Delivering on the Paris Agreement and the Sustainable Development Goals

14-16 MAY 2019 • PARIS

The power of water in a sustainable, interconnected world

Visit congress.hydropower.org/2019-paris/programme to see the most up to date programme
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PARTNERS

Sustainable hydropower does not happen in isolation.
Global leaders committed to sustainable development

Our common goal is to provide water and energy to all. Without this, none of the Sustainable Development Goals are achievable.

Our strategic partners are helping us with the knowledge, networks and resources needed to make the congress a catalyst for innovation, collaboration and progress in the water and energy sectors, with hydropower as a common thread in our discussions.

What good practices and ideas can we share to accelerate the deployment of renewable energy and ensure energy security in the face of climate change?

Coming from the world of business, academia, research, civil society, government or finance, each of our partners is committed to dialogue and to bringing their solutions and leadership to the table to resolve these pressing challenges.
AT-A-GLANCE

A week to influence the course of hydropower
Programme overview

**Tuesday 14 May 2019**

**Registration open: 08:00–20:00**

**Pre-congress**

Consultative Meeting

**Congress begins**

14:00–18:00 Opening Plenary

16:00–16:30 Coffee break

Opening Plenary (continues)

18:00–20:00 Opening Reception & Entertainment

**Wednesday 15 May 2019**

**Registration open: 08:00–18:30**

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**Thursday 16 May 2019**

**Registration open: 08:30–16:00**

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**Key**

- Open to all delegates
- Focus sessions
- Ticketed / exclusive events
- Regional sessions

*The core congress programme is complemented by associated events, including capacity-building and training workshops and study tours*

Participants from a range of backgrounds will address policy topics, good practices and identify responses to business challenges. Some of the toughest questions facing hydropower will be addressed in the programme.

Over the course of 5 days, 37 sessions and workshops will be proposed to participants, along with six unique study tours organised in partnership with leading hydropower companies in Europe.
SPECIAL EVENT
Setting the scene with leaders and decision-makers
Sustainable water and energy solutions as an integrated response to climate change

The adoption of the Paris Agreement on climate change and the 2030 Agenda for Sustainable Development has established a strong foundation for the coherent and holistic implementation of climate action and sustainable development worldwide.

Growing demand for natural resources and the unsustainable use of water and energy nonetheless pose profound challenges that are exacerbated by climate change. Hydropower therefore has an essential role in delivering on the Paris Agreement and the Sustainable Development Goals (SDGs) and supports integrated climate-friendly solutions for water and energy.

With the hydropower sector as a nexus for sustainable water and energy solutions, this event will share integrated approaches taken by governments and multi-stakeholders to address water (SDG 6) and energy (SDG 7) challenges, while advancing actions to combat climate change (SDG 13).

Panellists will discuss the risks generated by climate change; share policies, business models and programmes with an integrated approach to water and energy as adaptation and mitigation strategies to climate change; and highlight good practices and lessons learned for accelerating the implementation of the SDGs and the Paris Agreement.

This event will be a prelude to the 2019 World Hydropower Congress, which brings together industry, government, finance, civil society and academia to set priorities for the future of the sector under the theme ‘The Power of Water in a Sustainable, Interconnected World’.

Meeting objectives

On the occasion of the World Hydropower Congress, the International Hydropower Association (IHA) convenes broad stakeholder consultations in the form of consultative meetings.

These meetings serve as a platform for decision-makers and experts active in the energy, water and climate sectors to exchange perspectives on policy and business strategy and to guide future work and decisions.

In 2019, the consultative meeting is organised under the Sustainable Water and Energy Solutions Network established by the United Nations Department of Economic and Social Affairs (UNDESA) and Itaipu Binacional, of which the International Hydropower Association (IHA) is a member.

The objectives of the Consultative Meeting are to:
- Create awareness about multistakeholder initiatives in the water and energy sectors
- Exchange innovative approaches to integrated water and energy management
- Discuss possible pathways to realising SDGs 6, 7 and 13
- Identify opportunities for further collaboration between leading organisations.
FOCUS SESSIONS
Explaining, debating and resolving hydropower’s top challenges
Modernisation

Modernising hydropower to support a cleaner energy mix

Today's hydropower fleet, totalling 1,267 GW contributes around two thirds of global renewable electricity produced annually. By 2030, it is estimated that over half the existing fleet will have been, or be due to undergo upgrade and modernisation.

The International Energy Agency ‘Sustainable Development Scenario’ estimates that electricity generation from hydropower could rise up to 39 per cent over the next decade, from 4,109 TWh in 2017 to up to 5,722 TWh in 2030. For this to take place, it is crucial to retain and enhance the existing hydro fleet to continue its vital role as a major source of renewable energy in the global energy mix. SDG 9 recognises the need to retrofit existing infrastructure by 2030, taking advantage of efficiency increases, sustainability and industrial innovation.

One key aspect in the transition towards a cleaner energy mix is integrating the deployment of advanced hydropower, together with wind and solar. Innovative technologies are being implemented that go beyond business-as-usual practices for modernisation of ageing hydropower facilities. Looking forward, modernisation schemes will consider the need for increased hydropower storage and operating flexibility with much greater penetrations of variable renewables and greater climate extremes. Asset owners also need decision-making solutions to support their business case for advancing major investments in modernisation projects.

Providing decision-makers with the most current knowledge on how best to plan modernisation projects is therefore a top priority. This session will share strategies being implemented to modernise major assets, and discuss the opportunities as well as the risks for the sector.

Session objectives

What innovative strategies are being implemented globally to ensure that the existing hydropower fleet is well prepared for its role in the future energy mix? This session will:

- highlight the global projections for the energy mix, and the need for modernising existing hydropower assets;
- discuss innovative modernisation and planning strategies being implemented in the sector;
- support decision-making for new modernisation projects.

