



FROM SAVING ENERGY TO CREATING ENERGY

Use pumps as turbines to generate low-cost electricity from existing pipe systems with no associated environmental impact.



BENEFITS

Hydropower energy recovery is an effective response to rising energy prices.

Pumps used as turbines can transform the surplus hydraulic energy of water into electricity.

The newly generated electricity can be self-consumed or exported to the grid.



Green renewable energy for self-consumption or grid sale from 1 up to to 500+ kW.



Negligible environmental impacts, minimal water requirements and no need of artificial reservoirs.



Quick return on investment and simplified maintenance.



Our PATs are Made in Italy.



Quick lead time.



Plug-and-play turbines, easy installation and commissioning.

TECHNOLOGY

Pumps as turbines consist of a conventional water pump modified for use in reverse as a turbine.

The total water flow available can be split between several turbines in parallel.

It is possible to use a Variable Speed Drive to cater for varying flow/head conditions.

How?

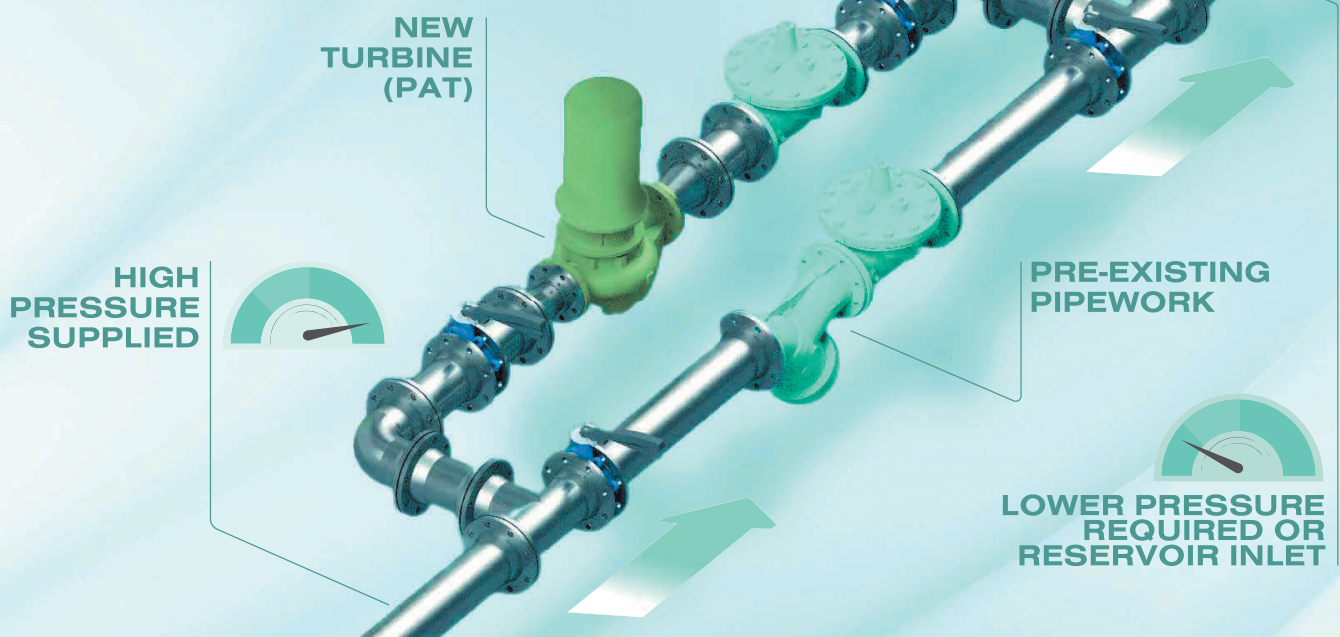
Small and medium-scale modular hydropower generating sets suitable for sites up to 500+ kiloWatts of nominal power. With low investment and maintenance costs, pumps as turbines (PAT) allow the recovery of the energy from existing pipe networks and achieve considerable energy savings. Instead of a specifically designed conventional turbine, we propose a standard water pump designed for reverse operations, which is easy to maintain and offers a low life cycle cost. This technology allows water-intensive organizations (e.g. water, irrigation, mining companies) to conveniently exploit an untapped energy source in a cost-effective way. PATs are suitable for applications in existing pipe systems where water pressure needs to be reduced or where water flows by gravity into a reservoir. Due to the use of existing infrastructure, all of this can be done with a negligible environmental impact.



Competitive advantages

- Short investment return time, especially in the presence of high energy prices.
- The turbine is optimized to operate in a reliable and fail-safe way.
- Real time information: a complete telemetry system can be provided for real time monitoring from your laptop, mobile or any other web-enabled devices.
- Easy maintenance, with spare parts readily available.

