# HRC's Annual Report on Foreign Affairs in 2015 and its Work Plan for 2016

**Hangzhou Regional Center (Asia-Pacific) for Small Hydropower (HRC)**

**National Research Institute for Rural Electrification, MWR**

In 2015, led by the Ministry of Water Resources (MWR) and its affiliated Nanjing Hydraulic Research Institute (NHRI), and supported by the Ministry of Commerce (MOFCOM) and the Ministry of Science and Technology (MOST), all HRC staff worked with high spirits and strict attitudes, so as to actively undertake international training projects, widely carry out international exchanges and implement multilateral & bilateral S+T cooperative projects successfully. It strived to expand its international market, thus attaining fairly good achievement and creating impressive social and economic benefits.

## I. International Training

In order to enhance the foreign-aid human resources development, deepen the South-South cooperation, popularize Chinese SHP technology and related E/M equipment, while promoting exchange and cooperation among the developing countries, HRC has successfully organized ten international training workshops


(seminars) in 2015, eight of which are foreign-aid training programs of MOFCOM, and the other two are foreign-aid training programs of MOST, with the participation of 222 officials or engineers in the field of water resources, SHP and rural

electrification from 41 countries in total.

The eight workshops (seminars) entrusted by MOFCOM include *2015 Seminar on Rural Electrification for Asian Countries*, a 21-day one with the participation of 25 officials from 5 Asian countries; *2015 Training Course on Hydropower Technology for Uganda* co-organized with ICSHP, a 20-day training with the participation of 20 officials from Uganda, including the Ministry of Energy and Mineral Development, Electricity Regulatory Authority, Rural Electrification Agency, Uganda Electricity Generation Company Ltd. and Uganda Electricity Transmission Co., Ltd.; *2015 Training Course on Small Hydropower Technology for Rwanda*, MOFCOM's first overseas foreign-aid training, a 20-day one with the participation of 25 officials from Energy Development Co. Ltd. (EDCL) and Energy Utility Co. Ltd. (EUCL) of Rwanda Energy Group; *2015 Seminar on Utilization and Management of Agricultural Water Resources for Chad*, a 21-day seminar with the participation of 19 experts and officials from the Ministry of Agriculture and Environment of Chad; *2015 Seminar on Rural Electrification for English-speaking African Countries*, a 21-day one with the participation of 25 officials from 6 English-speaking African countries; *2015 Seminar on Small Hydropower and Sustainable Development of Rural Communities for Officials of Developing Countries*, a 15-day seminar co-organized by HRC and ICSHP with the participation of 23 officials from 11 developing countries; *2015 Workshop on Water Resources Management & Planning for Developing Countries*, the only ministerial workshop in the field of water resources in China, a 7-day workshop with the participation of 21 ministers and high-ranking officials in charge of water resources management and planning from 9 developing countries; *2015 Seminar on Rural Electrification for Francophone African Countries*, a 21-day seminar with the participation of 21

officials from 10 Francophone African countries.

The other two foreign-aid training programs entrusted by the Ministry of Science and Technology include *2015 Training Workshop on SHP Technology for South and Southeast Asian Countries*, a 15-day one with the participation of 30 officials and technicians from 12 Asian countries; *2015 Seminar on Rural Electrification Based on Clean Energy*, a 7-day one with the participation of 13 experts and officials from Indonesia and Vietnam, which, as an APEC-funded training program, aims to promote the intensive & extensive cooperation in the field of clean energy utilization and rural electrification development among China, Indonesia and Vietnam.

Meticulous guidance and great support were offered from the concerned governmental authorities to the international trainings. Mr. Jiao Yong, Vice Minister of MWR, Mr. Huang Xuming, Vice Governor of the People's Government of Zhejiang Province, and Mr. Huang Dengping, Vice Director of the Academy for International Business Officials, Ministry of Commerce, were all present and delivered speeches at the opening ceremony of *2015 Workshop on Water Resources Management & Planning for Developing Countries*. Mr. Zhang Jianyun, Academician of Chinese Academy of Engineering and President of Nanjing Hydraulic Research Institute, presided over the opening ceremony. Leaders from Department of International Cooperation, Science and Technology, the Ministry of Water Resources were concerned about the preparation of the workshop, offered constructive advice on course contents, invitation of experts, selection of study tour destinations etc. as well as provide

manpower and material resources. The Department of Commerce, the Department of Water resources and the Department of Foreign Affairs of Zhejiang province also gave great assistances to this ministerial-level workshop, offering guidance to schedule arrangement and selection of study tours. The presentations were well prepared by the experts respectively from Nanjing Hydraulic Research Institute, International Center on Small Hydro Power, Water Resources & Hydropower Planning and Design General Institute under MWR, Taihu Basin Authority (TBA), etc. Besides, TBA offered a venue for the closing ceremony of *2015 Workshop on Water Resources Management & Planning for Developing Countries*.