When Wednesday 15 May 2019 | 09:30-10:45 | Eiffel 3
Leads David Samuel | Bill Girling
dts@hydropower.org bg@hydropower.org
Integrated planning

**Delivering on the water and energy nexus**

The fourth energy revolution has arrived and with an influx of affordable solar and wind technologies, hydropower’s role in securing this green energy future is changing. The industry will need to adapt, and swiftly.

Planning energy at the system scale - whether basin, national or transnational - is critical if the world is to create sustainable and secure energy systems that remain relevant in the wake of climate change. Whereas ‘system-scale’ planning has typically referred to optimising efficiencies across single source energy systems, increasingly the process is being applied to integrated energy planning. Governments are keen to diversify their energy portfolios and take advantage of cost-effective renewable technologies, in effect ensuring an affordable, reliable and sustainable energy supply.

Hydropower has an important role to play in the world’s transition towards a diverse energy mix, the ability to stabilise a variable renewable energy system and provide low-carbon storage services. Though energy projections are notoriously difficult to predict, trends indicate a mainstreaming of solar and wind, with hydropower’s role becoming increasingly specialised.

On top of renewables becoming progressively more competitive, climate change is predicted to make hydrological conditions less predictable for much of the world, which poses risks for energy systems that rely predominantly on hydropower. Predictions indicate the success of the industry moving forward may be largely dependent on its ability to define a niche role in this changing energy sector.

**Session objectives**

What are the most innovative approaches for integrated energy systems?

Through case studies, the session will highlight how system-scale planning for single source and integrated energy systems can create better outcomes for people, nature and industry.

Speakers will explore the right role for hydropower in creating a sustainable energy future and will spark discussion around leveraging integrated renewable energy systems to meet sustainable development and climate goals.

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

**Leads** Cristina Diez Santos | María Ubierna | Eiffel 1

cds@hydropower.org  mu@hydropower.org
Mitigating climate change is one of the most important goals for strategic sustainable development. It is recognised by a range of stakeholders, including financiers who look to quantify the greenhouse gas footprint of their investments. The greenhouse gas status of freshwater reservoirs – that is, any change in the GHG emissions in a river basin resulting from the creation of such a reservoir – has been the focus of a multi-year, multi-stakeholder research project led in partnership by IHA and the UNESCO Chair for Global Environmental Change. This research project resulted in the launch of the G-res Tool in 2017.

The G-res Tool employs a new conceptual framework that reflects a net emissions approach, which takes into account pre-impoundment conditions and emissions translated from other human activities. The tool is an online resource that builds upon this methodology and enables users to estimate the GHG footprint of reservoirs, and allocate these to the services it provides, including hydropower activities.

G-res Tool developers and users will share their insights and experiences using the tool. They will discuss the approach to emissions related to other human activities, infrastructure construction, and the allocation of emissions to the reservoir’s purposes.

The tool’s potential impact on future hydropower project development will be discussed, and how hydropower can be an positive agent to achieving the Sustainable Development Goals and Paris Agreement on climate change.
It is widely recognised that the transition towards cleaner and more sustainable energy systems will require a significant increase in the use of clean generation options, including wind and solar power. In turn, by their very nature these resources make power supply more volatile, reflecting the varying availability of wind and sunlight. Dealing with this new situation requires an increase in the flexibility of power systems. Flexibility in this context refers to the ability of a power system to maintain a reliable and continuous service when faced with potentially rapid changes in supply or demand. Flexible power plants, grid infrastructure, demand side response – and storage – can provide this flexibility.

Pumped hydropower storage (PHS) accounts for the vast majority of installed energy storage capacity worldwide. PHS provides large-scale energy storage, enabling balancing of variable renewable resources such as wind and solar PV on time scales from seconds to seasons, and it can also provide a suite of non-energy services to support reliable grid operation. Recent deployment of PHS, however, has varied significantly across countries and regions.

This panel will investigate the underlying drivers of PHS deployment. What technical, economic, market, and policy drivers have caused decision-makers to invest in the large-scale energy storage provided by PHS? 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 PHS as the grid and energy system evolves?
Projects affecting Indigenous Communities

When: Wednesday 15 May 2019 | 11:15-12:30
Lead: Kate Steel | Nick Troja | Eiffel 1
ks@hydropower.org  nt@hydropower.org

Turning aspiration into practice - putting FPIC into the hydropower context

Hydropower provides an important contribution to clean energy systems, but its development can affect the communities that live around it.

There is better understanding and recognition of the impacts of hydropower development, which has led to the advancement of good international industry practice guides and tools. Of particular importance is the consideration of the rights of indigenous peoples. The call for free prior and informed consent (FPIC) of project affected indigenous peoples has been one of the most contentious areas of debate.

Several organisations have attempted to define FPIC and provide guidance on what it means in practice.

Session objectives

The session will explore the practice of FPIC. Specialist consultants, industry and indigenous representatives will share their opinion and experience of FPIC in practice, and where it has been achieved.

The aspiration to protect indigenous people’s human rights is widely supported; however, the concept of FPIC has been the most controversial and increasingly litigious aspect for numerous sectors and stakeholders working with such communities.

How can FPIC be achieved? What are the key ingredients of success? What is the consent for? Who is the consent given by, and to whom? When has it been achieved and what evidence is required to demonstrate this? Can consent be retracted? Is the process undemocratic? Who would risk engaging in this process? What are the biggest risks? Could FPIC become a deterrent to sustainable development? Which projects would require FPIC? Can FPIC be used as a means to stop projects?
Capacity building

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

Leads João Costa | Alain Kilajian | Mansart

jc@hydropower.org  ak@hydropower.org

Co-convenor:

Strengthening local resource to promote understanding around good hydropower practice.

This session aims to build or strengthen local resources to improve understanding and ownership of hydropower good practice.

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

Capacity is a complex concept, both in theory and in 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 thus focus on developing in-country resources, physical and intangible, to guide sustainable hydropower performance and ensure the long-term viability of project benefits.

Session objectives

The objective of the session is to share knowledge and lessons learned of how capacity building programmes in hydropower can effectively result in strengthened local institutional capacity and ensure the long-term viability of project benefits. Panellists will also discuss environmental flows and their importance to the sustainability of hydropower projects.

