Technical Competence Center Hydro Power

General Presentation

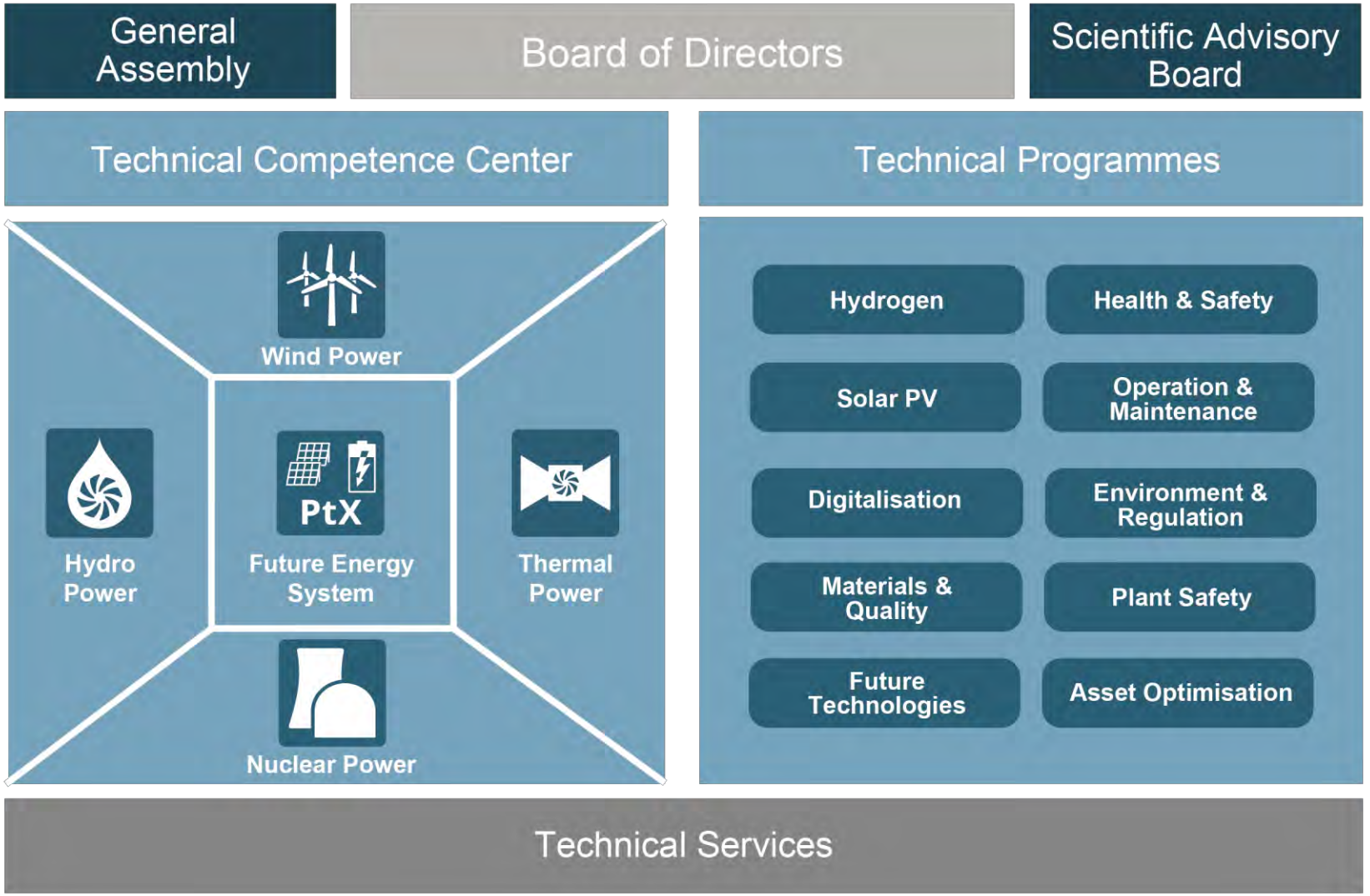
Individual success through exchange of experience

ENERGY IS US

Agenda

1 The Association

The Association



vgbe energy e.V. is the technical association of energy plant operators. Our members are companies that operate power, heat and cooling, energy storage and sector coupling plants worldwide. Since its foundation in 1920, vgbe energy has become the technical center of competence for the operators of power and heat plants.

Currently, vgbe energy has 411 members, comprising operators, manufacturers, and institutions connected with energy engineering. The members come from 29 countries and represent an installed power generation capacity of 342 GW.

2 Technical Competence Center Hydro Power

TCC Hydro Power – Focus

Technical Competence Center Hydro Power

The hydropower sector in Europe is going through a challenging phase, whilst at the same time hydropower provides plenty of opportunities for a safe and stable energy supply.

Technical Competence Center Hydro Power as part of vgbe energy is the first address for interested parties in techno-economic and ecological issues as well as application-oriented research concerning hydropower and maintenance and it performs as the collective European platform and key representative for operators, manufacturers and suppliers of the hydropower community.

In this context, our hydropower community has been sharing experiences and knowledge with a high level of expertise since the year 2000. Currently, more than 250 experts from 77 operators operating 2,000 hydropower plants and 25 equipment suppliers and consultants are actively participating in vgbe's Technical Competence Center Hydro Power and benefit from our offers as a member of the successful hydropower network.