In 2015, 10 international trainings were successfully conducted by HRC, reaching a new high in its history. Meanwhile, HRC has improved the training contents, optimized the program of study tour and enriched cultural exchange, thus constantly boosting the training quality and satisfaction rate of the participants. *"2015 Seminar on Rural Electrification for Asian Countries"* scored 98.67. *"2015 Training Course on Hydropower Technology for Uganda"* scored 94.9. *"2015 Training Course on Small Hydropower Technology for Rwanda"* scored 93. *"2015 Seminar on Utilization and Management of Agricultural Water Resources for Chad"* scored 96. *"2015 Seminar on Rural Electrification for English-speaking African Countries"* scored 98.12. *"2015 Seminar on Small Hydropower and Sustainable Development of Rural Communities for Officials of Developing Countries"* scored 93.9. *"2015 Workshop on Water Resources Management & Planning for Developing Countries"* scored 95.86. *"2015 Seminar on Rural Electrification for Francophone African Countries"* scored 96.2. The high satisfaction rate not only reflects the appreciation of the participants to HRC, but will stimulate and spur the work to be followed.

These foreign-aid training workshops (seminars), on one hand, disseminate China's advanced experience and applicable technology to the world and helps cultivate professionals for other developing countries, thus improving their competence in water resources management, construction of small hydropower plant and realization

of rural electrification. On the other hand, all the trainings promote the economic and technical cooperation with foreign countries and further push the export of China's hydropower technology and equipment, thus making the most of the training program stimulate manufacturing and supply as to better realize the "Go Global" strategy.

## II. Foreign Exchanges

### 1. Conferences and Meetings

(1) From May 4th to 5th, Ms. Cheng Xialei, Director General of HRC, attended the *Sino-Austria Seminar on Small Hydropower under China-Europe Water Platform* held in International Center on Small Hydro Power. Among the 30 attendees were Austrian Ambassador to China, the representative from Austrian Ministry of Agriculture, Forestry, Environment and Water Resources, the Principal from Austria in the field of small hydropower under China-Europe Water Platform, the representatives from Austrian enterprises of hydropower and environmental protection, Secretariat for China-Europe Water Platform under MWR, International Center on Small Hydro Power, National Research Institute for Rural Electrification, and enterprises of hydropower and environmental protection from Zhejiang and Jiangsu provinces. Ms. Cheng Xialei delivered at the seminar a presentation titled "Challenge, Potential and its Role in Renewable Energy of China's Small Hydro Power".

(2) From May 12th to 13th, Ms. Cheng Xialei, Director General of HRC, attended the *4th China-Europe Water Platform High-level Dialogue Meeting* in Copenhagen, Denmark. More than 200 attendants, including water or environment ministers, high-level officials, experts, scholars and enterprise representatives from China, EU, OECD, and 16 EU member countries, inclusive of Denmark, Finland, the Netherlands, Sweden, Switzerland, etc. attended this meeting and carried out high-level dialogues and deep exchanges in the field of water resources and sustainable development. At

the meeting was reached the Joint Declaration of 2015 High-level Dialogue of China-Europe Water Platform and the 2015-2017 Work Plan. H.E. Mr. Chen Lei, the Chinese Minister of Water Resources, attended the dialogue and made a keynote speech. Ms. Kirsten Brosbol, the Danish Minister of Environment, and Mr. Sabatier, Director of EU Department of Foreign Relations for East and North Asia and Pacific Affairs respectively delivered a speech. The Chinese Ambassador to Denmark, H.E. Mr. Liu Biwei also attended the meeting and related activities.