Finally, panel dialogue will debate key recommendations going forward.
Digitalisation

Understanding and implementing digitalisation in the hydropower sector

The ongoing revolution in digitalisation is helping to drive innovation in the hydropower sector, through the development of digital monitoring systems to reduce maintenance costs, coupled with advanced controls to improve operations and balance variable renewable technologies such as wind and solar.

Digitalisation will play a key role in meeting the Paris Agreement, by ensuring that existing hydropower assets are well maintained and can continue to operate efficiently and reliably well into the future.

This focus session will build knowledge on digitalisation in the hydropower sector; covering a broad range of issues, including advanced operating strategies to optimise hydropower generation, digital systems to improve maintenance practices, digital twinning, integrated control and cyber-security.

Session objectives

How will digitalisation ensure that hydropower will thrive in the future energy mix?

The session will focus on how digitalisation will enable hydropower operations to adapt to a more diverse role in the future energy mix, improving O&M practices, through improved condition monitoring systems and automated maintenance practices and through the development of advanced tools to optimise decisions around modernisation.

The session will also address change management, incentives and strategies to implement digitalisation across the business.

When Wednesday 15 May 2019 | 14:00-15:15
Leads Bill Girling | David Samuel | Eiffel 3

Session: 15-4A

bg@hydropower.org  dts@hydropower.org
Sustainability assessment

When  Wednesday 15 May 2019 | 14:00-15:15
Leads  João Costa | Alain Kilajian | Eiffel 1

Helping the sector to optimise sustainability practice

With the launch of the Hydropower Sustainability Guidelines on Good International Industry Practice (HGIIP), the sector now has a suite of tools to harmonise the understanding of sustainability in a hydropower context.

Performance against the guidelines can be assessed through two complementary tools: the Hydropower Sustainability Assessment Protocol (HSAP), which measures performance above and below the defined good practice. In addition, the Hydropower Sustainability ESG Gap Analysis (HESG) Tool can check for gaps against good practice on relevant topics, and includes a gap management plan to improve processes and outcomes.

Session objectives

The session will explore the best ways of using the guidelines and assessment tools to guide and measure performance with an optimum level of efficiency.

Furthermore, the session will discuss how the tools can be used to improve institutional capacity and enhance the development impact of hydropower projects worldwide.

Finally, panellists will share insights from their own experiences and discuss recommendations moving forward.
Climate resilience

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

**Leads** María Ubierna | Nick Troja | Mansart

*mu@hydropower.org*  
*nt@hydropower.org*

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**Climate resilience investment for the hydropower sector**

The hydropower sector is vulnerable to the impacts of a changing climate. Changes in precipitation and temperature impact power generation, dam safety, environmental and social aspects, as well as other infrastructure resilience.

Governments, lending institutions, and asset owners themselves are increasingly seeking assurances that hydropower projects – from greenfield developments to rehabilitations – are climate resilient.

This is partly driven by international agreements such as the Paris Agreement, and increasing awareness about the materiality of physical climate risks to investments.

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**Session objectives**

What does climate resilient hydropower investment mean in practice? And how can asset owners and developers demonstrate that their project is climate resilient?

In this session, these questions will be discussed by a mixed panel of representatives from government, financial institutions, operators and developers.

IHA will also present the Hydropower Sector Climate Resilience Guide, a tool that can provide all parties with a practical framework for assessing the climate resilience of hydropower projects.
Clean energy systems

Enabling clean energy systems with hydropower

All the systems that have succeeded in providing 100 per cent renewable electricity rely on hydropower. Hydropower, where available, plays an essential and vital role in creating and maintaining energy systems that are reliable, affordable and sustainable.

Hydropower’s flexibility can help balance variable renewable supply, by ensuring a firm power output to the grid and reducing reserve requirements. Power systems worldwide exhibit uniquely different characteristics depending on region and history, and the energy transition will need bespoke solutions in each case. However, common opportunities and challenges exist when it comes to hydropower’s role in the energy transition.

Hydropower has traditionally provided flexible power generation as well as the overwhelming majority of large-scale energy storage by storing water in reservoirs. The success of VRE sources is driving change in power systems around the world. New approaches are needed to fully utilise hydropower’s unique characteristics and to compensate hydropower for the flexible services it provides to power grids.

Session objectives

This session will highlight hydropower’s contribution to enabling the energy transition. The session aims to kick start discussion on how renewables working together can help ensure the provision of reliable, sustainable and affordable energy and water services for all, and how they could help meet and achieve global sustainability and climate goals.

When Wednesday 15 May 2019 | 15:45-17:00
Leads Mathis Rogner | David Samuel | Eiffel 3

Co-convenor

Session: 15-5A
River basin development

When  Wednesday 15 May 2019 | 15:45-17:00
Leads  Cristina Diez Santos | João Costa | Eiffel 1

Understanding connectivity, cumulative impacts and improving trade-offs

Basin and regional-scale planning in hydropower development comprise not only the optimisation of energy systems but also broader environmental, social, water, food and climate change outcomes when managing hydropower in a river basin or regional context.

Successful river basin management involves a holistic approach which encourages cooperation among a diverse group of stakeholders in the utilisation of natural resources. The integrated management of reservoirs and multiple uses of water, institutional and regulatory agreements, as well as the integration between neighbouring countries, comprises different trade-off methodologies to manage a hydropower project at a system level.

Session objectives

What are the upstream and downstream effects of hydropower facilities’ operational schemes and how do cumulative impacts influence decision making?

This session will discuss how the cumulative impacts of natural resources development in a basin can affect decision making. It will focus on the role that operation schemes of existing hydropower facilities have on trade-offs at the basin scale and long term impacts.

