

Developing Skills for Employability with German Partners

8 Success Stories from the Renewables
and Cleantech Sector



TRAINING – MADE IN GERMANY

AN INITIATIVE OF THE



Federal Ministry
of Education
and Research

Federal Institute for
Vocational Education
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Contents

Imprint	4
Preface	5
AQWA Academy Sustainable qualification in the water sector	6
BFW Bau Sachsen Building intelligence in China	8
ICON-INSTITUT Gesellschaft für berufliche Bildung und Training mbH Master craftsman qualification for solar technology and energy efficiency	10
German Academy for Renewable Energy and Environmental Technology Qualification for green economy demands	12
Renewables Academy (RENAC) Capacity building for engineers and managers in the MENA region	14
Saar-Lor-Lux-Umweltzentrum gGmbH (UWZ) Training of trainers for renewable energy	16
DWA – German Association for Water, Wastewater and Waste Training Curriculum Development in Bangladesh	18
Dr.-Ing. Paul Christiani GmbH & Co. KG Comprehensive renewable energy education concept	20
iMOVE	22

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Preface

Renewable energies are no longer “alternative” energies, but have become profitable investments in recent years which improve the foreign trade balance of many countries. Studies show that the increased use of renewable energies raises the economic output and the number of jobs, but also reduces energy costs and helps protecting the climate in the long run.

As a result, there is a need to train employees in the design, installation and operation of such systems. Training equipment for the study of energy derived from the sun, wind, water, etc. is in high demand as well as training designs to create professionals who are able to master the different solutions and propose the most suitable and efficient application for each situation.

Germany is one of the leading nations when it comes to renewable energies and holds a cutting-edge status with regard to environmental technology. The German government’s commitment to nuclear phase-out and to a gradual transition from fossil-fuel to renewable energies has spurred engineering research and technical innovation in this field. Around 380,000 people are already working in the renewable energies sector in Germany today. In addition there are around one million jobs in the environmental technology/cleantech sector.

Germany’s head start in this sunrise industry is reinforced by its training expertise. “Training – Made in Germany” offers the necessary know-how to meet the challenge in the field of vocational education and training. Germany has a long-standing tradition in this field and enjoys a high reputation for the demand-driven and practical orientation of its qualification programmes. The integration of professional, social and methodological competencies characterises the kind of knowledge German partners can provide.

The initiative iMOVE was established by the Federal Ministry of Education and Research in 2001, in order to promote international business relations of German training providers with international public and private organisations. iMOVE services include a multilingual database which contains information about German training providers, seminars, trainings and trade visits abroad.

This brochure presents eight success stories of skill development in the renewable energies and environmental technology sector, realised in a joint effort by German and international partners. With its wide range of training programmes and its strong emphasis on employability, “Training – Made in Germany“ has the potential to successfully contribute to the design process of the training system in many countries through transnational cooperation projects.

A handwritten signature in black ink, reading 'Markus Milwa'.

Markus Milwa
Head of Division iMOVE at the BIBB



AQWA Academy

Sustainable qualification in the water sector

Many international students and scientists benefit from RWTH Aachen University's high-quality study programmes and excellent facilities; currently 5,000 of the 37,000 students are foreign students. RWTH Aachen University is recognized by the German Federal Government as one of 11 Universities of Excellence. It attracts the best minds globally and places strong emphasis on internationalization, with the Arab region identified as a key partner. Emphasis is placed on providing academic training to the highest scientific standards and meeting the cultural and social needs of the participants as well as providing visa and travel assistance.

The RWTH International Academy, as RWTH Aachen University's official institution for executive education, recognizes that there is also a demand for knowledge from industry which renders it necessary to identify alternative educational formats. One example is the International Academy's cooperation with other academic institutions and industrial enterprises in the AQWA Academy to deliver German engineering knowledge to the water sector in the MENA region. With financial support from the German Federal Ministry of Education and Research, AQWA Academy aims at meeting the educational needs of water sector employees with varying qualifications, at different stages throughout their careers, whilst enabling them to continue their day-to-day job.

The MENA countries have the most serious water scarcity. Exacerbating the problem of secure water supply are crumbling or non-existent waste disposal systems, water pollution, and sometimes conflicts regarding the development of water resources. Population growth and increasing urbanization add to the critical situation. Investment in infrastructure, water supply, and sanitation technologies are essential, but an improved education framework for water sector professionals is also urgently required. Integrated solutions that combine technology with management know-how regarding administrative, ecological and commercial factors are in demand.

