



advancing sustainable hydropower

activity and strategy report

2018 - 2019



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Back cover image: The 480 MW Forces Motrices Hongrin Léman (FMHL) power station in Veytaux, Switzerland. Credit: www.dpicard.ch

FMHL will be part of an upcoming study tour to Switzerland hosted by Alpiq between 17 to 18 May 2019, following the World Hydropower Congress in Paris. Other post-Congress tours will take place in France, Germany, Luxembourg and Portugal.

Advancing sustainable hydropower

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In support of:



Sustainable energy is described as the golden thread that links all global development goals. Without clean, affordable and reliable electricity generation, targets to reduce poverty or limit climate change will remain out of reach. Equally critical is the responsible management of freshwater to nurture all three of the sustainability pillars.

Hydropower, as the world's largest source of renewable electricity, is central to our common goals. As well as reducing our dependence on fossil fuels and limiting air pollution, hydropower supports growth in solar and wind power through its flexibility in dispatch and clean 'water battery' storage. It can also provide a means of freshwater management for agriculture, homes and industry, while making society more resilient to the risks of floods and drought.

At the World Hydropower Congress hosted in Paris, 14-16 May 2019, leading decision-makers, innovators and experts from industry, government, finance, civil society and academia will address hydropower's contribution to the United Nations Sustainable Development Goals and the Paris Climate Agreement.

The city which four years ago hosted the historic climate accord which bears its name will this year give the stage to the hydropower sector. Delegates will have an unparalleled opportunity to exchange experiences and advance strategies that support sustainable hydropower project planning, development and operation.

Across some 40 focused sessions and workshops, participation will provide an opportunity to take on new learnings, build capacity and strengthen networks for the future. As places are limited, we encourage all members to register now and take advantage of a special IHA discount.

The outcomes of the World Hydropower Congress will help to shape our association's priorities and work programmes. As a non-profit membership organisation, we strive to support members in a practical way and advance policies which enhance the sector's performance.

Highlights from the past year include the launch of Hydropower Pro, a new online community and mobile app for members, as well as the announcement of our Fellow tier of membership, giving the sector's most experienced professionals the international recognition they deserve.

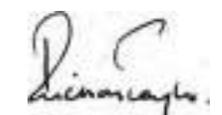
The Hydropower Sustainability Guidelines on Good International Industry Practice (HGIIIP) were released to provide definitions of good practice, alongside the Hydropower Sustainability ESG Gap Analysis Tool (HESG) which helps project proponents and investors to identify and address gaps. In addition, the Hydropower Sustainability Assessment Protocol (HSAP) was expanded with a dedicated topic on climate mitigation and resilience.

IHA is a platform for building enduring partnerships within and beyond the hydropower industry. Last year, we continued to work with international organisations, including the Inter-American Development Bank on hydropower modernisation, operations and maintenance; and with partners including the World Bank Group and European Bank for Reconstruction and Development on a forthcoming hydropower climate resilience guide. We are also partnering with a range of member organisations on research supported by the European Union relating to the modernisation and increased flexibility in hydropower operation.

Working collaboratively with our members and partners in this way, IHA will continue its mission to build and transfer knowledge on hydropower's role in renewable energy systems, responsible freshwater management and climate change solutions.



Ken Adams
President

Richard Taylor
Chief Executive



Who we are

The International Hydropower Association (IHA) is a non-profit membership organisation committed to advancing sustainable hydropower.

We were established to champion continuous improvement and sustainable practices in the hydropower sector.

Our members are active in over 100 countries and include more than 100 organisations, as well as individual members.

Corporate members range from organisations involved in the policy, planning, permitting, financing and regulation of hydropower, as well as corporations engaged as developers, designers, suppliers, owners and operators, plus non-profit organisations and specialist media.

Our individual members include those who are working, studying and teaching in the field of hydropower or a related discipline.

Our role

IHA's vision is a world where water and energy services are delivered to all in a sustainable way.

Our mission is to advance sustainable hydropower by building and sharing knowledge on its role in renewable energy systems, responsible freshwater management and climate change solutions.

We achieve this through four strategic objectives:

- *Advancing policies and strategies that strengthen the sector's performance*
- *Building a vibrant, inclusive and proactive hydropower community*
- *Creating an open, innovative and trusted platform for knowledge*
- *Delivering value to members throughout the world.*

Context

The world is facing a water and energy crisis. Urgent action is required to deliver clean energy to limit the effects of climate change, and meet people's basic needs for clean water and affordable energy.

Around the globe, almost a billion people do not have access to electricity, while 2.1 billion are without safely managed water services.

The dominance of fossil fuels drives global warming, exacerbating these problems. With the demand for energy expected to double from 2015 to 2060, the world must look towards a sustainable, renewable mix of energy sources.

IHA was formed on 16 November 1995 under the auspices of UNESCO. In the two decades since, the global hydropower sector has seen tremendous growth – doubling in size from 625 GW to over 1,250 GW today.

With this growth has come increasing recognition that hydropower development must be delivered according to fundamental principles of sustainability: respecting the rights of communities and bringing clear environmental benefits.

A watershed moment came in 2000 with the publication of the World Commission on Dams report. This marked the beginning of a new era for hydropower, with increasing focus on the participation of affected communities in project planning.

In the years that followed the report, we participated in the United Nations Environmental Programme's Dams and Development Project, and have continued to support international efforts to share and build knowledge on best practice in the hydropower sector.

Growth and partnerships

We employed our first full-time staff member in 2001 and, in 2010, opened new regional liaison offices in China and Brazil. By 2012 we had expanded to 15 staff.

We became a founding member of the International Renewable Energy Alliance (REN Alliance) in 2004 along with our association partners from the bioenergy, geothermal, solar and wind industries. The alliance was established to advance the role of renewable energy systems, and continues to build influence today.

Our values

At the heart of our work we place three core values:

Openness
Integrity
Excellence

A custodian of sustainability

The publication of our first sustainability guidelines for hydropower projects in 2004, followed by an initial IHA sustainability protocol in 2006, was an important step in providing tools for developers to guide performance.

This work was the basis for our engagement in the Hydropower Sustainability Assessment Forum, a multi-stakeholder body consisting of representatives of governments, commercial and development banks, social and environmental NGOs, and the hydropower sector.

The forum, which we initiated in partnership with the World Wildlife Fund (WWF) and the Nature Conservancy (TNC), collaborated from 2008 to 2010 to refine a new tool to measure and guide performance in the hydropower sector: the Hydropower Sustainability Assessment Protocol (HSAP).

In 2018, the launch of the Hydropower Sustainability Guidelines on Good International Industry Practice (HGIIIP) and the Hydropower Sustainability ESG Gap Analysis Tool (HESG) completed a full suite of sustainability assessment tools. In addition, the Hydropower Sustainability Assessment Protocol was expanded with a dedicated climate mitigation and resilience topic.

World Hydropower Congress

Building a community and creating a platform for knowledge have been central to our work in recent years. In 2007, we hosted our first world congress in Turkey, bringing together leading hydropower decision-makers, policy-makers and influencers.

We have continued to stage the World Hydropower Congress every two years, moving around the globe: 2009 in Iceland, 2011 in Brazil, 2013 in Malaysia, 2015 in China and 2017 in Ethiopia. The next World Hydropower Congress will be held between 14-16 May 2019 in Paris, France (see pages 52-62).

Join us

IHA membership is open to organisations and professionals with an interest in sustainable hydropower.

Our members are part of the world's most extensive hydropower network and enjoy better access to information, new connections and strong representation on issues that affect them.

IHA members receive reduced registration rates to participate in special events such as the World Hydropower Congress.

Shape your future

We provide a strong, credible voice for the sector and the role of hydropower in the future at national, regional and international forums. As a member, you can help to shape our strategy and activities through our events, knowledge networks and working groups.

Network and connect

Our membership comprises some of the world's most reputable hydropower sector organisations, active in more than 100 countries.

We also work in partnership with a range of influential organisations from government, finance, the scientific and academic communities, and civil society.

Members can connect, join specialist networks and access resources through our new Hydropower Pro online community and mobile app: hydropower.org/pro

Raise your profile

IHA membership enhances your visibility to an international audience of leading stakeholders from the hydropower sector and beyond. By joining our association, you can demonstrate your ambition, unlock new markets and reach new audiences.

Stay on trend

Our experts share updates on hydropower policy developments, good practice and new trends from around the world, offering insights on a range of specialist topics. These communications are supported by IHA's hydropower database which monitors sector growth and development in all regions.

Gain access

We offer members priority treatment and discounted registration to IHA events, workshops and training programmes, as well as privileged and exclusive access to essential publications, briefings and knowledge networks.

Online:

To view all benefits, membership rates and apply online, please visit:

hydropower.org/join



Individual membership

Anyone with a professional or academic interest in hydropower can apply to become an individual member of IHA.

Become an individual member:

hydropower.org/individual-membership

Become a Fellow

Fellowship is a new tier of IHA membership which recognises the expertise of leading professionals within the hydropower sector.

Awarded on the basis of proven experience, Fellow membership provides an opportunity to collaborate with industry leaders through online groups, training sessions, workshops, webinars and other events.

With their wealth of knowledge and experience, our Fellows help to shape IHA's work programmes. Fellow members are entitled to use the letters 'F.IHA' in their professional title.

Become a Fellow of IHA:

hydropower.org/fellow-iha

Corporate membership

Our membership community includes hydropower owners, developers and operators, equipment manufacturers, government agencies and utility companies, non-government organisations and national membership associations.

We have three levels of corporate membership, which are recommended based on an organisation's size or total installed capacity:

- Platinum (more than 10,000 MW)
- Gold (more than 2,000 MW)
- Silver (less than 2,000 MW)

Our corporate members nominate up to 40 employees, dependent on membership level, as corporate representatives to enjoy the full benefits of IHA membership.

Corporate members can also nominate up to 10 employees, dependent on membership level, to become Fellows of IHA free of charge.

Become a corporate member:

hydropower.org/corporate-membership

Become a Fellow of IHA



Recognising your experience

If you are a highly experienced hydropower professional, you can apply to become a Fellow of the International Hydropower Association. As a Fellow you will:

- Gain international recognition
- Join a global network of leaders
- Help steer hydropower's future

Online
hydropower.org/fellow-iha

IHA Fellow members

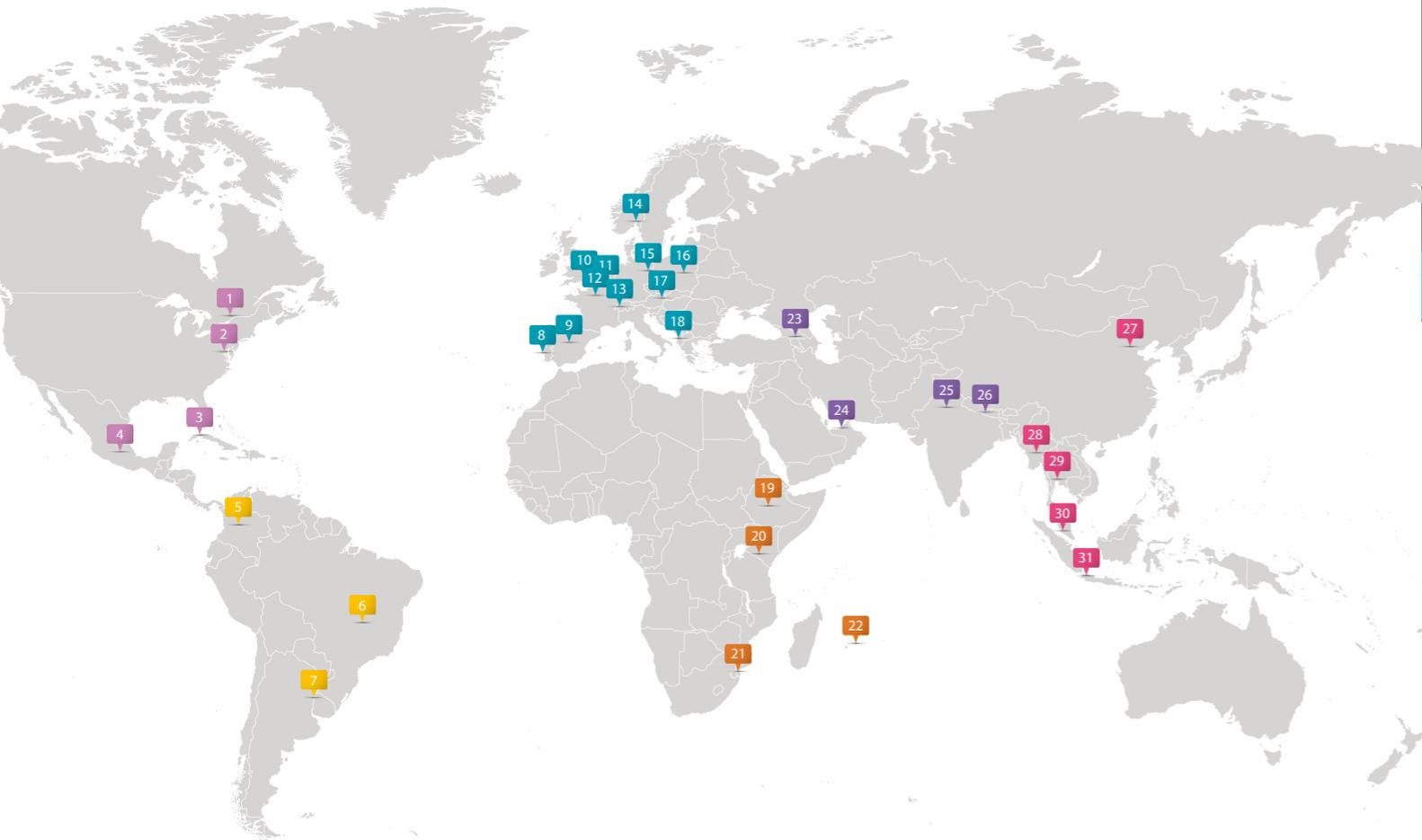
Mr Roy Adair, Sustainable Energy Services
Mr Evangelista Albertini, Hydro Tasmania
Mr Antonio Harley Anselmo, ARHPI Consultoria Ltda
Mr Jean Francois Astolfi, retired
Mr Antoine Badinier, EDF
Ms Erideta Bashi, KESH
Mr Alex Beckitt, Hydro Tasmania
Mr Laurent Bellet, EDF
Dr Edson Bortoni, Itajuba Federal University
Ms Christine Cantin, Hydro-Québec
Mr Andrew Catchpole, Hydro Tasmania
Mr Vincent Chanudet, EDF
Dr Chen Shiun, Sarawak Energy Berhad
Ms Tammy Chu, Hydro Tasmania
Mr Maurice José Corbellini, Itaipu Binacional
Mr Stephen Davy, Hydro Tasmania
Mr Gilles Feuillade, EDF
Dr Albert Cordeiro Geber de Melo, CEPEL
Mr Roger Gill, Hydro Focus Pty Ltd
Dr Leopold Heninger, Voith Hydro
Mr Jacques Henriot, EDF
Mr Frédéric Hofmann, EDF
Mr Huang Wenbao, HNAC Technology Co Ltd
Mr Mohd Narzam Jaffar, Sarawak Energy Berhad
Mr Ravinder Kalra, Voith Hydro
Dr Tobias Keitel, Voith Hydro
Mr Kaleem Khan, Larai Energy Limited
Mr Stanley Kocon, Voith Hydro
Dr Jiri Koutnik, Voith Hydro
Mr Stephen George Lewis, Voith Hydro
Mr Yew Hung Lu, Sarawak Energy Berhad
Dr Jorge Machado Damazio, Centro de Pesquisas de Energia
Mr Moisés Machava, Hidroeléctrica de Cahora Bassa
Mr Chouaibu Maiga, retired
Mr Kelly Malone, King & Spalding
Ms Lisa Martindale, Southern Company
Mr Lambert Mbuyi, retired
Mr Richard Mickwee, Southern Company

Mr Arvind Kumar Mishra, Mangdechhu Hydroelectric Project Authority
Mr Gil Maranhão Neto, Engie Brasil
Mr Encharang Ngtingih, Sarawak Energy Berhad
Mr Kenneth R. Odom, Southern Company
Mr Anton-Louis Olivier, Renewable Energy Holdings
Mr Daniel Paschini, EDF
Dr G.P. Patel, Indian Hydropower Association
Mr Florent Perrot, EDF
Ms Maria Elvira Pineiro Maceira, CEPEL
Mr Donald Proulx, EBC inc
Dr Jonathan Quebbeman, RTI International
Mr Brendan Quigley, Stucky
Mr Markus Rieck, Voith Hydro
Dr Norbert Riedel, Voith Hydro
Mr Bertrand Rochecouste Collet, Aurecon
Mr Ove Rusten, Multiconsult
Mr Gautam Saha, Tata Projects Limited
Mr Olivier Salignat, EDF
Mr Sergio Gil Sanudo, Berkeley Energy Uganda
Mr Cheling Sapon, Sarawak Energy Berhad
Mr Markus Schneeberger, Andritz
Dr Juergen Schuol, Voith Hydro
Mr Alexander Schwab, Andritz
Dr Sandip Shah, Dolma Himalayan Energy
Mr Marc Sheikh, Stantec Consulting
Dr Mirjam Sick, Andritz
Mr Travis Smith, SNC-Lavalin
Mr Peter Stettner, Andritz
Mr Sharbini Suhaili, Sarawak
Dr Oli Sveinsson, Landsvirkjun
Mr Tay Chang Seng, Sarawak Energy Berhad
Mr James Sing Kwong Ung, Sarawak Energy Berhad
Mr Sergio Vallesi, HR Wallingford
Mr Uwe Wehnardt, Voith Hydro
Mr Jonny Kwei Ji Wong, Sarawak Energy Berhad
Mr Polycarp Wong, Sarawak Energy Berhad

Visit the website for information on how to join the Fellows network

Events and workshops

During 2018, IHA convened or represented our members at over 50 sector events, workshops and conferences in more than 30 countries around the world.