(3) From Nov. 4th to 6th, under the framework of China-Europe Water Platform, The *Symposium on 13th Five-Year Plan for Rural Hydropower Development* cosponsored by the Special Committee of Hydropower Generation of China Hydraulic Engineering Society (CHES), the Special Committee of Small Hydropower of China Society for Hydropower Engineering (CSHE) and the Association of International Small Hydropower and co-organized by HRC and ICSHP, was held in Nanjing. Ms. Elisabeth Rysanek, the Counselor from the Embassy of the Republic of Austria in China, who is in charge of agriculture, forestry and environment, Ms. Birgit Vogel, Head of RBM Solutions-River Basin Management, Mr. Stefan Schmutz, Head of Institute of Hydrobiology and Aquatic Ecosystem Management of the University of Natural Resources and Life Sciences, and Mr. Peter Matt, Head of Engineering Services of the Vorarlberger Illwerke AG were invited to the symposium

and respectively delivered speeches titled "Water Resources Management and Hydropower in Austria as well as Related Cooperation Activities with China under the China-Europe Water Platform", "Implementation of Green Hydropower Standards in Austria and the European Union towards Sustainable Development", and "Hydropower and the Environment in Austria from the Point of View of a Hydropower Operator: today in context with the past and current environmental measures".

(4) On Nov. 4th, HRC dispatched staff to attend the *20th Annual Meeting and 20 year's Achievement Exhibition of China South-South Cooperation Network* held in Shanghai, which was organized by China International Center for Economic and Technical Exchanges. More than 60 representatives from about 30 network organizations were present at the meeting.

(5) From Dec. 4th to 5th, Mr. Lin Ning, Chief of Division of Foreign Affairs and Training of HRC, attended *2015 Training Course for Division Chiefs of Foreign Affairs* held in Changchun, which was organized by Ministry of Water Resources. Over 100 people from the departments of MWR and local departments of water resources and secretariats of international organizations in China studied the related documents on foreign affairs of the central government. All the attendees exchanged experience and achievements obtained from years' foreign affairs management, and discussed about how to improve the work on foreign affairs and the related management regulations.

In addition, Ms. Shi Jin, Assistant to the Chief of Division of Foreign Affairs and Training of HRC, attended the working meeting for foreign-aid training program organizers in Zhejiang province held in Hangzhou by the Department of Foreign Aid of MOFCOM, *2015 Training Course on Management of International Science & Technology Cooperation* organized by the Department of Science and Technology of Zhejiang province.

## 2. Foreign Guests Visiting HRC

In 2015, HRC received 13 delegations of 67 guests in total, respectively from Indonesia, Cuba, Uganda, Nepal, USA, Zimbabwe, Italy, Germany, Pakistan, South Sudan, etc. for technical exchange and project cooperation.

(1) On Jan. 6th, a delegation of 7 persons including Mr. Erman, Director of PLN Pusharlis and the project owners in Indonesia visited HRC. Both sides carried out discussions on hydropower and renewable energy planning and development in Indonesia as well as the potential hydropower projects, laying a foundation for future cooperation on small hydropower project.

(2) From Jan. 22nd to 31st, a delegation of 3 persons headed by Mr. Alberto, senior technical consultant from Cuba Energoimport Company visited HRC. The delegation checked the manufacturing progress of the E/M equipment of Mayari hydropower project in Cuba designed and supplied by HRC and witnessed some factory tests.

(3) On March 12th, a delegation of 5 persons headed by Dr. Harrison Mutikanga, CEO of Uganda Electricity Generation Company Limited (UEGCL), the Ministry of Energy and Mineral Development of Uganda, visited HRC and had in-depth discussion on setting up a training center on small hydropower and renewable energy in Uganda.

(4) On March 17th, a delegation from Nepal Electricity Authority (NEA) including Mr. Pandey, Director of Human Resources Department and Mr. Ayer, Deputy Director of Generation Directorate visited HRC. Two sides exchanges opinions on current status

of energy development and future cooperation. Up to now, NEA already sent 20 technicians and officials to HRC for the training workshops or seminars. Both sides intend to cooperate in more areas including technical training, standards formulation and hydropower development management.

(5) From March 23rd to 27th, 2 experts respectively from Rensselaer Polytechnic Institute and Upower Company in the USA paid a visit to HRC for the in-depth discussion and exchanges on the cooperative project called "*Decentralized & Complementary Power-supply Technology Based on Hydropower*". During the visit, Prof. Jian Sun from Rensselaer Polytechnic Institute delivered an academic report titled "*Microgrids and Renewable Energy System Integration*".