Our slogan for our common work is:
Individual success through exchange of experience

TCC Hydro Power – Competences

be energised
be inspired
be connected
be informed

Focus on operation and maintenance from a techno-economic and ecological perspective as well as application-oriented research

- **Exchanging knowledge and experience**
  - sharing knowledge in various formats and committees
  - connecting subject-specific experts from industry
- **Drafting of technical and operational standards**
  - compiling practice-oriented vgbe-Standards and guidelines considering experiences of operators
  - coordinating the elaboration of international technical standards
- **Supporting in implementation of EU regulations**
  - providing facts and figures to our European partner Eurelectric
  - interpreting EU regulation for practical use
- **Developing industry self-funded technical programmes**
  - organising and managing the programme implementation
- **Co-coordinating and participating in national and international research projects**
  - connecting subject-specific experts from industry and research
  - creating and exchanging knowledge
- **Organizing conferences and workshops**
  - presenting the state of technology and future developments
  - networking and directly exchanging experiences with experts

TCC Hydro Power – Structure

Technical Competence Center Hydro Power

Your Engagement

Steering Forum "Hydro Power"

Committees

TC Hydro "Power Plants"
- WG Hydro "Operation & Maintenance"
- WG Hydro "Performance Analytics RoR"
- WG Hydro "Failure Mode Classification"
- WG Hydro "Health & Safety"

TC Hydro "Ecology & Environment"

Cross-technology Committees
- TC "Fire Protection"
- TC "Network Codes"
- TC "Designation & Documentation"
- WG "OT Security""

TC Hydro "Research & Development"

Expert Groups
- Communication
- Dam safety
- Digitalisation
- Electrical engineering
- Francis turbine
- Generator
- IT security
- Kaplan turbine
- Network codes
- Pelton turbine
- Shut-off devices
- Taxonomy
- Transformers
- Weirs

Current Subjects

Engineering
- Asset optimisation
- Optimization of operations
- Predictive maintenance
- Digitization measures
- Improvement of flexibility
- Environmental management
- Availability and reliability of plants
- Damage analyses

Supporting and broader insights
- Techno-economic benchmarks
- Risk management
- Plant safety
- IT/OT and cyber security
- Hybrid solutions
- Exchange on implementation of EU regulations
- Technical support for advocacy (Eurelectric)

Activities

- Exchange of experiences and information
- Publications
- Collaboration with associations
- Subject-specific expert workshops
- Research projects
- Technical programmes
- Databases
- Standards and best-practice guidelines
- Conferences

TC … Technical Committee WG … Working Group

TCC Hydro Power – Exchange of experience

be energised
be inspired
be connected
be informed

Comprehensive experience transfer and exchange

- operational issues
- techno-economic issues
- environmental issues
- application-oriented research

Networking throughout Europe

More than 250 professionals participating in vgbe energy | Hydro Power committees.

68 Operators

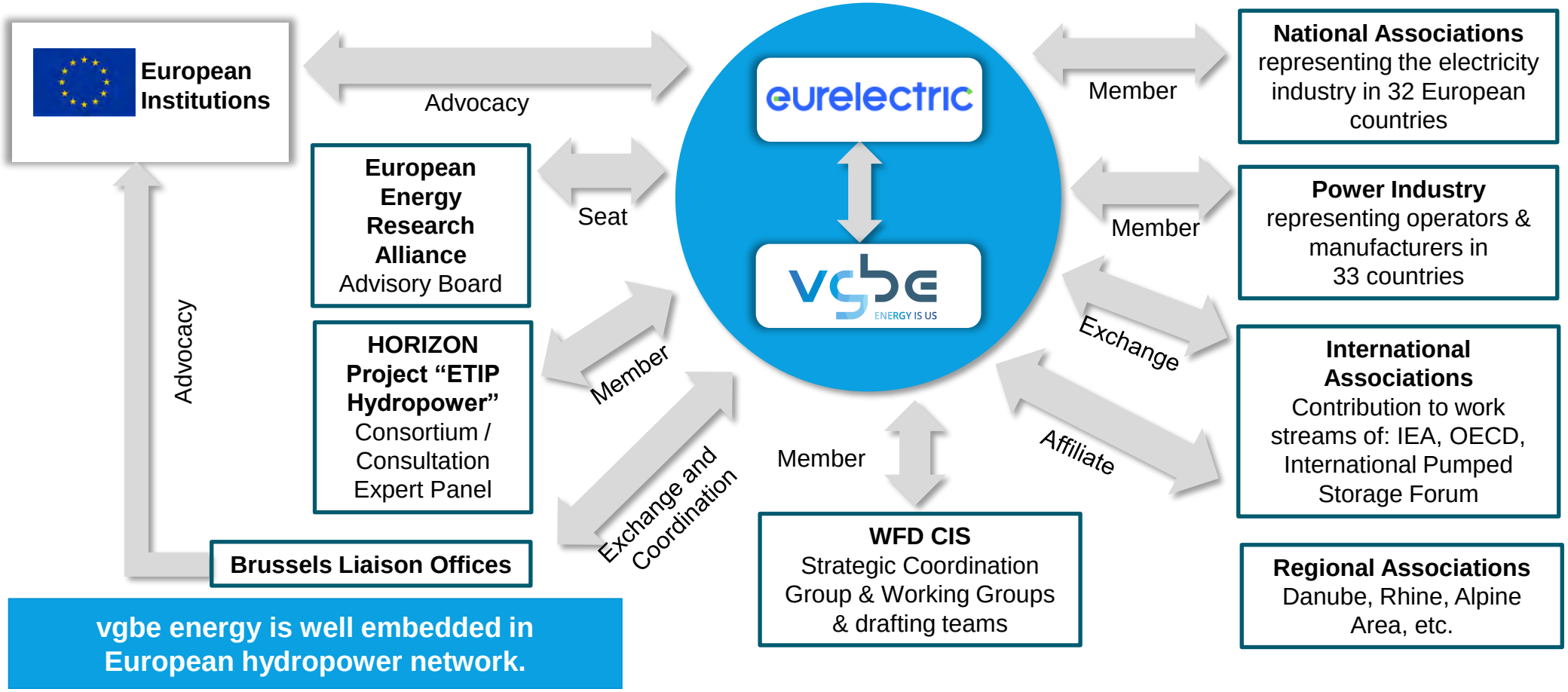
24 Suppliers

vgbe energy drives the practical exchange of experience.