- | | | | | |
|----------------------|--------------------|----------------|--------------------------|---------------|
| 1. Canada | 8. Portugal | 15. Germany | 22. Mauritius | 29. Thailand |
| 2. USA | 9. Spain | 16. Poland | 23. Georgia | 30. Malaysia |
| 3. Cuba | 10. United Kingdom | 17. Austria | 24. United Arab Emirates | 31. Indonesia |
| 4. Mexico | 11. Belgium | 18. Albania | 25. India | |
| 5. Colombia | 12. France | 19. Ethiopia | 26. Nepal | |
| 6. Brazil | 13. Switzerland | 20. Kenya | 27. China | |
| 7. Argentina/Uruguay | 14. Norway | 21. Mozambique | 28. Myanmar | |



Hydropower Now

Hydropower Now is a regular email newsletter for members and subscribers. It offers news and insights from IHA, our members and the wider hydropower sector. Members receive a special edition which includes highlights from Hydropower Pro, our online community and mobile app.

Request to subscribe

Email: communications@hydropower.org

2018 news highlights

February



Innovative financing solutions for hydropower

Leaders from the investment community along with hydropower developers joined an IHA finance workshop in London.



Indonesian projects gain from sustainability training

More than 80 government officials and external stakeholders participated in a high-level event, plus capacity building training.



IHA Blue Planet Prize launched

Entries opened for the prestigious award which recognises hydropower projects for their achievements in sustainability. It will be awarded at the World Hydropower Congress.

2018 news highlights

Sharing good practices in climate resilience and risk management

Hydropower operators, financial institutions, academics and humanitarian organisations gathered at an IHA and Red Cross workshop in Mexico.



May

2018 Hydropower Status Report shows rise in clean electricity

Worldwide hydropower installed capacity rose to 1,267 GW last year according to the report.



June

July

August

September

December



Training in Kenya on assessing hydropower sustainability

IHA organised a workshop on sustainability assessment tools for African hydropower projects at an International Water Stewardship Programme conference in Nairobi.



Sustainability tools released for assessing project performance

The Hydropower Sustainability Assessment Protocol was expanded and a new ESG Gap Analysis Tool launched by IHA and the Hydropower Sustainability Assessment Council.



Beijing forum: hydropower seen as integral to future energy systems

Business and policy leaders exchanged views on how to accelerate the adoption of renewable technologies at an IHA forum in China.



Hydropower operators address new reality of digitalisation

A workshop organised by IHA and the Inter-American Development Bank explored how digital systems are advancing project operations, maintenance and modernisation.



IDB and IHA partner to promote the sustainable modern role of hydropower

A partnership agreement was signed to support sustainable development involving hydropower across Latin America and the Caribbean.



IHA represents members at United Nations climate conference

IHA supported the launch of the Global Network on Sustainable Water and Energy Solutions by United Nations and Itaipu Binacional.



IHA launches Fellow membership for hydropower professionals

Experienced professionals working in the hydropower community can now apply to become a Fellow of IHA.



Sustainability guidelines define good practice for hydropower

A set of 26 new sustainability guidelines published by IHA and the Hydropower Sustainability Assessment Council define good international practice for the hydropower sector.



Decision-makers address climate change and digitalisation

More than 70 senior hydropower decision-makers came together for an IHA workshop in Paris to share experiences and look at tools to improve project performance.



Pumped storage hydropower paper published

An additional 78,000 MW in pumped hydro capacity will come online by 2030, according to a new IHA working paper.

Photo credit: Voith Hydro.

New membership benefit



Introducing Hydropower Pro, IHA's new online community

In early 2019, IHA launched Hydropower Pro, an exclusive new online community and mobile app for individual and corporate members.

Hydropower Pro brings together hydropower professionals to connect, exchange experiences and collaborate.

Online:

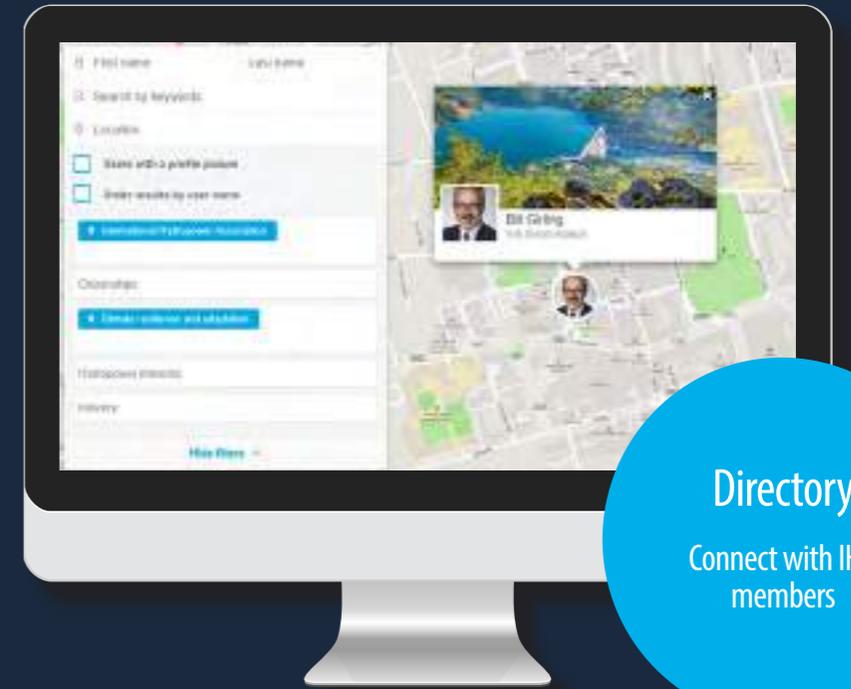
hydropower.org/pro

The platform offers:

- **Online groups** - forums for IHA knowledge networks and regions of interest
- **Resource libraries** - essential reports, publications, briefings and case studies
- **Member directory and messaging** - allowing members to network
- **News and blogging** - announcements and articles by IHA staff and members
- **Multi-platform access** - via desktop and mobile apps (iOS and Android)
- **Email alerts** - instant alerts and a weekly digest

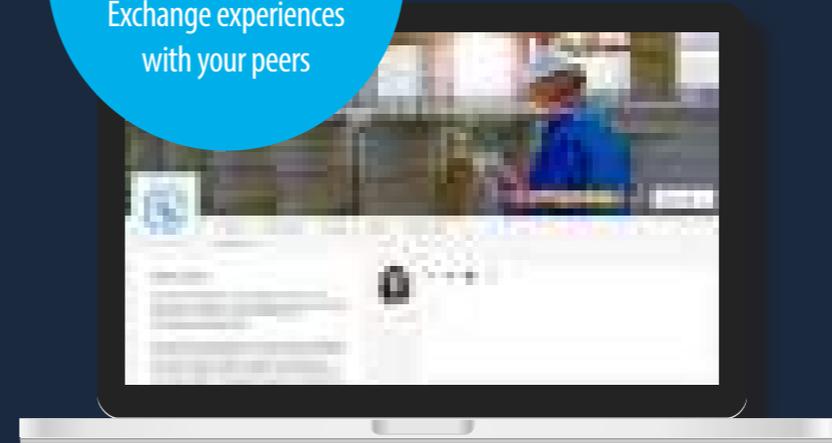
"Hydropower Pro is a rich source of knowledge for the international hydropower community. It provides up-to-date, authoritative coverage of a broad range of news, events, issues and facts for the sector."

Colin Clark, Chief Technical Officer for Brookfield Renewable and IHA Vice President



Knowledge networks

Exchange experiences with your peers

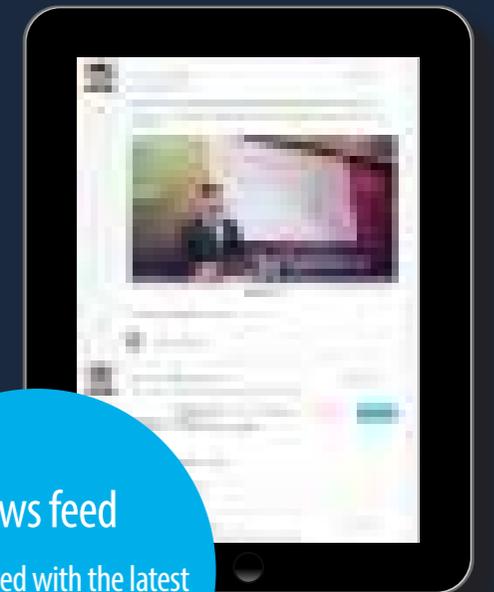


"Hydropower Pro offers a new link into the extensive world of hydropower. It helps me stay updated with the latest issues and events and network in my areas of interest."

Roger Gill, independent hydropower consultant and IHA Vice President

News feed

Stay updated with the latest developments





IHA supports hydropower professionals among its membership to share ideas, discuss new developments and collaborate through its Knowledge Networks.

Access and resources

By joining a Knowledge Network, you will gain access to professionals in the wider hydropower community who face similar challenges in their work. Participation enables you to showcase successful initiatives and learn from others' experiences.

Each Knowledge Network is supported by an online group in IHA's Hydropower Pro community, comprising a message board and links to essential resources.

Online:

hydropower.org/iha-knowledge-networks

IHA Knowledge Networks exist on:

- Asset Management
- Clean Energy Systems
- Climate Mitigation
- Climate Resilience
- Communications
- Finance and Investment
- Hydropower Benefits
- Regional Interconnections
- River Basin Development
- Sediment Management
- Water Footprint

Activities include:

- Webinars and presentations
- Surveys and briefings
- Technical workshops
- Informal gatherings at major sector events such as the World Hydropower Congress
- Development of resources and guidelines
- Circulation and dissemination of materials
- Informal discussion and idea-sharing

Knowledge building programmes

Providing authoritative insights on the status of hydropower

IHA monitors the growth of hydropower in all regions of the world.

Our analysts keep members informed of key trends and developments throughout the year with authoritative publications and exclusive briefings.

The research and statistics which feature in these reports are drawn from year-round sectoral monitoring, surveys of members and governments, and from IHA's own hydropower database.

Hydropower Status Report

IHA's flagship publication, the Hydropower Status Report, offers insights and information on hydropower development globally and provides statistics on installed capacity and estimated generation by country and by region.

The 2018 report found a total of 21.9 GW of installed capacity was added worldwide during the previous year. This figure included 3.2 GW of new pumped storage.

The report highlighted that a record 4,185 terawatt hours (TWh) in electricity was generated from hydropower in 2017, avoiding approximately 4 billion tonnes of greenhouse gases as well as harmful pollutants. In addition, the report looked at topics such as the greenhouse gas footprint of reservoirs and the growing focus on hydropower's resilience to climate change.

The next edition of the Hydropower Status Report will be published in April/May 2019.



hydropower installed capacity added in 2017



new pumped storage added in 2017

Online

hydropower.org/status2018

IHA Pumped Storage Tracking Tool



The world's most comprehensive hydropower database

With our comprehensive hydropower database and global network, IHA's Knowledge Building Team is uniquely positioned to provide analysis on hydropower development in all regions of the world.

Pumped Storage Tracking Tool

Our Pumped Storage Tracking Tool maps the locations and vital statistics of pumped storage hydropower projects around the world, including more than 100 projects in the pipeline. The tool allows users to filter projects by operational status, pump-turbine type and configuration, commissioning date, maximum head, generation capacity, pumping capacity and energy stored.

hydropower.org/pumpedstoragetool

Hydropower growth and modernisation

We have analysed hydropower growth since the turn of the twentieth century, looking at overall capacity additions and major developments. This analysis has informed our modernisation work programme by highlighting the age profile of existing hydropower capacity and how much has been or will be due for modernisation.

Project ownership study

To better understand the role of private sector financing in hydropower development and how the size of a project impacts its ownership model, we have conducted rigorous research and built a new project ownership database. The database contains information on project owners, engineering, procurement and construction contractors, lenders and turbine suppliers.

China's hydropower development

Although China has made significant progress in hydropower development over recent decades, international audiences are often unaware of the policies which have driven new projects. To fill this knowledge gap, in 2018 we conducted an in-depth research study on China and developed an infographic illustrating the country's capacity growth and major milestones over the years.

Hydropower benefits study

We have expanded our database to quantify hydropower's contributions to energy and food security, as well as to improvements in local community livelihoods, for 106 projects in Ecuador. This analysis has helped to quantify some of the often underreported benefits of hydropower.

Highlighting the expansion of hydropower's role in clean energy systems

The power sector, the largest source of global greenhouse gas emissions, must decarbonise to strengthen the global response to climate change.

The adoption of renewable, clean energy is integral to delivering the Paris Agreement, which aims to limit the global temperature increase to 1.5 °C, as this would substantially reduce the risks and effects of climate change.

In order to achieve this goal, fossil-fuel dominated energy systems will need to transition to low-carbon alternatives.

Hydropower remains the largest source of renewable electricity generation in the world. It represents over 16 per cent of global electricity production, more than all other renewables combined, and will play an important role in the energy transition.

Hydropower provides valuable grid services that enable increased and more efficient deployment of variable renewables, alongside other essential energy and water services.

IHA is increasing awareness of hydropower's contributions to reliable, stable and affordable energy systems and human development.

We work with international partners to highlight the role of hydropower in enabling the transition towards clean and sustainable energy systems.

Focusing on hydropower's balancing and ancillary services for grid stability, we also share knowledge on the evolving role of pumped hydropower storage in future energy systems.

We are actively engaged in developing publications, workshops, webinars and events highlighting hydropower as a vital component of future energy systems.



Knowledge network

IHA's Clean Energy Systems Knowledge Network gives members a platform to share knowledge on and examples of hydropower's role in enabling the transition towards clean and sustainable energy systems, the achievement of the Paris Agreement and the realisation of the SDGs.

Online

hydropower.org/cleanenergysystems

Contact us

Mathis Rogner, Senior Analyst at IHA
mathis.rogner@hydropower.org



world hydropower
congress 
14-16 MAY 2019 • PARIS

Register for a session and help set sector priorities:



Focus session:

Pumped hydro

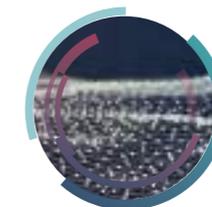
Wednesday 15 May 2019 | 11:15-12:30



Focus session:

Clean energy systems

Wednesday 15 May 2019 | 15:45-17:00



Focus session:

Hydropower and solar hybrids

Thursday 16 May 2019 | 09:30-10:45

Activity highlights 2018

- In April, we convened a workshop on innovations and technological disruption in the hydropower sector at the World Bank's headquarters in Washington D.C.
- In April, we highlighted the value of hydropower in delivering clean energy and water services and its role in meeting the SDGs on the BBC Radio 4 programme 'Costing the Earth'.
- In May, we participated in a webinar titled the Local Dimensions of NDCs and 100% Renewable Energy along with our partners the REN-Alliance and the 100% Renewable Energy Platform.
- In July, we attended the United Nations High-Level Political Forum on Sustainable Development in New York and participated in a session on Water Security and the 2030 Agenda for Sustainable Development.
- In October, we published a case study in collaboration with EDP which investigated the integration of hydropower and solar photovoltaics with an emerging technology known as 'floatovoltaics'.
- In December, we published a paper on pumped hydropower storage and its important role in the clean energy transition.

Secure your place: hydropower.org/congress

Connecting hydropower through regional interconnections

To reach new markets and customers, clean electricity requires long-distance transmission, often across national boundaries.

Hydropower offers sustainable, affordable energy for local communities. For many projects to become economically viable, however, they must be interconnected to a central grid and markets in neighbouring countries.

Regional interconnections involve joining up separate power systems and building cross-border grid infrastructure. They can result in lower electricity costs, greater flexibility and improved system reliability for trading partners.

Additional benefits include access to clean energy systems and energy storage, but they can be hindered by a lack of institutional capacity when navigating the cost and complexity of a transmission infrastructure project.

Projects can in some cases be burdened by regulatory structures which are not harmonised or coordinated, and disagreements over how benefits are shared and risks are allocated can delay or even halt new developments.

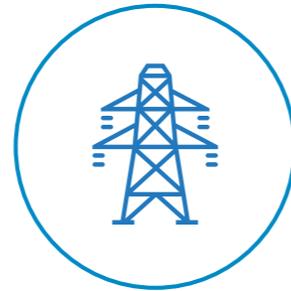
IHA is promoting the benefits and lessons learned from regional energy interconnections.

The growth in regional energy networks globally has created new opportunities to widen access to clean electricity and water services. This is essential for many countries to meet their renewable energy targets, reduce poverty and boost national development.

Hydropower development and regional interconnections often go hand-in-hand. In particular, long distance transmission can provide export routes for remote hydropower sites, while giving distant markets access to a low cost and flexible power supply.

We continue to explore the opportunities and challenges stemming from the growth of cross border energy grids and share knowledge with our members, partners and stakeholders.

Throughout 2019, we will be publishing a compendium of case studies, produced through collaboration with members and partners, to promote the mutual benefits of and lessons learned from regional interconnections involving hydropower.



Knowledge network

IHA's Regional Interconnections Knowledge Network supports member organisations, including integrated utilities, independent asset owners and contractors, with interests in regional electricity networks around the world.