This is where AQWA Academy comes into play: Private companies cooperate with higher education institutions to develop practical, high-quality, certified training programmes for the water sector in the MENA region. The AQWA Academy content encompasses the essential issues of design, construction, management, maintenance and rehabilitation of underground infrastructure, water supply and waste water facilities.

A key goal is to transfer theory into practical action. AQWA Academy's answer is a blended learning concept, combining traditional classroom attendance with e-lectures and practical training, adaptable to different degrees of difficulty and the local setting. The crucial factor is close cooperation with partners in the MENA region to design appropriate content and didactical



Internet: www.aqwa-academy.net

Upholding quality while adapting to participants' needs



methods to meet the regional demand. AQWA Academy uses a modular framework comprising basis modules and optional learning units so that formats can be created quickly while maintaining the university's high and widely recognized quality standards.

A good example of how AQWA Academy works is the cooperation between programme partner FiW (Research Institute for Water and Waste Management at RWTH Aachen University) and the Tunisian wastewater authority, ONAS. At the outset intensive dialogue about the content and formats was held. The agreed programme was a visit to Aachen for Tunisian engineers to experience hands-on training on a semi-industrial pilot plant, testing the theoretical knowledge they had acquired in lectures held in advance. These theoretical modules had been provided via the AQWA Academy e-learning platform and in classroom lectures. Finally, the participants discussed practical details with experts during field visits. AQWA Academy is adaptable

to the participant's qualification level which is ascertained in advance. For example, technicians receive longer practical training than the engineers from mid-level management.

Based on the blended learning-concept and the good results of its evaluation, the certified training course "Waste Water Collection & Treatment – WWC&T" has been designed by AQWA Academy, comprising a four weeks e-learning preparation phase, a two weeks stay in Germany with theoretical instructions, practical training and excursions to waste water plants. The course is open both for academic and non-academic target groups. Quality is assured by a triple certification: RWTH, external accreditation agency and a representative national water/waste water association. The certificate course will be on offer starting in 2014.



The courses are all run to the highest academic standards, adhering to the ethos of RWTH Aachen University. Appropriate accreditation and continual improvement based on established evaluation processes underpins the success and provides quality assurance. However, flexibility to meet the needs of participants at various stages in their careers while considering global and industrial logistics of transferring knowledge ensures success.



BFW Bau Sachsen **Building intelligence in China**

The combination of educational know-how with product and systems solutions is the speciality of the Berufsförderungswerk (BFW) Bau Sachsen. The BFW has been responsible for training staff in the construction industry since 1991 and has already achieved market leadership in Saxony. At the Bauakademie Sachsen, a fully-owned subsidiary of the BFW, management staff for the construction industry is trained in the fields of law, technology and business administration.

Already since the early 1990s, the BFW Bau Sachsen has worked together with international partners and, since that time, has been able to continuously increase the international share in its total turnover. This development has resulted in recruitment placing an increasing weight on competences that qualify prospective staff for international deployment, such as language competence.



By now, the BFW explores new avenues in establishing co-operations and alliances. In pursuing its internationalisation strategy, it increasingly puts emphasis on partnerships with its German customers in the construction industry. Such an approach makes good sense given the industry-specific structure of vocational education and training: the vocational education and training content not only directly derives from industrial practice, but the industrial standards based on this practice are also very often connected with specific products and brands.

BFW Bau Sachsen established its first contacts in China during an iMOVE trade mission. Now, BFW Bau Sachsen is active there in the field of climate protection. In China, some 40 per cent of primary energy consumption are used solely in supplying buildings with heat and electricity. Increasing the energy efficiency of buildings entails enormous potential for saving on energy and reducing CO₂ emissions. The tangible improvement of energy efficiency can be achieved by efficient facilities engineering, in addition to improving the thermal insulation of buildings. This is why building automation plays a central part. The adequate and demand-actuated as well as energy efficient and safe operation of buildings is possible only on the basis of optimised “building intelligence”. Modern automation comprises the management, control, monitoring, optimisation and operation of utility engineering facilities such as heating, air conditioning and lighting.

To promote this issue in China, the BFW Bau Sachsen is involved in a public-private partnership project in co-operation with the Zhejiang College of Construction (ZCC) in Hangzhou. The project objective is energy efficient building operation through optimised processes. The aim is the sustained transfer of know-how and technology, with an initial focus on industrial and commercial buildings. The project partner in charge is the German company bau msr with more than twenty years of

Energy efficient utilisation of building automation



experience in this field. Other industrial partners are the German companies Engelmann (manufacturer of heat and cooling meters), Xella (producer of construction materials) and members of the ETICS Quality Alliance (composite thermal insulation systems).