(6) On April 16th, Mr. Maphosa, General Manager of Kariba Hydropower Company of Zimbabwe paid a visit to HRC. Two sides carried out exchange and discussion on hydropower project cooperation. Mr. Maphosa once attended the foreign-aid training workshop organized by HRC 12 years ago.

(7) From April 22nd to 27th, a delegation of 2 persons including the Chief Engineer of WaterGen Power Company in Italy paid a visit to HRC. Two sides exchanged ideas on micro hydropower technology including the containerized mini hydropower unit and visited a containerized hydropower station. Italian side planned to popularize the technology and products of containerized mini hydropower in Italy and other European countries.

(8) On April 30th, a 2-person delegation from Fraunhofer IOSB in Germany headed by Prof. Thomas Rauschenbach, Director of Advanced System Technology (AST) Branch, paid a visit to HRC. Two sides exchanged ideas on many aspects including the optimized dispatching of SHP projects. Some professors from Zhejiang University of Technology, HRC's cooperative partner, attended the meeting as well.

(9) From May 7th to 15th, a delegation of 5 persons including the owner of Mayari

hydropower project in Cuba and AVIC International Aero-Development Corporation of China (HRC's partner) paid a visit to HRC. The delegation witnessed the factory test of the E/M equipment for Mayari hydropower station and signed related acceptance documents.

(10) From Aug. 11th to 19th, a 3-member delegation headed by Mr. Sajid, General Manager of UEC Company in Pakistan paid a visit to HRC, with a purpose of inspecting and accepting the electromechanical equipment for Rangar-II and Guinnala hydropower stations, and negotiating about the follow-up cooperation.

(11) On Aug. 31st, accompanied by Mr. Zhang Qingguo, Deputy Director of Administrative Office of Foreign-aid Training of the Department of Commerce of Shandong province, a 25-person delegation of *2015 Training Course on Civil Engineering for South Sudan* paid a visit to HRC. Two sides discussed training program and project development of small hydropower and renewable energy in South Sudan, laying a solid foundation for the follow-up cooperation.

(12) From Sept. 26th to 29th, a 3-person delegation headed by Mr. Mario, General Manager of WaterGen Power in Italy paid a visit to HRC. Two sides decided on the market promotion and application strategies of the containerized mini hydropower technology in Europe, mainly in Italy, France and Spain. Meanwhile, two sides exchanged ideas on the technology and application of TC operator and its overseas marketing plan.

(13) From Oct. 28th to Nov. 1st, a 5-person delegation including representatives from CV. Bina Hasil Abadi in Indonesia and partners from Philippines paid a visit to HRC. Both sides held talks on cooperation and financing of a hydropower project in Indonesia. Besides, the visitors communicated with a Chinese bank and Sinosure on the procedures of getting loan for the project. HRC's technical staff will later visit and survey the site.

## 3. Outbound Missions

In 2015, HRC dispatched 6 delegations of 20 staff respectively to Turkey, Macedonia, Denmark, Kenya, Rwanda, Uganda etc. for contract negotiation, technical consultation, E/M equipment installation and commissioning, China's foreign-aid training and international conferences.

(1) From Feb. 25th to April 9th, a HRC delegation was dispatched to Macedonia for the installation, testing and commissioning of TOPLEC hydropower project. The testing and acceptance of turbine, generator, governor, SCADA system etc. were accomplished.

(2) From May 12th to 13th, Ms. Cheng Xialei, Director General of HRC, together with the expert panel from MWR, attended the *High-Level Dialogue Meeting of the 4th China-Europe Water Platform*. During the meeting, Ms. Cheng Xialei exchanged her ideas on the cooperation of small hydropower project with Mr. Karl, Acting Director of Austrian Ministry of Agriculture and Forestry, Ms. Gitte Vogel, Principal of Sino-Austria small hydropower joint research team, Ms. Matha, representative from EU, and the plan on cooperation was agreed.

(3) From April 15th to 24th, a HRC delegation was dispatched to Kenya and Rwanda, working with the concerned local departments on the preparation of setting up a training center on renewable energy in Kenya and conducting technical training workshop in Rwanda. The ideas on the implementation of the concrete projects were exchanged respectively.