Online

hydropower.org/regionalinterconnections

Contact us

David Samuel, Analyst at IHA
david.samuel@hydropower.org

Activity highlights 2018

- In February, we hosted a workshop in Jakarta, Indonesia, which included case studies presented on the Sarawak-West Kalimantan interconnection and Tasmania's Basslink.
- In April, we participated in the APUA Forum on Regional Power Pools in Africa, held at the United Nations Economic Commission for Africa in Addis Ababa, Ethiopia.
- In May, we hosted the Beijing Forum on Hydropower and Future Energy Systems in partnership with GEIDCO, CTG, CSHE and IWHR. The forum included sessions on interconnections which brought together regional perspectives from around the world.
- In August, the Nordic Power Market operator Nord Pool provided us with a case study highlighting the mutual benefits of interconnection and hydropower.
- In November, we produced a case study on lessons learned from the Sarawak-West Kalimantan interconnection based on Sarawak Energy's experiences and input.

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Register for a session and help set sector priorities:



Focus session:

Regional interconnections

Thursday 16 May 2019 | 09:30-10:45

Secure your place: hydropower.org/congress

Preparing sustainable hydropower projects with a facility model



Investment in hydropower will help the world meet the United Nations Sustainable Development Goals, including a target to deliver 'sustainable energy for all' by the year 2030.

A significant barrier to private sector investment in hydropower is the financial risk associated with rigorous and complex planning and assessments, with no certainty for investors that a project will be given permission to proceed.

Meanwhile, national governments want to ensure that hydropower fits well with local, national and regional strategies, and adheres to international good practice in sustainability.

A new model for project development focused specifically on hydropower is needed to assist governments and investors in selecting and preparing potential sites, which will support the growth of renewable energy at speed and scale.

IHA is promoting the establishment of a hydropower project preparation facility.

Since it was first proposed at the World Hydropower Congress in Ethiopia in May 2017, we have continued to engage in dialogue with a number of governments, developers, financial institutions and NGOs to bring forward the concept.

The Hydropower Preparation Facility model could help investors, developers and governments get new projects off the ground by ensuring that each one is selected according to recognised sustainability criteria and national and regional development needs.

Under the model, the facility would support the scaling-up of sustainable hydropower in developing countries by improving the quality of project preparation, facilitating financing and assisting the implementation of projects.

Throughout 2019, working with partners including the World Bank, we will continue to build support for this concept and explore whether hydropower preparation facilities could be established in different regions around the world.



Knowledge network

Members interested in contributing to the Hydropower Preparation Facility concept development can join IHA's Finance and Investment Knowledge Network, which aims to share information on key trends and developments in hydropower financing.

Online

hydropower.org/preparationfacility

Contact us

Nicholas Troja, Senior Analyst at IHA
nicholas.troja@hydropower.org

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Register for a session and help set sector priorities:



Focus session:
Project ownership and financing

Thursday 16 May 2019 | 14:00-15:15

Secure your place: hydropower.org/congress

Activity highlights 2018

- During 2018, we participated in a number of events to advance the concept of a hydropower preparation facility, including:
 - In February, we convened an IHA executive workshop on innovation in hydropower financing in London, United Kingdom.
 - In February, we participated in a joint IHA and Bappenas hydropower capacity-building workshop in Jakarta, Indonesia.
 - Throughout the year, we consulted governments, donors, international institutions and NGOs on the principles, governance and resourcing aspects of a preparation facility model and its scope and strategic fit for countries in Africa, Asia and South America.

Unlocking the green bond market to hydropower

Green bonds direct investment towards renewable energy projects, but continued uncertainty over qualifying criteria for hydropower is stifling the sector's access to this growing market.

An innovative investment instrument, green bonds are fixed income loans for the finance and refinance of projects and assets that help address environmental and climate risks.

The green bond market has grown rapidly in recent years, up from USD 11 billion of issuances in 2013 to over USD 167 billion in 2018. This is helping to shift much-needed investment towards a low carbon, sustainable economy.

Some issuers have however excluded proceeds from green bonds being used to finance or refinance hydropower projects due to a lack of clarity over appropriate sustainability standards.

IHA is working with partners to agree recognised eligibility criteria for green bonds to fund hydropower projects.

We are seeking international agreement on climate compatible criteria for hydropower projects, which are approved by the Climate Bonds Initiative (CBI) and stakeholders, and accepted by the hydropower sector.

As part of the CBI's Hydropower Technical Working Group (TWG) we are working with partners to develop the criteria covering climate mitigation, climate resilience and adaptation and adherence to broader environmental, social and governance good practice. Since its formation, the TWG has made substantial progress in developing the eligibility criteria, which are expected to be released in 2019.

IHA's contribution draws upon the tools and guidelines which we have developed such as the Hydropower Sustainability ESG Gap Analysis Tool (HESG Tool). The tool is based on the framework of the Hydropower Sustainability Assessment Protocol and provides an action plan to help developers address any gaps against international good practice.



Knowledge network

Members interested in learning more about green bonds should join IHA's Finance and Investment Knowledge Network. The network focuses on building and sharing knowledge on key trends and developments in hydropower financing.

Online

hydropower.org/greenbonds

Contact us

Nicholas Troja, Senior Analyst at IHA
nicholas.troja@hydropower.org

Activity highlights 2018

- In July, we launched the HESG Tool, which enables developers and investors to identify and address gaps against good practice. The tool is expected to support criteria developed by the CBI.
- Over the course of 2018, there were several meetings with key stakeholders to discuss and further develop the criteria with a focus on the social impacts of hydropower projects.
- We organised and participated in several events to promote the development of hydropower's green bond criteria including:
 - In February, an IHA executive workshop on innovation in hydropower financing in London, UK.
 - In February, a joint IHA and Bappenas hydropower capacity building workshop in Jakarta, Indonesia.
 - In April, a workshop convened by IHA on innovations and technological disruption in the hydropower sector at the World Bank in Washington, D.C., USA.

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Register for a session and help set sector priorities:



Focus session:
**Green bonds for
hydropower**

Thursday 16 May 2019 | 11:15-12:30

Secure your place: hydropower.org/congress

Assessing greenhouse gas emissions for climate mitigation



There is a clear and pressing need to eliminate uncertainty in quantifying the greenhouse gas footprint of reservoirs.

The greenhouse gas (GHG) footprint of hydropower, in particular the emissions caused by the creation of a reservoir, has long been questioned in both scientific and policy spheres.

Up until now, there has been no consensus on how to quantify this footprint. The biochemical processes associated with the flooding of terrestrial land are very complex, and existing measurement techniques are both cumbersome and expensive.

This uncertainty has proved a significant obstacle in financing hydropower projects. There is an increasing need for policy-makers and decision-makers to better understand the GHG emissions of reservoirs.

IHA has led the way in developing a tool for reliably estimating the carbon emissions of hydropower.

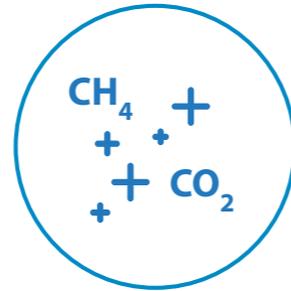
Since 2006, we have partnered with UNESCO, the World Bank and leading research institutions, along with supporting members including CTG, EDF, Hydro-Québec, Landsvirkjun, Sarawak Energy and Statkraft.

We have taken a leadership role in advancing a common understanding of how GHG emissions arise from reservoirs, working closely with leading scientists.

This led, in 2017, to the launch of the GHG Reservoir (G-res) Tool for estimating net emissions from reservoirs from both before and after development. The web-based tool is publicly available online.

We offer assisted assessments using the G-res Tool as well as dedicated training for new users. We will continue updating and refining the tool as new empirical data and scientific insights come to light.

Our goal is for the G-res Tool to become the internationally recognised methodology to reliably estimate reservoir GHG emissions and allocate emissions to other services, including hydropower generation.



Knowledge network

IHA's Climate Mitigation Knowledge Network looks to build and share knowledge on the climate mitigation potential of hydropower reservoirs. Members can receive training, support services and assisted assessments using the G-res Tool at a discounted price.

Online

hydropower.org/climatemitigation

Contact us

Mathis Rogner, Senior Analyst at IHA
mathis.rogner@hydropower.org

Activity highlights 2018

- In May, we presented the results of a study of 500 reservoirs using the G-res Tool in the 2018 Hydropower Status Report.
- In September, we presented the G-res Tool to sustainability assessors at an IHA training workshop.
- In October, we launched a dedicated website to showcase the G-res Tool at g-res.hydropower.org.
- In October and November, we held training courses in London, UK, and Montreal, Canada.
- Throughout 2018, we contributed to the identification of threshold criteria for future potential climate bonds standards.
- In addition, our G-res Tool experts participated in the expert panel for the update of the IPCC Guidelines for National Greenhouse Gas Inventories, which will be released in May 2019.

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Register for a session and help set sector priorities:



Focus session:
Hydropower's carbon footprint

Wednesday 15 May 2019 | 09:30-10:45

Secure your place: hydropower.org/congress

Developing a guide for climate resilient hydropower

Extreme weather events and changes in hydrological patterns can be expected in a world altered by climate change.

Hydropower systems are characterised by their longevity and are traditionally designed on the basis of historical hydrological data.

Planning hydropower systems from a long-term, climate-resilient perspective will ensure that future generations inherit infrastructure that will not be compromised by climate change.

The hydropower sector is already starting to experience the impacts of climate change and will face further climate-related risks in the future. As a result, the wider financial community and governmental agencies are engaged in resilient investment for adaptation to climate change.

Three years ago, the World Bank launched a new initiative aimed at developing a guidance document, based on industry good practice for the hydropower sector, on building climate resilience into new and existing projects.

In September 2017, after two years of development and multiple consultations with key stakeholders, the beta version of the Hydropower Sector Climate Resilience Guide was released.

IHA is testing and refining the Hydropower Sector Climate Resilience Guide to ensure that hydropower projects will be resilient to climate change.

The guide will provide practical and workable international good practice guidance for project owners, governments, financial institutions and private developers. It will incorporate climate change resilience and hydrological risk management into hydropower project appraisal, design, construction and operation, resulting in more robust and resilient projects.

Throughout 2018 and early 2019, several projects tested the guide. The objective was to gather useful feedback and ensure its applicability and viability. The European Bank for Reconstruction and Development (EBRD) and the World Bank joined forces to support IHA as the coordinator of the testing phase.

With the support of an advisory panel, IHA will integrate the recommendations of the testing phase and the finalised version of the guide will be launched at the 2019 World Hydropower Congress, which is being co-convened by EBRD.



Knowledge network

IHA's Climate Resilience Knowledge Network provides members with a significant library of material on climate resilience assessments for hydropower projects. Presentations, case studies and papers are made available to all members of the network.

Online

hydropower.org/climateresilience

Contact us

María Ubierna, Senior Analyst at IHA
mu@hydropower.org

Activity highlights 2018

- In February, with the support of EBRD and the World Bank, IHA became the coordinator for the testing and updating of the Hydropower Sector Climate Resilience Guide.
- In May, we co-organised a workshop titled 'Climate resilience and the effective management of risk in the hydropower sector', which took place during the Understanding Risk Forum in Mexico City, Mexico.
- In June, we participated in the kick-off meeting for the climate resilience assessment of the Kabeli A Hydroelectric Project in Nepal. Kabeli A is one of the pilot projects which participated in the testing phase of the guide.
- In December, we participated in a meeting to share the findings and results of the climate resilience testing of the Drin River hydropower cascade scheme in Albania.
- Throughout 2018, we reached out to potential testers and provided guidance on how to apply the guide and climate resilience assessments.

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Register for a session and help set sector priorities:



Workshop on climate resilience

Tuesday 14 May 2019 | 09:00-13:30



Focus session:

Climate resilience

Wednesday 15 May 2019 | 14:00-15:15

Secure your place: hydropower.org/congress

Reporting on hydropower's multiple benefits

The wide-ranging benefits of hydropower are often misunderstood or under-reported.

Benefits of hydropower include flexible energy generation and storage, as well as reducing dependence on fossil fuels.

Benefits to local communities include flood protection and water supply for domestic and commercial use, as well as opportunities for employment, education and recreation. Hydropower facilities also provide a boost to national economic growth through trade, transport and tourism.

Environmental benefits include pollution control and reduction of carbon emissions. Hydropower can also boost food security with a reliable source of water for irrigation.

These benefits are, however, often under-reported, and companies struggle to collect, quantify and share information on them. This is partially due to non-power related benefits being difficult to measure.

The absence of an adequate framework to define and quantify these benefits makes it difficult for society to evaluate them.

IHA supports its members to articulate the multipurpose benefits of hydropower.

Since IHA was first established, we have been building and sharing knowledge on the benefits of hydropower.

Our hydropower benefits work programme highlights the benefits which are not always built into the design of projects, but can be leveraged from them. Opportunities for non-power benefits should be evaluated and implemented in dialogue with affected communities.

We have been collaborating with the United Nations Economic Commission for Africa, the International Finance Corporation, the World Bank and several IHA members on research initiatives. These initiatives are focused on how we can identify and quantify impacts and benefit sharing mechanisms to better assess and articulate how hydropower projects can contribute to the realisation of the SDGs.

Our ongoing work looks at methods of identifying and quantifying the benefits of hydropower development at country and regional levels, as well as best practices to provide local communities with hydropower benefits.



Knowledge network

The Hydropower Benefits Knowledge Network provides opportunities to share information on the many benefits created by hydropower. Members who would like to share their experiences should join this network.

Online

hydropower.org/hydropowerbenefits

Contact us

Cristina Diez Santos, Analyst at IHA
cristina.diez-santos@hydropower.org



Activity highlights 2018

- In February, we began a collaboration with the International Finance Corporation and the World Bank on a benefit sharing study. The aim of the study is to help the private sector understand the different models of benefit sharing and how implementation can support developers in gaining a social licence to operate hydropower projects.
- In June, we presented a benefit sharing study and our hydropower benefits work programme at the International Water Stewardship Programme's Water Stewardship for Sustainable Hydropower conference in Nairobi, Kenya.
- Throughout the year, we continued to improve our hydropower database with information on reservoirs, hydropower's multipurpose functions, and additional benefits reported.

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Register for a session and help set sector priorities:



Workshop on hydropower benefit sharing

Monday 13 May 2019 | 13:00-17:30



Focus session:

Benefits of hydropower

Thursday 16 May 2019 | 09:30-10:45

Secure your place: hydropower.org/congress

Promoting collaboration in river basin development

A river basin is a network of connected ecosystems which is shared by different communities and water users.

The combination of climate change, population growth, economic development and the expansion of irrigated areas means it is becoming increasingly more difficult to manage shared rivers without a collaborative and adaptive approach.

When selecting a site for a hydropower project, decision-makers should examine the entire river basin. This involves considering how to maximise energy generation alongside the environmental, social and economic outcomes for all users.

Successful river basin development involves a holistic approach which encourages cooperation among a diverse group of stakeholders in the utilisation of river resources.

Site selection at the basin-scale ensures the optimal use of natural resources, supporting water supply, energy and agricultural uses. This minimises impacts, protects the environment and improves livelihoods.

IHA helps members and partners to understand how to design collaborative, adaptive approaches to river basin development.

Our strategy is to collect and share experiences and knowledge with members, policy-makers and other stakeholders to support hydropower development planning at basin-scale.

The river basin development work programme shares knowledge with regulators, state-owned entities and developers seeking a licence to operate, to help them identify risks, challenges and solutions to river basin development.

Throughout 2019, we will continue to gather case studies covering both transboundary and national river basin development as a means of sharing knowledge with our members. These case studies will be showcased during the 2019 World Hydropower Congress in Paris, France.



Knowledge network

Members interested in exchanging experiences and best practices on river basin development can join our River Basin Development Knowledge Network.

Online

hydropower.org/riverbasindevelopment

Contact us

Cristina Diez Santos, Analyst at IHA
cristina.diez-santos@hydropower.org



Activity highlights 2018

- In May, we organised a workshop on climate resilience and the effective management of risk during the Understanding Risk Forum in Mexico City, Mexico. We gave a presentation on the outcomes from a hydrological risk workshop in December 2017 and shared good practices for managing risk at a basin scale.
- In September, we participated in the first working group meeting of the FutureDAMS initiative. FutureDAMS is a four-year research project led by the University of Manchester's Global Development Institute, which aims to develop a tool to co-simulate and co-optimize water and energy infrastructures through a system scale design approach.
- Throughout 2018, we participated in several events and workshops to present collaborative and adaptive approaches to river basin development, with a focus on the application of the Hydropower Sustainability Assessment Protocol at a system scale.

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Register for a session and help set sector priorities:



Focus session:
Integrated planning

Wednesday 15 May 2019 | 09:30-10:45



Focus session:
River basin development

Wednesday 15 May 2019 | 15:45-17:00

Secure your place: hydropower.org/congress

Advancing innovative strategies for operations and maintenance

Innovative approaches to the operations and maintenance (O&M) of hydropower facilities are needed to ensure optimal performance.

Poor operations and maintenance, through a lack of investment, inadequate training or outdated approaches, can cause high forced outage rates, performance losses and increased operating costs. This can lead to lost energy production, reduced revenues and in some cases result in dam safety and environmental concerns.

As new industry standards are introduced, hydropower developers and operators in all regions are seeking more efficient, cost-effective methods for maintaining their existing hydropower assets.

The ongoing revolution in the digitalisation of control systems to enhance operations and reduce maintenance costs, coupled with the need to balance other variable renewable technologies such as wind and solar, is helping to drive innovation in O&M for the hydropower sector.

IHA is disseminating knowledge on innovation in operations and maintenance.

We are supporting members to better understand and exchange information on good practices in O&M for both existing and future hydropower plants. This will enable hydropower operators to enhance performance, reduce maintenance costs and integrate with other renewables through the operational flexibility and energy storage which hydropower can offer.

By preparing research briefings and hosting webinars, we are helping the global hydropower sector to understand and adapt to the digitalisation revolution in O&M.

