

ARE NEWSLETTER FEBRUARY 2012



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Editorial

Simon Rolland

Secretary General

OLD TRUTHS IN A NEW LIGHT

There is a lot of attention paid to renewable energy globally, and in 2012 it is put as high on the political agenda of the world leaders as possible. This is a great sign and brings a lot of opportunities for all of us working in this sector. And even more importantly, it provides real solutions to those living in the more unprivileged parts of the world, disconnected from any forms of energy access.

At the same time, mainly three buzzwords are ever heard: solar, hydro and wind. Undoubtedly, these sources of energy have a great potential, especially in developing countries, but one should not forget these are not alone. The best solutions can only be found when the comprehensive picture is taken into account, and then, the more solutions are available, the better.

Therefore, we have decided to devote this Newsletter to biomass and its contribution to enhancing rural electrification.

There are several different technologies to exploit energy from biomass and generate electricity. There is also an ongoing debate about possible harms arising from using natural resources and energy plantations (such as fast growing trees and oil and sugar producing crops) for energy generation. They can lead to overexploitation of natural resources and raise the price of already expensive food crops.

Meanwhile, there are vast resources available from agricultural and agro-industrial residues, resulting from harvesting or transforming agricultural products (rice husks, saw dust, wood chips, animal manure and others). A more efficient use of these can not only provide people with local sources of energy, but help solve numerous environmental and health issues arising from improper management of these residues.

To learn more about how biomass can contribute to the global energy access challenge, in our “In Focus” section features two inspiring projects from Southeast Asia. SNV Netherlands Development Organisation, together with the Vietnamese Ministry of Agriculture and Rural Development, has developed the Vietnam Biogas Program, which has so far benefited nearly one million people in the country. The Program received the prestigious Ashden Award in 2010.

Also, in neighboring Cambodia, successful biomass projects are being implemented, and ARE’s member IED talks to us about its activities there and the setting up of rice husk gasification units, which benefit local villages and provide electricity in remote areas. The particular project uses technologies provided by the Indian company Ankur Scientific Energy Technologies Pvt. Ltd., ARE’s member from India. We are especially happy to provide a more detailed interview with Ankur, the first biomass sector representative joining the Alliance.

Of course, also this time do not miss the latest news from the Alliance, as well as the upcoming events with our participation, and several interesting conferences on biomass sector. As always, a number of publications are highlighted for your attention, including a new study on bioenergy in Africa.

Spring is behind the corner here in Brussels. But it’s not only nature that wakes up, after the past grey months we faced here in Europe, this is the right time to get even more active and have great ideas and successful projects. The good spirit was felt already during the ARE’s General Assembly that was held earlier in February, and we hope all our members and supporters keep it up and will work actively with us during this eventful year!

Thanks for reading and until next time,
Simon Rolland



In Focus

BIOGAS TECHNOLOGY IMPROVES THE LIVELIHOOD OF FARMERS IN VIETNAM

We hear from Dagmar Zwebe, the Vietnam Program Leader Renewable Energy at SNV (Netherlands Development Organisation) and the Technical Advisor at the Biogas Program of the Animal Husbandry Sector of Vietnam.



In Vietnam over two million families have piggeries that create a huge odour and waste problem. At the same time, women spend significant time and money collecting wood or other fuels, and then cook on smoky, unimproved stoves. The Ministry of Agriculture and Rural Development (MARD) has partnered with the SNV Netherlands Development Organisation (SNV) to develop a nationwide biogas program. The program is turning Vietnam's waste problem into a source of clean energy, demonstrating that household biogas has the potential to be rolled out across the country on a large scale.

It began in 2003 and is coordinated by the Department of Livestock and Production (DLP), part of MARD, through the establishment of a formal Biogas Program Division (BPD), with guidance and advice from SNV. Finance for the program comes from the Dutch Ministry of Development Cooperation (DGIS), SNV, and the Vietnamese central and provincial governments.