(4) From June 1st to 10th, a HRC delegation was dispatched to Turkey for the negotiation of a hydropower project, and investigation of the local hydropower market. The delegation met with both the new and old business partners, reaching a preliminary consensus on the cooperation of several projects.

(5) From July 6th to 25th, a HRC delegation was dispatched to Kigali, Rwanda to conduct *2015 Training Course on Small Hydropower Technology for Rwanda*. During the stay in Kigali, the delegation headed by Ms. Cheng Xialei, Director General of HRC, paid a visit to Mr. Germaine KAMAYIRESE, Minister of Infrastructure, Energy and Water Resources, and met 10 old participants who attended the training workshops or seminars organized by HRC before.

(6) On July 13th, a 3-person delegation led by Director General of HRC Ms. Cheng Xialei paid a visit to Uganda and signed a MOU with Dr. Harrison Mutikanga, the CEO of UEGCL for cooperation on human resource training, R+D and setting-up of joint training center, and about 50 guests including Chinese Ambassador to Uganda H.E. Mr. Zhao Yali, Economic and Commercial Counselor Mr. Ouyang Daobin, Minister of State for Privatization of Uganda Mr. Aston, Chairman of the Board of UEGCL, representatives of Chinese enterprises, some journalists etc., attended the signing ceremony.

**4. Information Dissemination**

In 2015, HRC edited and published 6 issues of *Small Hydropower* in Chinese and *SHP News* of 2015 in English. Besides, the training alumni database has been updated, and the website released nearly 100 pieces of news in Chinese, English and French. Moreover, to cooperate with Chinese Society of Hydroelectric Engineering (CSHE) and Chinese Popular Science Writers Association, HRC dispatched experts to join the "*Popular Science Forum on Ecological Function of Small Hydropower*" in Beijing; HRC also actively participated in consulting work for *GEF (Global Environmental*

*Facility) Upgrading of China SHP Capacity Project* which was carried out by the International Center on Small Hydro Power, etc.

## III. International Scientific and Technological (S & T) Cooperation

### 1. Inter-governmental S & T Cooperation

(1) Under the great supports of both Chinese and Pakistani governments, the *China-Pakistan Joint Research Centre for Small Hydropower Technology*, a foreign-aid program on science and technology for developing countries sponsored by the Ministry of Science and Technology of China, has been completed. On April 20th, during the visit to Pakistan, Chinese President Mr. Xi Jinping unveiled for 8 China-Pakistan Cooperative Projects together with Pakistani Prime Minister Mr. Nawaz Sharif, among which, the *China-Pakistan Joint Research Centre for Small Hydropower Technology* is the one being implemented by HRC. Presently, the Joint Research Centre has been fully built up with the following achievements: the installation of E/M equipment and system supplied by HRC and on-site commissioning have been completed; the joint research on SHP automatic control and hybrid power generation technology has been carried out by both sides; 15 Pakistani professionals have been trained.

(2) The APEC-funded program called *Research and Experience-sharing on Rural Electrification Modes Based on Clean Energy* is being implemented. In the field of the rural electrification based on clean energy, HRC is conducting exchange and

cooperation with Vietnam and Indonesia by providing human resources training, sharing advanced technology and successful experience on rural electrification and promoting trilateral cooperation. In the next step, HRC plans to establish a simulation & demonstration platform of hybrid system integrating SHP, wind power and solar power in compliance with the actual situation of Indonesia and Vietnam, including the simulation software development and the establishment of decentralized generation technology demonstration.

(3) Having continually implemented the long-term exchange & research program on science and technology cooperation between Chinese and Vietnamese governments called *Emergency-supporting Technology for Rural Hydropower against Disasters Caused by Climate Change*, HRC has completed the installation of a container-type micro hydropower unit which is taken as the power supply of black-start. At present, on-site commissioning is being undertaken, and the technical researches have been launched jointly on SHP black-start and emergency-supporting technology for rural hydropower against disasters.

(4) The project of *948 Plan of MWR* called *Introduction and Development of Key Technology on Canal Turbine System* has been completed with success. The project team of HRC went to USA to attend the training about the canal turbine technology and equipment operation, and then the first demonstrative power plant of flow generation was set up in China. In addition, another *948 Plan* project called *Decentralized Power Supply Technology and Equipment of Hybrid Generation Based on Hydropower* has been completed smoothly by HRC for its on-site survey, and HRC has carried out the engineering design and finished the type selection on wind turbine and solar power system, together with the foreign side.