In addition, we are working with the World Bank on case studies illustrating good practice in O&M in developing countries, where there may be a lack of hydropower capacity and limited finance.



Knowledge network

Members interested in exchanging experiences and best practices on operations and maintenance can join our Asset Management Knowledge Network.

Online

hydropower.org/operationsandmaintenance

Contact us

Bill Girling, Senior Analyst at IHA
bill.girling@hydropower.org



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Register for a session and help set sector priorities:



Workshop on O&M strategy

Tuesday 14 May 2019 | 09:00-13:30



Focus session: Data management

Thursday 16 May 2019 | 11:15-12:30

Secure your place: hydropower.org/congress

Activity highlights 2018

- In August 2018, we organised a workshop on digitalisation in hydropower at the Salto Grande Hydroelectric Complex, in Argentina and Uruguay, in collaboration with the Inter-American Development Bank. The workshop shared knowledge on digitalisation initiatives at several Latin American hydropower projects.
- In late 2018, we contributed to planning an O&M and modernisation session on the changing role of hydropower in the energy sector transformation, which took place at the IRENA General Assembly in Abu Dhabi, UAE, in January 2019.
- We organised and participated in several events to promote the development of hydropower's green bond criteria including:
 - CEATI Spring 2018 Hydropower Conference in Tucson, USA.
 - Hydropower Plant Digitalization Forum in Berlin, Germany.
 - International Energy Agency's Annex IX workshop in Brussels, Belgium.

Building knowledge on innovation in modernisation

As the hydropower sector prepares for the future, a growing number of assets are due for modernisation.

By 2030 over half of the world's existing hydropower facilities will have undergone, or will be due to undergo, upgrading and modernisation, according to IHA's hydropower database.

By 2050, all current hydropower facilities are predicted to require modernisation.

To ensure that existing assets are retained and available to meet the future role of hydropower in energy systems, traditional modernisation practices will need to consider more than just 'business as usual' replacements.

Major refurbishment projects will look at both improved performance and innovative technologies. For example, fast response capability and optimised operating modes can ensure that hydropower assets have the flexibility to support higher penetrations of variable renewables.

A successful modernisation programme will bring the best technologies from the next generation of hydropower projects to an existing facility.

IHA is supporting the exchange of industry experiences and innovation in modernisation programmes.

We are working closely with our members to explore the range of investment strategies for improving and extending the lives of existing hydropower assets.

Throughout 2019, we will compile a compendium of case studies illustrating well-established and cutting-edge methodologies to showcase some of the best examples of modernisation. We will consult with our members to share knowledge on decision-making processes, including challenging life extension decisions and innovative enhancements.

Our modernisation work programme will gain insights into how organisations are improving equipment design to provide greater functionality and flexibility within the changing energy system, enhance grid support, reduce operating costs and build resilience to climate change.

IHA members will benefit from briefings and webinars on accepted good practice from leading organisations in the hydropower sector.



Knowledge network

Members can exchange experiences and learn from industry experts on successful modernisation programmes by joining IHA's Asset Management Knowledge Network.

Online

hydropower.org/modernisation

Contact us

David Samuel, Analyst at IHA
david.samuel@hydropower.org



Image:
©Voith Hydro

Activity highlights 2018

- In February, we participated in a Hydropower: Caspian and Central Asia event in Tbilisi, Georgia, and gathered knowledge on the modernisation of the 1,375 MW Saratov plant in Russia, on which an IHA case study is being developed.
- In June and July, we gathered knowledge on the refurbishment strategy of the UK's 360 MW Ffestiniog facility at workshops on pumped storage.
- In August, our digitalisation workshop at the Salto Grande Hydroelectric Complex in Argentina and Uruguay included presentations by utilities such as Itaipu Binacional on modernisation programmes.
- In September, we met with the International Energy Agency in Paris, France, to present the age profile of the existing global hydropower fleet and discuss the role of hydropower flexibility in future systems.
- Throughout the year, we continued to collect information from our members for future modernisation case studies.

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Register for a session and help set sector priorities:



Focus session:

Modernisation

Wednesday 15 May 2019 | 09:30-10:45



Focus session:

Digitalisation

Wednesday 15 May 2019 | 14:00-15:15

Secure your place: hydropower.org/congress

Identifying good practices in sediment management

Over the lifetime of a hydropower dam, sediment will be trapped behind the infrastructure and deposited in the reservoir.

Dams are traditionally designed to provide enough reservoir storage to offset at least 50 to 100 years of sedimentation, which is caused by natural erosion and activities such as construction, deforestation and agriculture.

As the reservoir accumulates sediment, its storage capacity will decrease. Sedimentation also causes operational and maintenance challenges, resulting in the obstruction of water intake, the abrasion of mechanical equipment, and reductions in power supply.

Downstream environmental impacts can include increased erosion, reduction in nutrient deposits inland and retreat of deltas. Changes in sedimentation due to climate change can also compromise the performance of a facility.

Effective sediment management is essential for ensuring storage capacity for water and renewable energy supply, and for protecting the health of the ecosystems that a river system supports.

IHA is building awareness and disseminating knowledge on successful sediment management strategies.

Working in collaboration with a group of industry experts and our partner organisations, we are identifying and sharing good practices on managing sediment in a variety of geographies and environments.

In December 2017, we launched a Sediment Management Knowledge Hub on the IHA website. The hub presents a range of strategies and resources, including more than 20 case studies from around the world. Resources on the hub include relevant publications and tools which aim to minimise the impacts of sedimentation and extend the life of hydropower facilities and reservoirs.

In 2019, we will continue to update the knowledge hub by sharing resources and case studies on successful applications of sediment management strategies.

Our ongoing work focuses on researching the effects of hydropower development to river connectivity and lessons learned from our sediment management case studies.



Knowledge network

IHA's Sediment Management Knowledge Network supports members to learn and exchange experiences on sediment management. Upcoming events, research competitions and enquiries about sediment-related issues are shared with members of the network.

Online

hydropower.org/sedimentmanagement

Contact us

María Ubierna, Senior Analyst at IHA
maria.ubierna@hydropower.org

Activity highlights 2018

- In March, we joined the SedNet working group on sediment quantity management of entire river-sea systems to increase the awareness of sediment management and promote experience sharing and best practices.
- In October, we presented research on the effects of hydropower development to river connectivity and lessons learned from our sediment management case studies at the Particles in Europe (PiE) conference in Lisbon, Portugal.
- In November, we participated in the UNESCO International Sediment Initiative (ISI) training workshop on integrated sediment management in river basins and attended, as an observer, an advisory experts group meeting in Beijing, China.
- Throughout the year, we regularly shared sediment management case studies through the knowledge hub and network. Case studies have focused on the sediment challenges and management experiences of a hydropower project.

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Register for a session and help set sector priorities:



Workshop on sediment management

Monday 13 May 2019 | 13:00-17:30



Focus session:

Sediment management

Wednesday 15 May 2019 | 15:45-17:00

Secure your place: hydropower.org/congress



The GHG Reservoir (G-res) Tool is a publicly available web-based tool for hydropower companies, researchers and other stakeholders to estimate and report the net greenhouse gas footprint of a reservoir.

Overview

A decade in development, the G-res Tool was first launched in May 2017 as part of a multi-stakeholder research project led by IHA and the UNESCO Chair for Global Environmental Change.

The G-res Tool uses a conceptual framework built with scientists from the University of Quebec at Montreal (UQAM), the Norwegian Foundation for Scientific and Industrial Research (SINTEF) and the Natural Resources Institute of Finland (LUKE).

Using the tool gives investors, regulators and local communities a reliable and cost-effective way of estimating the emissions created from building a reservoir, taking into account pre-existing conditions and naturally occurring emissions.



Services

Training

We offer a three-day interactive training course designed to allow individuals to independently use the G-res Tool and accurately interpret the results. The course includes a scientific introduction and a step-by-step tutorial on using the tool, as well as training on case scenarios and results analysis.

Assisted assessments

We can process results for one or more reservoirs and go into further depth with the analysis of the net GHG results obtained.

Validation of results

We can validate the results you produce using the G-res Tool. Validated results acknowledge the quality of the work done using the G-res Tool and certify the results for public disclosure.

Online

g-res.hydropower.org

Contact the G-res Team

ghg@hydropower.org

Sustainability programmes

Hydropower Sustainability Assessment Tools

Hydropower plays a vital role in reducing the world's dependence on fossil fuels. As a renewable energy, it is essential that hydropower is developed sustainably.

IHA has played a leading role in the development of recognised sustainability guidelines and tools, working together with a range of partner organisations.

We serve as the management body for the Hydropower Sustainability Assessment Council, whose 100 members include representatives of social and environmental NGOs, intergovernmental organisations, development banks, governments and hydropower companies and contractors

As part of this role, we serve as a custodian of the Hydropower Sustainability Assessment Tools (HSAT), which provide a framework for understanding and measuring hydropower project performance.

We also oversee the training and accreditation of independent project assessors, and deliver capacity-building programmes in developing countries.

Sustainability Guidelines

The Hydropower Sustainability Guidelines on Good International Industry Practice (HGIIIP) define expected sustainability performance for the hydropower sector across a range of environmental, social, technical and governance topics.

The 26 guidelines present definitions of the processes and outcomes relating to good practice in project planning, operation and implementation. As a compendium, the guidelines are a reference document for meeting the expectations of lenders, regulators and consumers.

Developed for a range of stages in the lifecycle of a hydropower project, compliance with each guideline can be specified in commercial contracts between financiers and developers, and developers and contractors.

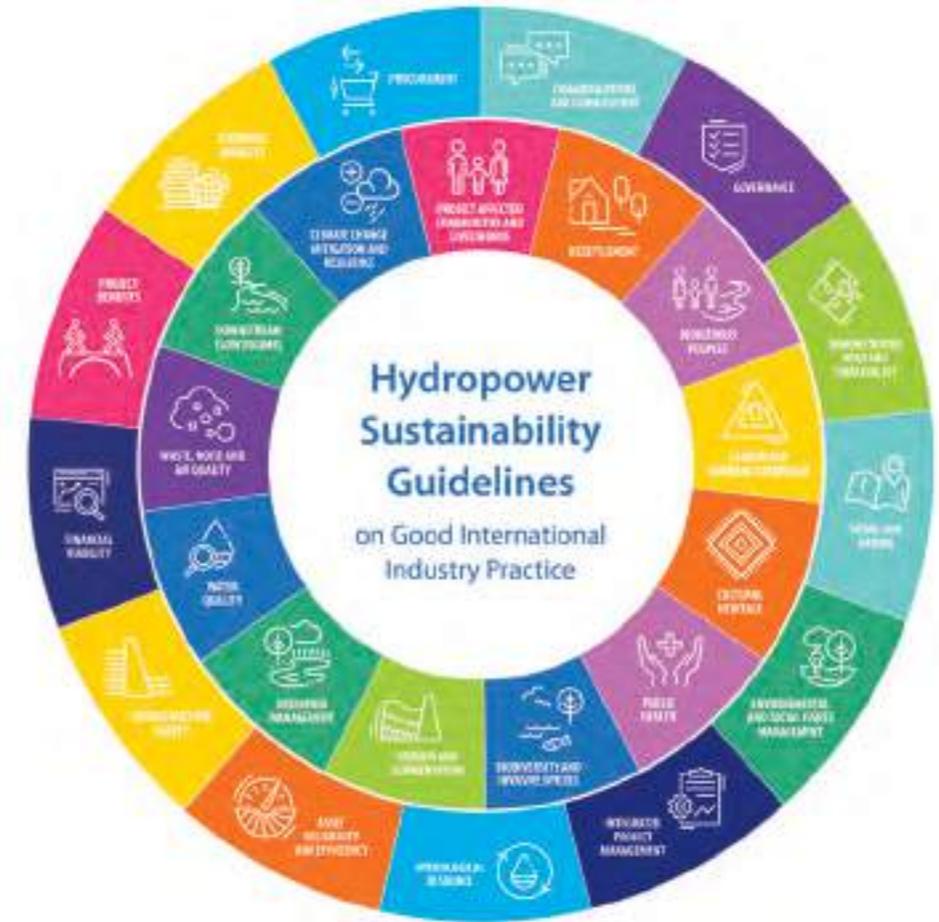
Launched in December 2018, the guidelines are aligned with standards developed by the World Bank, International Finance Corporation (IFC) and the Equator Principles group of banks.

Each guideline is hydropower-specific and designed to support assessments of project performance using either the Hydropower Sustainability Assessment Protocol or ESG Gap Analysis Tool.

Contact us

João Costa, Senior Sustainability Specialist
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Alain Kilajian, Sustainability Specialist
alain.kilajian@hydropower.org



Assessment Protocol

The Hydropower Sustainability Assessment Protocol (HSAP) was developed through 30 months of cross-sector engagement between 2007 and 2010, and a review of IHA's previous sustainability tools, the World Commission on Dams Recommendations, the Equator Principles, the World Bank Safe Guard Policies and the IFC Performance Standards.

As a tool, it provides a common language for understanding how the criteria outlined in the Hydropower Sustainability Guidelines can be addressed at all stages of a project's lifecycle. Assessments use objective evidence to create a sustainability profile, which can be used to identify gaps and drive improvement. These assessments are delivered by independent accredited assessors.

The Hydropower Sustainability Assessment Protocol was updated in July 2018, following an 18 month consultation process, to examine hydropower's carbon footprint and resilience to climate change. A project that scores well under the new criteria will have a low carbon footprint and be resilient to the impacts of climate change.

ESG Gap Analysis Tool

The Hydropower Sustainability ESG Gap Analysis Tool (HESG) was developed by IHA between February 2017 and June 2018 under the mandate of the Hydropower Sustainability Assessment Council, with the support of the Swiss State Secretariat for Economic Affairs (SECO).

The ESG Gap Analysis Tool is based on the framework of the Hydropower Sustainability Assessment Protocol. It assesses projects against the requirements of the Hydropower Sustainability Assessment Protocol's environmental, social and governance topics.

The tool provides an action plan to help a project team address any gaps against good practice. It is divided into 12 sections which are compatible with IFC Environmental and Social Performance Standards and the World Bank's new Environmental and Social Framework.

Online

hydropower.org/sustainability

Capacity building projects

Capacity building in sustainable hydropower aims to build or strengthen local resources to improve understanding and ownership of hydropower good practice in target countries.

Effective capacity building programmes look to increase the development impact and sustainability of hydropower in developing countries by strengthening normative and institutional capacity among local regulators, developers and project owners.

Capacity is a complex concept, both in theory and practice, and is typically defined as the ability to solve problems, make informed choices, define priorities and plan futures. The objective of capacity building programmes in hydropower should therefore focus on developing in-country resources, physical and intangible, to guide sustainable hydropower performance and ensure the long-term viability of project benefits.

Since 2010, IHA has supported government departments and hydropower project owners around the world to improve internal decision making using the Hydropower Sustainability Assessment Protocol (HSAP).

IHA also now offers capacity building support and training in two new Hydropower Sustainability Assessment Tools: the Hydropower Sustainability Guidelines on Good International Industry Practice (HGIIIP) and the Hydropower Sustainability ESG Gap Analysis Tool (HESG).

The Hydropower Sustainability Assessment Tools can be used to raise awareness of international good practice, increase the quality and scope of institutional training provision, and develop in-country resources to measure and guide performance.

Examples of the application of these tools, in particular the Hydropower Sustainability Assessment Protocol, can be seen through IHA's recent capacity building projects in Myanmar, Indonesia and the Zambezi River Basin in 2018.

Through a structured process of training, self-assessment, engagement and reflection, representatives from a range of operators and water resources managers effectively developed the skills required to apply the principles enshrined within Hydropower Sustainability Assessment Protocol to the promotion of equitable utilisation, efficient management and sustainable development of water resources.

Myanmar

The Myanmar capacity building project was funded by NORAD and focused on building institutional capacity through a series of workshops, trainings and self-assessments. It began with a workshop for government representatives, which introduced Hydropower Sustainability Assessment Protocol, and analysed how it could be used by the relevant departments to judge compliance with national laws and international standards.

A second IHA workshop introduced the assessment protocol to broader hydropower stakeholders at the national level. IHA assisted key government staff from the country's Ministry of Electricity and Energy to self-assess the Tha Htay hydropower project. The assessment was intended

to identify areas for improvement, with an action plan to be drafted to address the identified issues at the project, portfolio and policy level.

The work in Myanmar finished with a follow up workshop to share the findings of the project. The activities carried out under the Myanmar Programme of Action contributed to NORAD's overarching goal to increase development impact and sustainability of hydropower in a developing country.

Indonesia

The Indonesia capacity building programme, funded by SECO, was geared towards strengthening local institutional resources through assisted self-assessments and trainings. The approach included an official early stage assessment of the Pelosika hydropower project and an extensive element of capacity building through pre-assessment training of relevant government and local government officials.

The project incorporated local prospective assessors into the assessment team at Pelosika under the supervision of international accredited assessors. Key outcomes of this

development intervention were twofold. Firstly, the early stage assessment helped the project team to measure performance and identify opportunities to improve the Pelosika project. Secondly, IHA helped to build local capacity and understanding to deliver good practices in hydropower sustainability over the long-term.

Zambezi River Basin

The Zambezi River Basin capacity building programme was supported by the World Bank and consisted of a series of assisted self-assessments in the basin, followed by an official assessment of the Cahora Bassa hydroelectric scheme in Mozambique. Using the Hydropower Sustainability Assessment Protocol as a guiding reference, the objective of the programme was to assist the Riparian States in the development and utilisation of the hydropower potential of the basin in a sustainable and responsible way.

Online

hydropower.org/sustainability

The Konawehea river in Southeast Sulawesi, Indonesia, is the construction site for the Pelosika hydropower project.

