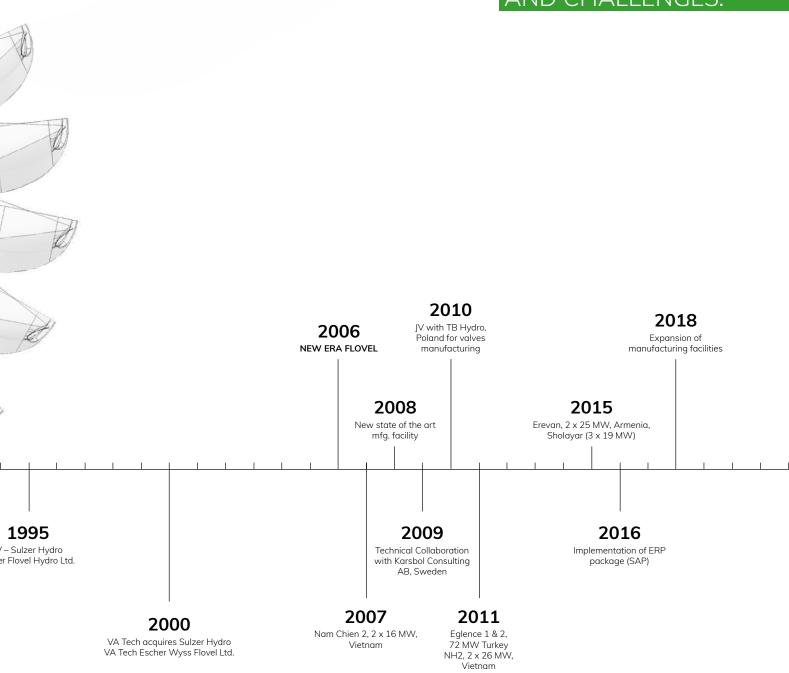


Collaboration, Tempella, Finland

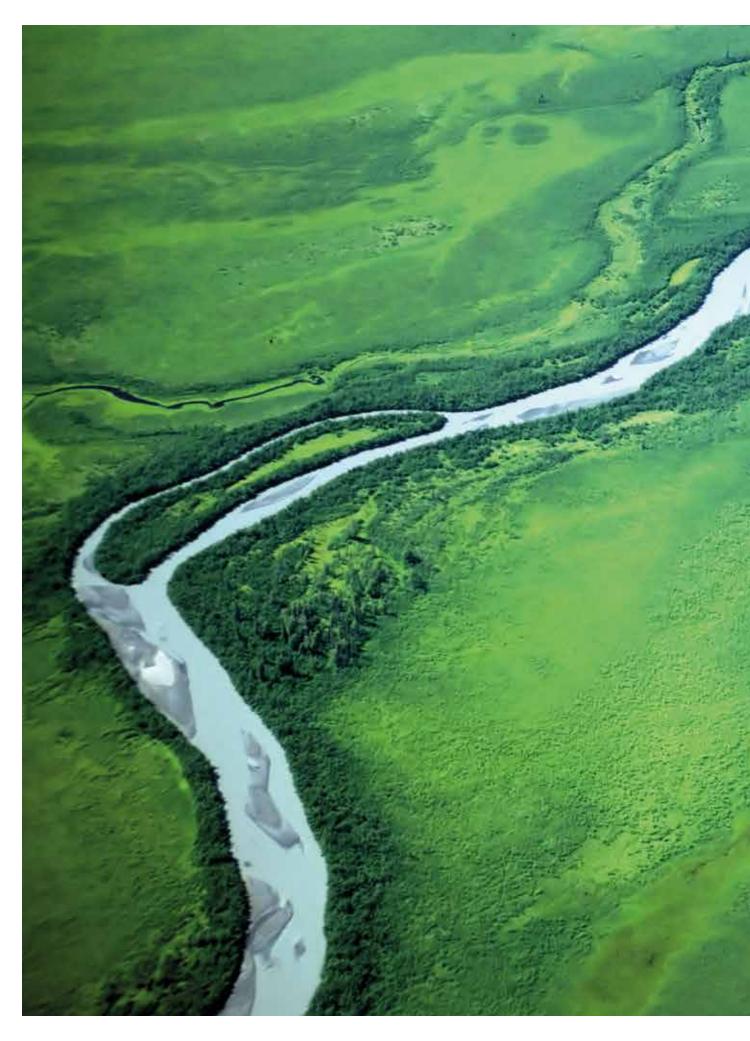


OUR JOURNEY LEADS US THROUGH MANY DECADES OF OPPORTUNITIES AND CHALLENGES.











OPPORTUNITIES WITH HYDRO-POWER

HYDROPOWER OFFERS

It is estimated by historians that waterpower was used about 5,000 years ago. In earlier years the mechanical energy was used directly. Today the same energy is transformed into electrical energy with generators. Waterpower plants exist since about 100 years. More than 16% of the total worldwide electricity is generated by hydropower. Hydropower is the most attractive and efficient renewable energy source on the planet.

Population increase, urbanization and increasing energy demands are exhausting the conventional energy sources. Climate change is making people rethink about how to protect our planet and the focus today is on renewable energy sources.

In recent decades, FLOVEL has been delivering highly efficient and cost effective solutions for Hydropower plants, using highly innovative and reliable operating technologies. We have executed more than 245+ hydropower projects around the world, delivering 5,000+ MW hydropower capacity. We are helping shape the future with one of the most efficient and sustainable ways to generate energy: HYDROPOWER.

WORLDWIDE HYDROPOWER FACTS
Unexploited technically feasible
In operation
Unexploited technically and economically feasible
知道在4、一种一个一个
Hydro capacity in operation ~ 1,170 GW
Hydro capacity under construction ~ 145 GW
Hydro capacity planned at least 319 GW
Figures in %

North & Central America	South America	Europe	Africa	Asia	Australasia / Oceania