While significant work and research has been put on approaches at planning level, this session focuses on the upstream and downstream effects of operational schemes of hydropower facilities, and approaches for evaluating and managing positive and negative impacts.
Sediment management

The importance of managing sediment in the context of climate change and integrated river basin development

Hydropower has a prominent role in achieving the Paris Agreement. Reservoir and run-of-river hydropower projects provide low carbon energy production, stability and reliability to the electricity grid, and water services.

Alteration in the sediment budget in the catchment, in particular sedimentation, undermines the capacity of the hydropower projects to deliver water and energy services in addition to the upstream adverse effects of delta formation and downstream scour.

Sediment management contributes to maintaining storage capacity, reducing operating risks, and minimising river connectivity impacts. Implementing effective sediment management strategies is essential to extend the life of the project, to ensure a reliable and sustainable source of water and energy, and to maintain river connectivity.

Session objectives

Why is sediment management important to hydropower projects for delivering sustainable water, energy and other multipurpose services? What are the policy needs, regulatory challenges, financial incentives and initiatives to promote sustainable sediment management?

This session will discuss the importance of managing sediment in reservoir and run-of-river hydropower projects. Sustainable development and management of current and future projects are essential to deliver effective water and energy services in a context of increasing challenges associated with and exacerbated by climate change.

After initial framing of hydropower operational challenges and sediment management at river basin scale, panellists will focus on policy needs, regulatory challenges, financial incentives and initiatives that will promote sustainable hydropower and sustainable water resources development.
Hydropower and solar hybrids

Renewables working together

Hydropower coupled with solar PV presents a significant opportunity to scale up solar energy deployment around the world. When treated as a single generation source, solar power fluctuations and variability is compensated by hydropower operations, resulting in water conservation, reducing reserve requirements and the efficient use of existing transmission and distribution infrastructure.

In particular, floating solar PV technologies, or “floatovoltaics,” have seen rapid growth in the past four years, from a worldwide installed capacity of 10 MW at the end of 2014 to more than 1.1 GW by the end of 2018 (World Bank). Floatovoltaics have a distinct advantage especially in countries where land-use constraints are high. At some large hydropower plants, covering just 3-4 percent of the reservoir with floating solar could double the capacity of the solar plant, potentially allowing water resources to be more strategically managed by utilising the solar output during the day.

Combining solar and hydropower can also be used to smooth the variability of solar output, thus supporting renewable energy deployment in grids that lack the flexibility to incorporate large injections of variable renewable energy.

Session objectives

This session will showcase hydropower – solar PV hybrids, with a particular focus on the potential for floating PV to augment hydropower production. It seeks to explore the regulatory and policy barriers to increasing the uptake of this technology worldwide.
Regional interconnections

Connecting hydro to new markets

As electricity grids become more interconnected, hydropower will increasingly supply not just national but regional needs. Future energy systems will pool energy resources spanning geographical areas, enabling hydropower to work together with other renewables.

Hydropower has offered baseload and grid balancing for decades, and as market integration continues, new synergies between adjacent grids can be captured. For example, high voltage transmission can connect remote hydropower resources over long distances to market centres, or extend access to flexible pumped storage in areas where high wind and solar needs storage.

However development of cross-border grid connections can be challenging, given the complexity and cost. This session will gather experts from around the world with experience in regional interconnections, to discuss existing schemes, planned projects, and power pools. A key focus will be sharing lessons learned, and hydropower’s potential for region-wide markets.

Session objectives

Universal access to energy services by 2030 is a key Sustainable Development Goal (SDG 7), with international cooperation highlighted as an important objective. Export of hydropower’s low cost, reliable and flexible electricity across territories and national borders already brings benefits, and can be a key driver for investment.

The session will highlight the benefits of regional interconnection and hydropower potential for region-wide markets. A key objective will be understanding what models help the development process.
Benefits of hydropower

Quantifying the benefits of hydropower projects

Single and multipurpose hydropower facilities can deliver multiple power and non-power benefits. Over and above electricity generation, the power related benefits include flexible generation and flexible storage, as well as a reduction in the dependence on fossil fuel. Moreover, they can provide local macroeconomic revenues, benefits related to employment, education and recreation, and constitute new possibilities for trade, transport and tourism. Furthermore, affected communities can benefit also from flood mitigation, water supply, pollution control and irrigation.

Hydropower projects have been designed to suit particular needs and specific conditions and are classified by project type, head or purpose, where these classifications are not rigorous indicators of the impacts, values and benefits of hydropower. Setting out more realistic indicators that can quantify the above mentioned power and non-power benefits will help to meet the power needs in developing countries and emerging economies together with the development of the UN Sustainable Development Goals.

Session objectives

What is the state of knowledge on the quantification of benefits attributed to the development and operation of a hydropower facility?

How could a tool or template be developed to quantify hydropower benefits in order to support decision making by power utilities and governments?

What are the resilience mechanisms that can be built into hydropower planning that can facilitate the realisation of benefits?

The session will cover the differences and similarities between purposes, uses and benefits, including discussions of how compensation and mitigation measures can be considered. This session seeks to broaden the range of perceived benefits to the ones that are much less apparent.

When Thursday 16 May 2019 | 09:30-10:45
Leads Cristina Diez Santos | María Ubierna | Mansart

cds@hydropower.org mu@hydropower.org
Green bonds for hydropower

Bringing standards to the green bond market and what it means for hydropower

Green bonds are examples of the emerging instruments for green finance and investment in the energy sector that can be used for hydropower. They are fixed income loans created to finance and refinance projects and assets that help address environmental and/or climate risks and shift investment to a low carbon, sustainable economy. In 2018, over USD 167 billion of labelled green bonds were issued, with expectations of it reaching USD 250 billion this year.

Following over two years of discussions with industry, academia, governments and international NGOs, the Climate Bonds Initiative, an investor-focused not-for-profit is due to launch a consultation later this year on proposed green bond criteria for hydropower.

This criteria is seen as key to fully unlocking the market to the hydropower sector, as to-date there has been a lack of clarity over appropriate standards.

Session objectives

What role will the green bond market have in the future of hydropower financing?