Become an assessor

Gain the necessary skills and knowledge to become an accredited assessor for the hydropower sector's leading sustainability assessment tools.

Our five-day training courses cover the internationally recognised Hydropower Sustainability Assessment Protocol (HSAP), including new 2018 criteria on climate mitigation and resilience, as well as the newly launched Hydropower Sustainability ESG Gap Analysis Tool (HESG).

How will I benefit?

On successful completion of the course participants will:

- Gain a professional certificate recognised by IHA and the hydropower sector
- Achieve comprehensive knowledge of HSAP and HESG
- Meet the requirements to become an accredited HSAP and HESG assessor
- Possess the skills and competencies to prepare, execute and deliver official HSAP and HESG assessments
- Understand the Code of Conduct for Accredited Assessors and the Terms & Conditions.

Online

hydropower.org/accredited-assessor-training

How will I learn?

The course is comprised of a structured training programme, group discussion, practical exercises and a final exam, all of which are designed to focus on issues commonly arising with hydropower projects.

Who should attend?

Applicants should have a combination of:

- Education - degree level
- Work experience - at least six years of relevant experience
- Auditor training - 40 hours of IRCA-certified training in EMS, health and safety or social auditing
- An appropriate auditing qualification or experience - all candidates will be required to have obtained certification on an IRCA-certified auditing course which includes sufficient content on ISO 19011, such as an EMS Lead Auditor course, prior to accreditation (but not necessarily prior to the training course)
- Familiarity with the Hydropower Sustainability Assessment Tools.

Contact us

Kay Rhodes, Sustainability Administration Officer
sustainability@hydropower.org

Better hydro: compendium of case studies



IHA has published a landmark series of case studies in sustainable hydropower development.

Better Hydro: Compendium of Case Studies (2017) presents 34 project examples from around the world.

The case studies were compiled through a collaboration with the World Bank, and are based on assessments carried out under the Hydropower Sustainability Assessment Protocol, a tool for measuring performance against a range of social, environmental, economic and technical criteria.

The publication includes 23 topic case studies looking at specific aspects of development, such as cultural heritage, indigenous people economic viability, and water quality.

Online

hydropower.org/betterhydro

world hydropower
congress 
14-16 MAY 2019 • PARIS

Register for a session and help set sector priorities:



Workshop on new sustainability assessment tools

Monday 13 May 2019 | 13:00-17:30



Francophone workshop on sustainability and good practices

Tuesday 14 May 2019 | 09:00-13:30



Focus session:

Indigenous peoples & hydropower

Wednesday 15 May 2019 | 11:15-12:30

Image: Laos © Bonga1965

Secure your place: hydropower.org/congress



World Hydropower Congress



THE WORLD'S MOST IMPORTANT GATHERING OF HYDROPOWER DECISION-MAKERS

Overview

The World Hydropower Congress brings together leading decision-makers, innovators and experts from industry, government, finance, civil society and academia.

Knowledge sharing, capacity building and stakeholder dialogue are at the heart of this high-level biennial event which is organised by the International Hydropower Association (IHA) and supported by a range of partner organisations.

Shaping new strategies

The World Hydropower Congress provides an unparalleled opportunity to share experiences, guide policies and develop strategies to strengthen the sector's performance and support sustainable development.

Focus sessions and workshops are co-convened with knowledge partners that bring a depth of understanding to each topic. These partners include United Nations organisations, financial institutions, intergovernmental agencies and research institutes.

"The Nature Conservancy participates in the World Hydropower Congress because it is an agenda-setting event, convening the decision-makers and facilitating the discussions critical to the successful energy transition that we are working towards."

Giulio Boccaletti, Chief Strategy Officer, The Nature Conservancy



70 + countries



37 sessions



3 awards

A shared vision

The World Hydropower Congress provides a global stage for the birth of new partnerships and cross-sectoral initiatives, and the showcasing of excellence across the sector.

Each event contributes to advancing a shared vision: a world where water and energy services are delivered to all in a sustainable way.

12 years in the making

IHA hosted the first world congress in Turkey in 2007, followed by Iceland in 2009, Brazil in 2011, Malaysia in 2013 and China in 2015, and Ethiopia in 2017. The 2019 World Hydropower Congress will be held in Paris.

The 2017 World Hydropower Congress in Addis Ababa, Ethiopia, emphasised the need for systemic approaches in tackling energy, water and climate challenges. Drawing 700 delegates from over 60 countries, it was hosted in partnership with the African Union, the United Nations Economic Commission for Africa, GEIDCO, the World Bank and the Government of Ethiopia.





world hydropower congress

14-16 MAY 2019 • PARIS

The 2019 World Hydropower Congress will be held in Paris from 14 to 16 May. The event is organised by IHA and will focus on hydropower's role in delivering on the Paris Agreement and the Sustainable Development Goals, under the theme 'The Power of Water in a Sustainable, Interconnected World'.

Lead the conversation on the biggest questions facing hydropower today

Hundreds of leading decision-makers, innovators and experts from more than 70 countries will be in attendance, representing industry, government, finance, civil society and academia.

Across 37 invaluable focused sessions and workshops, attendance will provide an opportunity to join the conversation, take on new learnings, strengthen networks and build enduring partnerships for the future.

Delegates will share knowledge on how hydropower can be financed, developed and operated sustainably, as they learn from success stories and experiences from across the sector.

ORGANISER



STRATEGIC PARTNERS



SUPPORTING PARTNERS



KNOWLEDGE PARTNERS



Programme

Visit hydropower.org/congress for a full programme overview and to **secure your place in Paris.**

	MON 13 MAY	TUE 14 MAY	WED 15 MAY	THU 16 MAY	FRI 17 MAY
Morning	<p>BY INVITATION ONLY</p> <p>Hydropower Sustainability Governance Committee</p> <p>Multilateral development banks</p>	<p>Morning</p> <p>WORKSHOPS</p> <p>Francophone sustainability Climate resilience Operations & maintenance</p> <p>BY INVITATION ONLY</p> <p>HYDROPOWER CONSULTATIVE MEETING 2019</p>	<p>Early morning</p> <p>FOCUS SESSIONS</p> <p>Modernisation Integrated planning Carbon footprint</p>	<p>Early morning</p> <p>FOCUS SESSIONS</p> <p>Hydro & solar hybrids Interconnections Hydropower benefits</p>	<p>STUDY TOURS</p> <p>Savoie (France) Isere (France) Kems (France) Germany & Luxembourg Portugal Switzerland</p>
Afternoon	<p>WORKSHOPS</p> <p>Sustainability tools Hydropower benefit sharing Sediment management</p>	<p>Afternoon</p> <p>OPENING PLENARY</p> <p>Industry Governments Intergovernmental institutions Civil society</p>	<p>Late morning</p> <p>Pumped hydro Indigenous peoples Capacity building</p>	<p>Late morning</p> <p>Green bonds Small-scale power systems Innovative data solutions</p>	
Evening	<p>BY INVITATION ONLY</p> <p>Hydropower Sustainability Assessment Council</p>	<p>CEO roundtable</p>	<p>Early afternoon</p> <p>REGIONAL SESSIONS</p> <p>Europe Africa North America</p>	<p>Early afternoon</p> <p>REGIONAL SESSIONS</p> <p>Central Asia Latin America East Asia & Pacific</p>	
		<p>Evening</p> <p>RECEPTION & CULTURAL SHOW</p>	<p>Late afternoon</p> <p>FOCUS SESSIONS</p> <p>Digitalisation Sustainability assessment Climate resilience</p>	<p>Late afternoon</p> <p>FOCUS SESSIONS</p> <p>Hydropower safety Project ownership World Heritage Sites</p>	
			<p>Clean energy systems River basin development Sediment management</p>	<p>CLOSING SESSION</p>	
			<p>IHA GENERAL ASSEMBLY</p>		
			<p>Evening</p> <p>DINNER & AWARDS</p>		

Highlight sessions

Workshop on sustainability and good practices



Tuesday 14 May 2019 | 09:00-13:30

Session objectives: The objective of the session is to present the Hydropower Sustainability Assessment Protocol (HSAP), Hydropower Sustainability ESG Gap Analysis Tool and Hydropower Sustainability Guidelines to a French speaking audience. The aim of the session is to raise awareness among French speaking developers and project sponsors that the HSAP and good practice can be applied in a Francophone environment.

CO-CONVENOR:



Pumped hydro



Wednesday 15 May 2019 | 11:15-12:30

Session objectives: This panel will investigate the underlying drivers of pumped hydropower storage deployment. What technical, economic, market, and policy drivers have caused decision-makers to invest in the large-scale energy storage provided by pumped hydro? How have they handled the set of uncertainties associated with investment in such a long-lived asset? What changes, if any, do panellists anticipate in the role of pumped hydro as the grid evolves?

CO-CONVENOR:



Workshop on climate resilience



Tuesday 14 May 2019 | 09:00-13:30

Session objectives: What is the international guidance to assess climate-related risks and opportunities and ensure the resilience of a hydropower project in the context of climate change? In this workshop, the audience will be trained in the use of the Hydropower Sector Climate Resilience Guide. Practical examples will show how the guide has provided guidance to ensure resilient investments.

CO-CONVENORS:



Project ownership and financing



Thursday 16 May 2019 | 14:00-15:15

Session objectives: With the need for private sector investment only to increase in the future, this session will discuss and debate whether traditional models still have a role in the sector and what innovative financing structures are being considered or employed. In addition, panellists will explore what mitigation tools are available to ensure that all stakeholders including governments, development finance institutions, lenders and developers accept a fair allocation of risk.

CO-CONVENOR:



Study tours



Isère, France

Hosted by EDF

This study tour provides World Hydropower Congress delegates with the opportunity to visit some of the Isère region of France's most impressive hydropower achievements: the Grand'Maison Dam and the under-construction Romanche-Gavet hydropower plant.



Kembs, France

Hosted by EDF

This study tour supported by EDF provides World Hydropower Congress delegates with the opportunity to visit the Kembs hydropower facility, south of the Upper Rhine in France.



Savoie, France

Hosted by EDF

This study tour provides World Hydropower Congress delegates with the opportunity to visit some of the most impressive hydropower achievements in France's Savoie region: the La Coche pelton hydraulic project and La Bâthie power station.



Gaildorf, Voith HQ and Vianden, Germany & Luxembourg

Hosted by Voith

This study tour provides World Hydropower Congress delegates with the opportunity to visit the Gaildorf hybrid power plant and Voith's headquarters in Germany, as well as the Vianden pumped storage plant in Luxembourg, which is used as a flexible electricity storage system.



Frades II and floating photovoltaic plant, Portugal

Hosted by EDP

This study tour provides World Hydropower Congress delegates with the opportunity to visit the Frades II hydro plant and the pilot project of the Floating Photovoltaic Plant in Alto Rabagão. These projects are located on the north coast of Portugal, near the Spanish border.



Nant de Drance & Forces Motrices Hongrin Léman, Switzerland

Hosted by Alpiq

This study tour provides World Hydropower Congress delegates with the opportunity to visit some of Switzerland's most impressive hydropower achievements: the under-construction Nant de Drance hydropower plant and the country's second largest pumped storage power station Forces Motrices Hongrin Léman.

IHA Mosonyi Award for Excellence in Hydropower



Anton-Louis Olivier (pictured right) of Renewable Energy Holdings, Kuang Shangfu of the China Institute of Water Resource and Hydropower Research (IWHR) and Eduard Wojczynski (pictured left) of Manitoba Hydro are the recipients of the 2017 IHA Mosonyi Award for Excellence in Hydropower.

The Mosonyi Award for Excellence in Hydropower recognises individuals within IHA's membership for outstanding contributions to the sector.

The award is named after Emil Mosonyi, the founding President of IHA, who made major contributions to hydropower during his long career. His determination to champion excellence in hydropower lives on through IHA's vision and mission.

The award recognises individual contributions related to:

- a long-standing commitment or initiative that has had a major impact on the profession;
- a specific hydropower project, the performance of an organisation or the hydropower sector in general; or
- an aspect of hydropower sustainability (technical, economic, social or environmental) or a broad-ranging initiative, such as national-level or basin-level strategic planning.

Online

hydropower.org/mosonyi-award

Anton-Louis Olivier is a leader in the development and implementation of small-scale hydropower projects in South Africa. In 2002 he developed a vision to use water from the Lesotho High Land project to generate power. After raising funding from the Dutch Government for feasibility studies, he raised sufficient funds to construct the project. At the time, the project was a first in many ways. It was the first project of its kind to obtain a generation license, PPA and water abstraction permit under the Water Act of 1986. He is viewed as a pioneer in the industry in the southern African region and has helped advance the quality and the perception of small-scale hydropower, leading to a greater interest by other developers.

Eduard Wojczynski, formerly of Manitoba Hydro, has been involved in hydropower for most of his 35-year career. He was instrumental in driving major enhancements to the planning and implementation of hydropower projects in Manitoba resulting in greater emphasis on avoiding or mitigating environmental and social impacts, and increasing benefits of hydropower with the objective of projects being welcomed as an overall benefit to communities. Among his many achievements, he has: improved the environmental and social characteristics of hydropower in Manitoba; supported hydropower research, climate change and lifecycle GHG analysis; and improved North American perceptions of hydropower as a preferable renewable resource and a climate change solution.

Dr Kuang Shangfu, President of the China Institute of Water Resources and Hydropower Research (IWHR) has spent over a decade promoting excellence in hydropower development and sustainability. He has been instrumental in facilitating the exchange of knowledge and experience not only in China but on a global scale, enabling many developing countries to improve their sustainable hydropower development. Under Dr Kuang's leadership, IWHR has provided research and consultancy services to almost all of China's key hydropower projects and a further 150 projects in more than 30 countries. He has helped to develop an extensive talent pool, and has been instrumental in establishing IWHR as both the National Research Center for Sustainable Hydropower Development under China's National Energy Administration, and the IHA China Office.

IHA Young Researcher of the Year



Three candidates received the accolade in 2017, at the World Hydropower Congress in Addis Ababa: Alexandros Korkovelos, Sara Mercier-Blais and Rafael Schmitt (pictured left to right).

The IHA Young Researcher Award recognises emerging talent in the hydropower sector.

It was first presented to Sami Khan at the 2015 World Hydropower Congress in Beijing for his work on the case for versatile hydrophobic rare-earth oxide coatings in hydropower systems.

Online

hydropower.org/iha-young-researcher-award

Alexandros Korkovelos is a young researcher at KTH Royal Institute of Technology in Sweden. His research focuses on small-scale (0.01-10 MW) hydropower potential in Sub-Saharan Africa, which he carried out in response to ongoing global dialogue on energy poverty and in view of the region's plentiful renewable resource potential. Using open-source geospatial datasets, he was able to evaluate 712,615 km of river network over 44 countries, taking into account environmental, topological and social constraints. This resulted in the identification of 15,599 potential sites across the subcontinent, including micro and small-scale potential.

In **Sara Mercier-Blais's** research, she outlines the rationale behind the G-res tool. Sara began work on this globally-important project to model greenhouse gas emissions from hydropower reservoirs after gaining an MSc in biology. The G-res tool has been developed to enable decision-makers and stakeholders to accurately measure greenhouse gas emissions from existing and planned reservoirs, ultimately empowering them to make well-informed societal, economic and environmental decisions. In her award submission, she explains how the tool can be used not only to accurately calculate net emissions from the introduction of a reservoir into the landscape, but also for understanding factors that contribute to emissions levels.

Rafael Schmitt works at the College of Environmental Design at UC Berkeley on developing lower-impact dam portfolios and studying the optimal sequencing of dam developments in the transnational Mekong river basin. His research focuses on reducing the conflicts between hydropower and environmental objectives through basin-scale planning of dam portfolios in the world's large river basins. He presents the CASCADE (Catchment Sediment Connectivity and Delivery) framework, a computationally effective numerical model for network sediment transport and reservoir sediment trapping. He explains how application of CASCADE in a major tributary of the Mekong river basin, revealed that when 17,000 different dam portfolios were considered, just 60 result in an optimal trade-off between sediment trapping and hydropower production.

IHA Blue Planet Prize

The IHA Blue Planet Prize is awarded to hydropower projects which demonstrate excellence in sustainable development.

The prize is awarded on the basis of an assessment using the Hydropower Sustainability Assessment Protocol, a tool that measures the sustainability of a hydropower project across a range of social, environmental, technical and economic aspects.

It was last awarded at the 2017 World Hydropower Congress, where it was won by the Blanda project in Iceland, owned and operated by Landsvirkjun. The prize has previously been awarded to six other projects since 2001.

The winner of the 2019 prize will be announced at the World Hydropower Congress in Paris, France, between 14 and 16 May.

The winner will be chosen by a panel of experts from the hydropower and sustainability sectors. Shortlisted projects not selected for the prize will be recognised as highly commended.

Online

hydropower.org/iha-blue-planet-prize



Our team and resources

How we deploy our resources

The International Hydropower Association (IHA) is a mutual association of members established in 1995 under the auspices of UNESCO's International Hydrological Programme.

IHA's headquarters are in London, UK, with activities carried out by two not-for-profit companies: International Hydropower Association Ltd and IHA Sustainability Ltd.

Our income comes from a combination of membership fees, external funding for programmes and projects, and revenue from events and sponsorship.

We deliver value to members and advance our mission through sustainability and knowledge building programmes and projects, alongside outreach and events for members.

The information in the column to the right gives an overview of our expenditure covering the 12 month period up to 30 September 2018, in UK Sterling.

Knowledge Building Programmes, accounting for £938k, covered our research programmes and knowledge projects, and associated staff and administrative costs. This included member engagement and representation at external meetings and events.