44,8	39,6	28,7	31,7	40,2	52
37	23,4	48,8	7,5	24,1	21,5
18,2	37	22,5	60,8	35,7	26,5
15,3	13,7	17,2	2,8	49,8	1,2
4,5	18,9	3,1	14	59,4	0,1
8,2	12,6	2,2	15,9	61	0,1

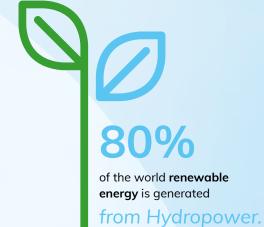
Source: The international journal on Hydropower & Dams, 2017





100% commitment of FLOVEL towards Hydropower.





1998

2008

Hydropower is the **biggest** and cheapest renewable energy source of the world.





~50% share of Hydropower of electricity production in 35+ countries.

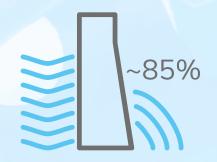
regional growth centres and local jobs.

RENEWABLE ENERGY



share of Hydropower

in the total world electricity supply.



dams in the world

are not used for Hydropower generation.



most efficient

Hydroeletric powerplants are the most efficient technology to produce electricity. Zero consumables, long-life, endless supply, low recurring cost.

THE CONTINUOUS
OPERATION OVER DECADES
GUARANTEES HIGH PROFIT.

 CO_2

Small hydropower has no CO₂ emissions, which would be produced from other energy sources.

This is an important contribution to the climate protection.



No resources are wasted and the nature is not polluted with waste products.



unlimited

Waterpower is an unlimited energy source.



noiseless

Waterpower plants are noiseless.

WELL ENGINEERED TECHNOLOGIES ENSURE RELIABLE FUNCTIONING AND

ONG LIFETIME.







As manufacturer of Hydraulic Turbines and Valves, we are a full line supplier of Electromechanical Equipment & Services for small & medium Hydropower projects including Renovation, Modernisation, Upgrading and aftermarket services for existing power plants.