This session will focus on the development of eligibility criteria whilst also assessing what role the green bond market will have in the future of hydropower financing. Furthermore, with the market acting as a bridge towards many of the Sustainable Development Goals (SDGs), panellists will explore how the criteria helps better align the hydropower sector with SDG 6, 7 and 13 and the Paris Agreement.

Finally with an eye on the future, panellists will discuss how the criteria may evolve over time to take into account improved methodologies and the latest in climate science.

When Thursday 16 May 2019 | 11:15 -12:30
Leads Nick Troja | João Costa | Eiffel 3
nt@hydropower.org  jc@hydropower.org
Implementing small-scale hydropower systems for energy access and development

To address environmental challenges, energy security, and to pursue inclusive and sustainable development, leaders are strategising ways to transition economies towards renewable energies. Access to affordable and reliable energy and water services provided by sustainable hydropower can bring economic, social and environmental dividends, and contribute to achieving the sustainable development goals, especially SDG 6 (Sustainable water for all) and SDG 7 (Sustainable energy for all).

Hydropower is a mature technology, which can easily be designed, operated and maintained. Despite exhibiting one of the lowest electricity generation prices of all technologies, hydropower potential in many developing countries remains largely untapped. Small-scale power systems involving hydropower remain site specific, i.e. each development has to be designed for the specific characteristics of the chosen site. Small-scale hydropower systems represent a significant resource that can provide significant multi-dimensional benefits to underserved areas.

Session objectives

This session aims to take stock of the opportunities and challenges facing small-scale deployment around the world. It will explore how to remove barriers and to highlight benefits of smaller-scale hydropower systems, especially to small, and perhaps under developed grids, with a particular focus on the solutions and partnerships that could lead to increasing sustainable and high-impact hydropower development.

Panellists will draw upon their expertise and experience in developing hydropower and will discuss small-scale power systems from socio-political, techno-economic and environmental vantage points.
Innovative data solutions for hydropower

Managing, sharing and securing data for hydropower

Data sharing and data management has been the cornerstone of every successful hydropower project. In the developed world, organisations develop their own internal databases for hydrological data, energy statistics and market information. Organisations in least developed countries often depend upon publicly accessible data for planning and operating hydropower facilities.

Advancements in the digitalisation of data in the water and energy sector has the potential to offer tremendous opportunities for real-time access to volumes of data that were not possible in the past. Emerging trends such as artificial intelligence (AI), neural networks and the advent of block chain technologies all stand to move the water and energy sector into an advanced regime of data management.

Session objectives

How will advanced data management systems improve hydropower operations and maintenance (O&M)?

The session will illustrate how advanced data management systems and data sharing can positively impact the hydropower sector through examples of information systems for improved decision making, enhanced cyber-security and access to baseline climate and watershed data.

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

Leads Bill Girling | David Samuel

Co-convener

bg@hydropower.org  dts@hydropower.org
Hydropower safety

When Thursday 16 May 2019 | 14:00 -15:15
Leads Bill Girling | María Ubierna | Eiffel 3

Advancements in safety at hydropower facilities

Safety continues to be the top priority for all hydropower utilities globally, centred around ensuring that all staff on site are properly trained, to prevent accidents related to design, construction, operation and maintenance of hydropower facilities.

In addition, recent incidents related to the operation and maintenance of hydropower facilities illustrate the need to enhance dam safety and emergency preparedness planning (EPP) as a fundamental element of planning new facilities and modernising existing assets.

Advancements to hydropower safety measures are essential to ensure that hydropower remains a leading source of renewable energy into the future, by continuously improving dam safety measures under all plausible future climates, and ensuring that operators and maintenance staff are building the necessary skills to adapt to more extreme operating conditions, while maintaining a higher level of cyber-security.

Session objectives

What are the key challenges the hydropower sector is facing in terms of ensuring the overall safety of the world’s hydropower assets?

The session will discuss some of the challenges the hydropower sector is facing in terms of ensuring the overall safety of the world’s hydropower assets, highlighting advancements being made by leading organisations, who are continuously improving their overall safety programmes.

Session: 16-4A
Project ownership & financing

When Thursday 16 May 2019 | 14:00 -15:15
Leads Nick Troja | David Samuel | Eiffel 1
nt@hydropower.org   dts@hydropower.org

Combining public and private sector support to unlock hydropower development

Governments around the world are continuing to seek greater private sector involvement in hydropower development.

This is particularly the case in developing countries where public funds are scarce with many competing priorities and there is a need to utilise the technical expertise of the private sector.

However, to date it remains difficult to attract private investment in developing countries as hydropower’s risk profile is poorly understood by many banks who have only limited experience of similar investments.

The circle of lack of experience, poor understanding of risk and reluctance to invest is difficult to break.

Session objectives

How can governments best leverage the role of the private sector?

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.
Synergies between hydropower and World Heritage Sites

Protected areas are one of the most important tools to halt the global loss of biodiversity. They also contribute to achieving multiple Sustainable Development Goals (SDGs), such as SDG 6 (Water and sanitation) SDG 14 (Life below water) and 15 (Life on land). Healthy protected areas provide basic goods and services, and help to provide access to food, fibre, shelter and security, and clean water. They can also offer valuable options for society to mitigate and adapt to climate change through ecosystem benefits such as water and climate regulation.

Some of the most valuable and exceptional protected areas are given an international protected status through the World Heritage Convention. Through their World Heritage Listing, the global community has recognised a shared international responsibility to protect these outstanding sites and manage them for the planet, and its future generations.

Hydropower projects can offer clean energy, various water services, and regulate water flow. Hydropower projects have the potential to promote the sustainable development of the communities they serve, yet they inevitably alter the existing conditions of the river basins they operate in. This can create positive and negative impacts both locally and upstream and downstream of projects. These impacts may be direct and/or indirect and have intended and/or unintended consequences. Increasingly, these impacts may also affect protected areas, including globally significant World Heritage Sites where they overlap or share their watershed with potential hydropower sites. The challenge is to carefully assess these impacts on protected areas and World Heritage Sites, and to consider the best options available to avoid or mitigate negative impacts, while identifying solutions to meet water and energy needs.