BPD has reached the outstanding result of 115,000 biogas units (by the end of 2011) in 48 provinces all over Vietnam. This is done through the provision of several trainings on (for example) construction of biogas systems, business development, on marketing and selling skills and quality control. SNV has provided advice and support throughout the program.

How does it work?

Biogas systems take organic material such as animal dung into an air-tight tank, where bacteria break down the material and release biogas – a mixture of mainly methane with some carbon dioxide. The biogas can be burned as a fuel, for cooking or other purposes, and the nutrient-rich slurry which is left can be used as organic compost.

BPD promotes fixed-dome biogas systems, designed and developed in Vietnam, which range in size from 4 m³ to 50 m³. It requires manure from minimum six pigs or two cows, and can have the

household toilet connected as well. A family-sized plant provides enough gas for all cooking needs and lighting and in some cases for electricity generation or other income generating activities as well. The slurry from digester can be used on fields as organic fertiliser.

Market Oriented

The program is set up in a market oriented way, where most investment is coming from the farmer him or herself. An 11 m³ system, which is the average size, costs about VND 10 million (USD 500), typically 70% for materials and 30% for labour. A small subsidy of VND1.2 million (USD 60) can be reclaimed by the family once the system has been checked and it has been confirmed to be working properly by a technician from the program. This subsidy is mainly used to leverage the quality of the units and to secure therefore a durable and sustainable product for the end-user. Sales, support, guarantees, cost price and other aspects related to the biogas digesters are set-up in a way that it is closely linked to normal market dynamics.

Benefits

The program has benefitted more than 550,000 people directly and another 400,000 indirectly as research has shown that outside the program almost as many units are being built by the certificated masons as inside the program. The benefits of the technology and program are numerous.

Environmental benefits

Biogas digesters cut greenhouse gas emissions by replacing fossil fuels (LPG and coal) for cooking, and by reducing the production of methane from poorly managed manure. They also replace biomass (wood and agricultural residues) for cooking and reduce dependency on natural resources. Based on the calculations for the Voluntary Gold Standard project that is developed for the biogas program, the average CO₂ reduction per plant per year is 6.55 CO₂eq (ex-ante). Which means the program now reduces over 750,000 CO₂ eq. annually, and construction is continuously ongoing.

When the production of biogas is large enough it can be used for electricity production. With a high rate of power cuts countrywide, this application starts to be more attractive, giving farmers the advantage of continuous access to electricity and other income generating activities. It is unfortunate that such “biogas ready” equipment (engines, generators) is not being made in Vietnam. Imported equipment from, for example, China is being adopted. Sometimes old truck or car engines are modified and used, but due to corrosion and other wear and tear such equipment can only be used for a short period of time. Nevertheless farmers do invest and use the electricity generating equipment for biogas as it gives them multiple benefits and replaces the diesel engines that were used before.

Social benefits

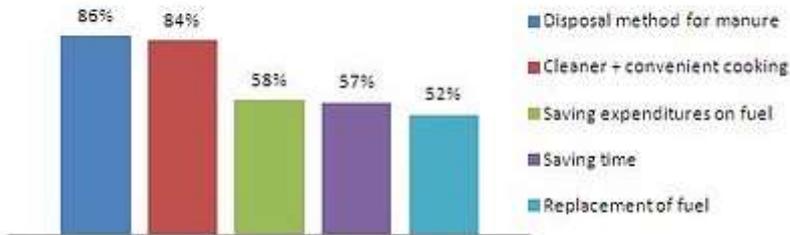
Surveys show that the most appreciated fact when using biogas is the ability to manage farmers’ pig manure, and thus keep their homes clean and odour-free, with fewer flies. Families with biogas

plants save time from not having to collect firewood and residues, light and tend cooking fires. BPD’s surveys suggest that most of this time is saved by women, and that the amount is significant – about 2.3 hours a day on average. Women use this time for work, childcare and leisure. Health benefits of the biogas plants include reduced indoor air pollution from wood and coal stoves, improved hygiene and sanitation, and less smell from piggeries and poultry farms.