Sustainability Programmes, accounting for £690k, covered activities relating to the Hydropower Sustainability Assessment Protocol and the Hydropower Sustainability ESG Gap Analysis Tool, convening training sessions and other capacity-building initiatives, as well as staff and administrative costs.

Communications, accounting for £145k, included the costs of print and digital publications in English and other languages, event branding, website support and development, our new members' zone, email newsletters and social media engagement, as well as staff costs.

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Specialist



Kay Rhodes
Sustainability
Administration Officer



Chen Liang
China National
Liaison Officer



**Renata de Biasi
Ribeiro Tufaile**
South America
Regional Liaison
Officer, Brazil



Rufino Andrés Rojas
South America
Regional Liaison
Officer, Paraguay

China Office

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iwhr.com

China Institute of Water Resources and Hydropower Research

China Institute of Water Resources and Hydropower Research (IWHR) is a national research institution under the Ministry of Water Resources of China, and is engaged in almost all the disciplines related to water resources and hydropower research.

With over 60 years of development, IWHR has grown into an indispensable think tank of the Chinese government for decision making and a backbone technical consultant in water related areas. It is at the same time the host of multiple international organisations or their Chinese branches, including WASER, WASWAC, IAHR, ICFM, ICOLD, ICID, IAHR, GWP, IHA and ARRAN.

With 11 research departments and four affiliated enterprises, IWHR is endowed with research capacity in: hydrology and water resources, water environment and ecology, flood control, drought relief and disaster reduction, soil and water conservation, river and lake management, water resources in rural and pastoral areas, hydraulics, geotechnical engineering, hydraulic structures and materials, earthquake engineering, hydro machinery and electric equipment, automation, engineering monitoring and examination, renewable power resources, water history and informatisation and remote sensing technology.



ctgpc.com.cn

China Three Gorges Corporation

Founded in 1993, China Three Gorges Corporation (CTG) has taken full responsibility for the construction and operation of the Three Gorges Project (22.5 GW), and four large-scale hydropower stations of Xiluodu (13.86 GW), Xiangjiaba (6.4 GW), Wudongde (10.2 GW) and Baihetan (16 GW) located in the upper reaches of the Yangtze River.

CTG is a world leader in the production of clean energy backed by a workforce of 35,000 people and total assets of RMB 698.6 billion. The Group is specialising in hydropower development and operation, as well as in the development of new energy like wind and solar in China and abroad.

With a total installed capacity of 124GW, 17.7GW of which is overseas, CTG has become China's largest clean energy corporation and the world's largest hydropower enterprise, operating in 47 countries with 89 ongoing international contracts and investment projects in Africa, Asia, Europe and the Americas.



edf.fr

EDF

EDF relies on three main activities to increase its hydropower production: rehabilitation (Romanche-Gavet, France's biggest hydro project), modernisation (the Rance Tidal Power Station) and development of new projects abroad (Brazil, Cameroon).

EDF Group's hydro installed capacity is 20 GW in France (400 MW in Corsica and the French overseas departments), 1,443 MW in Europe and 1,000 MW in Laos. The company uses innovative high-tech tools such as regional e-operating centres for a real-time performance, the e-storage project, and a variable-speed generator at the Cheylas pumped-storage facility.

Within its "value creation" approach, the purpose of which is to contribute to the economic development of the territories, in 2012 EDF launched the "Une rivière, un territoire" programme to boost the economy in the valleys with two main objectives: stimulating the development of innovative projects focusing on water, energy and the environment; and increasing the contribution of local industrial capacities and skills to EDF investment and operation needs. EDF has numerous exemplary initiatives in support of ecosystems; for example, the re-establishment of natural habitats on Kembs Island (the biggest European project of its kind) and the lowering of the Poutès Dam to support the local ecosystem.



gerenewableenergy.com

GE Renewable Energy

GE Renewable Energy is a \$15 billion business which combines one of the broadest portfolios in the renewable energy industry to provide end-to-end solutions for our customers demanding reliable and affordable green power. Combining onshore and offshore wind, blades, hydro, storage, utility-scale solar, and grid solutions as well as hybrid renewables and digital services offerings, GE Renewable Energy has installed more than 400+ gigawatts of clean renewable energy and equipped more than 90 per cent of utilities worldwide with its grid solutions. With nearly 40,000 employees present in more than 80 countries, GE Renewable Energy creates value for customers seeking to power the world with affordable, reliable and sustainable green electrons.

GE believes in combining the power of water and digital intelligence. Smarter and more connected, our hydro plants no longer just generate power, they store it and deliver it to the grid with an unmatched level of predictability, flexibility and efficiency. The hydropower energy we deliver improves access to healthcare, sustains agriculture, develops industry and mitigates water challenges. Most importantly, it brings education and high-quality jobs. GE takes pride in being a trustworthy long-term social partner creating value locally.



itaipu.gov.br

Itaipu Binacional

A binational initiative, the construction of the Itaipu power plant was the result of negotiations between Brazil and Paraguay, initiated in the 1960s. The Treaty of Itaipu, the legal instrument for the exploitation of the hydroelectric potential of the Paraná River, shared by the two countries, was signed on 26 April 1973.

In May 1974 the Itaipu Binacional company was created with the mandate of both countries to build and operate the Itaipu power plant. Generation began in May 1984.

In 2016, Itaipu achieved the new world record for annual production of a single hydroelectric power plant, reaching a nine-digit figure of 103,098,366 MWh, with its generating units having a record availability index of 96.3 per cent. Another noteworthy aspect has been an operational performance of 96.2 per cent (having achieved a record of 99.3 per cent in 2014). Today, Itaipu is responsible for supplying 15 per cent of all electricity consumed in Brazil, and 82 per cent of Paraguay.



en.powerchina.cn

POWERCHINA

SINOHYDRO was established in China as a state-owned hydropower project contractor during the 1950s. To date, the company comprises 65 per cent of the market share in China's large and medium-scale hydropower project construction. With foresight and prudent decision-making on strategy, SINOHYDRO keeps an open mind on business operation; absorbing multiple talents and technologies, the company continues extending its business lines along the industry chain.

In 2013, SINOHYDRO, as an industry leader in engineering and construction, successfully delivered a number of major projects across the world in all its business sectors. On the 2018 ENR lists of the top 250 global and international contractors, SINOHYDRO ranked sixth and tenth respectively.

Boasting outstanding expertise in various infrastructure sectors, including water and hydropower facilities, airports, roads, ports and housing projects, SINOHYDRO offers package-solutions through project models from simple construction to EPC and BOT. Currently, SINOHYDRO has 486 international projects under construction in more than 72 countries, with total contract value of nearly USD 43 billion. Many large and mega-scale projects built by SINOHYDRO are landmarks in host countries.



Platinum corporate members



sarawakenergy.com.my

Sarawak Energy

Sarawak Energy is both an energy development group and a vertically integrated power utility with a vision to achieve sustainable growth and prosperity for Sarawak by meeting the region's need for reliable, renewable energy. With a multi-disciplinary workforce of 5,000, Sarawak Energy serves a population of nearly three million and close to 650,000 customers across the state.

Building on a strong foundation of 100 years as the single provider of electricity in the state, Sarawak Energy is taking bold steps to support the transformation of Sarawak in its vision to developed status by 2030, through its role in powering the Sarawak Corridor of Renewable Energy or SCORE.

Through Sarawak Energy's generation projects which focuses on developing renewable, affordable hydropower complemented by thermal energy for security of supply, Sarawak is on track to providing reliable 24 hour electricity supply for all Sarawakians, meeting the bulk power demand of our industrial and export customers and becoming the regional powerhouse of ASEAN.



sgxy.sgcc.com.cn

State Grid Xinyuan Company Ltd.

State Grid Xinyuan Co., Ltd (SG Xinyuan) was established in March 2005, with a registered capital of RMB 10.286 billion yuan. Of the shareholding, 70 per cent is taken by State Grid Corporation of China, and 30 per cent by China Three Gorges Corporation. SG Xinyuan is mainly responsible for the development, construction, operation and management of pumped storage power stations, and shoulders the basic mission of ensuring the security, stability, economy and clean operation of the power grid.

By the end of 2017, the total asset of SG Xinyuan was RMB 84 billion yuan. It has 55 subsidiary companies with a total capacity of 54 GW, which are distributed over 20 provinces (autonomous regions and municipalities) in China. Among which, there are 40 pumped storage power stations with a total installed capacity of 49 GW, and eight conventional hydropower stations with an installed capacity of 4,984 MW.

The company has carried out feasibility and pre-feasibility studies of pumped storage projects with a capacity over 40 GW, and is the world's largest peak regulation and frequency control power supply company.



eng.spic.com.cn

State Power Investment Corporation (SPIC)

State Power Investment Corporation (SPIC), newly established through the merger of China Power Investment Corporation and State Nuclear Power Technology Corporation in June 2015, is a large state-owned enterprise with a registered capital of RMB 45 billion (USD 7 billion) and total assets of RMB 722.3 billion (USD 112 billion).

As the only integrated energy group in China that holds assets of nuclear power, thermal power, hydropower and new energies simultaneously, SPIC establishes itself with such industries as power, coal, aluminum, logistics, finance, environmental protection and high-tech industries.

By the end of August 2015, SPIC achieved a total installed capacity of 100.44 GW, 39.59 per cent of which were clean energies, coal production capacity of 80.4 million tons per year (t/y), aluminium smelting capacity of 2.72 million t/y and railway transportation line of 504 km. SPIC has its presence in 35 countries (regions), such as Japan, Turkey, Pakistan, Brazil and Guinea, with business covering power project investment, technical cooperation, EPC and O&M projects etc.

Statkraft

Statkraft is a leading company in hydropower internationally and Europe's largest generator of renewable energy. The group produces hydropower, wind power, gas power and bio power and grows in district heating in the Nordics. Statkraft is a global player in energy market operations, and has 3,800 employees in 16 countries.

Statkraft's power production takes place in Europe, Asia and South America and about 96 per cent of its annual power production of 63 TWh is based on renewable energy sources. The company's total installed capacity is about 19,300 MW, distributed in more than 360 different power plants fully or partly owned by Statkraft.

The world needs more environmentally friendly energy, and Statkraft is uniquely positioned to play an important role in addressing this green shift. The group's ambition is to grow in renewables internationally and secure its position as one of the most profitable district heating players in the Nordic market. Statkraft's development and management of renewable energy sources creates significant value both in Norway and internationally. Statkraft contributes to energy access for more people and helps solve the global climate challenges.



statkraft.com

Voith

Voith is one of the world's leading suppliers of hydroelectric equipment, technology and services. The company has a portfolio of products covering the entire life cycle of new and existing large and small hydropower plants. Stand-alone solutions for the plant automation as well as lifetime services for all types of hydro equipment also belong to this portfolio.

The first turbine was produced by Voith in 1870. In the following years, the company took control in quick succession of first the German and then the international hydropower market. Voith today is a global technology group. With its broad portfolio of systems, products, services and digital applications, Voith sets standards in the markets of energy, oil & gas, paper, raw materials and transport & automotive. Founded in 1867 the company has more than 19,000 employees, sales of €4.2 billion, locations in over 60 countries worldwide and is thus one of the largest family-owned companies in Europe.

The Group's know-how in the fields of automation, IT, software, data analytics and sensor technology is pooled in the Digital Solutions Division which provides new systems for mechanical and plant engineering in the age of digitisation.



voith.com

Yalong River Hydropower Development Company, Ltd.

Yalong River Hydropower Development Company, Ltd. (Yalong Hydro) is a fully state-owned hydropower developer/owner based in Chengdu, China. Authorised by the Chinese government, Yalong Hydro is solely responsible for development and operation of the planned 22 cascade stations on the river of Yalong with a total installed capacity of 30 GW.

Incorporated in 1989, Yalong Hydro started with the Ertan Hydroelectric Project. With a double-curvature concrete arch dam of 240m in height and an installed capacity of 3,300 MW, it used to be China's largest hydropower project. Yalong Hydro currently has five large hydropower stations in operation, totalling 14.7 GW in capacity and producing approximately 70 TWh of electricity per year on average. Of these stations, Jinping-I has the world's tallest double-curvature arch dam of 305m in height.

Another two hydropower projects, Lianghekou and Yangfanggou, are under construction and will increase the company's generation capacity by another 4,500 MW when completed in early 2020s. Hydropower development of the entire river is expected to be accomplished in the next 20 to 30 years.



ylhdc.com.cn

Gold corporate members



altomaipo.com

Alto Maipo

The Alto Maipo hydroelectric project is located in San Jose de Maipo, Chile, and more than 90 per cent of the works are developed underground and concentrated in the valleys of Volcan, Yeso, Colorado and Maipo river.

The project, which began in December 2013, includes two run-of-river power plants: Alfalfa II and Las Lajas, arranged in hydraulic series, for which 67 km of tunnel with a combined generating capacity of 531 MW will be built between the high sector of the Volcan River and Las Lajas in the Maipo River.



andritz.com

ANDRITZ HYDRO

ANDRITZ Hydro is one of the leading global suppliers of electromechanical equipment for hydropower plants. With over 175 years of accumulated experience and more than 31,000 turbines installed, totalling approximately 430,000 megawatts output, the business area provides the complete range of products, including turbines, generators, and additional equipment of all types and sizes – ‘from water to wire’ for small hydro applications to large hydropower plants with outputs of more than 800 megawatts per turbine unit.



renewableops.
brookfield.com

Brookfield Renewable

Brookfield Renewable operates one of the world’s largest publicly traded, pure-play renewable power platforms. Our portfolio consists of hydroelectric, wind, solar and storage facilities in North America, South America, Europe and Asia, and totals over 16,000 megawatts of installed capacity.

Over 75 per cent of Brookfield Renewable’s total generation comes from hydropower facilities located on 81 river systems in Canada, the United States, Brazil and Colombia, with approximately 7,900 megawatts of capacity. Brookfield Renewable’s portfolio also includes approximately 2,700 megawatts of pumped storage hydropower capacity across three facilities in the U.S. and U.K.



cfe.gob.mx

Comisión Federal de Electricidad (CFE)

The Comisión Federal de Electricidad (CFE) is a productive government enterprise with the purpose of providing electricity as a public service. CFE reaches 42.2 million clients that together represent 120 million Mexicans, and has an annual growth of a million users.

CFE’s electricity generation infrastructure consists of 187 power plants, with a combined total of 55,890 MW installed capacity. The private sector has a 23.7 per cent share of this capacity (independent private producers). CFE’s transmission and distribution lines extend over more than 937,000 km, providing energy services to 98.64 per cent of the population in both rural and urban settlements.



cie.ci

Compagnie Ivoirienne d’Electricité

Compagnie Ivoirienne d’Electricité (CIE) is a flagship company in the Ivorian energy sector, responsible for the supply of electricity in Côte d’Ivoire since 1990. Its activities are governed by a concession agreement signed with the State of Côte d’Ivoire, which was renewed in October 2005 for another 15 years. This agreement entrusts CIE with the operation of generation facilities owned by the State, transmission and distribution, marketing, and import and export of electricity throughout the country and the sub-region. Currently, CIE operates a total installed electricity generation capacity of 704 MW.

EDP

Energias de Portugal SA (EDP) is a Portugal-based company engaged in the electric energy and gas sectors. It develops its activities in the business areas of generation, supply and distribution of electricity, and supply and distribution of gas.

EDP is currently developing the largest hydropower project in Europe, having increased its hydro capacity by 1,182 MW between 2011 and 2015, and will complete a further 1,030 MW in 2016. It is also third worldwide in non-hydro renewable energy.



edp.pt

Eletrobras

As a holding company, Eletrobras controls a significant proportion of the electric power generation and transmission systems of Brazil through six subsidiaries: Eletrobras Chesf, Eletrobras Furnas, Eletrobras Eletronorte, Eletrobras CGTEE and Eletrobras Eletronuclear.

In addition to holding 50 per cent of the capital of Itaipu Binacional, the generating capacity of Eletrobras is 42,333 MW – equivalent to 35 per cent of the country’s total power. The company’s transmission lines total 55,118 km, which is 52 per cent of the country’s total.



eletrobras.com

ENGIE Tractebel Energia

ENGIE Tractebel Energia S.A. has a portfolio of 28 power plants throughout Brazil and is the country’s first private independent power producer. The company’s installed capacity of 8,765 MW represents 7 per cent of Brazil’s total power generation capacity. Close to 80 per cent of this capacity relies on clean and renewable energy sources, mainly big hydropower plants, all with ISO 9001, 14001 and 16001.

ENGIE Tractebel Energia is listed and is 68.7 per cent controlled by the international group ENGIE, formerly called GDF SUEZ.



engie.com

EuroSibEnerg (ESE)

EuroSibEnerg (ESE) is the largest private power producer in Russia and among the largest hydropower generating companies in the world.

ESE operates power plants with a total installed capacity of 19.6 GW, providing approximately 8 per cent of Russia’s electricity and over 40 per cent of the electricity in Siberia. Over 15 GW of its generation portfolio comes from hydroelectric power plants. In December 2015, the company diversified its clean energy mix by launching a pilot solar PV power project in Siberia – the Abakan SPP.



eurosib.ru

Furnas

Furnas runs a range of enterprises which generate 10 per cent of Brazil’s electricity. These enterprises include 17 hydroelectric power stations, two thermal power stations, approximately 24,000 km of transmission lines and 62 substations.

In total, 40 per cent of all of the energy consumed in Brazil passes through the Eletrobras Furnas System. The company is responsible for supplying energy to an area accounting for 63 per cent of Brazilian homes and 81 per cent of Brazilian GDP.



furnas.com.br



Gold corporate members



hydro.com.au

Hydro Tasmania

Hydro Tasmania is the largest water manager in Australia, and is the country's leading renewable energy business, generating hydropower in Tasmania and trading electricity and energy-related environmental products in the Australian market.

