DECISION TO POSTPONE

Aqua-Media announces, with great regret, the need to postpone AFRICA 2021 until next year. This decision has not been taken lightly, as we felt very optimistic about holding an in-person conference in July, not least because Uganda has handled the pandemic so well, and the conference venue was perfect for well spaced, or semi-open-air, sessions and social events.

However, in the interests of successful planning, a decision had to be taken before the end of April, at a time when COVID 19 cases have been increasing greatly in continental Europe, parts of Asia, and Latin America; also, the pandemic has begun to affect countries neighbouring Uganda. We are aware that travel restrictions will be continuing in some countries, quarantine rules will apply, and in some parts of the world vaccination programmes are slow. We naturally feel it would not be right to encourage an international gathering at this time.

The Ugandan Government authorities, in particular UEGCL, feel so sorry not to welcome the conference this year, but fully support this decision, as does our co-host ICOLD, and we now continue to work towards an event next year so that a fully international audience can be welcomed.

AFRICA 2022

New dates: 18-20 JULY 2022

- - - - - - - - TECHNICAL PROGRAMME - - - - - - - -

Our abstract review process was recently completed, and we have accepted many papers which will form the basis of an excellent programme, covering projects, plans and potential in all parts of the African continent, regional developments, and many aspects of design, development, construction, operation and maintenance, which are of particular relevance to Africa. A number of special sessions and workshops are planned by ICOLD, IEA, HYPOSO, the University of Cambridge, the World Bank, and others.

Below is an outline of the programme as it stands today. Full details of timings and speakers are not announced now, in view of the longer time ahead, but all papers accepted now will remain on the programme, and can be updated if necessary. It may be possible to welcome more contributions over the coming months, to reflect new developments.
Please note: The programme outline does not include details of all accepted papers, but represents highlights of the sessions.

The opening ceremony will begin with addresses from high-level representatives of the Ugandan Government (Ministry of Energy and Mineral Development, Ministry of Water and Environment, UEGCL and UGCOLD), as well as the President of ICOLD and representatives of other supporting organisations. There will then be keynote talks from officers of the international finance institutions, and by others on some important global water and energy issues.

- - - - - - - - Potential and planning - - - - - - - -

Short overviews will be given of development programmes and planned projects in the main countries focusing on hydropower in North, East, West, Central and Southern Africa.

A paper from the Energy Commission of Nigeria will give details of GIS and RE-based hydro scheme identification systems, with reference to the Benin Owena river basin, and there will be contributions on hydrological modelling of the Awa river in Uganda, plans for an HVDC transmission system in Cameroon, the impact on rainfall variability in the Volta basin in Ghana, and current and future developments in Burkina Faso.

- - - - - - - - Finance - - - - - - - -

A session on risk and complexity in hydropower finance is being organized, and will examine the risks and benefits associated with all forms of finance, with illustrative examples from sub-Saharan Africa and Southeast Asia, and the ways in which hydropower finance has changed over time. The scale of finance needed for large-scale energy infrastructure projects is beyond the levels which can be provided by development finance alone. Increasingly, projects are being financed through public-private-partnership (PPP) arrangements with multilateral development bank guarantees. However, private financing packages are complex, and can take a long time to reach financia closure leading to delays in development. Obtaining private finance for economically viable projects in emerging economies can also be challenging, because private sector investors are often not remunerated by Government for the economic and system benefits of a large hydropower dam.

Emerging economies are increasingly turning to new bilateral finance options, from the export credit agencies (such as China Exim Bank). Financial experts as well as representatives of the major IFIs, such as the World Bank and African Development Bank will participate.

- - - - - - - - Workshop on Finance - - - - - - - -

A workshop on 'Financing hydropower and pumped storage for a renewable energy future' will be presented by the University of Cambridge's Institute for Sustainability Leadership, for a diverse group of stakeholders with an interest in finance, to discuss the role that the private sector may play in future investment in hydropower. In particular, the group will review the finance options, together with the risks and possible risk mitigation strategies. The discussion will offer the participants an opportunity to review research on the financing of hydropower projects.