We provide turnkey Hydro Power Solutions – with cohesive integration of design, manufacturing, execution and service support. With our incessant focus on quality and total customer satisfaction, we have set new benchmarks in 'implementation finesse' that have translated into sustainable benefits for our customers.

DELIVERING EXCELLENCE

THE STRENGTH OF FLOVEL IS TO OFFER WATER-TO-WIRE PACKAGES FOR



S&M Hydro Small & Medium Hydro (up to 60 MW units)



RenServ (Renovation, Modernisation and Upgradation)

Design &
Engineering
Manufacturing

Cutting Edge Technology Modern Machinery & Facilities

Highly Skilled Personnel Stringent Quality Checks & Processes

Advanced Solutions

- **» Safety:** Optimum Technology deployment for infallible safety and reassuring reliability
- **» Performance:** Higher plant availability, system efficiency and Lower downtime

RELATIONSHIPS WORLDWIDE

OUR PRINCIPLE IS TO BE
CLOSE TO THE CUSTOMER

– ALWAYS AND EVERYWHERE.





245 projects executed across 12 countries



THERE IS COMMITMENT IN THIS RELATIONSHIP.

At FLOVEL, customer comes first. We work closely with our customers to deliver optimal solutions by deploying cutting-edge technologies. Our custom-solutions are tailored for maximum performance and reliable operations. We build sustainable relationships by exceeding customer expectations, bringing the advantage on your side.



ADVANTAGE ON YOUR SIDE

CONTRACTING

- » No hidden clauses
- » Dedicated point of contact

SOLUTION DEVELOPMENT

- » Collaborative approach
- » Fully equipped, technologically advanced design facilities

PRODUCT MANUFACTURING

- » State-of-the-art manufacturing facilities
- » Global standard quality checks & processes

