green Building Council
Toby Stirling Hill	UK	Guardian
Teresa Godoy	Paraguay	Onda Verde
Federico Gaona	Paraguay	CADEP
Jhojhanni Fiorini	Paraguay	FreeLancer
Ángel Rincón	Paraguay	University of Paraguay
Jessica Olivares	Perú	Acciona Microenergía
Isabel Carreño Girio	Perú	Diario de la República
Daniela Hirschfeld	Uruguay	ScidevNet
María Emilia Jorge	Venezuela	El Nacional
Claudia Canales	UK	Smart Villages
Roberta Mutschler	UK	Smart Villages
Richard Hayhurst	UK	Smart Villages
Bernie Jones	UK	Smart Villages
Lia Barrios	Paraguay	Media student

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SMART VILLAGES
New thinking for off-grid communities worldwide

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