Economic and employment benefits

The biogas programme is providing over 1,800 local masons with training and work. Team leaders of each mason group are also given additional business training to help them operate more independently. BPD’s surveys show that household expenditure on all types of energy can decrease up to about USD 220/year (VND 4.4 million) after the installation of a biogas plant. Thus a typical plant pays for itself in between two to three years from savings in fuel, slurry sales and chemical fertilizer savings.

Small farmers often buy more pigs after the installation of a biogas system, because the elimination of odour and the easy management of pig manure make it attractive to expand their business. This demonstrates the success of biogas and its benefits.



Reasons why non-biogas users invest in a biogas unit (Biogas User Survey, 2011)



A woman showing her biogas stove at the celebration of the 100,000th unit of the program, Hanoi province, Vietnam, 2010



Technicians being trained in quality control during a week-long training program for technicians and masons in Bac Ninh Province, Vietnam, 2011

THE ADVANTAGES OF BIOMASS FOR RURAL ELECTRIFICATION IN CAMBODIA

We hear from Anjali Shanker, the Managing Director of IED, ARE's member from France providing technical, economic, financial, regulatory and social services on power sector issues, rural services, renewable sources of energy and energy efficiency, and sustainable development.

IED Group (Innovatie Energie Developpement), a French consulting and engineering firm, has more than 60 employees based in Europe, Africa and South East Asia. It has established a subsidiary in Cambodia - Cambodia Consulting Development Engineering Co., Ltd (CCDE), employing 15 people and being involved in rural electrification projects. In 2011 IED Group established a sister company IED Invest to develop, finance and operate small renewable energy projects. CCDE with its strong field experience will be the operator of the renewable energy unit and will be selling to a local distributor, a Rural Electrification Enterprise (REE). The selected REEs have successfully managed a network with very low default rates for the clients.

IED, together with its local partner CCDE, implemented The Sustainable Rural Electrification Master Plan (SREP) which was officially endorsed by the Ministry of Industry, Mines and Energy of Cambodia (MIME) in April 2011. The SREP identified a high potential for the introduction of renewable energy supply for small isolated Rural Electrification Enterprises currently operating with diesel/fuel. Among the 200 existing diesel mini-grids with very high production costs due to inefficient gensets and poor design of distribution systems, any opportunity for the development in rural areas is currently prevented. These constraints have a strong impact in terms of energy access to the poorest, sustainability of the service and greenhouse gas emissions. One example of a possible renewable energy solution is the rice husk gasification project in Char Chuck, Siem Riep Province.

The Char Chuck Commune consists of 20 villages, of which only four (500 households) are supplied with intermittent power by a Rural Electrification Enterprise, operating since 2006 and running an old and very inefficient diesel genset, and having a long distribution network which has high loss levels. The district capital is located in the Commune, which means there are substantial rice production and milling activities going on, and a large number of potential clients are present, such as telecom antennas providers, welders, ice makers, local health center, local bank, and others.

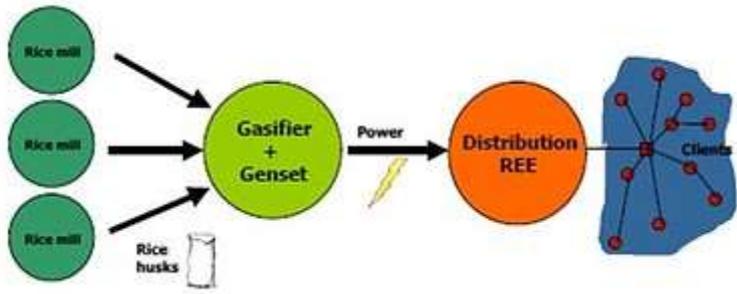
Given the local availability of rice husk, IED with a strong support of the Ministry of Industry, Mines and Energy, in collaboration with the Electricity Authority of Cambodia and with co-financing from UNIDO, is setting up a rice husk gasification unit. It comprises a 150 KW gasifier, a dual fuel genset and a 100% gas genset, which will provide 24h power to the local Rural Electrification Enterprise. The distribution network has been upgraded to reduce losses by at least 30%.