TCC Hydro Power – Network

be energised
be inspired
be connected
be informed

The strength of our European hydropower network



vgbe energy is well embedded in European hydropower network.

TCC Hydro Power – Members

be energised
be inspired
be connected
be informed

77 Operators (29 operators with more than 100 MW)

25 Manufacturers, Suppliers, Consultants and Others

TCC Hydro Power as part of vgbe energy is the first address for interested parties in techno-economic, ecological and application-oriented research concerning hydropower and performs as the collective European platform and key representative for operators, manufacturers and suppliers of the hydropower community.

In this context, our hydropower community has been sharing experiences and knowledge on a high level of expertise since the year 2000. Currently, more than 250 experts from 77 companies operating 2,000 hydropower plants and 25 suppliers and organisations are actively participating in vgbe's Technical Competence Center Hydro Power and benefit from our offers as a member of the successful hydropower network.

3 Committees and Expert Groups

Committees and Expert Groups

Objectives

vgbe energy with its leading role in techno-economic and environmental understanding about good and best practices in the operation and maintenance of hydropower plants offers an exchange between operators on an expert level.

vgbe energy provides a platform for networking knowledge sharing, and professional development among its members to address specific challenges in the wind industry.

Networking

Knowledge sharing

Technical Committees Working Groups

- Regular exchange of operating experience and development of best practice approaches for wind power operators

Expert Group

- Exchange on an as-needed basis on topic-specific issues in the form of consulting experts in this field

Benefits

- **Improve your business**
  Benefit from mutual exchange and support each other through best practices in their professional endeavours.
- **Expand your network**
  Through a topic-specific assignment, you gain access to a valuable and targeted network in your field of expertise.

vgbe's contribution

- Organizing, managing and supporting the work in the committees, working groups and expert groups

Steering Forum “Hydro Power”

Steering the activities in TCC Hydro Power

vgbe contact
Mario Bachhiesl
mario.bachhiesl@vgbe.energy

Main Purpose

The Steering Forum is a platform for networking and exchange of experiences regarding industry challenges of operators and manufacturers. The participants are mainly high-level executives and have a wide overview of:

- Energy market situation in their home country and in Europe
- Techno-economic and environmental challenges for hydropower
- National and European policies

Tasks

- Steering the TCC, focusing on techno-economic and environmental issues and ensuring the exchange of experiences and lessons learned
- Coordination of the interests of the European hydropower sector on management level by synchronising requests, requirements and challenges

Technical Committee Hydro “Power Plants”

Setting priorities for an exchange on techno-economic issues

vgbe contact
Mario Bachhiesl
mario.bachhiesl@vgbe.energy

Main Purpose

The TC Hydro "Power Plants" coordinates the development of practice-orientated results on techno-economic challenges.

Tasks

- Discussion of tasks and results of the Working Groups
- Discussion on techno-economic challenges in hydropower
- Setting priorities for future vgbe activities and their implementation, e.g. with the following focal points.
  - Asset optimisation
  - Optimization of operations
  - Predictive maintenance
  - Digitization measures
  - Improvement of flexibility
  - Techno-economic benchmarks
  - IT/OT and cyber security
  - …

TC Hydro “Power Plants”

- WG Hydro “Operation & Maintenance”
- WG Hydro “Performance Analytics RoR”
- WG Hydro “Failure Mode Classification”
- WG Hydro “Health & Safety”

Working Group Hydro “Operation & Maintenance”

Developing a guideline for a risk-assessed maintenance concept

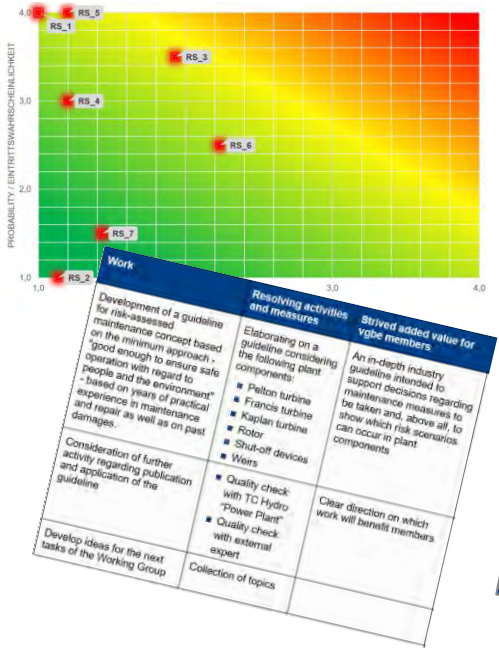
vgbe contact
Mario Bachhiesl
mario.bachhiesl@vgbe.energy

Objective

To elaborate a guide for a risk-assessed maintenance concept based on the minimum approach - "good enough to ensure safe operation with regard to people and the environment" - based on years of practical experience in maintenance and repair as well as on past damage.

The plant components considered a description of 51 risk-scenarios and 37 damage events are:

- Pelton turbine
- Francis turbine
- Kaplan turbine
- Generator
- Shut-off devices
- Weirs



Benefits

Overview of possible technical risks of subcomponents,
so that members can inspect them in more depth if necessary.

