

TM

SURFACE HYDROKINETIC TURBINE

UNLOCKING SUSTAINABLE HYDRO POWER POTENTIAL



MALEC

Since 2008

About us

Welcome to MACLEC Technical Project Laboratory Pvt. Ltd.

Founded by the visionary Bhardwaj Brothers - Mr Narayan and Dr. BalRam - MACLEC is revolutionizing the future of hydro power with its cutting-edge SHK Turbine Technology, unlocking the immense energy potential of global waterways. By harnessing the kinetic energy of canals, rivers, and streams that too without dams or civil structures, SHK Turbines provide a game-changing, plug-and-play solution for reliable, clean, and sustainable energy production."

With scalability from a few kilowatts to several megawatts, SHK Turbines are environment friendly, cost-effective and built to last over 35 years, ensuring minimal maintenance and seamless grid/off-grid integration. Recognized globally for their impact, MACLEC is empowering communities and advancing a sustainable future with every stream harnessed.

Visionary Founders



Narayan Bhardwaj

Tech. Pioneer, Founder & Chairman of MACLEC

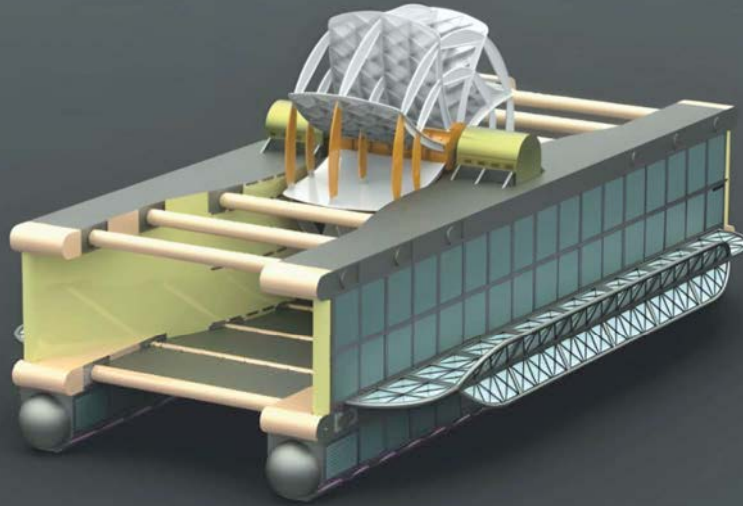
Narayan Bhardwaj's journey shows the power of vision and hard work that with determination, anything is possible. From a young age, he dared to dream big, driven by a passion to illuminate billions of lives with reliable, affordable, and accessible energy. Hailing from Ratlam, a small Indian town, he turned his bold vision into a remarkable reality. His perseverance has taken MACLEC from small beginnings to a global leader in sustainable energy.

BalRam Bhardwaj

Co Founder & Managing Director

BalRam Bhardwaj embodies the spirit of innovation, leveraging his environmental engineering expertise to make sustainable technology accessible. With over a decade of experience in engineering design, manufacturing, and business development, he leads MACLEC's mission to revolutionize renewable energy. His dedication to ecological balance and harmony with nature, inspires the team to craft impactful solutions, paving the way for a brighter and greener future.





Innovation is at the Heart of SHK Turbines

Introducing our pioneering innovation, Surface Hydrokinetic Turbines (SHK Turbines), which produce continuous renewable hydro energy without civil constructions and with little impact on the environment and its inhabitants. This unique technology, now commercialised in India, allows for global installation. Following extensive research and testing across various streams worldwide, MACLEC has created over 150 SHK Turbine models.

Advantages



State-of-the-art Technology

Unlike other turbines, SHK Turbines are surface water velocity driven and thus have very low RPM and don't harm aquatic life.



Efficiency

Efficiency of SHK Turbines is almost twice that of other hydrokinetic turbines due to their unique blade profile.



Low Installation & OEM cost

SHK Turbines can be installed at an economical cost and are easy to service/repair since they're indigenously manufactured.



Environmental Impact

Our technology doesn't emit any GHG emission, and is thus environmental-neutral. Also, the material used is completely recyclable.



Effective

1 MW installation reduces 332880 tonnes of GHG emissions - equivalent to saving 366168 tonnes of coal.



Ecological

Enhances dissolved oxygen level up to 32%, and helps in water self-rejuvenation and supporting aquatic life.