Session objectives

The objectives of this session are to:

• increase awareness within the hydropower community of the risks hydropower development can bring to Protected Areas;
• provide evidence of synergies between hydropower and Protected Areas;
• make recommendations on how the hydropower sector can be better informed about the risks and synergies between hydropower projects and Protected Areas;
• discuss the possibility of initiating a working group, where WWF and IUCN work with IHA to guide the hydropower sector to optimise synergies with Protected Areas through case studies from inside and outside the sector.
WORKSHOPS

Building capacity for professionals and decision-makers from around the world
Workshop on new sustainability assessment tools

Monday 13 May 2019 | 13:00-17:30 | Mansart 3

Lead João Costa | Alain Kilajian

cjc@hydropower.org  ak@hydropower.org

How the Hydropower Sustainability Tools can help enhance the impact and sustainability of development interventions

This workshop introduces new Hydropower Sustainability Tools and explores how they can help enhance the impact and sustainability of development interventions:

- The Hydropower Sustainability Guidelines on Good International Industry Practice (HGIIP), launched in 2018, which define expected performance for the hydropower sector across 26 environmental, social, technical and governance topics.

- The Hydropower Sustainability Assessment Protocol (HSAP), launched in 2010 and updated in 2018, which offer a framework for independent assessments of hydropower project performance.

- The Hydropower Sustainability ESG Gap Analysis (HESG) Tool, launched in 2018, for project proponents and investors to identify and address gaps against international good practice.

Workshop objectives

The objective of the workshop is to introduce these new tools to delegates, and to discuss how the tools can contribute to wider sustainable hydropower development.

The workshop will look at specific case studies in terms of their application and how they can be used to improve the impact of development programmes and encourage the sustainability of project benefits.

United Nations Sustainable Development Goal (SDG) 7 (Affordable and clean energy) will be addressed, as well as other goals such as SDG 6 (Clean water and sanitation) and SDG 13 (Climate action).
Mechanisms to improve people’s livelihoods

Hydropower development can help improve social and economic benefits for local and regional communities. Benefits for local communities may include employment, community services, infrastructure, energy, education, new markets, government revenues and economic development.

It is a continuing challenge to ensure that benefit sharing responds to local expectations, builds on existing capacities, and results in sustainable and positive impacts.

From existing research, it appears that many factors influence the success of benefit sharing programmes including: thorough understanding of local context and stakeholders; examination of the business case, company values and culture; suitable engagement carried out by experienced practitioners and selection of benefit sharing programmes and implementation mechanisms that make most sense for the given context and business model.

Workshop objectives

What are the current trends and lessons learned from implementation of benefit sharing mechanisms by hydropower developers? What challenges and opportunities arise from different benefit sharing mechanisms?

The workshop will present key findings from an ongoing study on benefit sharing practices in hydropower projects commissioned by the International Finance Corporation (IFC). Additional experiences that focus on selected benefit sharing mechanisms and lessons learned will be discussed.

Facilitated discussions will allow participants to share experiences, ask questions and reflect on needed improvements in benefit sharing practices.
Workshop on sediment management

Monday 13 May 2019 | 13:00-17:30 | Mansart 1

Lead María Ubierna
mu@hydropower.org

Using sediment management strategies for sustainable hydropower projects

Reservoir and run-of-river hydropower projects provide low carbon energy production and stability and reliability to the electricity grid with an increasing share of intermittent renewable energy sources.

Sedimentation or sediment related issues undermine the capacity of hydropower projects to deliver these water and energy services and weaken therefore the path to accomplish SDG 6 and SDG 7.

Sediment management contributes to maintaining storage capacity, reducing operating risks, and minimising river connectivity impacts. Managing sediment is essential to extend the life of a project, to ensure a reliable and sustainable source of water and energy, and to maintain river connectivity.

This workshop will focus on the impacts of sedimentation and available sediment management techniques, and will provide guidance on tools to determine an effective strategy that contributes to sustainable reservoir operation. It will also demonstrate how numerical and physical scale models can support the design of sediment management measures.

Workshop objectives

The workshop aims to present international good practices on effective sediment management to contribute to the sustainable operation of hydropower assets.

In this workshop, the audience will be trained in the RESCON 2 tool for a rapid assessment of sediment management strategies as well as the capabilities of numerical and physical modelling to support detailed sediment management studies.

Case studies will offer examples of how effective sediment management alternatives contribute to sustainable operations of hydropower assets.
Francophone workshop: sustainability and practices

Tuesday 14 May 2019 | 09:00-13:30 | Mansart 1

Lead Alain Kilajian | Marine Dominguez

ak@hydropower.org marine.dominguez@hydropower.org

Introduction to sustainability assessment tools

This workshop, supported by the Francophone Institute for Sustainable Development, will be the first tailored workshop for the francophone hydropower community designed to introduce the new Hydropower Sustainability Tools.

The tools comprise the Hydropower Sustainability Guidelines on Good International Industry Practice (HGIIP), which define expected performance, an expanded version of the Hydropower Sustainability Assessment Protocol (HSAP) to include climate change mitigation and resilience, and a new Hydropower Sustainability ESG Gap Analysis (HESG) Tool to identify gaps against good practice in environmental, social and governance topics.

The workshop will also showcase examples of good practice in sustainable hydropower in francophone countries, including projects and programmes from Électricité de France, The Nature Conservancy Gabon, the Association of Power Utilities of Africa, Hydro-Québec and ENERGIES 2050. Finally, this workshop will explore how the Hydropower Sustainability Tools can help enhance the impact and sustainability of development projects in francophone countries worldwide with a focus on Africa.

Workshop objectives

The objective of the workshop is to introduce the new Hydropower Sustainability Tools to French speaking delegates, identify linkages to relevant IFI standards and to discuss how these tools can contribute to wider sustainable hydropower development, especially in the context of francophone Africa. The workshop will also look at case studies of good practice in sustainable hydropower in francophone countries.