Working Group Hydro “Performance Analytics RoR”

Developing a technical benchmark with time- & energy-based KPIs for evaluating the performance of run-of-river power plants

vgbe contact
Stefan Prost
stefan.prost@vgbe.energy

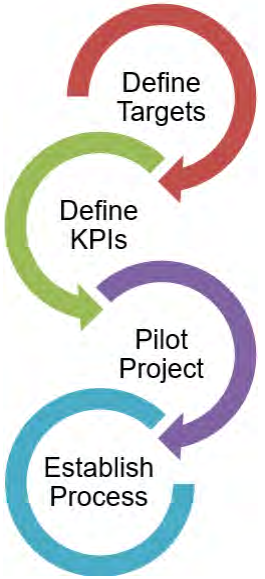
Objective

This Working Group develops a technical benchmark with time-based and energy-based KPIs for evaluating the performance of run-of-river power plants. For this purpose, corresponding definitions were viewed, edited, developed or included in the existing vgbe-Standard. In total 41 technical KPIs including 8 time-based and 8 energy-based KPIs have been developed.

Benefits

With a harmonised KPIs database, technical benchmarks can subsequently be carried out for run-of-river power plants:

- Installing a process for data collection and data evaluation
- Providing the key performance indicators
- Making anonymised aggregated statistics available
- Enabling members to evaluate their assets with an international pool of run-of-river power plants



Indicator	Formula
Standard Utilisation	$n_{wr} = \frac{W_B}{W_{HR}}$
Energy Capability Factor	$n_{w\,ecf} = \frac{W_H}{W_{HR}}$
Flow Coefficient	$n_Q = \frac{Q}{M_Q}$
Energy Utilisation	$n_w = \frac{W_B}{P_E * t_N}$ *or* $\frac{W_B}{P_N * t_N}$
Energy Availability	$k_w = \frac{W_v}{W_N} = \frac{W_N - W_{nv}}{P_N * t_N}$

Working Group Hydro “Failure Mode Classification”

Developing a vgbe-Standard on Failure Mode Classification to increase resilience of the hydro industry enabling data sharing between utilities

vgbe contact
Mario Bachhiesl
mario.bachhiesl@vgbe.energy

Objective

The scope is to classify failure modes of hydroelectric components in mechanical systems and civil works. The mandatory failure mode classification enables integration across systems and organizations and is represented using fault trees – graphical tools that illustrate conditions leading to a defined "top event”. In total 463 failures have been classified.

Benefits

The corresponding code of the failure mode shall be used for each:

- Unavailability classification
- Outage report
- Root cause analysis
- Planned maintenance check classification
- Component health status
- Risk analysis
- Maintenance dashboard
- Best practice sharing
- Predictive alerts and notification

Classification scheme

Character position									
1	2	3	4	5	6	7	8	9	...
Matching code									
F	T	A	M	0	char	char	number	char	char
Origin									
Custom for failure mode classification			IEC 61850 Hydro Data Model		IEC 61850 Hydro Data Model			Custom with alphanumeric character	
Description									
Fixed FTA code to define the code is a Failure Mode: always **FTA**			Reserved for principal node; code derived from IEC61850 and related to Power plant Unit: always **M0**		Reserved for first failure node: e.g. Waterway cannot supply flow **LNO**			Every subnode will add a character in the String range A-Z	Every subnode will add a character in the String range A-Z

Working Group Hydro “Conformity Assessment”

Revision of the vgbe-Standard on Interaction of Conformity Assessment and Industrial Safety in Hydropower Plants

vgbe contact
Jens Ganswind
jens.ganswind@vgbe.energy

Objective

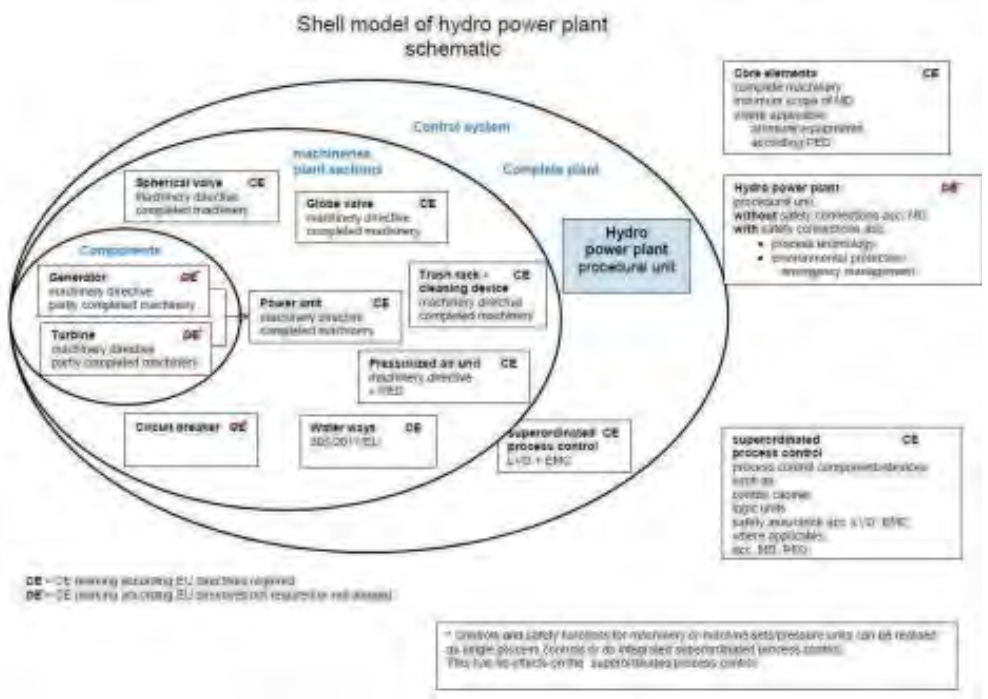
The scope is to provide employers a reference framework for making safe work equipment available in the field of hydropower, which indicates what concrete statutory requirements have to be observed.