Economical

No civil structure such as dam, reservoir, artificial lake formation, penstock, canal, etc. required.



Ultramodern

The newest form of hydro power generation is set to revolutionise the hydro power sector.

SHK Turbines



Floating Turbines

Water body-

Rivers & Canals with greater width & adequate depth

Design Capacity of single unit-

0.5 kW to 3000 kW



Fixed Turbines

Water body-

Small canals & rivers with less width & water depth

Design Capacity of single unit-

0.5 kW to 3000 kW

Advantages



Hassle-free Installation

Minimal cement/concrete work with negligible construction requirements.
No need for dam/reservoir/diversion.



Easy Operation & Maintenance

Plug & Play type installation
IoT-based control and real-time monitoring for seamless operations and upkeep.



Grid Independent

Can be connected with grid and also works well for off-grid, solutions by varying the speed with employing battery



Continuous Power

Designed to deliver round the clock uninterrupted and predictable base load energy output.
Provide Reactive Power for Grid stability.



100% Circular Economy

Fully recyclable materials ensure a sustainable power generation & post life utilisation of the scrap.



Eco-friendly Solution

Fish friendly design, zero carbon emission providing a sustainable alternative to conventional hydro power generation.

Versatile SHKT Deployments

SHK Turbines are adaptable to harness hydrokinetic energy from any running water, regardless of water quality, turbidity, salinity, of floating debris, in both lined and unlined channels.



MAJOR CANALS

Lined Canals
with >100 m³ discharge



RIVERS & STREAMS

Unlined Rivers
& Streams



MICRO IRRIGATION

Micro/ Small lined/
Unlined canals



HYDRO DAMS

Head/Tail Race Channels



POWER PLANT

Cooling Channels



REFINERY & INDUSTRY

Cooling Channels of such plants



PUMP IRRIGATION

Pump Canal &
Lift Irrigation Scheme



TIDAL STREAMS

Tidal rivers,
Island currents, etc.



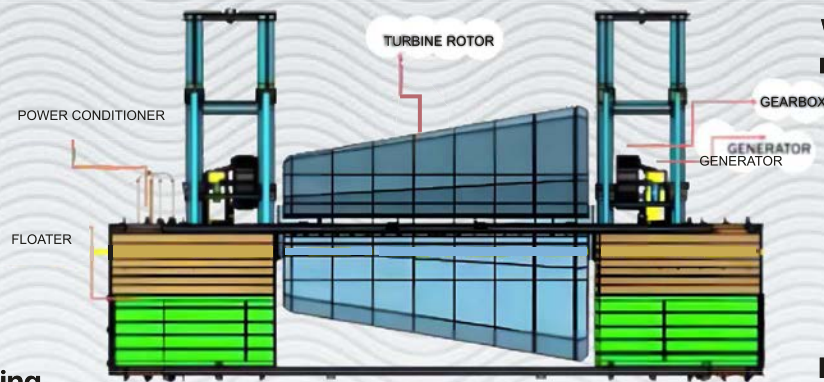
SEWAGE WATER CANALS

STP/ WTP/
Major Sewage Canals

Tech Specifications

Water Velocity
0.5 to 7 m/sec.

Water Depth
minimum 0.1 meters



Installation Type
Floating/semi floating
/fixed type

Power Output
110V/ 220V/415V/any

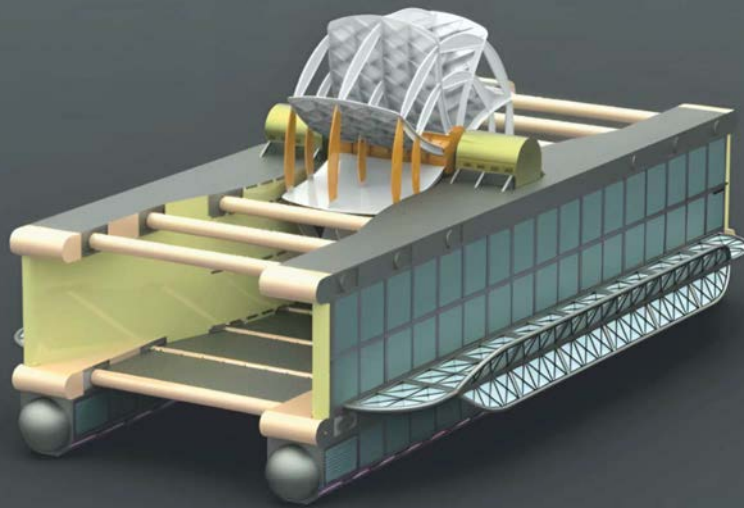
SHK Turbine Mounting	Length	Height	Width	Weight	Rated Capacity
Fixed Type	4 - 30 m	1.5 - 12 m	1.5 - 15 m	0.3 - 30 Tones	0.5 - 3000 KW
Floating Type	6-30 m	3-15m	2-20 m	0.6 - 45 Tones	
Hybrid Type	8 - 65 m	4 - 20 m	3 - 35 m	2 - 80 Tones	