In a first step, the energy efficiency show house at the ZCC constructed by Xella was equipped with a building management system. Since then, the show house has been used as a complex training facility, combining both the energy efficient cladding and the energy-saving facilities engineering control under one roof.

At the show house, all regular renewable energy sources (photovoltaics, solar and wind power as well as geothermal heat) are demonstrated in actual application. The demand for heat or cooling can be simulated for training purposes.

The target groups for this know-how and technology transfer are, in addition to the teaching staff and students at the ZCC and other educational institutions, also planners, architects and building owners, facility management companies, building authorities as well as the energy efficiency office at the Ministry of Housing and Urban-Rural Development (MoHURD). The ZCC offers workshops for these external target groups to equip the Chinese construction industry with a comprehensive set of ideas and incentives for implementing energy-saving building investments.

Parallel to the implementation and installation of the automated building management system, German experts from bau msr and the BFW Bau Sachsen have developed training material for the energy efficient utilisation of building automation in co-ordination with the ZCC. This information and training material was integrated into the existing curricula at the ZCC. It not only presents modern regulations and standards as well as options for their technical implementation, but contains also calculations of profitability.

Prior to launching the new training programme, specialist teachers at the ZCC were trained in two-week intensive training courses on site combining theory and practice. Since May 2012, some 400 students per semester can take part in the newly introduced training provision.

Because the ZCC is one of about 100 educational institutions country-wide that have been selected as a model college, the ZCC can train also specialist teachers from other colleges. This is why, in the further course of the project, the train-the-trainer courses are going to be extended to include also teachers from other construction colleges in other provinces. The teaching staff at the ZCC is actively involved in these trainings to increase their impact as multipliers in the long term.



ICON-INSTITUT Gesellschaft für berufliche Bildung und Training mbH

Master craftsman qualification for solar technology and energy efficiency

The main economic drivers in the Caribbean Republic of Trinidad and Tobago are oil and gas production and the mining of natural asphalt. To overcome the economic dependence on these non-renewable energy sources and to pay justice to the impending catastrophe of global warming, the island republic increasingly focuses on renewable energy sources and the technical requirements for their utilisation.

Against this background, the Metal Industries Company Ltd. (MIC), one of the largest providers of vocational training and continuing education in Trinidad and Tobago, and its German co-operation partner ICON-INSTITUT have launched a new qualification

project. In 2013, fourteen MIC employees took part in a continuing education course on “Solar technology and energy efficiency”, which was carried out co-operatively by MIC, ICON-INSTITUT and the Chamber of Crafts in Aachen, Germany.

MIC, headquartered in the capital city Port of Spain, and ICON-INSTITUT have maintained a partnership for many years, starting with a continuing education project in the field of vocational training in 1994. Since that time, more than 200 MIC employees have received further training, for example, to qualify as master craftsmen/instructors in the fields of electrical engineering, mechanics, mechatronics and the construction industry. The subsequent programmes were implemented by way of a twinning model: the prospective MIC master craftsmen first received basic training in Trinidad and subsequently attended a three-month main training course in Germany at the Aachen Chamber of Crafts.



Regarding the continuing education programme on the topic of solar technology and energy efficiency, both phases of the training course were for the first time carried out at the MIC vocational training workshops in Trinidad. The programme pursued a two-fold approach: on the one hand, the course participants were qualified in the field of solar technology; on the other, the course focused on energy efficiency in buildings.



Internet: www.icon-institute.de

inning project in Trinidad and Tobago



This topic in particular is of increasing importance with respect to the high rate of energy consumption by way of permanent air conditioning of buildings. The course participants also received training to qualify as consultants for energy efficiency of buildings.

The curriculum was developed in close co-ordination between all involved parties and according to technical standards. The first phase, during which the course participants studied the necessary functional and technical requirements for the second phase, was taught by MIC instructors. This included learning content from the fields of electrical engineering, construction of buildings, structural physics and waste water engineering.

The second phase, which was taught by German experts and instructors, predominantly focused on practical planning and implementation of measures. In the field of energy efficiency, the course participants developed a tool for calculating building insulation values that allows for the assessment of energy savings and amortisation rate of insulation measures. By way of practical

application, the MIC halls were measured, the structural components were assessed regarding their insulation efficiency and the energy requirements for cooling the buildings in both insulated and non-insulated state were calculated.