The company's consulting business, Entura, delivers clever solutions in water and energy to clients locally, nationally and internationally.



hydroquebec.com

Hydro-Québec

Hydro-Québec generates, transmits and distributes electricity. Its sole shareholder is the Québec government.

Hydro-Québec generates more than 99 per cent of its electricity from water – a source of clean, renewable and reliable energy. It supports the development of other technologies, such as wind energy and biomass, through purchases from independent power producers. It also conducts research in energy-related fields, such as energy efficiency.



lcjzd.cn

HydroLancang

HydroLancang is a subsidiary of the China Huaneng Group, one of the top five power-generating companies in China. The company manages large hydropower projects mainly along the Lancang River (e.g. Nuozhadu HPP, 5,850 MW and Xiaowan HPP, 4,200 MW) and takes an active role in developing other domestic and overseas hydropower resources. This includes small and medium hydropower stations, wind power projects and a photovoltaic on-grid solar power station, the largest of its kind in Asia. HydroLancang is dedicated to quality and clean energy for all customers.

Media affiliate partner



waterpowermagazine.com

International Water Power & Dam Construction

Launched in 1949, International Water Power & Dam Construction has established itself as the leading monthly international publication serving the needs of those involved in dam construction and the hydroelectricity industries. Independently published, it offers a highly respected, unrivalled, in-depth, quality editorial to its readers.

With a monthly magazine, annual yearbook, weekly email newsletter and an extensive website at www.waterpowermagazine.com, International Water Power & Dam Construction is an absolute must for anyone involved in the hydropower and dams industry.



isagen.com.co

Isagen

Isagen S.A. ESP is a public services company based in Colombia, with an installed capacity of 2,212 MW. The company owns five hydroelectric power plants (1,912 MW in total).

The company adopted the UN Global Compact initiative in 2005 and is currently constructing one hydropower plant at Sogamoso (820 MW). The Amoyá Project, which entered commercial operation in 2013, will sell 167,025 tonnes of CO2 per year.

KHNP

KHNP is a public enterprise indirectly owned by the Government of Korea via KEPCO (Korea Electric Power Corporation) and established on 2 April 2001, as a result of a corporate spin-off from KEPCO.

Since 1937, KHNP has developed and built 24 nuclear power units at six nuclear power plants, 51 hydropower units at ten hydropower plants, seven pumped-storage power plants and eight small hydropower plants. Its total installed capacity reaches 27,097 MW.



khnp.co.kr

Landsvirkjun

Landsvirkjun is the state-owned power company of Iceland. The company generates electricity exclusively via renewable energy sources such as hydropower, geothermal and wind power.

The company is Iceland's largest electricity generator, with over 70 per cent of the country's electricity production.



landsvirkjun.com

Manitoba Hydro

Manitoba Hydro is one of Canada's major energy utilities. Today it provides electricity at rates that are among the lowest in Canada. Over 95 per cent of the electricity produced in Manitoba comes from 15 hydroelectric facilities located on the Nelson, Winnipeg, Saskatchewan, Burntwood and Laurie rivers. The remaining electricity production comes from a combination of thermal, diesel and wind. A new hydroelectric station, the 695 MW Keeyask project, is under construction in partnership with four local aboriginal First Nations.



hydro.mb.ca

Odebrecht

Construtora Norberto Odebrecht S.A. is present in 19 countries and has constructed hydroelectric power plants with an installed capacity of 52,300 MW.

The company has been building dams and hydroelectric plants for over 60 years, and is the largest company in its sector in Latin America. Over the past ten years Odebrecht has been one of the world's three top builders of hydropower projects.



odebrecht.com

RusHydro

RusHydro is one of Russia's largest energy holdings and leader in the production of power from renewable energy sources, including water flows, tides, wind and geothermal heat. The company unites over 90 renewable energy facilities in Russia and abroad, thermal power plants and electrical grid assets in the Far East, energy supply companies and research and design institutes.

The installed capacity of RusHydro's hydroelectric plants is 38.9 GW. The company's assets include geothermal stations in Kamchatka and the highly manoeuvrable Zagorskaya pumped-storage hydropower plant in the Moscow region.



RusHydro
rushydro.ru

Gold corporate members



sogem-omvs.org

SOGEM

Created by a January 1997 treaty signed by the heads of state and government of the Senegal River Basin Development Organisation, the SOGEM (Manantali Energy Management Agency) is in charge, among other missions, of the operation, maintenance and renewal of the shared works required for the production and transmission of electrical energy in the region (Manantali Complex, Felou, transmission lines and substations and other associated works). It is also responsible for any industrial, commercial or financial operation directly or indirectly related to the objects and missions of the agency.



southerncompany.com

Southern Company

Southern Company (SoCo) is an investor owned utility. It owns and operates 32 FERC licensed hydro projects in the southeast of the USA. Combined, it has over 2,600 MWs of hydro generation, which consists of storage reservoirs, run-of-river sites and pumped storage hydro. Five of its projects are over 100 years old, with its newest plants coming online in 1984.

SoCo's hydro organisation oversees: dam safety, licensing, O&M, security, hydrological modelling and system schedule/dispatch.

Silver corporate members

Alpiq

Hydropower is the number one renewable energy source and the backbone of Swiss electricity generation. Alpiq has been using this energy source for more than 100 years with our own run-of-river, storage and pumped storage power plants in Switzerland. Hydropower will become even more important in the future: It is carbon-free, efficient and highly flexible, and as such the ideal energy source to enable further penetration of intermittent energy sources such as wind and solar.

Alpiq participates in two of the largest pumped storage projects in the Alps, which will provide an additional 1,200 MW of capacity within the coming years..



alpiq.com

Carpi Tech

Carpi, established in 1963, by using synthetic geomembranes, has gained a worldwide experience and reputation in the waterproofing and protection of all types of hydraulic structures (concrete, RCC and embankment dams, reservoirs, canals, tunnels), and of underground structures, civil works and environment protection facilities.

The company has pioneered new installation techniques that now are patented systems, while continuously introducing to the market new products of higher performance.



carpitech.com

Changjiang Institute of Survey, Planning, Design and Research

Changjiang Institute of Survey, Planning, Design and Research (CISPDR) is a stated-owned high-tech enterprise and an international contractor certified by the Ministry of Commerce of China. The company is mainly engaged in engineering survey, planning, design, scientific research, consulting, construction supervision, construction management and EPC contracting for projects in China and abroad.

It successfully completed survey, planning and design for the Three Gorges project and the South-to-North Water Diversion project, two of the most important hydraulic projects in China.



cjwsjy.com.cn

CK Power

CK Power Public Company Limited (CKP) is the first Thai holding company listed on the Stock Exchange of Thailand with its core assets overseas. The company engages in businesses that create sustainable energy and focuses on investment in power business, both in Thailand and in ASEAN region under efficient management.

It is also committed to social responsibility for all stakeholders in order to develop sustainable energy while balancing the environment and the quality of life for the people and society.



ckpower.co.th/en

Comision Tecnica Mixta de Salto Grande

The Salto Grande Hydroelectric Complex generates resources which are essential for everyday life in Argentina and Uruguay. Thanks to this, it is possible to continue working and growing from the region for the common good of the founding countries, their inhabitants, industry, commerce and development.

It is, above all, an example of integration and unity between two countries which, more than thirty years after the completion of the hydroelectric complex works, continues to generate and carry electric energy, as well as studying and working on the goals that many years ago both the people and government wanted to accomplish.



saltogrande.org



Silver corporate members



E-CO Energi

E-CO Energi is one of Norway's leading energy groups. Its core activities are the ownership and management of hydropower plants and development of new renewable power projects. The group is Norway's second largest hydropower producer, with an average production of 9.7 TWh per year. Its production capacity is approximately 2,800 MW. The City of Oslo owns 100 per cent of the parent company, E-CO Energi Holding AS.

e-co.no



Ecofish Research

Ecofish Research Ltd. provides key environmental assessment, monitoring, and mitigation services on all aspects of hydroelectric project development and operations. With extensive experience gained from hundreds of successful project assignments, and a unique perspective earned through publishing environmental guidelines for government, Ecofish has unrivalled expertise in the hydroelectric sector.

A more comprehensive list of our services includes compliance and effects monitoring, water resources engineering, fish passage, habitat offsetting and restoration and planning and adaptive management. We help our clients lead the way in hydropower sustainability, delivering high quality, guideline-compliant environmental information and research services, ensuring value with competitive costs and efficient service.

ecofishresearch.com



Empresas Públicas de Medellín

Empresas Públicas de Medellín (EPM) is a state-owned utilities company in Colombia, with a 22.6 per cent market share, generating 3,249 MW. EPM has 26 generation plants, comprising 24 hydroelectric plants, one 460 MW thermal plant and a 19.5 MW wind park.

EPM is constructing the Ituango hydroelectric project (2,400 MW), which is the largest in Colombia, and is developing the Bonyic hydroelectric power plant in the Republic of Panama. The company contributes to well-being and equitable development in communities.

epm.com.co



Energy Norway

Energy Norway is a non-profit industry association representing about 270 companies involved in production, distribution and trading of electricity in Norway. The power-producing members generate close to 130 TWh yearly, which counts for approximately 99 per cent of all power production in Norway.

Meanwhile, the grid members represent approximately 2.5 million customers, about 91 per cent of Norway's grid customers. The members of Energy Norway have approximately 15,000 employees and an annual gross turnover to end-users of €10 billion.

energinorge.no



Environmental Resources Management (ERM)

Environmental Resources Management (ERM) is a leading global provider of environmental, health, safety, risk, social and sustainability related consulting services.

Operating from 160 offices in 45 countries worldwide, ERM has been serving the hydropower industry for over 30 years. ERM has extensive global experience siting, reviewing facility design, and evaluating the construction and operational effects of hydropower projects on the natural and human environment and assisting our clients manage associated risks.

erm.com

Gilkes Hydro

Gilbert Gilkes & Gordon Ltd is a privately owned, internationally established manufacturing business based in the UK. Hydro and pump specialists since 1856, Gilkes now exports to over 85 Countries around the world.

Gilkes Hydro offers a reputable single source solution for a range of hydropower turbines. The company's range of Pelton, Francis and Turgo Turbines cover low, medium and high head projects capable of generating up to 30 MW per unit and includes compact solutions for the 50 kW to 100 kW market as well as a new Streamline range designed for the sub 1 MW market. Having manufactured over 6,800 turbines, Gilkes offers complete water to wire solutions for small hydroelectric developments. Activities include design, manufacture, installation, commissioning, testing, routine service and plant upgrade.



gilkes.com

Hatch

Hatch is passionately committed to the pursuit of a better world through positive change. It embraces your vision as its own and partners with you to develop better ideas that are smarter, more efficient, and innovative. Hatch's corporate roots extend back more than a hundred years, and its experience spans over 150 countries around the world in the metals, energy, infrastructure, digital, and investment market sectors.

Hatch's hydropower team provides greenfield hydro engineering; dam, spillway and powerhouse design; dam safety assessments; generating station rehabilitation; underground tunnel design; powerhouse equipment and systems design, upgrading and rehabilitation; and project management services.



hatch.com

Heindl Energy

Heindl Energy's mission is to transform the world's energy storage landscape, paving the way towards a sustainable, clean power supply. As a technology driven company, based in Stuttgart, Germany, Heindl Energy is engineering and developing the concept of Gravity Storage, a new way of pumped storage reaching storage volumes of 8 GWh at maximum cost efficiency. A team of civil engineering, geology, mining and geophysics specialists is planning a first pilot plant.



heindl-energy.com

Hidroeléctrica de Cahora Bassa

Hidroeléctrica de Cahora Bassa (HCB) operates the Cahora Bassa hydropower plant, which has an installed capacity of 2,060 MW. Located in Tete province, Mozambique, the company's mission is to generate, transmit and sell clean electricity efficiently and sustainably, maximising the benefits for the shareholders and generating wealth for the country. In 2009 the company launched its environmental management policy, under which it is pushing for ISO 14001 certification.



hcb.co.mz

HNAC

As the UNIDO ICSHP Hydropower Control Equipment Manufacturing Base, HNAC Technology Co., Ltd. (HNAC) has been dedicated to providing EPC service and overall automatic solutions to hydropower stations, substations, pump stations and water treatment projects including investigation, design, manufacture, equipment configuration, transportation, installation, debugging and after service since its establishment in 1993. Until the end of 2015, HNAC provided its products and services to 33 foreign countries and over 6,000 projects in the world.



en.cshnac.com



Silver corporate members



湖北能源
HUBEI ENERGY

qol.qdc.com.cn

Hubei Energy

Hubei Qingjiang Hydropower Development Co., Ltd. (Qingjiang Hydro), a fully-owned subsidiary of Hubei Energy Group located in Yichang City of Central China's Hubei Province, is a leading hydropower developer established in 1987 for the development of cascade projects in Qingjiang river valley.

Qingjiang Hydro is the largest local power generation enterprise in Hubei Province, with total installed capacity of 3,360 MW, including Geheyang (1,212 MW), Gaobazhou (270 MW) and Shuibuya (1,840 MW), the highest CFRD dam (233m) operated in the world at present.

HydrofE3

HydrofE3, a not-for-profit forum of thought leaders in India and Nepal, was founded by Awadh B Giri with the objective of promoting understanding of new and better hydro among governments, developers and institutions. The organisation aims to bring global knowledge to the hydropower sector in the region. It promotes hydropower policy which encourages integration with other renewables and supports comprehensive and scientific preparation of sustainable development plans.



hydromineinc.com

Hydromine

Hydromine is a US-based sustainable energy developer with a multinational team in offices across New York, London and Yaoundé. Hydromine has officers each with over 35 years' experience in the international power sector, and is actively developing 1.5 GW of hydropower in sub-Saharan Africa, in addition to hydrokinetic and wind projects in the US and other markets globally.

Hydromine is committed to social and environmental corporate responsibility, adhering to the International Finance Corporation Performance Standards, and is a member of Power Africa.



hydroplan.co.uk

Hydroplan

Hydroplan UK is a leading hydropower consultancy specialising in the design, construction and project management of small to medium-sized hydropower projects in the UK and internationally. Since being formed in 1990, Hydroplan has undertaken over 600 projects ranging from modifications to existing schemes to the full implementation of new schemes. In association with Sanima Hydro & Engineering P. Ltd (Nepal), Hydroplan has a multi-disciplined and international team of skilled engineers and designers complemented by experts with diverse specialist skills and experience.



igemyanmar.com

IGE Group of Companies

IGE Group of Companies (IGE Group) is a large Myanmar conglomerate with a diverse portfolio of businesses, including trade, real estate, construction, energy, financial services, hospitality, and telecommunications. A driving force in the business community fostering the growth of the Myanmar economy, IGE Group is both diverse and distinctive.

Over the years, IGE Group has consistently reinvented and adapted to keep in line with the evolution of Myanmar, moving into new areas as business opportunities arise and greater development is needed. At the same time, IGE Group has earned a reputation for understanding what is needed to achieve a successful business venture in Myanmar.

Joule Africa

Joule Africa is a developer owner-operator of sustainable power projects across Africa, with offices in Freetown, Yaounde and London.

In addition to developing the 143 MW Bumbuna II hydro-project in Sierra Leone, Joule Africa is also developing Kpep, a 485 MW hydro-project in Cameroon, while considering various options, including other technologies, for a third project. The ambition is to have 1 GW under development through these three projects.



jouleafrica.com

King & Spalding

King & Spalding, a leading international law firm that works in the global hydropower sector, advises sponsors and host governments during the development, construction, financing and/or acquisition of major hydropower projects worldwide.

During the past four years, our lawyers have supported the implementation of 23 major hydropower projects with more than 10,000 MW of aggregate installed capacity, located in Latin America, Africa, the former Soviet Republics, South Asia and Southeast Asia.

KING & SPALDING

kslaw.com

Laraib Energy Limited

Laraib Energy Limited is the owner and developer of the New Bong Escape Hydroelectric Power Project, the first hydel independent power producer of Pakistan and the State of Azad Jammu and Kashmir. The project has paved the way for development of vast hydropower potential within the country.

Since the beginning of its commercial operations in March 2013 until 30 November 2018, the state-of-the-art facility has contributed 2,604,295 MWh of green energy with a maximum availability of 99.96 per cent.



laraibenergy.com

Lunsemfwa Hydro Power Company

Lunsemfwa Hydro Power Company Limited (LHPC) is the first independent power producer in Zambia. LHPC, having expanded its installed capacity by 50 per cent in the last ten years, operates two hydropower plants with a total installed capacity of 56 MW.

LHPC is currently undertaking feasibility studies and has a strategic plan to increase the installed capacity to 500 MW by 2020. LHPC is a subsidiary of Agua Imara, an SN Power Group company.



Mainstream Energy Solutions Limited

Mainstream Energy Solutions Limited specialises in hydroelectric power generation. The company is the concession of the Kainji Hydro Electric Company, comprising the Kainji hydroelectric plant, with a total installed capacity of 760 MW, and the Jebba hydroelectric plant, with an installed capacity of 578.4 MW. Cascading along the course of the Niger River in Nigeria, the Jebba plant is located 100 km downstream of the Kainji plant. The power plants have a combined installed capacity of 1338.4 MW



mainstream.com.ng

Silver corporate members



mottmac.com

Mott MacDonald

Mott MacDonald is a £2bn engineering, management and development consultancy. We're involved in solving some of the world's most urgent social, environmental and economic challenges; helping governments and businesses plan, deliver and sustain their strategic goals; responding to humanitarian and natural emergencies; and improving people's lives. Our expertise by sector includes buildings, communications, defence, education, environment, health, industry, mining, oil and gas, power, transport, urban development, water, wastewater and more.



multiconsult.no

Multiconsult

Multiconsult is a global engineering consultancy company with broad competence within renewable energy generation, transportation and consumption. The company dates back to 1908, and is a listed company with more than 2,800 employees in Norway, Sweden, Denmark, UK, Poland, Singapore, Tanzania, Thailand and Kenya.