(5) HRC applied for a *Perez-Guerrero Trust Fund (PGTF)* project of UNDP called *Seminar on Hydropower Development Planning for South Asian Countries*. This Seminar is planned to be held in a South Asian country with abundant hydroelectric resources and huge development potential, and one or two delegates from each of the South Asian countries will be invited to attend for discussion and exchanges on SHP technology and development & planning mode, as well as negotiation on multilateral cooperation. Presently, the project has got the fund approval, and the preparations are just going on.

(6) HRC applied to the Ministry of Water Resources for a China-ASEAN Cooperation project called *China-ASEAN Seminar on Water Resources and SHP Development*. This Seminar is planned to be conducted in Hangzhou, China, and one or two participants from each of the ASEAN countries will be invited. At present, the project is under approval.

Moreover, HRC also applied to the Ministry of Foreign Affairs for the *China-ASEAN Offshore Cooperation Fund* project called *Assessment on Island Energy Resources of ASEAN Countries and Research on Development Modes*, applied to the Ministry of Science and Technology for a 2015 foreign-aid program called *Joint Research & Demonstration on Rural Electrification Technology Based on Hydropower Development* and to the Ministry of Commerce for a 2016 foreign-aid reserve program called *Research on Low-head Hydropower Generation Technology for Pakistan*, etc. Meanwhile, under the framework of governmental cooperation, HRC has carried out all-round cooperation with Ethiopia, Tanzania, Kenya, Uganda, the Philippines, Serbia and Venezuela etc. in terms of SHP technical research, equipment manufacturing, and project demonstration & promotion and so on.

**2. Setting-up of International S & T Cooperation Base**

In 2015, by taking advantage of being "*Zhejiang International Science & Technology Cooperative Base of Renewable Energy and Rural Electrification*", HRC conducted

extensive and intensive scientific & technical researches and development, and attached great importance to the application of research results. Meanwhile, HRC spared no effort to introduce and popularize the advanced technology and equipment from developed countries, and actively participated in the joint research, equipment manufacturing, project demonstration, national & industrial standards translation and overseas exchange & promotion, etc. In recent years, HRC has been constantly consolidating the foundation for international cooperation so as to strive to build up a national international S & T Cooperation Base within one or two years.

## IV. International Marketing & Trading

In 2015, HRC accomplished a large amount of work in SHP planning, design, consultation, E/M equipment supply and on-site installation as well as overhaul or maintenance for the built hydropower stations, etc. These services not only meet the demands of other developing countries, but also really benefit the local governments and people and even show Chinese technical capability in the field of water resources and hydropower to the international community, which has achieved favorable economic and social benefits.

### 1. Electromechanical Equipment Supply, Installation and Commissioning

(1) In Turkey, HRC has finished the runner replacement for PINAR hydropower plant,

accomplished the equipment installation, commissioning and acceptance test for the additional unit of GARZAN hydropower plant, completed equipment maintenance, installation and commissioning for SENA hydropower plant. The equipment installation for IKILER hydropower project has been finished, which just waits for the commissioning and acceptance test after the completion of civil works. The E/M equipment for SIRVAN hydropower project has been completed, awaiting the on-site installation notice from the Owner.

(2) In Macedonia, HRC has completed the commissioning, acceptance and computer system upgrading for TOPLEC micro hydropower station. The after-sales service for TURIJA container-type micro hydropower unit has been accomplished.

(3) HRC has finished the installation and acceptance test for GANGELAS hydropower project in Angola.

(4) HRC has finished the equipment delivery and on-site inspection for both right-bank and left-bank stations of MAYARI SHP project together with AVIC International Development Corporation, and wait for the notice of dispatching technicians to the site for installation and commissioning.

**2. Hydropower Project Design and Consultation**

The design and consultation services for numbers of hydropower projects in Vietnam, Pakistan, Indonesia etc. have been continued, e.g. THUAN HOA hydropower station in Vietnam, CHIANWALI and DEGOUTFALL hydropower stations in Pakistan and PAKKAT hydropower plant in Indonesia, etc., which achieved favorable economic benefits.