Benefits

In the case of new plants the assurance of a uniform procedure for the implementation of the product and industrial safety directives in the contractual relationship between employer and contractor and for plant manufacture in the responsibility of the employer. This finds expression among other things in the CE marking and in scope and delivery dates of the documentation to be supplied.

In the case of modifications to plants the identification and observance of the statutory requirements of the Directive on the introduction of measures to encourage improvements in the safety and health of workers / Directive on the use of work equipment, with regard of specific requirements of the Product Safety Directives.

Shell model of hydropower plant, schematic representation



Working Group Hydro “Health & Safety”

Exchange of information, experiences and lessons learned from measures regarding H&S issues

vgbe contact
Gregor Lipinski
gregor.lipinski@vgbe.energy

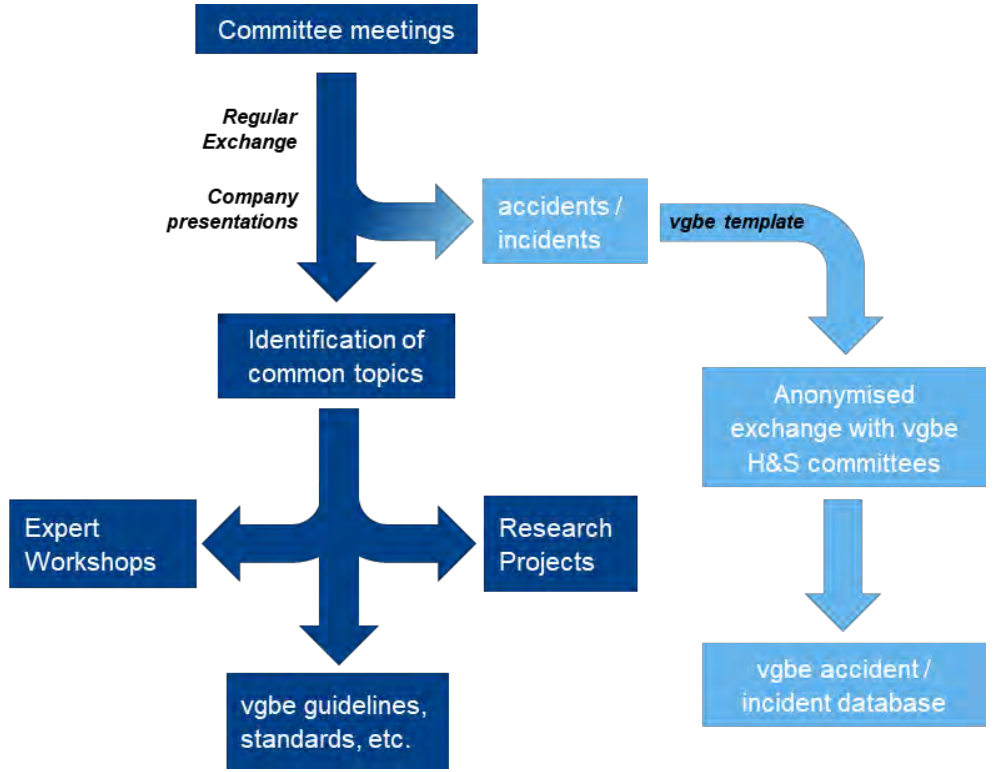
Objective

The aim of the activities of the WG Hydro “Health and Safety” is the exchange of information, and in particular of experiences and findings from measures on H&S topics.

Benefits

Exchange of information and experiences regarding:

- Hands-on solutions
- H&S management-related topics
- Discussion of current issues
- Identification of common topics
- Sharing information about accidents/incidents



Technical Committee Hydro “Ecology & Environment”

Setting priorities for an exchange on ecological and environmental issues

vgbe contact
Lee Estrellado
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Objective

This TC coordinates the development of practice-orientated results on ecological and environmental challenges. They take part in an exchange of information and experience on environmental and ecological issues, they report on experiences from ecological measures implemented and they clarify the effects of the implementation of regulations.

Benefits

- Discussion of tasks and results of the Working Groups
- Discussion on ecological and environmental challenges in hydropower
- Setting priorities for future vgbe activities and their implementation, e.g. with the following focal points
  - Erosion and sedimentation
  - Climate change adaptation
  - Water use and allocation
  - Fish migration
  - Habitat disruption
  - …….

Technical Committee Hydro “Research & Development”

Benefit from the results from various research projects

vgbe contact
Mario Bachhiesl
mario.bachhiesl@vgbe.energy

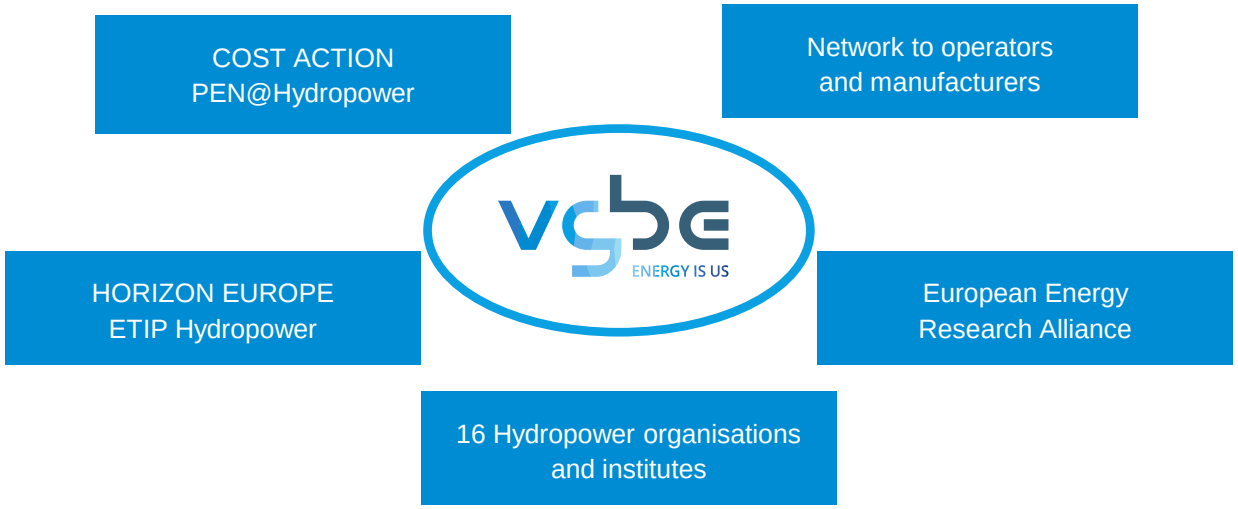
Objective

The main objective is to learn and benefit from the results of the research projects and to gain additional valuable information for operation and maintenance.

