Hydropower Activity Overview

Key goals:
• Increase the HP electricity production under changing demand, climate and operating condition by 3160 GWh (after investment to respect the law for residual water: -1400 GWh)
• Ensure maintenance, improvement and operation of the infrastructure in the long term future

Innovation technologies
• Glacier ice thickness survey: new glacier lakes
• Sediment evacuation systems
• Impulse waves assessment and dam safety
• Cascade reservoir flushing concept
• Reduce water losses, friction in water ways
• Optimum environmental flow
• Enhanced operating range hydro units: variable speed, predictive maintenance.
• Energy harvesting micro turbines (Duo-Turbo)
• HP design under uncertainties

Innovative integrated solutions
• Robust and flexible HP projects
• Increase of operation flexibility at existing HP
• Services to the grid: transient & part load
• Mitigation of cavitation, sedimentation and abrasion
• Safety of steel lined pressure shafts for rough operation
• Intake design for control of air entrainment and floating debris; optimum location for sediment transfer
• Dam heightening: spillways/bottom outlets and structural safety
• Impact of hydro- and thermo-peaking; innovative measures
• Improved environmental flow criteria

Forecast modeling of water and sediments with climate change – HP system optimization

Phase 1-2

Phase 3
New innovation technologies and turbine developments

New Large HP Plants: +1'430 GWh until 2050
New Small HP plants: +1'600 GWh until 2050
Retrofit PP: +1'530 GWh until 2050