In addition, one sub-company of HRC called *Hangzhou Yatai Hydro Equipment*

*Completing Co., Ltd.* has accomplished the contract signing and L/C issuing for Tara Khola SHP project in Nepal; cooperated with WaterGen Power in Italy for popularizing container-type micro hydropower units and other micro hydropower devices, which has obtained some progress so far; and has followed SAGANAN EPC project in Kenya, which PPA will be signed soon. All of these efforts have laid the foundation for launching more projects in 2016.

## V. Work Plan for 2016

In 2016, HRC will make full use of its technical advantage, and actively participate in the implementation of the *"Six 100s" Initiative on South-South Cooperation* and *"10 Major China-Africa Cooperation Programs"* proposed by Chinese President XI. Following the strategy of "*One Belt And One Road*" developed by China, HRC will continue to provide capacity-building services to other developing countries in the field of clean & renewable energy (such as small hydropower, etc.), carry out extensive international S&T cooperation including joint research and project demonstration, provide SHP planning, design & consulting and E/M equipment, and popularize China's national and industrial technical standards overseas. The main tasks are as follows:

### 1. Continuing to undertake international training, popularize and promote China's SHP and renewable energy technology and equipment

In 2016, entrusted by the Ministry of Commerce, the Ministry of Science and Technology, UNDP etc., HRC will organize 6 foreign-aid training workshops and seminars in China for other developing countries, namely *2016 Seminar on Small Hydropower & Rural Electrification for Asian Countries*, *2016 Seminar on Small Hydropower & Rural Electrification for English-speaking African Countries*, *2016 Seminar on Small Hydropower and Sustainable Development of Rural Communities for Asian and African Countries*, *2016 Training Course on Integrated Management of*

*River Basins for Southeast Asian Countries*, *International Training Workshop on Rural Electrification for Developing Countries*, and *China-ASEAN Seminar on Water Resources and SHP Development*. It is planned to cultivate about 150 officials and technicians in the sector of water resources and hydropower for other developing countries. Moreover, HRC will conduct *2016 Training Course on Small Hydropower Technology for Rwanda* in Rwanda and *Seminar on Hydropower Development Planning for South Asian Countries* sponsored by *Perez-Guerrero Trust Fund (PGTF)* of UNDP in a South Asian country to widely popularize advanced technology and applicable equipment of SHP and rural electrification to local technicians and organize the meetings with those old training participants as well.

Besides the training programs of Chinese government and international organizations, HRC makes use of its abundant experience in foreign-aid program and excellent capacity of project management, and will hold a SHP training workshop in China for Nepal Electricity Authority. In addition, entrusted by hydropower departments of Sri Lanka and Uganda, HRC will launch the tailor-made training programs on overhaul, maintenance, operation and management. These bilateral training programs based on specific hydropower plants will constantly expand the training fields and extend the training content, which definitely helps overseas marketing and future cooperation.

**2. Carrying out extensive joint research and project demonstration and further strengthening international S&T cooperation on SHP and renewable energy**

In 2016, HRC will continue to implement the existing international S&T cooperative projects, and the concerned work will focus on the following aspects:

(1) Since the China-Pakistan cooperative project implemented by HRC has been listed in *International S&T Cooperation Three-year Rolling Program of MOST*, HRC plans to carry out the local R&D and production on hydropower equipment and automatic control system in Pakistan. Khanpur dam, located in Taxila, Islamabad has been

recommended as the demonstrative site for a project of equipment localization & application. Meanwhile, it is planned to select a suitable site in AJK region for building a demonstrative project of containerized mini hydropower unit and automatic control system and launch research on operation & maintenance for the off-grid hydropower plants in remote area. Moreover, HRC will cooperate with International Islamic University and National University of Sciences and Technology to carry out research on capacity-building and technical cooperation with the aim of taking Pakistan as the base to build *China-Pakistan Joint Research Centre for Small Hydropower Technology* to be a demonstrative base of technical R&D and training for South Asia Region.