PROJECT IMPLEMENTATION

- » On-time as guaranteed delivery
- » Faster response time to issues

POST-IMPLEMENTATION

- » High plant availability
- » Quick response to any issue

Single source responsibility

Senior management involvement

Safe and high-performance products

Within budget, on-time delivery

Lower Cost of Ownership translating into higher returns

Profits & Peace of Mind

Manufacturing facility

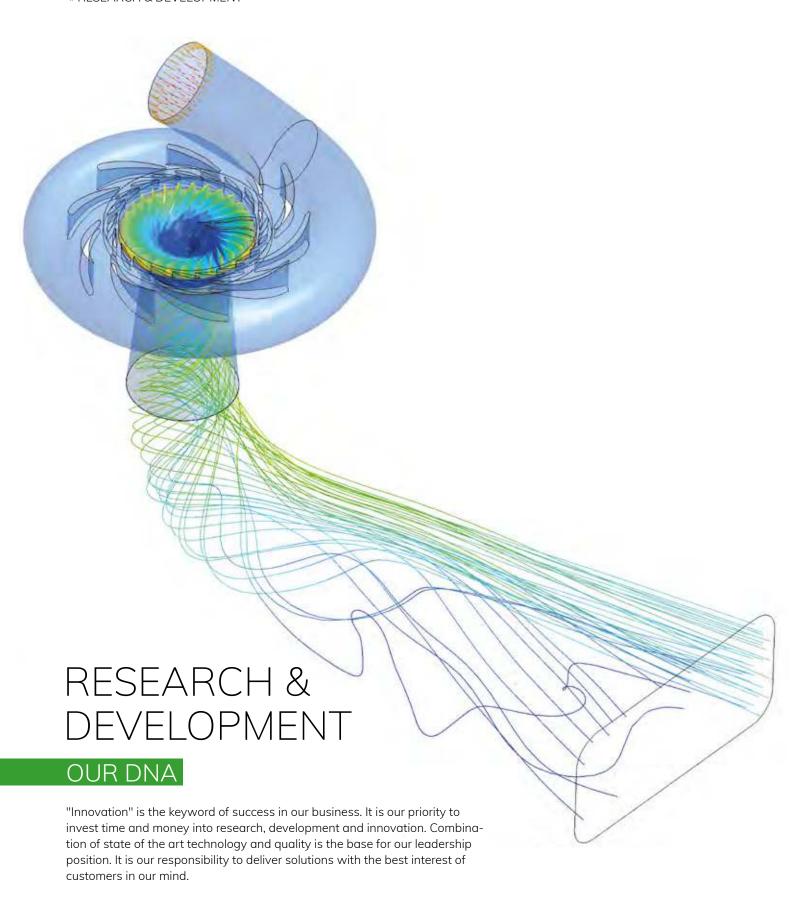


FLOVEL is certified for Integrated Management Systems, which includes ISO:9001, ISO:14001, OHSAS 18001 and CE Certification



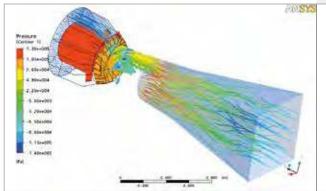


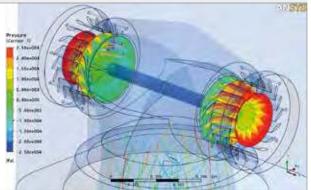




CFD

Tools to accurately predict flow characteristic. CFD is used to improve hydraulic design of turbine water passages, including the runner and static components. For renovation projects CFD is a very important tool for improving turbine output, efficiency and cavitation characteristics.







FEM

Finite element method (FEM) tools for calculating stresses, strains and deflections in components of a hydraulic turbine.

MODEL TEST

Should the customer require a model test to be performed, FLOVEL is equipped to have a model test conducted at an accredited / independent model testing laboratory.

KARSBOL CONSULTING AB., SWEDEN

» Karsbol is a world leading technology provider for hydraulic turbines based out of Sweden. Karsbol specialises in research and development and design of Pelton, Francis, Kaplan and Axial Flow units.





A GOOD JOB FOR AN EXCITING MARKET

FLOVEL's key personnel and co-workers in all functions are among the best in the Country with right educational qualifications and vast experience in their respective field and trained at various international locations to work to global standards. FLOVEL has a total strength of more than 300 people who by their knowledge, experience and innovative approach assure a competitive edge to the market and to a long term development of the company.















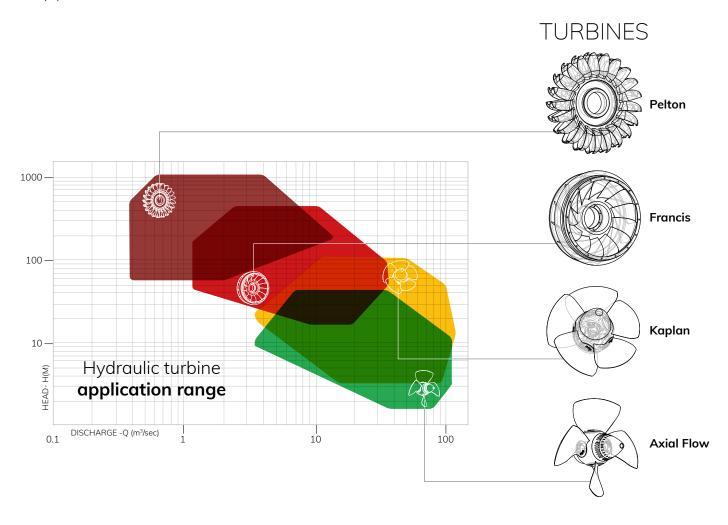


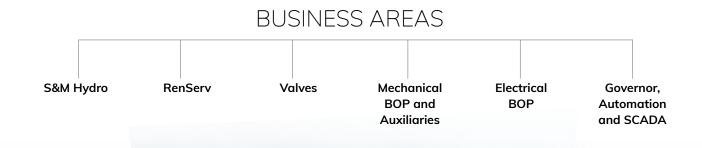




PRODUCT OVERVIEW

It is our commitment to produce quality in all spheres of operation. FLOVEL is a single source supplier and integrator of all components of hydropower plants including inlet valves, hydraulic turbines, generators, control systems, switchyard equipment and much more.