Power Take-off	Transmission Type	Gearbox/Drive train
	Generator Type	Both, Permanent Magnet & Excitation Type
	Turbine Power Rating	0.5 - 3000 KW (Site Specific)
Control System	Communication	Radio/ Cellular/ Wifi
	Power Electronics	Grid Synchronised/ Off-grid+Storage/ Hybrid
	Turbine Output Voltage/ Phase	220V/415V/1100V Single/ Three Phase
	Grid Frequencies	50/60 Hz
	Electronic Protection & Control	Controller / PLC / Customised
Operational Requirements	Cut-in Water Speed	0.5 m/s
	Survival Water Speed	7 m/s

DESIGN PHILOSOPHY:- MACLEC stands as the sole global company capable of delivering site-specific SHK Turbine plants. Through a detailed analysis of a decade's hydrological data, including factors like average discharge, velocity and water depth at each specific site. MACLEC empowers clients to harness uninterrupted hydrokinetic power.

Present Scenario:

- Utilizes kinetic energy of canal flow for generation of electricity.
- Best in Class technology with strong IP portfolio.
- Highly Efficient, Modular, Scalable from kW to MW Capacity.
- Works at minimum flow 0.5m/Sec onwards.
- Generates Firm and Dispatchable Power.
- CUF varies on canal flow 40-95%.
- Turbine life is 35+ years.
- Scope - 100GW+ in India and 3000GW+ Globally.
- Technology recommended by Central Electricity Authority, Ministry of New & Renewable Energy, Govt. of India.
- Received Global Recognition and commercial interest.



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GOVERNMENT OF INDIA

विद्युत मंत्रालय
भारत सरकार
MINISTRY OF
POWER
GOVERNMENT OF INDIA



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MINISTRY OF
NEW AND
RENEWABLE ENERGY



Recent Recognition



Press Information Bureau

Government of India

Ministry of Power

CEA recognizes indigenously developed Surface Hydrokinetic Turbine Technology under Hydro Category

CEA demonstrates Its dedication to promote renewable energy Innovations

Central Electricity Authority (CEA) has recognized Surface Hydrokinetic Turbine (SHKT) Technology under the Hydro Category to drive innovations and explore alternate technologies to achieve net zero emission target and ensure sustainable development of power sector for the nation.

SHKT, uses kinetic energy of flowing water with practically zero potential head for generation of electrical energy unlike conventional units, which utilize potential energy of water through construction of suitable civil structures such as dam diversion weir and barrages for creation of necessary 'Head'.

This technology is a solution that may support the power sector in meeting the growing demand for base-load, round the clock renewable energy, especially in areas with poor grid accessibility. Surface Hydrokinetic turbines are easy to install and cost-effective, with generation cost of 2-3 per unit. This technology provides win-win situation both for renewable energy buyers and generators.

Adoption of SHKT technology shall mark a significant milestone in leveraging India's extensive water infrastructure, including canals, hydropower tailrace channels, etc. for sustainable energy generation. This technology has huge potential in GW scale with lot of opportunities to harness renewable energy, leading to overall growth of power sector.



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MINISTRY OF
NEW AND
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SUSTAINABLE DEVELOPMENT GOALS

7 AFFORDABLE AND CLEAN ENERGY



Ensure access to affordable, reliable, sustainable and modern energy for all.

11 SUSTAINABLE CITIES AND COMMUNITIES



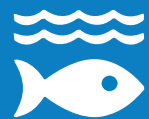
Make cities and human settlements inclusive, safe, resilient and sustainable.

13 CLIMATE ACTION



Take urgent action to combat climate change and its impacts.

14 LIFE BELOW WATER



Conserve and sustainably use the oceans, seas and marine resources for sustainable development.



Since 2008



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