The target is to achieve a 50% increase in the number of customers in 5 years, provide additional services with a positive social and economic impact, achieve about 30% decrease in the end-user tariff, 30% decrease in generation cost, improve financial sustainability of the local operator, and achieve more than a 50% decrease in CO₂ emissions per kWh. Hopefully, tariff and service levels allowing for productive uses will be achieved, such as irrigation, serving the telecom relays, cooling produce, and improvement of living conditions of the poorest, whose consumption level is highly determined by the tariff.

The gasifier will be sourced from Ankur Scientific Energy Technologies Pvt. Ltd. from India and constructed locally by SME Renewables, and IED Cambodia (CCDE) will be the local operator of the renewable energy systems. The proposed gasifier will use the most up to date dry ash removal and water treatment devices available in order to serve as a show case in the country. Investment costs are between 1,500 and 2,000 USD/kW, and price of electricity produced will depend on the purchase price of rice husk, and in this case will be far below the current cost of diesel.

Providing a cheaper and clean source of power will have a positive impact on welfare and health, as well as the environment – and will contribute at a local level to achieving the MDGs.

There are a large number of rice mills in Cambodia, which means there is an excess of husk which can be harnessed in a number of Provinces. In other areas, different forms of biomass offer opportunities, such as residues from rubber plantations, corn, cashew nut areas and others.



Project organisation scheme



Waste rice husk in a mill in Cambodia



A village in Char Chuck, Cambodia



MEMBER INTERVIEW

ANKUR SCIENTIFIC ENERGY TECHNOLOGIES PVT. LTD.

We talk to Ankur Jain, the Managing Director of Ankur Scientific Energy Technologies Pvt. Ltd., ARE's member from India.

Can you please tell us more about Ankur Scientific Energy Technologies Pvt. Ltd., its main activities and objectives?

Ankur Scientific is a company which has been working in the field of Biomass to Energy since 1986 and has been developing and manufacturing biomass gasifiers and Biogas plants to produce a combustible gas. The gas is used for process heat applications as well as power generation.

Ankur Scientific was founded in December 1986 by Dr. B.C. Jain, a gold medalist from BITS, Pilani, a Double M.S., Ph.D and an M.B.A. from M.I.T. (Cambridge). The company has extensive manufacturing facilities and as the sole focus is on production of biomass to energy solutions, the facilities have been specifically designed and are frequently upgraded to ensure least cost and most efficient production. Ankur's competitive edge lies in its long history of developing and improving the technologies that drive its business. Ankur has patents for various technical features in its gasifiers systems and it has also won awards from the Federation of Gujarat Industries (FGI) as well as Government of India for excellence for Research in Science and Technology. It has a DSIR approved lab and the company is now ISO 9000, 14000 and 18000 certified. Its products are CE certified.

Apart from equipment design and supply, Ankur Scientific offers EPC solutions and O&M services for power plants, gasifiers for heat etc. It is also building its own portfolio of projects for generating electricity/gas.

Ankur Scientific is today seen as a world leader in this technology area and its products are marketed all over the world. In developing countries we help to provide energy that is cheap and on demand, while in developed countries we help make the energy mix "Greener". Our products are marketed in countries like Argentina, Bolivia, Cambodia, Canada, China, Colombia, Germany, Italy, Latvia, Russia, Slovenia, Sri Lanka, USA, Vietnam among others.

When it comes to off-grid solutions for rural electrification, it seems not to be exploited as much as for example solar, wind and hydro technologies. Where do the main advantages of biomass lie and how could they be utilized more?

Ankur Scientific has done a bunch of successful off-grid projects.

One of the prime and very early examples is the electrification of Gosaba Island, Sundarbans, India (case study [here](#)). Subsequently, a number of individual villages in various parts of India have been electrified using small biomass gasifier power packs.

Some of the advantages: universal availability of the feedstock, ability to supply grid quality power round-the-clock, income generation in terms of the revenues for the rural population through sale of biomass feedstocks and job opportunities etc.