Hydropower is cost-effective and can offer many additional benefits beyond power generation. However, these projects are highly capital-intensive and site-specific, with a long preparation phase, lengthy construction period, and multiple environmental and social concerns. As a result, they are often regarded as risky investments, especially by private sector investors, making it difficult to attract financing for new projects. Yet hydropower accounts for the largest share of renewable energy generation globally and will, as such, play a key role in facilitating the transition to a zero-carbon economy and improving energy access in emerging markets. It could also support the transition to a greater proportion of intermittent renewables in electricity grids through providing energy storage and grid stability services. The limited nature of public resources means that more private sector financing will be needed in the future to facilitate this transition.

- - - - - - - - Civil engineering - - - - - - - -

As usual, sessions in this category will cover: design and construction; upgrading of civil works; monitoring, safety and risk relating to water infrastructure; materials for dams; and geotechnical issues. Contributions from major international consultants, owner/operators and world-renowned universities will cover topics such as: appropriate dam types for Sahelian countries; foundation treatment for the heightening of Cambambe dam in Angola; asphalt sealing elements for reservoirs; experience with geomembrane installations in Africa; scour issues at Kariba dam; risk analysis for Nachtigal in Cameroon; safety inspection procedures at Isimba dam, Uganda; the RCC mix and application at the Kafue Gorge Lower dam in Zambia; problems of alkali aggregate reaction at several African dams; and, underwater concrete repair works at the Nalubaale hydro plant in Uganda.

The session on spillways will include talks on the spillway design for the Kikagati scheme for Uganda/Tanzania; an innovative duckbill spillway in South Africa; intelligent systems to improve spillway operation at Bujagali, Uganda; the PK Weir at the Jiji-Mulembwe scheme in Burundi; as well as discussion on the reliability of mechanical gates.

The upgrading of civil works and hydro plants will have a dedicated session, with topics including: modernization of Kainji in Nigeria; the study for refurbishment of Nalubaale and Kiira in Uganda; and rehabilitation of the Mwadingusha scheme in DR Congo.

A special session will be devoted to the Karuma project in Uganda, reaching completion (in 2021). This will cover aspects of its design, construction, special features of the tailrace, numerical simulation of temperature control measure for mass concrete for the underground powerhouse; and lessons from first filling of the reservoir. This scheme can be visited on a post-conference tour.

- - - - - - - - Reservoir operation and sediment management - - - - - - - -

These topics will include presentations on: probabilistic inflow forecasting for the operational system of the Cahora Bassa reservoir, Mozambique; flood control at Isimba, Uganda, in view of increased discharges from Lake Victoria; challenges of downstream reservoir management in an ungauged cascade; sediment yield and mass balance determination of the Limpopo river for a proposed off-channel dam scheme in South Africa/Zimbabwe; and, impacts of future climate change and land use change on the sediment yield at the proposed Crocodile river abstraction works, South Africa.

- - - - - - - - Environmental and social issues - - - - - - - -

Paper topics include: how the unusual 'floating island' problem (of aquatic weeds), was dealt with at the Nalubaale and Kiira hydro plants in Uganda; social impacts and rock excavation challenges associated with the Rusumo Falls scheme (Rwanda, Tanzania and Burundi); solutions to problems of fish passage at large African dams; a study of water quality in the Cahora Bassa reservoir, Mozambique; and, relocating ancestral spiritual heritage sites for the Nyagak small hydro plant in Uganda.

- - - - - - - - Hydrology and climate - - - - - - - -

The increasingly important topic of climate change adaptation and mitigation will be the focus of a full session. This will include reviews of current research by experts in the field, including details of modelling methods, as well as cases involving aspects of project design to allow for future extreme climatic events.

Climate change resilience, adaptation, and a mitigation communication strategy for water storage and hydropower development in Africa will be presented by a speaker from Kyambogo University in Uganda, and another contribution from Uganda will cover modelling of the impact of climate and land use change on hydropower reliability, with reference to the Muzizi scheme. A paper from Ethiopia will discuss the effect of temporal sampling mismatches between satellite rainfall estimates and rain gauge observations, on modelling extreme rainfall in the Upper Awash Basin. Another will be on modelling of inflow conditions and hydropower generation on the Akagera river, East Africa. There will also be talks from invited international experts on climate issues.

- - - - - - - - Hydro plants: Equipment, O&M and safety - - - - - - - -

Papers on electromechanical equipment will cover new digital technology, as well as improvements in efficiency, safety and economy of traditional machinery. One speaker will present on a new hydro plant simulator, a tool for transient phenomena in powerplants; another will describe challenges associated with the equipment for the Kashimbilla hydro plant in Nigeria.