In the field of solar technology, the course participants learned about the planning and installation of solar and photovoltaic facilities by way of practical experience. They installed an on-grid facility (which feeds into a public grid) and an off-grid facility (without connection to a public power grid) as well as a thermosiphon grid (which allows for heat exchange by utilising natural convection without requiring a conventional pump) and a solar-thermal facility on the roof of the MIC head offices. In this context, the topics of drinking water and warm water supply were likewise covered.

Various excursions to institutions such as the Meteorological Office of Trinidad and Tobago and to the laboratories at the University of the West Indies (UWI) completed the course programme. The final examination was supervised by an examination board which consisted of representatives from MIC, ICON-INSTITUT and the Aachen Chamber of Crafts. Successful graduates received a master craftsman diploma issued by the Aachen Chamber of Crafts.





German Academy for Renewable Energy and Environmental Technology Qualification for green economy demands

The German Academy for Renewable Energy and Environmental Technology develops and organises training programmes on the topics of sustainability, renewable energy sources, water management and environmental technology. It qualifies skilled personnel for the labour market demands in a green economy and provides them with improved career opportunities. The seminars, workshops, conferences, courses and training programmes run over one to three weeks, depending on the topic and target group. They are tailored to meet the requirements of the respective target group and are augmented by lectures and presentations, exercises of practical relevance, business games, simulations and factory tours. The practice-oriented part includes the implementation of joint projects, such as the construction of a wind or solar farm or a biogas plant. In part, these facilities continue to be used for training purposes by partners of the German Academy.

The events are organised in co-operation with German universities and research institutions that are active in the field of renewable energy sources. The target group includes students, investors, engineers and technicians as well as policy makers and decision makers in private industry companies. The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ – German Society for International Co-operation) has its overseas staff trained by the German Academy. Most international course participants come from the MENA region, Southern Europe, Latin America and Central Asia. On the basis of their newly acquired qualifications, several German Academy graduates have already been able to establish businesses in the field of renewable energy sources or have successfully implemented corresponding projects for their employers in their respective home countries Turkey, Egypt, Nigeria, Palestine, Uzbekistan, Bangladesh and Tajikistan.

Since 2012, the German Academy has also been co-operating with German Chambers of Commerce Abroad, the Cairo University and the British University in Cairo. A co-operation



project of UN Decade of Education for Sustainable Development 2014



agreement was concluded with the Saudi Arabian company Renewable Power in 2014. These activities have contributed to an increase in the German Academy's total turnover of about 70 per cent. By now, these co-operation agreements have led to the implementation of training programmes in Egypt, Saudi Arabia, Qatar and Nigeria.

In 2013, for instance, the German Academy trained employees of the company Avenam Links International in the Nigerian city of Lagos, which in turn provides consultancy services to customers in the field of biogas plants. The course participants were introduced to the biological and chemical basics of biogas production, gathered information on technical requirements for the construction and operation of plants, looked into the legal framework conditions and learned how to avoid hazardous situations.

In 2014, the German Academy trained employees of Al Hamad Engineering, a construction company in Qatar that is in the process of increasingly shifting its activities towards energy-efficient building. In that country, the academy presented itself also at the largest regional trade fair, the Project Qatar 2014 for "Green Technology and Construction".

Moreover, it plans exchange programmes for Egyptian students in the fields of electrical engineering, computer sciences and mechanical engineering. During two- to three-week courses

in Germany, 40 to 60 budding professionals per year are to receive additional qualifications in the fields of renewable energy sources, environmental technology and energy efficiency.

In 2014, the German Academy was nominated an official project of the UN Decade of "Education for Sustainable Development" by the German UNESCO Commission. The German Academy advertises its services also by way of a service portfolio in the iMOVE provider database.



Internet: www.germanacademy.net



Renewables Academy (RENAC)

Capacity building for engineers and managers in the MENA region

With its headquarters in Berlin, RENAC is Germany's leading provider of vocational training and continuing education in the field of renewable energies and energy efficiency. Since its establishment in 2008, more than four thousand participants from 130 countries have benefitted from RENAC's training courses and also from the incidental exchange amongst each other.

In order to increase worldwide attention for its educational programmes, RENAC directly addresses energy agencies, educational institutions, ministries and enterprises in the respective target countries. The company likewise closely cooperates with German institutions and associations that are part of a strong international network, including iMOVE. RENAC already used the opportunity of presenting its service provision during an iMOVE delegation visit to the MENA region.