But the real challenge for large scale deployment of the biomass solution in off-grid communities is the right operational model. Biomass technologies unlike solar, wind, hydro etc. mandate a certain local involvement in terms of plant O&M and biomass collection. Thus the right model becomes key, as the activities will be undertaken by people if - and only if - they somehow improve lives. Also, appropriate policy support becomes critical as the purchasing power in many of these areas may be quite limited.

What are the key market segments you target? How do the poor communities in remote areas benefit from biomass gasification solutions, is there a direct socio-economic benefit for the Base of the Pyramid?

We are looking at two main markets:

- 1. Off-grid systems for communities.*
- 2. On grid distributed systems.*

Both ideas would bring the following benefits to the rural people:

- 1. Make electricity available in areas where it has erstwhile not been available.*
- 2. Strengthen the local economy by giving a value to biomass and creating local jobs.*

In a number of our projects we have seen these things happen.

You have been in the Indian market for more than 25 years now. What are the major changes in the energy sector that you have observed, and what would you say are the most important challenges that still remain? Is there a direct government support particularly for the biomass sector?

The energy sector has changed dramatically within the last 25 years. The Indian electricity regulations are now on par with the best in the world: from a completely government controlled sector, electricity is now increasingly becoming a private play with the associated efficiencies.

The sector still has issues in terms of low tariffs due to political compulsions.

The other main issue where biomass is concerned is the Indian fixation with large projects. Small projects are seen as a solution that should be pushed back. This is changing but still a lot of work needs to be done to change this mindset.

Further, while some incentives exist for the biomass sector, they are inadequate thus not motivating the private sector to invest. The key issues are simplified procedures and reasonably attractive tariffs. This is the key if this sector is to really take off.

At the moment you are mainly operating in India. Can you tell a bit more about your activities in other regions, are there any further expansion plans? Any particular locations where you see an untapped potential for biomass usage?

At the moment about 65% of our business comes from abroad. We are doing projects in SE Asia, USA, Europe, Africa, South America etc.

The markets with a lot of potential are South/Latin America and Africa, though the potential has hardly been tapped adequately in any part of the world, particularly in terms of small projects and off-grid applications.

We are actively looking for partnerships in these areas.

Do you think the UN target of achieving universal access to modern energy by 2030 is realistic, and how do you expect the biomass sector to contribute to this goal? From your perspective, how important is the role of private sector in this initiative?

I really do not believe this is a realistic target. Half of the world – that's about 3-4 billion people do not have access to modern energy sources. To get electricity to all of them in the next 2 decades seems like a tall order.

But then again targets need not be always realistic. They are to be seen a goal – the closer you get to it, the better. From this perspective, I think the targets set are great.

There is no way we can get anywhere close to these targets without the private sector. What thus needs to happen for bodies like the UN to push policies all over the world which allow the private sector to invest into this area.

Thank you very much for your time



Ankur system for village/rural electrification



Ankur gasifier system



News from the Alliance

NEW MEMBERS IN THE ALLIANCE FOR RURAL ELECTRIFICATION:

ARE is proud to welcome new members:



ENERGIEBAU SOLARSTROMSYSTEME GMBH

Country: Germany

Website: www.energiebau.de

Energiebau Solarstromsysteme GmbH was established in 1983 as a consultancy and engineering firm for energy efficiency and renewable energies. Over a quarter of a century has passed since then, which allows the company to consider itself as a pioneer, particularly since it is still one of the driving forces in the field of photovoltaic today. After successfully specializing in solar power in 2001, Energiebau became one of the leading international systems houses in Germany with a growing share of the international project market.

Energiebau focuses its expertise on three particular business segments: the project development of photovoltaic systems, specialized wholesale in solar power components and the manufacture of the LORENZ® mounting system.

For almost 30 years, Energiebau has also been involved in supplying electricity to remote areas. With its many years of experience, Energiebau, a former pioneer of standalone PV-systems, has become one of the most expert providers of off-grid systems.