Benefits

- Gaining an overview of completed, ongoing and planned research activities of the vgbe’s hydropower members
- Exchange of experiences and lessons learned from the research projects
- Further developing an extensive partner network
- Recruiting project partners and/or self-participation in research projects

vgbe’s network in the research landscape



Technical Committee “Network Codes”

Monitoring of the European Process at the interface Power Plant Grid and identifcation of topics with the need of vgbe/Eurelectric-Input, Exchange of Experience, Networking

vgbe contact
Rainer Fronius
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Objective

The TC sees itself as a cross-technology committee. Coordination with the topics and activities at the interface to the grid from the areas of all generation technologies.

Benefits

- Collaboration and representation of vgbe in the European Stakeholder Committees (ESC) as an active independent stakeholder for the implementation of the Connection Codes and Operational Codes
- Coordination, collaboration, and representation of vgbe in the Expert Groups (EG`s) for RfG (Connection Codes)
- Technical Expertise, active contributions to consultations, workshops, stakeholder meetings of ACER, Entso-E and others“
- Follow-up of the national implementation: Exchange of National procedures and the solutions, support with arguments against unacceptable decisions

Cross-technology Committee

Technical Committee “Designation & Documentation”

Setting standard in the field of designation and documentation

vgbe contact
Andreas Böser
andreas.boeser@vgbe.energy

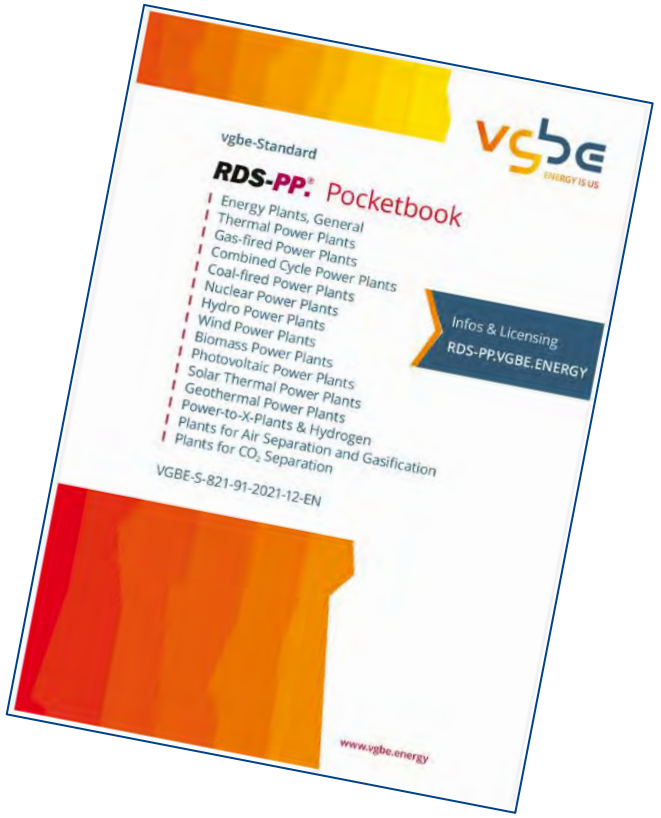
Objective

The TC “Designation & Documentation“ develops and maintains the vgbe Standards for the tasks of Reference Designation and Documentation.

Support for user questions on topics relating to Reference Designation and the application of the corresponding vgbe guidelines.

Benefits

- Discussion of tasks and results of the Working Groups
- Further development of guidelines in the field of designation and documentation
  - Abbreviations for power supply units
  - Document Designation
  - Provision of Technical Documentation
  - RDS-PP and KKS
  - Application Guidelines for power supply units



Working Group “OT Security”

Status, development and implementation of European and German regulations and standards as well as research on developments in the field of IT/OT security

vgbe contact
Thomas Eck
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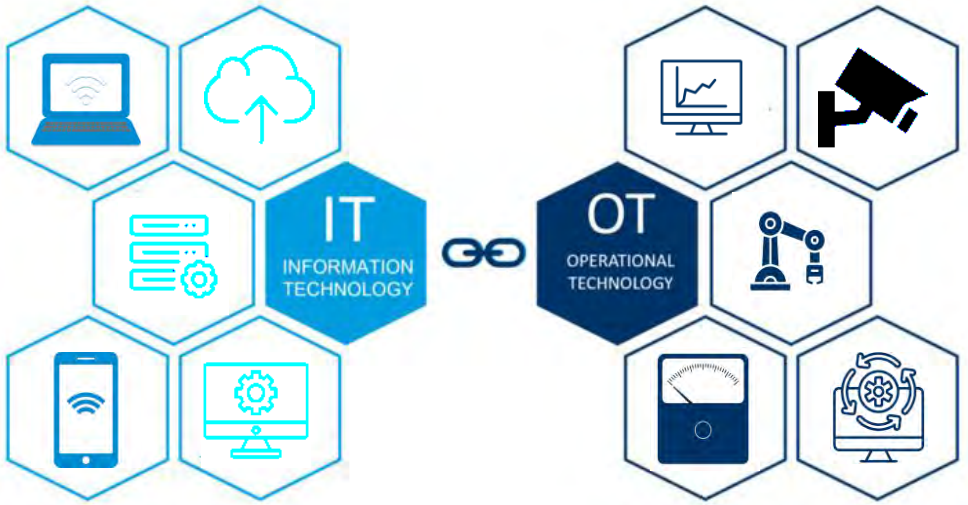
Objective

Support of the member companies, in particular the KRITIS-companies in the increase of the IT-/OT-Security and the implementation of the legal and official regulations.