(2) The implementation of China-Indonesia cooperative project called *Joint Research & Demonstration on Rural Electrification Technology Based on Hydropower Development* will further improve Indonesian rural electrification technology and equipment development & production level, enhance its scientific innovation and product development, push forward the technical progress in rural electrification, vigorously promote the development of hydropower, wind power, solar power and other clean & renewable energy, and raise the level of rural electrification. Meanwhile, this project will promote the capacity cooperation on renewable energy and E/M equipment trading between China and Indonesia and other ASEAN countries, which will achieve favorable economic and social benefits. HRC will continue to focus on *General Construction Plan on 21st-Century Maritime Silk Road* and *Action Plan on China-ASEAN New Energy & Renewable Energy* and seize the opportunity of Strategy of *2015 China-ASEAN Marine Cooperation Year* to set up *Technology Transfer Center for China-ASEAN Renewable Energy* in Indonisia with the cooperation of the ASEAN Secretariat.

(3) HRC will cooperate with Laos to carry out research on *Renovation and Rehabilitation on Hydropower Station & Automatic Control System* and demonstration of *Off-grid Solar System Technology and Equipment Promotion*.

(4) Based on the foundation in Africa, HRC will develop extensive cooperation with African Countries. It is planned to establish a base for overseas technical training and R&D in East Africa, and then taking it as a platform, will conduct joint research, equipment trial-manufacturing and technology promotion on SHP and rural electrification together with all African countries, actively drive the localization of SHP and rural electrification technology and equipment in Africa, promote the construction of rural electrification for African countries, and raise the electrification rate, which will benefit the vast African people indeed.

(5) HRC will continue to implement *948 Plan of MWR* called *Decentralized Power Supply Technology and Equipment with Hybrid Generation Based on Hydropower*, and introduce the decentralized power supply system from UPower (an engineering company in the U.S.A.) to set up the test platform of decentralized power supply and intelligent power grid formed by the simulator, digital simulation module and controlling & regulating module. Localization study, software trial-manufacturing and building & commissioning of this system will be completed. At the same time, the system design applicable to China will be put forwarded for doing a good job in localization, trial-manufacturing and technology promotion, etc.

**3. Assisting other developing countries for the preliminary work on SHP, such as planning, design & consultation and E/M equipment supply**

HRC provided consultation services on national and regional hydropower resources survey and SHP resources development planning for Malaysia, Indonesia, Rwanda, Kenya, Tanzania etc., and compiled reports on development planning. This cooperation mode not only exploits the advantage of government domination to the full, and fundamentally ensures the efficient development of hydropower and electric power resources, but also lays a foundation for cooperation among Chinese SHP designing companies, equipment manufacturers and those in the vast developing countries. Therefore, HRC will go on carrying out information and technology

exchanges with neighboring and African countries provide them with technical consultation, help them formulate planning on integrated river management and hydropower resources development, and launch engineering design and consultation, and provide technical, economic and trading services on E/M equipment supply etc.

**4. Playing a leading role in formulating and revising national & industrial standards so as to popularize China's SHP standards abroad**

At present, Chinese industrial standards on SHP and rural electrification are perfect and matured, while there is scarcely any relevant national or industrial standard and technical specification in many developing countries and Chinese standards are not familiar to these countries, which discourages Chinese SHP technology and equipment from further going global to same extent. For this reason, HRC will fully play a leading role in formulating and revising national and industrial standards and organize the people to translate those standards (including water resources and hydropower engineering construction contracts and bidding documents) used in design, consultation and construction of Chinese hydropower plants and standards on SHP equipment manufacturing and installation. Meanwhile, overseas exchange and promotion on Chinese standards will be well organized, which will be conductive to the export of Chinese SHP technology and equipment.

**5. Fully taking the advantage of HRC as the "Family of Small Hydropower in the World", and strengthening the extensive exchange between HRC and other governmental departments or counterparts worldwide; Further enhancing the links with World Bank, Asian Development Bank and other international financing organizations, thus expanding business scope and extending influence of HRC itself**

**6. Improving the foreign affairs management, streamlining and standardizing the work concerned**

## 7. Taking measures to improve the editing, translation and promotion of the two magazines *SMALL HYDRO POWER* in Chinese and *SHP NEWS* in English, as well as HRC website

2016 is the first year of China's "13th Five-year Plan" and a critical year for building up a well-off society in an all-round way. Under the leadership and support of MWR and Nanjing Hydraulic Research Institute (NHRI), HRC will identify the significance of China's foreign affairs on water resources under new situation, and make clear its primary missions for international cooperation. By actively striving for development, HRC will push its international cooperation to a new level.