Due to their favorable climate conditions, the countries of the MENA region have a particularly high potential for sustainable energy generation. In the ReGrid Project of RENAC, which started in 2011, students from Algeria, Egypt, Jordan, Lebanon, Libya, Morocco, and Tunisia learn how large quantities of wind- and solar-generated electricity can be fed into the network without any negative impact on the power system. To this end, RENAC has developed a multi-stage training programme with online courses, classroom seminars, and other types of educational offers. The ReGrid Project is supported by the International Climate Protection Initiative of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), which is financed by the Energy and Climate Funds and through auction revenues from emissions trading.

In an initial stage, RENAC held preliminary talks with ministries, energy providers and network operators in the partner countries to determine the requirements for expertise in each country. The range of introductory online courses focused on the fundamentals of wind power, photovoltaics and solar-thermal power stations as well as the crucial concepts for stabilizing power networks when feeding in renewable electrical energy. The participation was not only helpful in preparing for the subsequent classroom seminars, but was also a prerequisite



Internet: www.renac.de

Preparatory online seminars and praxis-oriented workshops



for taking the examination. This was highly demanding as successful participants had to be in a position to implement the corresponding quality standards in the market from the onset.

In addition, interested parties were able to apply for a grant for a two-week seminar at RENAC's Renewable Energy Training Center in Berlin. Seven of a total of 14 seminars were aimed at engineers. In particular, the focus here was on the technical aspects of network integration. Another seven seminars were aimed at participants from management and administration. They gained a basic understanding of the technical problems of network integration and project planning expertise.

In order to be able to address each participant individually and to guarantee learning success, RENAC only allowed a maximum of twelve applicants per seminar. RENAC places particular value on interactive instruction with the highest

possible amount of practice. To this end, numerous practical exercises, group work and strategic exercises were integrated in the classes. For example, participants had to develop a national strategy based on an electricity consumption of which 80 per cent would be covered by renewable energies by 2040. This scenario was then examined in the seminar at both a technical and political level.

Using the technical equipment in the RENAC training center, participants could simulate the operation of the system under real conditions. In addition, excursions to multi-megawatt solar and wind farms, control rooms for electricity networks and network connection installations were arranged.

As not everyone has the opportunity to travel to Berlin, RENAC has also prepared training courses in which people can learn more on the subject locally. Advanced online training courses have started in 2014, conveying the content of the classroom seminars held in Berlin. In addition, RENAC has also designed a mobile exhibition in English, French and Arabic, which will be shown as travelling exhibitions in the partner countries. A total of 15 exhibition boards can be borrowed free of charge by RENAC's local partner organizations. Informative brochures and teaching materials in Arabic can be downloaded from the RENAC website.





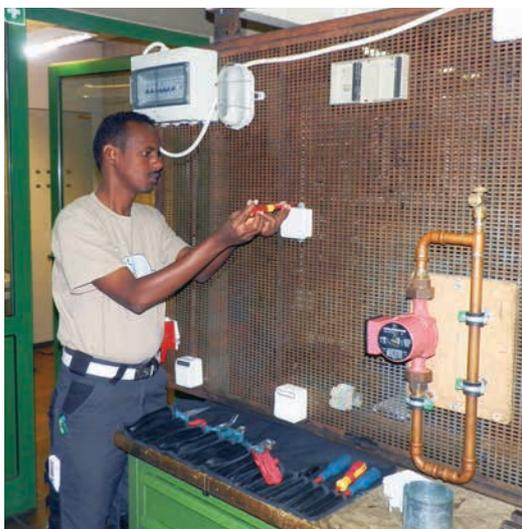
Saar-Lor-Lux-Umweltzentrum gGmbH (UWZ) Training of trainers for renewable energy

The Saar-Lor-Lux-Umweltzentrum gGmbH (UWZ) was established in 1994 by the Chamber of Crafts of the Federal State of Saarland and 25 trade guilds. The centre advises companies and public institutions in the areas of environment, climate protection, renewable energy and energy efficiency. An approved provider of continuing education, it trains energy advisers for buildings in the trades and organises vocational training and continuing education courses in this field.

Since the mid-1990s, the UWZ has been supervising several projects in Africa, including South Africa, the Ivory Coast, Benin, Djibouti and Tunisia. The co-operation activities are

focused on renewable energy and energy efficiency. Moreover, in the context of chamber-associated partnership projects, the UWZ provides support in establishing chambers and training centres, in providing training for instructors and in developing curricula. Currently, four members of staff are responsible for the ongoing projects in Djibouti and Tunisia.