Benefits

- Ensures unified risk assessments and enhances incident response by addressing both IT and OT vulnerabilities
- Breaks down silos between IT and OT teams, fostering knowledge sharing and coordinated security efforts
- Strengthens threat detection, reduces attack surfaces, and supports compliance with industry-specific regulations and standards
- Exchange on NIS-2 Directive, KRITIS DG, AI use in components



Technical Committee “Fire Protection”

Status, advancement and harmonised implementation of fire and explosion protection systems, culture, regulations and incident learning

vgbe contact
Lukas Biesen
lukas.biesen@vgbe.energy

Objective

Support of member companies in strengthening fire and explosion protection, ensuring regulatory compliance, and promoting best-practice implementation and incident learning across the energy sector.

Benefits

- **Regular expert exchange** with additional topic-focused working groups.
- **Incident learning** through a planned database to facilitate sharing of accidents and near-misses, strengthening prevention and operational resilience.
- **Practice-oriented knowledge sharing** to optimise fire prevention, detection, and suppression strategies in diverse generation, storage, and grid environments.
- **Advancing standards** by updating existing documents, developing new ones, and supporting harmonised industry practices.

Expert Groups

Contact the experts with practical experience with your questions

vgbe contact
Mario Bachhiesl
mario.bachhiesl@vgbe.energy

Objective

The Expert Groups are a pool of experts made up of vgbe members with experience from operators and manufacturers and form the backbone of the network in vgbe energy.

The Expert Groups meet on an ad-hoc basis depending on the topic at hand.

- Exchange on technical issues
- Development of concepts
- Preparation and provision of facts on positions and recommendations

Benefits

- Receive knowledge from experts with practical experience

Our Expert Groups are

- Communication
- Dam safety
- Digitalisation
- Electrical engineering
- Francis turbine
- Generator
- IT security
- Kaplan turbine
- Network codes
- Pelton turbine
- Shut-off devices
- Taxonomy
- Transformers
- Weirs

4 Services and Products

Technical Programmes

Objectives

vgbe energy with its leading role in understanding good and best practices in hydropower operation and development launches different Technical Programmes in cooperation with its members.

These programmes are part of the comprehensive activities of vgbe energy for the hydropower sector to support the daily work in operation, maintenance and plant optimisation as well as in techno-economic, environmental and strategic challenges. Therefore, the programmes are open for vgbe members as well as vgbe non-members.

Database

Industry funded projects

Some Technical Programmes

- Cost comparison for run-of-river power plants
- Operations management comparison for storage and pumped storage power plants
- Digitalisation barometer for hydropower operators
- …

Benefits

- **Management of industry funded projects**
  vgbe energy initiates, coordinates and/or conducts industry funded projects together with scientific partners.
- **Development and management of databases**
  vgbe energy develops databases or IT-based tools to support the optimisation of operation and maintenance.

vgbe's contribution

- Initiating and coordinating industry-funded projects (e.g. description of the programme, contracts and organizing the meetings)
- Developing databases (e.g. description, implementation, recruiting of participants, hosting and operation)

Research Projects

Objectives

vgbe energy offers collaborative research activities to meet new challenges. In these projects, manufacturers and operators, universities, research institutes and the public sector pool their specific know-how and financial resources.

- Initiation and coordination of national and international research projects
- Building up of know-how and knowledge transfer

Research project

Some Research Projects

- ETIP Hydropower
- PanEuropean network for sustainable hydropower
- Reliable reinforcement learning for sustainable energy systems
- Innovative and ecological approach for dam restoration

Benefits

- **Improved funding opportunities**
  Higher likelihood of being awarded a contract due to our network with various stakeholders and institutions.
- **Expertise in submission phase**
  Benefit from vgbe's expertise in developing a dissemination, exploitation and communication plan and market uptake plan for submission.
- **Dissemination network**
  Events and conferences across Europe, partner organizations and editors of journals.

vgbe's contribution

- Recruiting project partners and/or self-participation
- Co-coordinating the submission proposal
- Responsible for different WPs (e.g. DEC, Market uptake, Upscaling strategy)

vgbe Expert Workshops

Objectives

vgbe energy organises topic-specific expert workshops for vgbe members only to foster exchange and problem-solving between experts with extensive practical experience.

The Expert Workshops are targeted at operators that are vgbe members and require an active participation according to the policy **“Give and Take”.**

Therefore, it is mandatory to give a presentation in order to join the active discussion and benefit from the experience of the other participants.