Multiconsult offers a complete range of consulting services for planning and development of renewable energy projects, and has served as a trusted partner of governments, utilities and private industry for more than 1,000 hydropower and energy-related projects worldwide.



stantec.com

MWH, now part of Stantec

MWH, now part of Stantec, specialises in water and natural resources, using innovative ideas and technology to solve complex infrastructure and environmental challenges. Built on a nearly 200-year history, MWH has delivered services from initial planning and design through construction, start-up and operations on projects small and large throughout the world.

As a recognised leader in the hydropower industry, MWH, now part of Stantec, delivers long-lasting, high-performing, safe and economical projects, supplying clean reliable energy for today and future generations, all while preserving the environment.

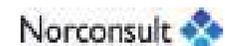


neoenergia.com

Neoenergia

The Neoenergia group is among the 45 largest private groups in Brazil and acts through the entire supply chain in the trade of electric energy: generation, transmission, commercialisation and distribution. The group is awarded Standard & Poor's BB+ rating in the global scale, and AA+ in the national scale.

Neoenergia has an installed capacity of 1,536MW, which may reach 3,992 MW by 2019 with new hydropower projects at Teles Pires, Belo Monte and Baixo Iguaçú.



norconsult.com

Norconsult

Norconsult is a multidisciplinary engineering and design consultancy, providing services to clients in the public and private sectors worldwide. The company provides services within the power sector, including power system studies and hydropower engineering, from the initial reconnaissance through all phases of design, tender preparations, investigations, contract evaluation, construction supervision and commissioning.

ONEE

The Office National de l'Electricité et de l'Eau Potable (ONEE), a key player in the electricity and water sector in Morocco, is at the heart of a strategic and vital public service for the improvement of living conditions of Moroccan citizens as well as the economic competitiveness of the country.

ONEE is investing in major structuring projects for Morocco, providing it with infrastructure for the generation, transmission and distribution of electricity and water, as well as the purification of wastewater, essential for sustainable development. As of January 2018, the company has a total installed capacity of more than 8,700 MW and serves over 5.6 million customers.

المكتب الوطني للكهرباء و الماء الصالح للشرب
Office National de l'Electricité et de l'Eau Potable

one.org.ma

Pacific Hydro

Pacific Hydro is a global clean energy solutions provider. Operating for over 20 years, the company develops, builds and operates renewable energy projects, and sells electricity and carbon abatement products to customers in its chosen markets.

With hydro, and wind power projects at varying stages of development, construction and operation in Australia, Brazil and Chile, the company's vision is to create economic, social and environmental value by being its customers' preferred clean energy solutions provider.



pacifichydro.com

Pöyry Switzerland

Pöyry is one of the world's leading hydropower engineering companies and has designed hydropower schemes all over the world for more than one hundred years. Its successful design and supervision services cover all types of hydropower schemes, which include an installed capacity of more than 100,000 MW in the past 20 years alone.

The company's experts are available to assist its clients worldwide in each project phase as consultants, owners, contractors, lenders or engineers.



poyry.ch

RAZEL-BEC

Since 1957, the family-owned company founded by Clément FAYAT has grown to become the first independent Construction Group in France. FAYAT's Public Works division, RAZEL-BEC is a large and innovative international civil engineering contractor with a 140-year long history of earthworks and road works, both in France and abroad, mainly in Africa and South-East Asia, also specialized in civil works, dam projects and tunnelling works.



razel-bec.com

REH Group

The REH Group is a leader in the investment, development, ownership and operation of hydroelectric power plants in the range of 5 MW to 50 MW across southern and eastern Africa.

REH owns and operates the 3 MW Sol Plaatje (2009), the 4 MW Merino (2010) and the 5 MW Stortemelk (2016) plants and is developing a 60 MW run-of river portfolio in Zambia.



rehgroup.co.za



Silver corporate members



hidroelectrica.ro

S.C. Hidroelectrica

Established in 2000, Hidroelectrica occupies a key position in the Romanian energy market owing to its experience, credibility and flexibility. It is the leading energy generator and supplier in Romania and the main provider of ancillary services.

With an average output of 17 TWh, generated in its subsidiaries strategically located throughout the country, Hidroelectrica provides approximately 25 per cent of the country's total production, depending on the hydrology of the year. Hidroelectrica also provides approximately 90 per cent of the ancillary services needed for the operation of the National Power System.



SNC • LAVALIN

sncvalin.com

SNC-Lavalin

With over 100 years' experience, SNC-Lavalin's hydro division covers all hydro solutions, from planning and feasibility studies, to detailed engineering, procurement, construction, supervision and commissioning of facilities.

Engineering News-Record consistently rates SNC-Lavalin as one of the top international design engineering firms on the continent.



snowyhydro.com.au

Snowy Hydro

Snowy Hydro Limited is an integrated water manager and energy business. Using its portfolio of generation assets including the 4,100 MW Snowy Mountains Scheme, the 300 MW Valley Power gas-fired power station and the 320 MW Laverton North gas-fired power station – both located in Victoria – the company provides national electricity market participants with price risk management products.

Snowy Hydro is also the parent company of Red Energy and Lumo Energy, two successful electricity and gas retail companies.



stellba-hydro.de

Stellba Hydro

Founded in 2002, Stellba Hydro is a private, medium-sized company specialising in the revision, modernisation and upgrading of hydroelectric power. Its focus is to exploit potential and build robust, efficient machines.

Hydroelectric power plants must be maintained as a long-term investment over their entire lifespan. Stellba Hydro is ISO 9001 certified and offers a range of support ranging from a simple inspection of a part through to a general revision.



a Gruner company

stucky.ch

Stucky

Established in Switzerland, Stucky is an engineering consultancy firm, specialised in hydropower and active worldwide. Stucky is a member of the Gruner Group, established in 1862, the largest infrastructure consultancy in Switzerland with over 1,000 engineers.

Stucky's state-of-the-art expertise covers all aspects of hydroelectric projects. Working on the basis of a project-focused organisation, Stucky provides engineering and project management services from the identification stage to the design and commissioning of complete power schemes.

The Albanian Power Corporation

The Albanian Power Corporation (KESH) is the public producer and, at the same time, largest electricity producer in Albania. KESH operates the most important electricity generating plants in the country. These assets consist of the Drin River Cascade hydropower plants on the Drin River, which is the largest in the Balkans by installed capacity, as well as by the size of the hydropower plants.

By operating 79 per cent of the generation capacity in the country, KESH supplies about 70-75 per cent of customers' demand for electricity, provides the energy needed to cover losses in the transmission grid and guarantees the security of the Albanian energy system through balancing energy and auxiliary services.



kesh.al

The Eranove Group

With more than 9,000 employees, the Eranove Group is developing a unique model on the continent, combining more than 50 years of presence in Africa, expertise in the entire value chain in the fields of water and electricity (structuring and development of plans, production, network management, distribution, commercialisation) and a strong commitment to public-private partnerships.

The Eranove Group is currently operating six hydroelectric dams with an installed capacity of 604 MW and is developing hydroelectric projects in Mali (Kenie), Gabon (Ngoulmendjim and Dibwangui), Madagascar (Sahofika), Côte d'Ivoire (Cavally), representing a planned capacity of 580 MW.



eranove.com

Tinguiririca Energia

Tinguiririca Energia is a Chilean hydroelectric power company. Founded in June 2004 under the name Tinguiririca Energía Joint Venture, today it is co-owned by Pacific Hydro which is controlled by the Chinese company SPIC and the Norwegian company Statkraft. The company is based in the Tinguiririca Valley, in Chile's Libertador Bernardo O'Higgins Region, which is where its two run-of-the-river hydro power stations, La Higuera and La Confluencia, are both located. The two power plants have a total installed capacity of 334 MW and they are connected to the main electrical grid in Chile, producing enough energy to supply more than 800,000 homes.



tinguiriricaenergia.cl

TIWAG – Tiroler Wasserkraft

TIWAG-Tiroler Wasserkraft AG, is located in Innsbruck, Austria, operating nine large >10 MW and 40 small <10 MW hydropower stations, with a maximum capacity of 1,544 MW.

The most important are the pumped-storage hydropower station Sellrain, the hydropower station Silz (781 MW) and the Kaunertal hydropower station (392 MW).



tiwag.at



Silver corporate members

Tractebel



tractebel-engie.com

At the helm of the Energy Transition, Tractebel provides a full range of services throughout the life cycle of its clients' projects. As one of the world's largest engineering consultancy companies and with more than 150 years of experience, Tractebel is able to offer its customers multidisciplinary solutions in energy, water and infrastructure. The company's broad range of expertise extends across Europe, Africa, Asia and Latin America, allowing it to rise to its clients' most demanding challenges with the same high-quality engineering and consulting services no matter where their projects are.

Uniper Kraftwerke GmbH



uniper.energy

E.ON's hydropower fleet – represented by E.ON Kraftwerke GmbH – operates more than 200 plants in four countries, with an overall installed capacity of more than 5.4 GW and an annual production of approximately 15.5 TWh. With more than 100 years of experience and a total number of more than 500 units of all types, E.ON is among the most capable hydropower operators in the business.

As an IHA sustainability partner, E.ON successfully applied the Hydropower Sustainability Assessment Protocol in 2013 and 2014.

Volta River Authority



vra.com

The Volta River Authority (VRA) is a wholly owned state utility with installed capacity of 2,600 MW (December 2017): 1,180 MW from hydroelectric power, 1,292 MW from thermal generation and 2.5 MW from solar PV.

VRA generates hydropower from the Akosombo and Kpong dams. The Akosombo Dam was constructed in 1961, with a reservoir capacity of 84.73m and a generating station with six 170 MW generators. The Kpong Hydro Electric Power Plant is a run-of-river plant downstream from the Akosombo Plant. The dam, commissioned in 1982, has a maximum head of 17.68m and is fitted with four 40 MW turbines.

WorleyParsons



worleyparsons.com

WorleyParsons provides customers with a wide range of consulting and advisory services, and deep technical expertise across multiple projects. The company's integrated offerings cover full asset management services and engineering, procurement and construction capability.

ZESCO



zesco.co.zm

ZESCO Limited is a parastatal company formed after the enactment of the Zambia Electricity Supply Act. It was established in 1970, and its governance has evolved over time to one that defines an arms-length relationship with the Zambian Government.

The company currently owns eight hydropower stations with a combined capacity of 2,216 MW and diesel power plants with a combined capacity of 8 MW, resulting in a total installed capacity of 2,224 MW. The company also has power distribution and transmission lines of 15,142 km.

Affiliate members

Canadian Hydropower Association



canadahydro.ca

Founded in 1998, the Canadian Hydropower Association (CHA) is the national trade association dedicated to representing the interests of the hydropower industry. Its nearly 50 members span the breadth of the industry and include hydropower producers, manufacturers, developers, engineering firms, organisations and individuals interested in the field of hydropower. CHA members represent more than 95 per cent of the hydropower capacity in Canada. The association is governed through an elected representative board of directors.

CSHE



hydropower.org.cn

China Society for Hydropower Engineering (CSHE) is a non-profit national academic and social organisation for hydropower engineering professionals under the guidance of the China Association for Science and Technology (CAST). CSHE was founded in 1980 and has 40,000 individual members; 203 corporate members, including 22 provincial hydropower engineering societies; 30 professional committees; one working committee; and 48 academicians of Chinese Academy of Science and Chinese Academy of Engineering.

Generators of Chile



generadoras.cl

Generators of Chile is the trade association of the Chilean electricity generators, which aims to promote the development of power generation in the country, based on the principles of sustainability, reliability (safety, adequacy and quality) and competitiveness, and to promote the efficient combination of all energy sources, technological development and innovation.

Hohai University



en.hhu.edu.cn

Hohai University is a state key university under the direct jurisdiction of the Ministry of Education of China. The faculty and graduates of Hohai University have been extensively involved in the research, design, construction and management of engineering projects such as the Yangtze River Three Gorges Project, the South-to-North Water Transfer Project and the Yellow River Xiaolangdi Project. Hohai University has a student population of over 33,000, including over 9,000 graduate students and more than 20,000 undergraduate students.

Hydropower of Russia



hydropower.ru

Hydropower of Russia, located in Moscow, is the association for hydro energy professionals in Russia. Its goal is to increase the energy efficiency and safety of hydropower plants in the country. It unites and works together with its members, negotiating solutions to emerging issues and representing the interests of the industry at national and international level. It unites and works together with its members, negotiating solutions to emerging issues and representing the interests of the industry at national and international level.



Apply today



cbip.org

Indian National Hydropower Association

The Indian National Hydropower Association (INHA) was established in June 2003 to provide a forum for the exchange of views and enhancement of knowledge for developing the balance potential in a sustainable manner. The organisation also works to advocate the interests and represent the views of Indian hydropower fraternity. INHA aspires to become the voice of Indian hydro sector across the national and international spectrum for promotion of its sustainable development.



ich.no

International Centre for Hydropower

The International Centre for Hydropower (ICH) is an association of companies and organisations which are active in all aspects of hydropower generation and supply. The centre aims to promote the development and utilisation of hydropower resources by enhancing the skills of industry personnel, raising awareness of the benefits of hydropower, sharing information, and showcasing the industry by organising seminars, workshops and conferences. Membership is open to all parties involved in the development, implementation and operation of hydropower.



Myanmar Hydropower Society

The Myanmar Hydropower Society works with national and international organisations to develop hydropower in Myanmar and ensure that sustainability is considered in all projects. Hydropower was first introduced in Myanmar more than 50 years ago and the country now has 26 hydropower plants with an installed capacity of over 3,000 MW. The Society educates Myanmar's population on the benefits of hydropower, helps its members with socio-economic development and offers technical assistance.



tew.pl

Polish Hydropower Association

The Polish Hydropower Association was founded in 1991 and currently has 176 members. The main goal of the association is the protection and representation of the hydroelectric power industry, and active support of the development of hydropower and other renewable energy sources. The association operates mainly in the areas of water management and renewable energy, providing analysis, development and expertise; organising exhibitions, conferences, seminars and training; and organising promotional activities and advertising.



rti.org

RTI International

RTI International is an independent, global non-profit research institute dedicated to improving the human condition. Its world-class water resources experts are well-versed in providing leading-edge decision-making tools. RTI's core areas of technical expertise include hydropower operations and optimisation, hydrological and hydraulic analyses, risk analysis, river basin modelling, watershed management, flood forecasting/warning, climate change, hydro-economics, water quality, conjunctive use of groundwater and surface water, data collection and management, Geographic Information Systems and decision support systems.

Eligibility

Membership of the International Hydropower Association (IHA) is open to professionals and organisations with an interest in sustainable hydropower.

Benefits

IHA brings people together to exchange experiences, connect and collaborate. By joining our association, you become part of the world's most extensive hydropower network.

Members enjoy better access to information, representation on issues that affect them and access to exclusive sector briefings, webinars, events and workshops.

Members can join IHA's new online community, Hydropower Pro, and our specialist knowledge networks.

- **Shape your future** - gain insights into good practice, policy and sector trends
- **Access resources** - discover essential tools for building sustainable projects
- **Connect with experts** - identify sector specialists and share knowledge
- **Learn technical skills** - build understanding of important new practices
- **Identify new ventures** - make contacts and create new business opportunities
- **Make your voice heard** - participate in hydropower sector events and briefings
- **Member discounts** - special rates for events such as the World Hydropower Congress

Membership options

For organisations:



Major organisations including hydropower companies with installed capacity of more than 10,000 MW.



Large organisations including hydropower companies with installed capacity of more than 2,000 MW.



Small to medium sized organisations including hydropower companies with installed capacity of less than 2,000 MW.

For individuals:



Individuals with a personal, professional or academic interest in hydropower.

Both corporate representatives and individual members can apply to become a Fellow of IHA:



Senior professionals from the sector or a related field.

Read more about membership on pages 8-11.

world hydropower congress



For more information: hydropower.org/congress

The seventh World Hydropower Congress is organised by the International Hydropower Association (IHA).

Delegates from up to 100 countries are expected to be represented at the biennial event in Paris, France, between 14 and 16 May 2019.

With the theme of 'The Power of Water in a Sustainable, Interconnected World', the Congress will focus attention on hydropower's role in delivering on the Paris Climate Agreement and the Sustainable Development Goals.

Join us

Latest information on the programme and speakers will be announced at hydropower.org/congress.

Contact us at congress@hydropower.org for early registration and to participate in preparatory meetings.

Become a partner

To become a strategic partner and learn about sponsorship opportunities, please contact iha@hydropower.org

Delivering on
the Paris Climate
Agreement and
the Sustainable
Development Goals

The power of water in a
sustainable, interconnected world

14-16 MAY 2019 • PARIS

The global gathering that brings together decision-makers, innovators and experts to shape the future of hydropower.

This high-level event will chart the course for hydropower development, ensuring that reliable and resilient water and energy systems benefit all.

ORGANISER



The image is a composite graphic. The background is an aerial photograph of a large concrete dam with a curved spillway, situated in a lush green valley. In the distance, there are snow-capped mountains. The water in the reservoir is a deep blue. On the right side, there is a large, semi-transparent blue graphic element that looks like a close-up of turbulent water, with white foam and deep blue swirls. The overall composition is dynamic, with diagonal lines separating the different elements.

hydropower.org

The International Hydropower Association (IHA) is a non-profit organisation that works with a vibrant network of members and partners active in more than 100 countries.

Our mission is to **advance sustainable hydropower by building and sharing knowledge** on its role in renewable energy systems, responsible freshwater management and climate change solutions.