Also presented will be ideas on best practice for O&M in the African context, and some speakers will showcase specific case studies, such as an intelligent remote maintenance system to ensure stable operation at Mount Coffee in Liberia; cost-effective methods of protecting machines from water-borne debris; a fast depressurization system for the transformers at Karuma; and, firefighting systems and other safety measures for hydro plants.

- - - - - - - - Hybrid systems - - - - - - - -

There will be a number of technical papers dealing with hybrid renewable energy schemes, with emphasis on floating solar PV panels, and the advantages this technology brings to Africa. Case studies will be presented from different parts of the world, and studies for Nigeria, Uganda, and other African nations will be discussed.

There will be important input to this session from the Chairman and members of ICOLD's Technical Committee on Emerging Challenges and Solutions, who are currently preparing a Technical Bulletin on the subject of the role, technology and benefits of floating solar panels.

- - - - - - - - Small hydro - - - - - - - -

Presentations on small hydropower arranged so far include talks on the overall advantages for small hydro as a power supply for industrial applications in Africa; and, on a cascade of three small plants on the Giciye river in Rwanda. There will also be two case studies from Uganda: one a success story of small hydro implementation, and another on lessons learned in repairing a small plant from flood damage. Recent developments in small hydro equipment will also be covered. International speakers will discuss innovations in technology.

- - - - - - - - Workshop: Design a small hydro plant in a day - - - - - - - -

As usual at the Aqua-Media conferences, a pre-Conference workshop will be hosted by the UK-based company Learning Hydro, on designing a small hydro plant.

The lecturers will demonstrate that many factors are considered in the design and construction of the optimum hydror project. All parts of a scheme are interrelated and interdependent; if one component is changed, all others will be affected. The workshop, following successful ones held in Vientiane, Montreux, Marrakech, Seville, Danang, Gdansk, Windhoek, and Porto, is aimed at people who are, or will be, involved in hydropower development as part of rural electrification programmes. It will cover run-of-river hydro projects in the 'pico' to 'mini' range (1 kW to 1 MW capacity).

As this is a diverse form of energy production, there are always areas which are unfamiliar to people, despite many individual professional special areas of expertise. This workshop aims to fill in the gaps, and help people to gain a good basic grounding in the topic.

All relevant aspects will be covered, from hydrology to energy evaluation, including site identification, technical components of the project and national or local grid connection.

This will be a 'hands-on' workshop, which will involve the participants, working in groups, to develop a realistic hydropower project during the day, based on real data and criteria. After presentations on the individual scheme aspects, the groups will put together the components of the project. This will follow through to the completed design.

- - - - - - - - HYPOSO - - - - - - - -

The findings of the EU-supported research project HYPOSO will be presented and discussed with particular emphasis on the two African target countries: Uganda and Cameroon. The project developments include the results of the analysis of the small hydropower framework conditions in these two countries, as well as the progress towards identification of potential small hydro sites. The selected three case studies for each country will be presented, and challenges in their development will be discussed so that a proposal of recommendations can be established on how to facilitate the projects in Uganda and Cameroon. Experts will also elaborate on the idea of knowledge and capacity development in the hydropower sector for the target countries, as well as show the opportunities of promoting the European small hydropower industry there. It is expected that the conclusions from the debate held during the session will help relevant governments, authorities and local stakeholders to create better framework conditions for hydropower investment and that the European know-how will be able to foster the transition into more sustainable energy systems in African countries.

The session will be co-hosted by HYPOSO Board Members and the Ugandan Hydropower Association, and presenters will give an overview of: hydropower solutions for developing and emerging countries; the identification of sites in Uganda and Cameroon, pilot schemes in each of the countries; financial models; and opportunities for collaboration between the European and African small hydro industries.

- - - - - - - - Additional sessions - - - - - - - -

Additional sessions are expected to be hosted by the International Energy Agency, and ICOLD's Committee on Capacity Building. Another session is being organized on large regional transboundary schemes in Africa, examining their roles, benefits and challenges.

- - - - - - - - Tours and social programme - - - - - - - -

All existing arrangements, for social activities at various places within the Speke Resort and beside Lake Victoria, and for study tours to Isimba, Karuma, Bujagali, Nalubaale and Kiira will remain the same.

AFRICA 2022

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(In view of the postponement, if you would still like a presentation to be considered on one of the topics outlined above, please contact us, in case there could be capacity in the relevant session to add another presentation).