GIC CADIRE

Country: Cameroon

Website: www.barreaulittoral.org/devcadire

GIC CADIRE is a non-profit organization founded in 2006 in Cameroon. The organisations aims at promoting sustainable development and implementing projects in partnership with local municipalities and the government of Cameroon. The goals of CADIRE are to encourage technology transfer and know-how in Africa, fight the poverty and unemployment, and contribute towards achieving the MDGs. Among others, it is involved in such sectors as education, environment and energy, ICT, and water and sanitation.

In total Cameroon about 65% of the population has no access to electricity, which encourages CADIRE to join the Alliance and work on the solutions for this problem with the help of renewable energy applications.

SAFT

Country: France

Website: www.saftbatteries.com

Saft, a French company, is the world's leading designer, developer and manufacturer of advanced technology batteries for industrial and defence applications, including such applications as vehicles and renewable energy storage.

With approximately 4,000 employees worldwide, Saft is present in 19 countries. Its 15 manufacturing sites and extensive sales network enable the group to serve its customers worldwide. Saft is listed in the SBF 120 index on the Paris Stock Market.

Saft joins the Alliance with the aim to create good awareness and understating of the added value of batteries for renewable energy storage and off-grid solutions. To facilitate the increasing integration of renewable energy sources for off-grid stand alone systems, it will require the capability to store energy and regulate power-quality. Thus, batteries will play a crucial role in developing rural, autonomous residential storage solutions.

ARE GENERAL ASSEMBLY WAS HELD ON 16 FEBRUARY 2012



Ernesto Macias, ARE President, speaking during the General Assembly

On 16 February 2012 ARE organised its annual General Assembly, preceded by the traditional Networking Dinner the day before.

We were happy to welcome 27 of our members, both in Brussels and following the meeting online. We were also glad to have several non-members, including representatives from the European Commission, taking part as well and showing the interest in the activities carried out by the Alliance.

ARE's activities and achievements in 2011 were reported, and the objectives for 2012 discussed and approved. The Agenda of the meeting is available [here](#), and in case you would like to receive more detailed information on any of the topics, please contact the [Secretariat](#).

Mr Rainer Hakala from the DevCo Energy Unit of the European Commission informed the participants about the energy cooperation initiatives of the EC. His presentation can be downloaded [here](#).

The election of the Board took part during the Assembly as well. As a result, three new Board members were elected and two re-elected. A warm welcome to

- Lauha Fried, GWEC (International)
- John Freelove Mensah, Sunrise Solar Solutions Ltd (Ghana)
- Xavier Vallve, Trama Tecno Ambiental (Spain)
- Balthasar Klimbie, Wind Energy Solutions (The Netherlands, re-elected)
- Michael Wollny, SMA Solar Technology AG (Germany, re-elected)

OFF-GRID RENEWABLE ENERGY INDUSTRY WELCOMES UN'S INTERNATIONAL YEAR OF SUSTAINABLE ENERGY FOR ALL



ARE welcomes the United Nations' [International Year of Sustainable Energy for All](#), which was officially launched in January 2012. Alexandra Reis from the Alliance participated in the European launch of the initiative on 8 February in Brussels.

Ernesto Macias, President of ARE highlighted that any initiative that supports environmentally and economically sustainable solutions to the energy poverty issue should be supported:

“This initiative is a clear sign from decision-makers that energy access is set to become a priority on the global political agenda. For ARE’s members it is also an opportunity to demonstrate the benefits of off-grid renewables to supply electricity to rural areas of developing countries, where 80% of the world’s 1.4 billion people without access to electricity currently live. A lot of policy work and support remain to be done but this initiative is an important step in the right direction.”

We especially welcome the acknowledgement by the UN's Secretary-General of the essential role the private sector can play in developing and marketing sustainable energy products, for instance through public private partnerships.

"Sustainable energy for all will only be possible through business-driven solutions for technologies such as small PV, small wind and small hydro, ideal in areas where grid extension is often too expensive." said Ernesto Macias, "These areas represent a whole market yet to be fully tapped by the private sector. But there are already some early birds, as demonstrated by Bloomberg New Energy Finance's recent study which concluded that the fastest investment growth in renewable energies will be seen in the rapidly developing economies of India, the Middle East, Africa and Latin America, with projected growth rates of 10-18% per year over the period 2010 to 2020."