E SERIES TURBINES

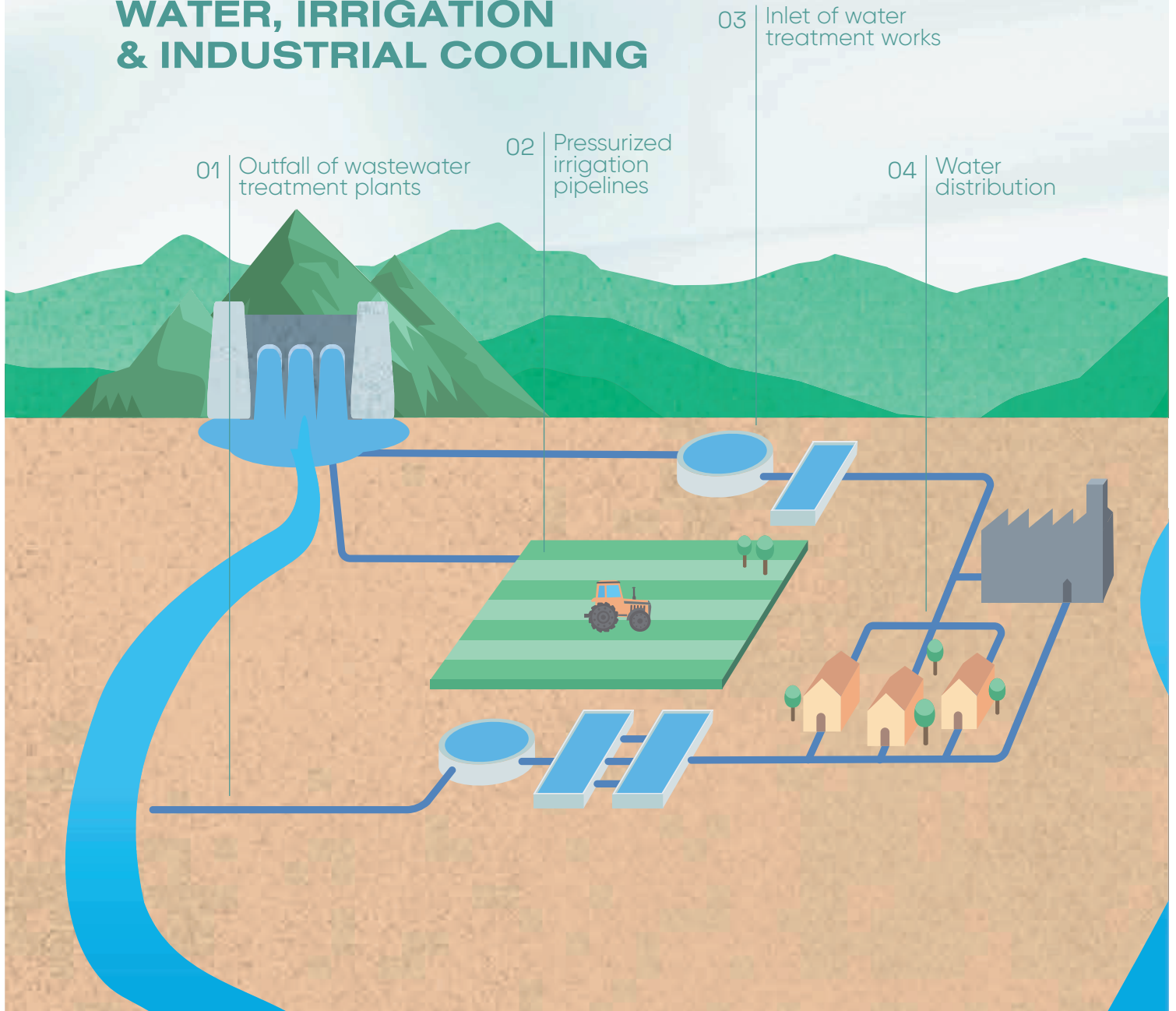


WHERE?

PATs can be installed on either man-made water networks (e.g. drinking water or irrigation networks) and natural ones (rivers, lakes).

Application

WATER, IRRIGATION & INDUSTRIAL COOLING



FEATURES

01

Wide choice of performances and design configuration to fit your system.

02

Different materials to handle several kind of liquids: from cast iron to Super Duplex steel.