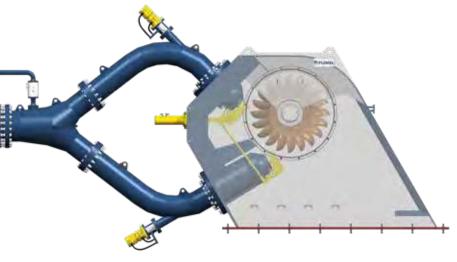


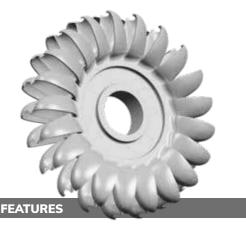


PELTON TURBINES

for high head applications

Pelton Turbine is an impulse turbine used primarily for applications with high head and small flows. FLOVEL's Pelton turbines are based on decades of know-how and state-of-the-art technology. These Pelton turbines guarantee the highest operating efficiency and reliability.





- » Fully Forged or Cast runner
- » Runner mounted on extended shaft of the generator
- » Full unit assembled in factory and shop tested
- » Internal or external Servomotor options
- » Simple interface with civil works
- » Guarantees for efficiency based on model test

Application Range:

- » Heads up to 1,000 Meters
- » Horizontal axis (1 to 3 jets)
- » Vertical axis (2 to 6 jets)

FRANCIS TURBINES

for medium head applications

Francis Turbine is a reaction turbine used primarily for applications with medium head and large flows. FLOVEL's Francis turbines are based on decades of know-how and state-of-the-art-technology. These Francis turbines guarantee the highest operating efficiency and reliability.

FEATURES

- » Weld fabricated or Forged runners
- » Library of 40 models available to choose from
- » Guarantees for output, efficiency and cavitation based on model test
- » Runner mounted on extended shaft of the generator
- » Common base frame concept for horizontal units

Application Range:

- » Heads up to 450 Meters
- » Horizontal or Vertical axis
- » Steel or Concrete Spiral

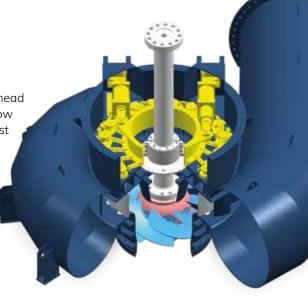


KAPLAN TURBINES

for low head applications

Kaplan Turbine is a reaction turbine used primarily for applications with low head and large flows. FLOVEL's Kaplan turbines are based on decades of know-how and state-of-the-art technology. These Kaplan turbines guarantee the highest

operating efficiency and reliability.



FEATURES

- Oil free runner hubs
- » Internal or external Servomotor option
- Maintenance free water-lubricated guide bearing
- Blade dismantling without runner removal
- » Library of 20 models available to choose from
- Guarantees for output, efficiency and cavitation based on model test

Application Range:

- » Heads up to 70 Meters
- » Runners with 3 to 8 blades
- Double or Single regulated
- » With or without Gearbox
- Steel, Concrete Spiral or Syphon Intake

FEATURES

- Library of 20 models to choose from
- Oil free runner hubs
- » Internal or external Servomotor option
- Maintenance free water-lubricated guide bearing
- Blade dismantling without runner removal
- Guarantees for output, efficiency and cavitation based on model test

Application Range:

- Heads up to 35 Meters
- Runners with 3 to 6 blades
- » Double or Single regulated
- With or without Gearbox
- » Horizontal, Diagonal or Vertical orientation

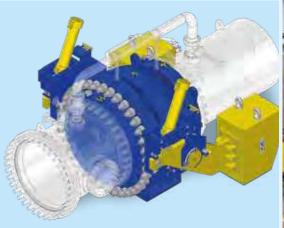
AXIAL FLOW TURBINES

for very low head applications

Axial Flow units are used primarily for applications with low head and large flows. FLOVEL's Axial Flow units are based on decades of know-how and state-of-the-arttechnology. These Axial Flow units quarantee the highest operating efficiency and reliability.