Since 2010, the UWZ has been implementing a new vocational training programme on the topic of renewable energy in Djibouti on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) and the Sequa organisation, which organises projects for the BMZ. Djibouti is a small country located in the Horn of Africa with more than 350 days of sunshine per year and an energy supply that fully relies on fossil fuels. It has neither infrastructure nor experience with respect to renewable energy.



Photovoltaics plant for energy supply and training



The main objectives of the project are improvement of earning and employment opportunities in the field of renewable energy in Djibouti. To this end, the UWZ co-operates with two partners on site: the LIC “Lycée Industriel et Commercial”, a technical and commercial vocational college in Djibouti, and the national Chamber of Commerce CCD “Chambre de Commerce de Djibouti”. In the context of this project, the UWZ has installed a photovoltaics facility at the LIC, which not only provides the college’s administrative building with electricity, but serves also as a training facility for future training courses that are being developed together with the college in the context of curricula.

In addition to equipping the local vocational training centre with machinery and establishing an advisory structure for renewable energy and energy efficiency at the Chamber of Commerce, the UWZ is responsible for training several instructors from Djibouti, who are trained in the latest technology in Germany and on site in Djibouti. These instructors attend a four-week qualification course in the Saarland, covering the fields of photovoltaics, solar thermal energy and electrical engineering. The programme comprises the development of practical and theoretical competences within trade businesses and trade training centres in the Saarland, which are also responsible for installing the facility and implementing the trainings in Djibouti.

The UWZ is in the process of implementing a similar project at two training centres in southern Tunisia, likewise with a focus on vocational education and training, renewable energy and energy efficiency. With its “Employment Pact Tunisia”, the German Federal Foreign Office (AA) has been supporting the development of a national energy strategy in that North African country since 2011. The UWZ is not only responsible for equipping and furnishing the training centres (including a mobile training facility). It also gives Tunisian instructors the opportunity of taking part in a two-week dual system work experience programme in trade businesses and training centres in the Saarland.





DWA – German Association for Water, Wastewater and Waste Training Curriculum Development in Bangladesh

Environmental compliance is of growing interest for industrial enterprises which want to benefit from sustainable production and successfully expand their business activities. The government of Bangladesh puts increasing pressure on industries that are polluting water, air and soil to abide by environmental laws. It is a well-known fact that there is a need for industries to adopt ecologically friendly practices but only a few industries are aware of the impact they have on the environment.

Before blaming the private sector for being disengaged from the battle against environmental pollution, another factor has to be taken into consideration which aggravates the situation: It is hard to find employees who possess the necessary knowledge and skills. There is a dearth of environmental specialists in the market. As a result, industries employ staff in technical key positions who have little or no expertise in their field of work.

In response to this, the Deutsche Gesellschaft für Internationale Zusammenarbeit GIZ in co-operation with the Swedish furniture manufacturer IKEA, launched an initiative to develop technical expertise in the area of waste water management. The German Association for Water, Wastewater and Waste (DWA) was invited into the joint project on the planning and implementation of a programme to qualify managers and operators of effluent treatment plants (ETPs) in Bangladesh.

As an international training partner, DWA contributed to the initiative with its experience in vocational training in the area of waste water treatment. DWA assisted the local training partners in setting up a training curriculum on the management, operation and maintenance of ETPs for managers and operators based on the German training model and training approach.

DWA is a non-profit German NGO with 14,000 members. DWA employees are regular participants of iMOVE seminars. The association is well grounded in setting standards and developing



Internet: www.dwa.de

al expertise in waste water management



curricula for environmental professions. Each year around 35,000 participants are trained in DWA vocational training programmes in Germany. This comprehensive experience in combination with expert knowledge on technical safety management makes DWA a sought-after partner when it comes to capacity development in newly industrializing countries.

Main objectives of the DWA preparatory mission were to obtain the buy-in from industry on the training programme and the proposed training approach. In preparation of the training measure, DWA also settled the learning subjects and expected learning outcomes of the proposed training programme with the initiative's stakeholder and assessed the suitability of the short-listed ETPs for on-site practical training. Finally DWA arrived at a working agreement with the short-listed local training partners for the development and implementation of the training programme.