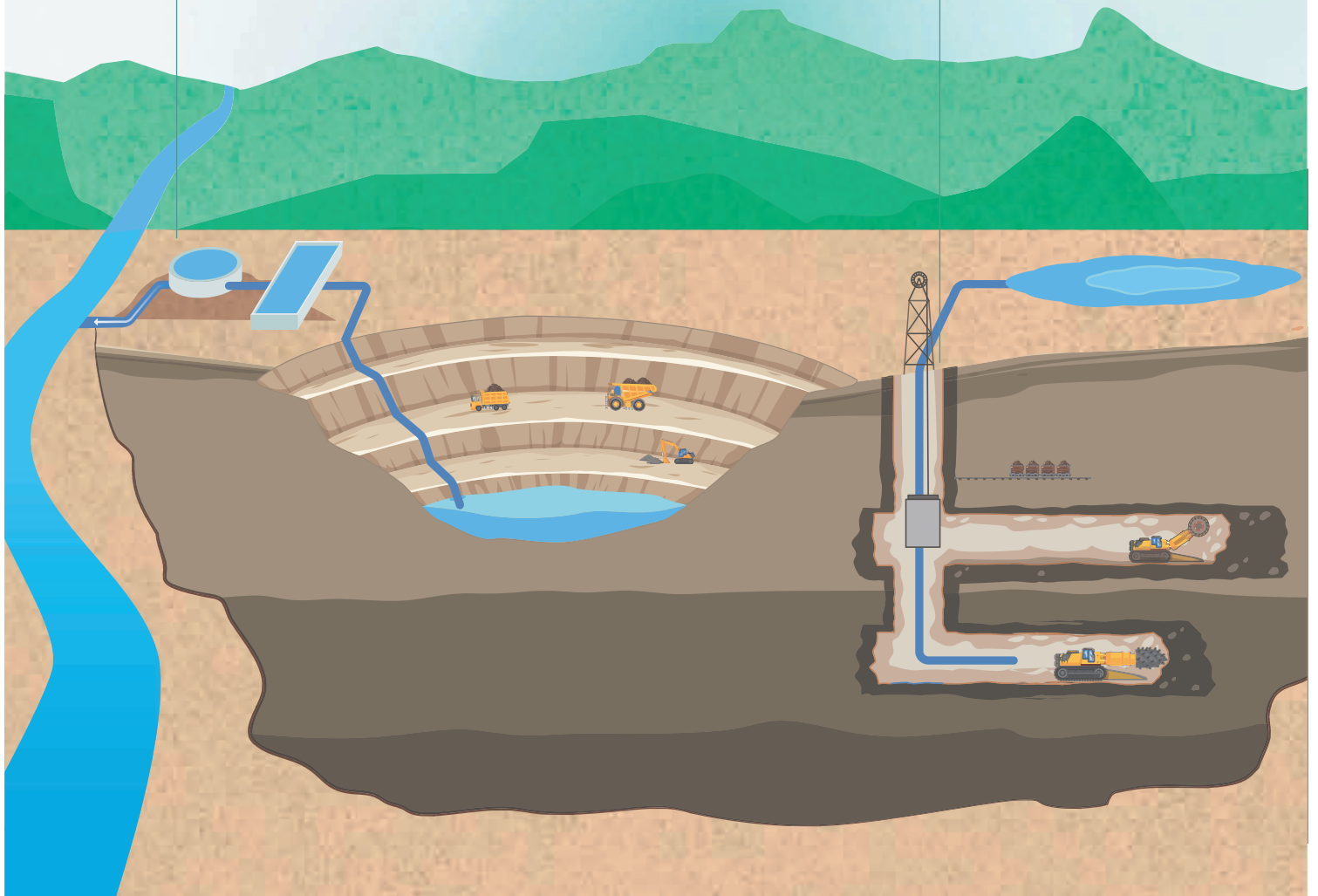
03

Special Design for reverse rotation.

Application **MINES**

01 Outfall of mine water treatment plants

02 Water supply of underground mines



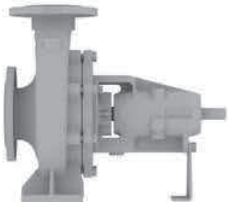
04

The turbines can be fitted with a complete suite of sensors: shaft speed, pressure, vibrations, bearing temperature.

05

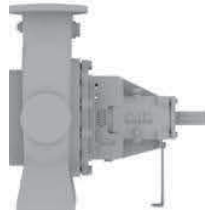
Approval for drinking water (on request).

WHICH TYPE OF TURBINE?



E-NCB (K)

End suction extensive range, available in several configurations and materials such as Super Duplex, AISI 316, bronze or cast iron.



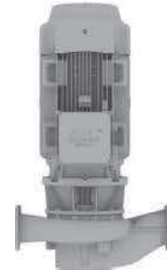
E-NCA

End suction pumps available with multichannel or closed impeller.



E-MG

Characterized by rigid couplings with a solid and reliable design allowing easy maintenance.



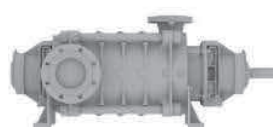
E-L

Inline pumps for easy installation in already existing straight pipelines.



E-TM

Multistage pumps: whenever high pressure has to be handled, over 160 different versions available. Low noise and high resistance to wear, thanks in part to the oversized ball bearings. Soft shaft seal as standard, various types of mechanical seal also possible.