Networking opportunity

Topic-specific workshops

Some Expert Workshops

- Workforce management
- Digital documentation system
- Underwater inspection
- Sensors and diagnosis systems for generators
- Grid integration of large renewable capacities
- Data management and evaluations as well as structures for predictive analytics
- …

Benefits

- **Proactive approach**
  Overcome emerging challenges before they become an issue at your company.
- **Expert talks**
  Discuss with experienced and specialized experts.
- **Train young professionals**
  Take the opportunity to train your young professionals on specific topics through exchanges with experienced industry experts.
- **Documentation**
  Presentations available to all members.

vgbe’s contribution

- Organizing the expert workshops

vgbe Expert Workshops #HydropowerHighlight

Intensify exchange of experiences through topic-specific Expert Workshops

Title	Category
Sensors and diagnosis systems for generators	Operation
Digital documentation management system	Management
Underwater inspection	Operation
Surveillance and maintenance concepts for dams and refurbishment of the water side of concrete dams	Maintenance
Practical experiences of EU Taxonomy reporting in the hydropower sector	Concept
Used parameters for condition assessment of transformers and generators	Maintenance
Sensors and diagnosis systems for turbines	Operation
Evaluation of redispatch for PSP	Operation
Plant Documentation - From paper to digital documentation	Concept

Title	Category
Condition Monitoring System (CMS) for auxiliary systems	Operation
Data management, evaluations and structures for predictive analytics	Maintenance
Examples of applications and use of artificial intelligence	Operation
Workforce management	Operation
Lifespan evaluation and criteria for cables, generators, turbines and transformers	Operation
Maintenance concepts after refurbishment and modernisation	Operation
How prepared are you for a total blackout?	Operation
Sediment management in rivers and reservoirs	Ecology
Climate change and its consequences in the hydropower sector	Ecology

So far since 2022
21 Expert Workshops
490 Participants

All presentations and take aways are available for vgbe members.

vgbe Expert Events

Objectives

vgbe energy organises Experts Events for vgbe members and non-members to foster exchange and networking between experts.

The Expert Events are planned by vgbe energy in cooperation with its members and cover a broad variety of applications that include established and emerging technologies for energy generation and storage.

Networking opportunity

Knowledge transfer

Some Expert Events

- River Management and Ecology
- Digitalisation in Hydropower
- Innovations in Hydropower Plants Operation and Maintenance

Benefits

- **Onsite Expert Events**
  Challenges, problems and questions can sometimes be better addressed in a relaxed onsite atmosphere. Deeper exchange and increased learning effects improve the benefits for all participants.
- **Online Expert Events**
  Online events enable a location-independent exchange of information with the flexible option of participating in sessions. The costs and time required are significantly lower (no travel).
- **Documentation**
  Presentations available to all participants.

vgbe's contribution

- Organizing the expert events including moderation

vgbe Expert Events
#HydropowerHighlight

Direct exchange of experiences with experts, subject-specific events, and the latest information on the state of technology. Reduced registration fee for vgbe members.

- **Expert Event “Digitalisation in Hydropower“**
  The international Expert Event will provide a comprehensive overview of all topics regarding digitalisation in hydropower dealing mainly with the results of newly developed and implemented innovative digital measures, products and tools.

- **Expert Event “River Management and Ecology“**
  This Expert Event will focus on environmental protection and the balance between the development of hydropower and the preservation of the environment, which requires innovative solutions, sustainable practices and joint efforts to ensure long-term energy and environmental stability.

- **Expert Event “Innovations in Hydropower Plant Operation and Maintenance“**
  This Expert Event will explore innovative strategies for operating, maintaining, and inspecting hydropower facilities to optimise performance, reduce costs, and enhance reliability through informed decision-making and shared industry insights.

Discount for vgbe members and all presentations are available for vgbe members.

vgbe-Standards

Objectives

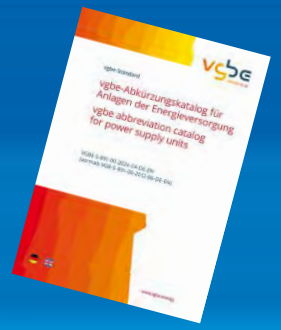
vgbe-Standards are guidelines, specifications or best practices that serve as a common framework in the wind energy sector. These standards are developed and agreed upon by experts, organisations, and stakeholders within the industry to ensure uniformity, quality, safety, and interoperability.

This may involve terminology, structural measures, plant-specific features, fire protection measures or even operational aspects.

vgbe-Standards

Some vgbe-Standards

- Hydropower – Definition and Indicators (DE/EN/FR)
- Operational safety in electro-technology (DE/EN)
- Conformity assessment and health and safety in hydropower plants (DE/EN)
- …



Benefits

- **Quality Assurance:** Standards help ensure that services and processes meet established quality and performance criteria.
- **Safety:** Safety regulations and guidelines help to reduce risks and prevent accidents.
- **Interoperability:** Standards enable different products or systems to work together smoothly. This is particularly important in fields like technology and communication, where compatibility is crucial.
- **Cost Reduction:** Standardized processes can lead to cost savings through economies of scale and reduced complexity.

vgbe's contribution

- Initiating and coordinating (Initiation of a working group, engagement of external experts, contract formulation, session organisation, publication)

vgbe Publications

Objectives

Our publications serve as a platform for sharing valuable knowledge, insights, and expertise within the association and updates on the latest developments, trends, and best practices in hydropower and produces a range of publications on hydropower's role, new trends and developments in the sector.

Networking opportunity

Knowledge transfer

Some Publications

- 2023 Hydropower Industry Guide
- 2023 Hydropower in Europe: Facts and Figures
- 2021 vgbe Interpretation Note: EU Taxonomy & Hydropower: Criteria on Climate Change Mitigation and Adaptation

Benefits

- **Knowledge Sharing**
  Be always up-to-date with the facts, products, services and overviews in the hydropower sector.

vgbe's contribution

- Creating, managing, and disseminating content to its members and the broader community

5 Contact

Benefit from our expertise – Get in touch with us

be energised
be inspired
be connected
be informed

Your contact

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Technical Competence Center Hydro Power

Performing as the collective European platform for hydropower operators, manufacturers and suppliers

Being the first address for interested parties in techno-economic and ecological issues as well as application-oriented research

Serving as an information hub and key representative for the hydropower community in Europe