The first training course for ETP operators took place in October 2013. The training course comprised 60 hours over a period of three months. The topics encompassed mechanical, biological, chemical and advanced wastewater treatment, sludge management, wastewater in different industries, metal and electric work as well as health, safety and legal issues. All eleven participants passed the final examination. The ETP manager course is still pending.

The project aims at implementing a training-of-trainers in the future so that the acquired knowledge can be transferred to other plants and industries as well. A book about "Operator Skills for Textile Effluent Treatment Plants – Toolbook for Practice" is to be published in 2015, in which the experiences of the conducted trainings will be summarized.

In May 2014, DWA organized a visit of a delegation from Bangladesh to the famous environmental fair IFAT in Munich, which also included a tour to one of the municipal wastewater treatment plants. In addition, the project partners prepared a recommendation for a national effluent sludge regulation which has been submitted to the government of Bangladesh via its Ministry of Environment and Forests.



Dr.-Ing. Paul Christiani GmbH & Co. KG

Comprehensive renewable energy education concept

For 80 years, the Christiani Technical Institute for Vocational Training has been synonymous with high-quality and practice-relevant vocational training and continuing education. Christiani is a committed and competent partner in all phases of technical vocational education, from school, over vocational training and continuing education, to university. With its comprehensive know-how and continuously growing range of services, Christiani has developed into a full-range supplier. In addition to traditional text books and learning materials, its portfolio includes also interactive media, project work and equipment for training facilities as well as consultancy for and implementation of training projects.

Christiani has been active in the iMOVE network for over ten years and, in roughly the same period, has expanded its international business, which currently comprises more than 60 countries. Christiani has been structuring its international business in a targeted manner especially in the past three years, since the German education system increasingly meets with international interest and the educational material from Germany is in high demand. In 2013 and 2014 alone, Christiani equipped schools, universities and training centres in Brazil, China, Iraq, Mexico, Mongolia, Peru and Tunisia as well as at numerous sites within Europe with training systems. In the context

of these projects, Christiani created corresponding training materials and carried out additional train-the-trainer courses. The in-house development and production of these materials allows for a high degree of flexibility, in particular in adapting an existing concept to the conditions and needs in the target regions.

In response to the growing demand for renewable energy, Christiani decided in 2007 to develop a high-quality and comprehensive educational concept for this field. It is essentially based on the development of action-oriented training systems, didactic documentation and train-the-trainer courses that perfectly complement each other and thus lead to optimal learning success.

The Christiani educational concept in the field of renewable energy includes an energy wheel that immediately makes energy consumption visible and illustrates the potential for reducing the dissipation of energy. A solar power case conveys basic



Highly flexible with technology and didactics made in Germany



knowledge on photovoltaics in a practical manner and the solar energy lab is used to train future photovoltaics professionals. The training system heat pump with solar thermal energy and photovoltaics consists of six training booths that can be combined in varying manner depending on the training target. This allows for the setting up of different facility concepts, to assess them metrologically and evaluate them in comparison to each other.

All training systems come with high-quality didactic documentation, consisting of substantiated basic information, detailed exercises and tasks and the corresponding solutions or proposed solutions. The teaching staff is trained in all technologies (photovoltaics, solar thermal energy, heat pump and biomass) on the basis of training materials and practice-relevant training systems that were specifically developed for the purpose; they are prepared for their job with respect to technology as well as didactics and methodology. The training systems and materials are adapted to the requirements of the respective target region, as is the training of the future trainers.

Notable users of this educational concept are four vocational education and training institutions in Switzerland. At the end of 2010, Switzerland introduced the job of “Solateur” as an accredited continuing education qualification. The target groups for the “Solateur” continuing education qualification include electricians, plumbing and heating installers, installers

of industrial and building systems, architects and energy advisers. By qualifying their staff, businesses, especially in the fields of electrics and heating, can increase their solar energy-related professional competence.

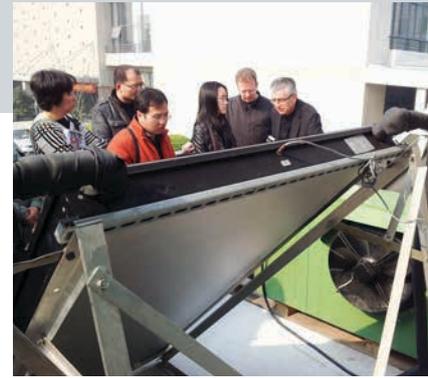
A training programme with 250 lessons grouped into modules focuses on the professional planning and consultancy for as well as installation, commissioning and maintenance of solar power plants. Moreover, the budding experts learn how to professionally link the various solar energy components. This comprehensive continuing education concept for the utilisation of renewable energy sources is offered at four sites in Switzerland, each equipped with training systems by Christiani. A fifth site is in preparation. In addition, Christiani has supervised the qualification of the trainers.