E-TMB



E-TMV



E-SKD

Split case double volute design: to reduce stress and increase pump life, simplifying maintenance.

CASE HISTORY

WATER TREATMENT PLANT



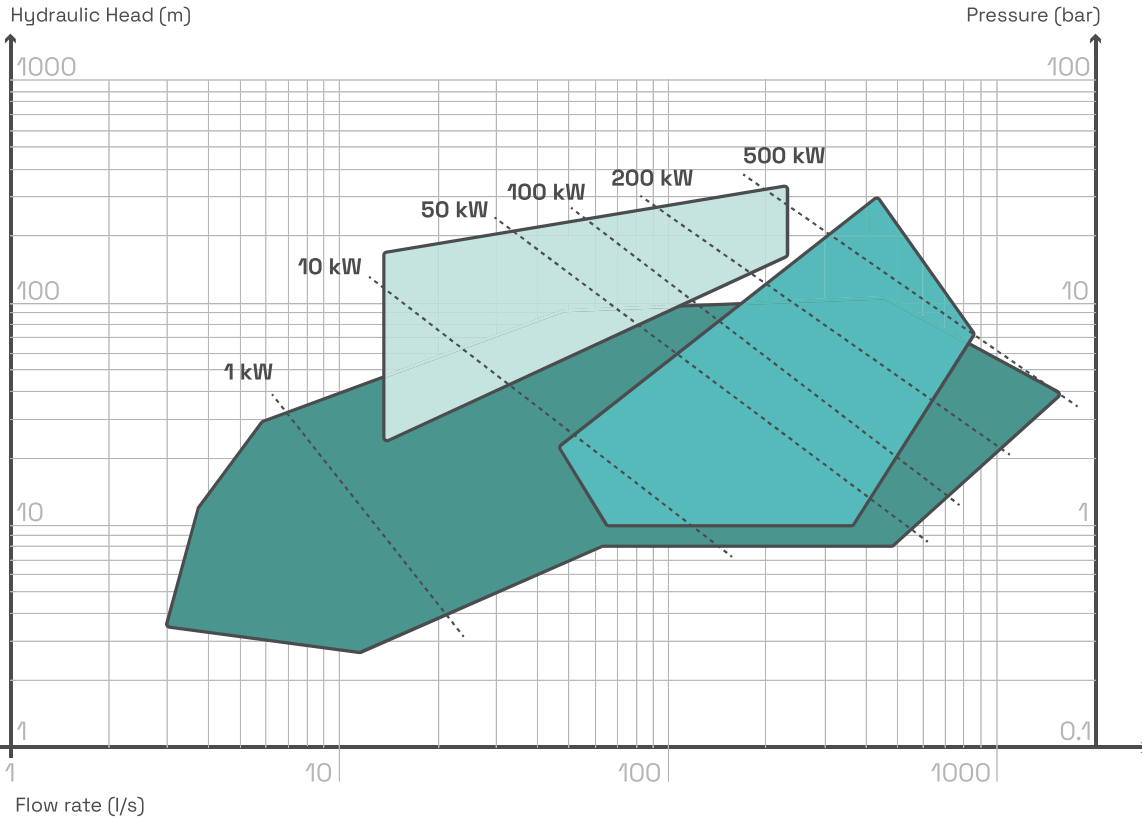
Head: 55m
Flow: 15-35 l/s
Maximum output: 10kW
Annual generation: 50-60MWh

The water treatment plant is supplied by a gravity source. Previously the supply pipe simply discharged into a water tank but now, thanks to our E-NCB PAT, it generates up to 10 kW of green electricity.

The generated power is entirely used on-site and has substantially reduced the grid-imported electricity previously needed to run the water treatment process.

SAER can provide in collaboration with his partner Easy Hydro, a service to analyse your site, select the optimum turbine and design a full installation & control package, that will optimise your energy generation from these products.

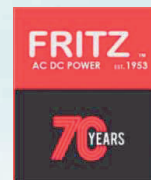
Civil, irrigation & industry



LEGEND

■ E-NCB, E-NCBK, E-L, E-MG, E-NCA Series
 ■ E-TM/TMB/TMZ Series
 ■ E-SKD Series

Easy Hydro



UNDERGROUND ZINC MINE



Head: 210m
Flow: 22 l/s
Maximum output: 30kW
Annual generation: 200MWh

The PAT has been installed in parallel to an existing pressure reducing station on a DN 150 pipeline carrying cooling water from the surface into the depths of the mine. The turbine location is 300m underground. Instead of just dissipating the water pressure as heat and noise via the pressure reducing valves, the E-TMZ multistage turbine is generating power which helps the mine operator to reduce the electricity import from the grid.