VALVES

FLOVEL manufactures full range of Valves under its joint venture with TB Hydro, Poland. These valves are manufactured by JV company TB Hydro Flovel Valves Private Limited.

TYPES

- » Butterfly Valves
- » Spherical / Ball Valves
- » Pressure Relief Valves etc.





MECHANICAL BOP & AUXILIARIES

SCOPE

- » Oil Pressure System for turbine, MIV & PPV
- » Cooling Water System
- » Drainage System
- » Dewatering System
- » Crane
- » Fire Fighting System
- » Ventilation & Air Conditioning System
- » Compressed Air System
- » Bearing Lubrication System
- » Oil Filtration System
- » Flow & Level Measurement System
- » Vibration Measurement System

GENERATOR, AVR & AUXILIARIES

- » Control & Protection System
- » Generator Transformers
- » AC-DC distribution
- » LV and MV-switchgear
- » Bus Ducts
- » Cables, HV, LV, Control & instrumentation
- » Outdoor Switchyard equipment
- » Integration of automation system, governing system, electrical system, mechanical system etc.
- » Digital automation of mechanical, electrical, LV system & other auxiliaries



ELECTRICAL BOP

We deliver tailor-made systems as per customer requirements. Our solutions are safe, reliable and provide cost-effective operation. We are a single source provider ensuring complete service and seamless availability for your hydropower plant and all its components and systems. Our long-term process know-how and control system expertise in hydropower applications coupled with high efficiencies and post implementation service brings the Advantage on your side.

GOVERNOR, AUTOMATION & SCADA



DIGITAL GOVERNOR TECHNOLOGY

- » Integration of automation system, governing system, electrical system, mechanical system etc.
- » Digital automation of mechanical, electrical, LV system & other auxiliaries.



Akinci – I/II, Turkey

Type of Turbines: 'PIT' Type – Axial Flow

Rated Head: 6.40 m Installed Capacity: 4 x 3,600 kW





Omokawa, Japan

Type of Turbines: Horizontal Francis

Rated Head: 28.38 m Installed Capacity: 1 x 110 kW





Khao Mang, Vietnam

Type of Turbines: Vertical Francis Rated Head: 109.00 m Installed Capacity: 2 x 15,000 kW

Sarbari – II, India

Type of Turbines: Horizontal Pelton 2 Jets

Rated Head: 189.65 m Installed Capacity: 2 x 3,375 kW





Gemciler, Turkey







Type of Turbines: Horizontal Pelton

316.00 m Installed Capacity: 3 x 3,600 kW







Type of Turbines: Horizontal Francis Rated Head: 50.39 m

Installed Capacity: $3 \times 2,673 \text{ kW}$

Brua, India

Type of Turbines: Horizontal Pelton 2 Jets

Rated Head: 572.74 m Installed Capacity: 2 x 4,950 kW







Saray, Turkey

Type of Turbines: Vertical Full Kaplan

Rated Head: 24.87 m Installed Capacity: 2 x 6,750 kW



FURTHER PROJECTS

Ambarlik, Turkey

Type of Turbines: Horizontal Pelton 3 Jets

Rated Head: 247.84 m Installed Capacity: 2 x 4,500 kW

Bac Na, Vietnam

Type of Turbines: Vertical Pelton 4 lets

Rated Head: 279.00 m Installed Capacity: 2 x 9,350 kW

Eglence - I, Turkey

Type of Turbines: Vertical Francis Rated Head: 276.23 m

Installed Capacity: $2 \times 18,060 \text{ kW} + 1 \times 8,663 \text{ kW}$

Eglence - II, Turkey

Type of Turbines: Horizontal Francis

Rated Head: 168.90 m

Installed Capacity: $2 \times 11,025 \text{ kW} + 1 \times 5,250 \text{ kW}$

Erevan - 1, Armenia (Renovation Project)