Christiani

Technical Institute for
Vocational Training

Internet: www.christiani.eu



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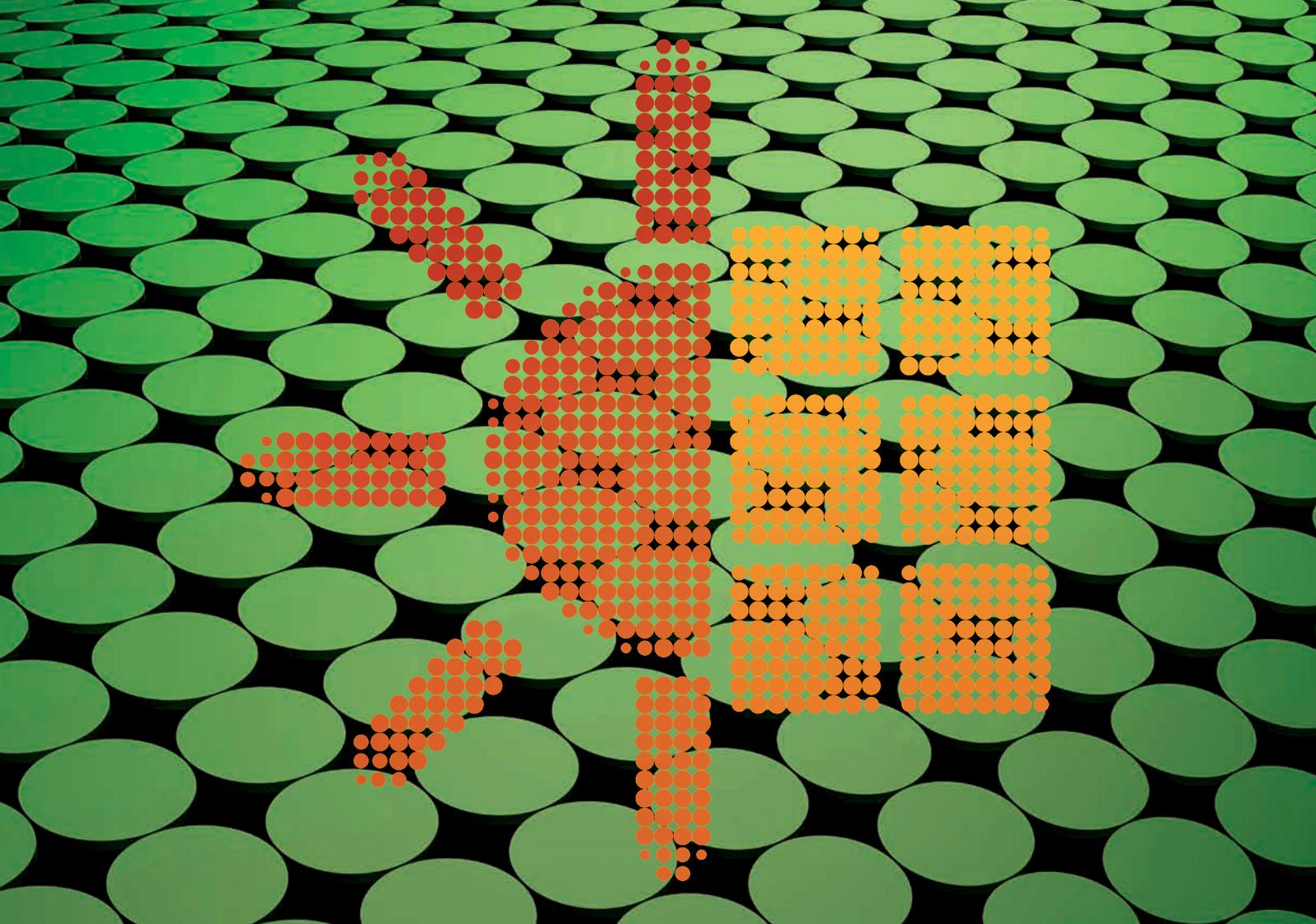
iMOVE is an initiative of the Federal Ministry of Education and Research. Our mission is to promote international cooperation and business relations among German training providers and international public and private organisations.

Our services:

- Trade Missions
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