In terms of its contribution to sustainable development, the workshop covers many of the SDGs but it will most directly address SDG 7 ‘Affordable and Clean Energy’, SDG 6 ‘Clean Water and Sanitation’, and SDG 13 ‘Climate Action’.
Workshop on climate resilience

Tuesday 14 May 2019 | 08:30-13:00 | Mansart 3 & Ledoux

Lead María Ubierna | Nick Troja

Co-convenors

Workshop 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 provides guidance to ensure resilient investments.

Climate resilience and hydropower development

Hydropower will have a prominent role in achieving the Paris Agreement. Optimising the role of hydropower infrastructure in the provision of climate adaptation services is possible by understanding and assessing the climate-related risks and opportunities.

The forthcoming IHA Hydropower Sector Climate Resilience Guide, which will be launched at the World Hydropower Congress on 15 May 2019, will provide practical guidance to better prepare for an uncertain future and ensure robust and climate resilient hydropower projects.

This training workshop will provide an introduction to the Hydropower Sector Climate Resilience Guide and a walk-through of the steps and activities required to complete a climate risk management plan. The workshop will also include practical examples of how the guide has proven useful to ensure resilient investments.
Workshop on preparing O&M strategies

Tuesday 14 May 2019 2019 | 08.30 -13:00 | Mansart 2 + VLD

**Leads** Bill Girling | David Samuel

bg@hydropower.org  dts@hydropower.org

Co-convenor

**Good practice in operating and maintaining hydropower**

While global statistics on the performance of existing hydropower assets are not readily available, there are a number of documented cases, especially in developing countries, where hydropower has been shown to be under-performing.

Local conditions such as weak regulatory environments, inadequate contractual arrangements, poor governance and insufficient financing for O&M can explain such cases. But poor performance can also be correlated to lack of capacity and training in operation and maintenance of hydropower assets.

As a follow-up to the O&M workshop in Addis Ababa, the World Bank, with the support of Swiss cooperation, has collaborated with IHA to develop a guidance note that will support decision makers and O&M practitioners in planning O&M strategies aiming at improving & sustaining the performance of existing or new hydropower assets.

This has been achieved through consultation with the sector and the development of case studies that illustrate good O&M strategies and practices.

Workshop objectives

The objectives of this workshop are to provide a synopsis on the content of the World Bank Guidance Note for preparing O&M Strategies, and to invite participants to identify where there may be gaps or major revisions required that could be addressed in final version.

The workshop will identify good practices, opportunities and barriers towards the preparation and implementation of O&M strategies through group discussions with participants and experts from various sectors of the hydropower industry.

The session will also illustrate good practice in O&M across the global fleet of hydro, through presentations on a number of case studies.
REGIONAL FOCUS
Exploring challenges and opportunities from the people who are the closest to them
Regional focus: Europe


Lead Mathis Rogner

mr@hydropower.org

What are the key challenges facing Europe?

The European Union as well as many non-EU countries including Switzerland, Norway and Turkey have brought forward climate and energy policies over recent years aimed at establishing affordable, secure and sustainable clean energy systems.

In order to meet ambitious climate mitigation commitments, European countries will need to rapidly decarbonise their power sectors and increase the share of renewable energy. Toward this end, in early 2018 the EU parliament voted to increase its renewable energy goal for 2040 from 27 per cent to 35 per cent.

To help address environmental, social, technological and market barriers to hydropower development, a multi-partner consortium has launched an EU funded initiative, HYDROPOWER-EUROPE. The initiative involves consultation with hydropower stakeholders to develop a research and innovation agenda for Europe.

Session objectives

This session will introduce the HYDROPOWER-EUROPE forum which is exploring hydropower’s role in achieving Europe’s regional and global sustainability goals. Building on an extensive programme of public consultations, the forum will develop a set of research and innovation priorities as well as a strategic roadmap for the future of hydropower.
How can hydropower solve new challenges in Africa?

Hydropower has a major role in the transition to low-carbon energy systems in the region and is a vital solution towards the achievement of the Sustainable Development Goals (SDGs). Its development offers the opportunity to boost clean electricity production, widen access to electricity and improve livelihoods.

With over 350 GW of hydropower potential, only about 7 per cent of the continent’s economically feasible hydropower potential has been tapped and only about half of the population has access to electricity.

Many African countries are embracing hydropower to meet electricity demand, which is expected to increase to an average rate of 4 per cent per year. Moreover, regional cooperation and integration – through Power Pools – presents an opportunity for effectively exploiting and managing the region’s hydropower resources. At the same time decentralised solutions can help complement grid-based electrification. Both on-grid and off-grid solutions are vital to meet the targets set out in SDGs 6 and 7.

Session objectives

This session will present the latest trends and developments shaping the region comprising:

- an overview highlighting where capacity has been added as well as significant policy and project updates; and
- short deep dives into key countries in the region from local experts.
Regional focus: North America

When Wednesday 15 May 2019 | 12:50 – 13:50 | Mansart

Lead Bill Girling
bg@hydropower.org

What are the business strategies of North American sector leaders?

Hydropower is the dominant source of renewable electricity generation in North America and will continue to play an essential role towards achieving both the Sustainability Development Goals and the targets set out in the Paris Agreement.

Although growth in hydropower in North and Central America remains modest compared to other regions, there is increased focus on pumped storage projects with 510 MW of new installed capacity added in 2017. Around a quarter of this came from pumped storage, to take total installed capacity to 203.1 GW. Hydropower’s role in the clean energy mix will evolve, as more intermittent renewable energy sources such as wind and solar are deployed, particularly in the US.

In Canada, major storage projects under construction include Keeyask generating station in Manitoba, Site C in British Columbia, Muskrat Falls in Newfoundland and Labrador and Romaine-4 in Quebec. In the United States, 140 MW of installed capacity was added through retrofits to existing facilities. Of particular interest for business strategies in North America are the opportunities for power export within the region.