Type of Turbines: Vertical Francis Max. Net Head: 88.35 m Installed Capacity: 2 x 25,000 kW

Ghatte Khola, Nepal

Type of Turbines: Horizontal Pelton 2 Jets

Rated Head: 322.50 m Installed Capacity: 2 x 2,750 kW

Hang Dong B, Vietnam

Type of Turbines: Horizontal Francis

Rated Head: 174.00 m Installed Capacity: 2 x 17,500 kW

Khlong Tron, Thailand

Type of Turbines: Horizontal Francis

Rated Head: 30.55 m Installed Capacity: 2 x 1,250 kW

Mukerian, India (Renovation Project)

Type of Turbines: Vertical Kaplan
Rated Head: 16.80 m + 22.00 m

Installed Capacity: $6 \times 15,000 \text{ kW} + 6 \times 19,500 \text{ kW}$

Nam Cum 4, Vietnam

Type of Turbines: Vertical Francis
Rated Head: 147.60 m
Installed Capacity: 2 x 27,000 kW

Nam Sana, Laos

Type of Turbines: Horizontal Francis

Rated Head: 145.77 m Installed Capacity: 3 x 5,159 kW

Nilwande, India

Type of Turbines: Vertical Full Kaplan

Rated Head: 38.50 m Installed Capacity: 2 x 4,200 kW

Perunthenaruvi, India

Type of Turbines: 'S' Type – Axial Flow

Rated Head: 17.33 m Installed Capacity: 2 x 3,300 kW

Power Plants on Abohar Branch Canal, India

(Renovation Project)

Type of Turbines: Semi Kaplan Installed Capacity: 8 x 2,750 kW

Power Plants on Bathinda Branch Canal, India (Renovation Project)

Type of Turbines: Full Kaplan Installed Capacity: 8 x 2,150 kW

Ranja Ala Dunadi, India

Type of Turbines: Horizontal Francis

Rated Head: 148.50 m Installed Capacity: 2 x 8.250 kW

Shanan, India (Renovation Project)

Type of Turbines: Vertical Pelton & Horizontal Pelton

Rated Head: 487.70 m

Installed Capacity: $1 \times 50,000 \text{ kW} + 4 \times 15,000 \text{ kW}$

Sholayar, India (Renovation Project)

Type of Turbines: Vertical Francis
Rated Head: 303.00 m
Installed Capacity: 3 x 19,800 kW

Segara 2, Indonesia

Type of Turbines: Horizontal Pelton 2 Jets

Rated Head: 140.30 m Installed Capacity: 2 x 1,000 kW

Suoi Sap 1, Vietnam

Type of Turbines: Horizontal Francis Rated Head: 100.38 m Installed Capacity: 2 x 10,500 kW

Super Mai, Nepal

Type of Turbines: Horizontal Francis Rated Head: 123.93 m Installed Capacity: 2 x 4,290 kW

Trung Xuan, Vietnam

Type of Turbines: Vertical Full Kaplan

Rated Head: 17.50 m Installed Capacity: 2 x 5,250 kW

Upper Sindh - II, India (Renovation Project)

Type of Turbines: Vertical Francis Rated Head: 224.00 m
Installed Capacity: 3 x 35,000 kW

Yan Tann Sien, Vietnam

Type of Turbines: Horizontal Pelton 2 Jets

Rated Head: 633.21 m Installed Capacity: 2 x 9,750 kW With everything that comes with our daily business we reflect on our core-values. Together these values bring:

THE ADVANTAGE ON YOUR SIDE





GET IN TOUCH



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