RECENT PUBLICATIONS AND STUDIES

BIOENERGY FOR SUSTAINABLE DEVELOPMENT IN AFRICA



Based on the results of the EU-funded COMPETE Bioenergy Competence Platform for Africa, this is the first publication dedicated to sustainable development of bioenergy in Africa. The five sections of the book cover biomass production and use, biomass technologies and markets in Africa, biomass policies, sustainability, and financial and socio-economic issues.

Read more and download the report [here](#).

BUSINESS SOLUTIONS TO ENABLE ENERGY ACCESS FOR ALL



The report was released by the WBCSD Access to Energy initiative in line with the launch of the UN International Year of Sustainable Energy for All in January 2012.

The publication presents the key opportunity areas for scaling up the business contribution in expanding access to energy – innovative business models, enabling policy frameworks and financing mechanisms – and provides recommendations on how to enable these opportunities.

Read more and download the report [here](#).

FINANCING RENEWABLE ENERGY IN DEVELOPING COUNTRIES: DRIVERS AND BARRIERS FOR PRIVATE FINANCE IN SUB-SAHARAN AFRICA



The report by UNEP Finance Initiative was released in February 2012 to mark the Africa launch of the United Nations International Year of Sustainable Energy for All. It outlines how current obstacles to the scaling-up of sustainable energy solutions in Africa – such as the cost of electricity generation or difficult grid access - can be tackled.

The report is based on a survey of 38 institutions, mostly from the private sector, which are all involved in energy infrastructure finance in developing countries.

Read more and download the report [here](#).

POOR PEOPLE'S ENERGY OUTLOOK 2012



Practical Action has launched the “Poor People’s Energy Outlook 2012”. It serves as a catalyst for a movement for change on energy access (achieving universal energy access by 2030), and a source of information to support it

Read more and download the report [here](#).



UPCOMING ARE EVENTS

6TH EUROPEAN CONFERENCE ON PV-HYBRIDS AND MINI-GRIDS, CHAMBÉRY, FRANCE, 26-27 APRIL 2012

The conference gathers stakeholders from various renewable energy and rural electrification sectors, including manufacturers, public utilities, development program specialists and energy policy makers.

The focus of the conference is on

- Development and Application of Technologies
- Exchange of Results and Ideas
- Know-how Transfer
- Identification of R&D Needs
- Presentation of Field Experience

Michael Wollny, ARE's Board member, will be among the conference speakers to give an overview of the off-grid market opportunities.

More information [here](#).

HIDROENERGIA 2012, WROCLAW, POLAND, 23-26 MAY 2012



ARE will participate in the International Congress and Trade Fair on Small Hydropower, presenting a paper on the benefits of small hydro applications for rural electrification.

More information about the event [here](#).

6TH INTERNATIONAL CONFERENCE ON APPLICATION OF BIOMASS GASIFICATION, STUTTGART, GERMANY, 30 MARCH 2012



The event is the leading conference on biomass gasification for combined heat, power and refrigeration (CHP/R) in the capacity range of installed electrical power up to 5 MW.

More information [here](#).

INTERNATIONAL BIOMASS CONFERENCE & EXPO, DENVER, COLORADO, 16-19 APRIL 2012



The event gathers industry professionals from all sectors of the world's interconnected biomass utilisation industries—biobased power, thermal energy, fuels and chemicals.

More information [here](#).

IBC LEIPZIG INTERNATIONAL BIOMASS CONFERENCE 2012, LEIPZIG, GERMANY, 24-25 APRIL 2012



During the conference, topics of the current state of research and development, as well as the practical implementation of biomass projects will be presented and discussed.

More information [here](#).

WORLD BIOENERGY 2012, JONKOPING, SWEDEN, 29-31 MAY 2012



This event is based on the unique "Taking you from Know-How to Show-How" concept, combining tradeshow, conference sessions, field excursions and match-making.

More information [here](#).