Session objectives

This session will present the latest trends and developments shaping the region including an update on new hydropower capacity and major refurbishments in the region and an overview of major policy updates impacting hydropower such as carbon and environmental policies.
Regional focus: South & Central Asia

When Thursday 16 May 2019 | 12:50 – 13:50 | Eiffel 3
Lead David Samuel
dts@hydropower.org

What will drive growth in South and Central Asia?

With rising power demand and vast water resources, South and Central Asia offers significant hydropower potential. Recent trends show capacity growing by almost 4 GW per year across the region, and a pipeline of projects. India for example recently declared large hydropower as renewable, signifying a major milestone in policy making. Progress has also been made in countries like Tajikistan with its Rogun project in Pakistan where hydropower capacity grew by over 25 per cent last year alone, and in Russia, Georgia, Kyrgyzstan, among other players, where modernisation of existing assets and planned hydro are high on the national agenda.

Regional policies and measures will also help attract investment. Projects to expand cross-border trading, in particular, will help boost hydropower development and market access, such as through bilateral agreements between Bangladesh, Bhutan, India, and Nepal (BBIN) underway in South Asia and the CASA 1000 initiative in Central Asia.

Session objectives

Recent changes at the political level have signalled a will to develop the region’s hydropower potential, while ensuring that existing assets are optimised. What factors will ensure the success of these policies and projects?

This session will present the latest trends and developments shaping the region including:

- an overview highlighting where capacity has been added as well as significant policy and project updates; and
- short deep dives into key countries in the region from local experts.
Regional focus: Latin America

What is driving growth in Latin America?

Latin America remains the second region worldwide in hydropower capacity increase. Led by Brazil, the region accounts for approximately 15 per cent of the world’s installed capacity and generation.

Ambitious government targets to decarbonise the energy matrix foster hydropower development in particular in Ecuador, Peru and Bolivia.

The El Niño meteorological event hit South America heavily in 2017, leaving ten times more rainfall than usual in the west coast while Brazil experienced the fourth consecutive year of drought. Long-distance interconnections between the region’s countries would strengthen the hydropower sector, support the energy transition and are under consideration.

There is increasing need for modernisation of ageing large hydropower infrastructure to extend asset life and boost electricity generation to cope with growing electricity demand.

Session objectives

This session will present the latest trends and developments shaping the region including:

- an overview highlighting the energy transition in the region, and energy planning
- hydropower’s role and contribution into the energy systems in the region supported by OLADE’s projection until 2030
- the need for large-distance transmission lines linked to large-scale hydropower development;
- social and environmental challenges of the sector in the region and analysis of social and environmental controversies raised at international level
- where capacity has been added, project developments and policy updates.

When Thursday 16 May 2019 | 12:50 – 13:50 | Eiffel 1
Lead María Ubierna
mu@hydropower.org
Regional focus: East Asia & the Pacific

What is driving growth in East Asia and the Pacific?

East Asia and the Pacific remains the world’s engine room for hydropower development. Led by China, the region accounts for nearly 40 per cent of world’s installed capacity and annual generation.

Rapid economic growth together with an increasing focus on achieving sustainable outcomes, has helped propel hydropower development in many countries across the region.

Outside of China, which added a further 8.5 GW of capacity last year, Southeast Asian countries including Indonesia, Malaysia and Myanmar have a strong pipeline of projects backed by ambitious government targets.

In the Pacific, Australia is witnessing a flurry of hydropower activity, particularly in pumped storage. Meanwhile, Papua New Guinea has several projects under active development which could transform the country and provide electricity to hundreds of rural communities.

Session objectives

This session will present the latest trends and developments shaping the region including:

- an overview highlighting where capacity has been added as well as significant policy and project updates; and
- short deep dives into key countries in the region from local experts.

When Thursday 16 May 2019 | 12:50 – 13:50 | Mansart

Lead Nick Troja nt@hydropower.org

Session: 16-3C
SPECIAL EVENTS
Networking and acknowledging excellence
Fellow members welcome reception
Tuesday 14 May 13:00-13:45

“Since IHA was formed more than 20 years ago we have championed continuous improvement and sustainable practices in the hydropower sector. Through our Fellow membership, we are seeking to recognise senior professionals who, through their service and commitment, have moved the sector forward and been an inspiration to others.” Richard Taylor Chief Executive, IHA

The association has now more than 75 Fellows from around the world, working together to advance sustainable hydropower by sharing their knowledge and experience.

This special event, organised by IHA, will take place immediately before the opening of the congress. It is an opportunity for fellows of IHA to network and connect with their peers and welcome members of the 2018-2019 intake.

This event is reserved for IHA Fellows. If you would like to know more about Fellow membership, please contact fellows@hydropower.org.

Women in Hydropower: Networking Lunch
Thursday 16 May 12:30-14:00

Gender diversity drives innovation, opens new pathways for technology deployment, brings fresh perspectives to the development of societies and attracts and retains a richer pool of talent.

This networking event, organised in partnership with the Global Women’s Network for the Energy Transition (GWNET), is the first in a series to empower female professionals in the hydropower industry. It will discuss drivers in addressing gender imbalances in the hydropower sector and promoting gender sensitive action around the energy transition to strengthen the entire industry.

To express your interest in this networking event, please email congress@hydropower.org
Event Opening Plenary
When Tuesday 14 May 14:00 – 18:00 | Eiffel 3

Event Reception & Entertainment
When Tuesday 14 May 18:00 – 20:00 | Eiffel 2

Event Congress Dinner
When Wednesday 15 May 19:00 – 23:00 | ticketed

Event IHA Young Researcher Award Ceremony
When Wednesday 15 May | during dinner

Event IHA Blue Planet Prize Award
When Wednesday 15 May 21:30 | during dinner

Event Mosonyi Award for Excellence in Hydropower
When Wednesday 15 May | during dinner
20% off for IHA members

congress.hydropower.org