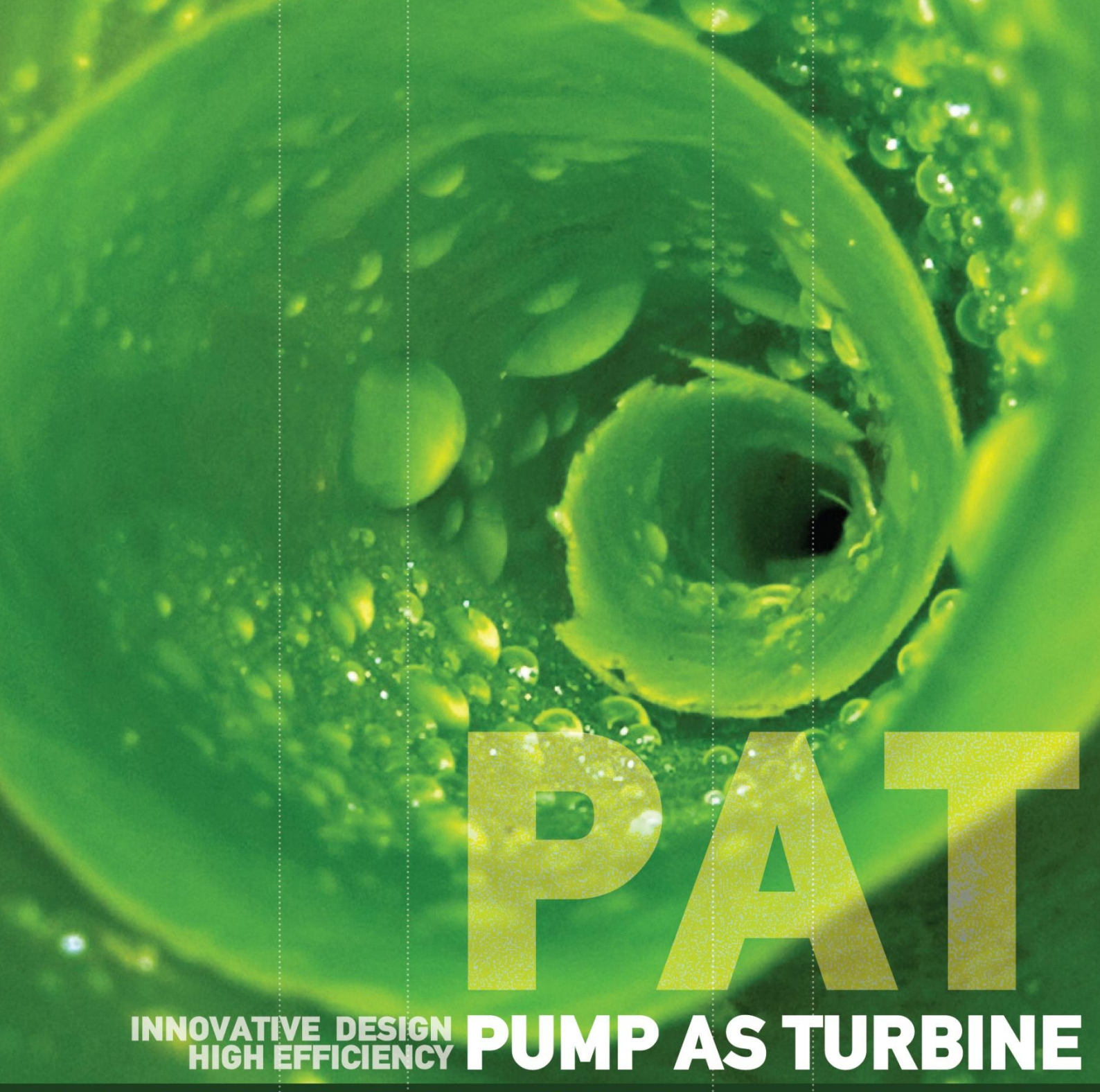


PAT

INNOVATIVE DESIGN
HIGH EFFICIENCY

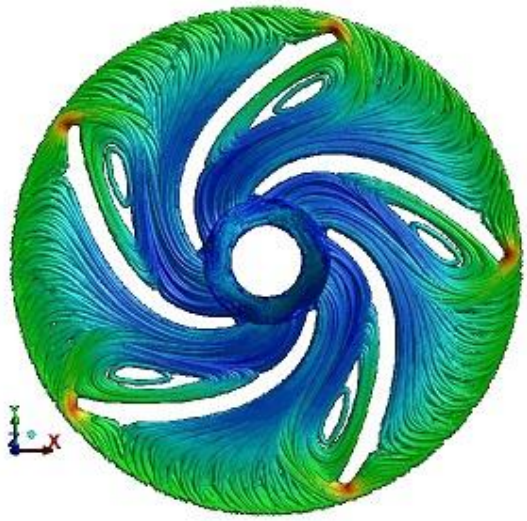
PUMP AS TURBINE

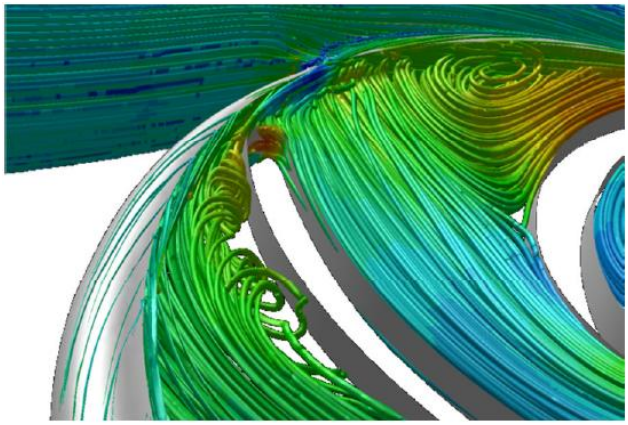
TAKING ADVANTAGE OF THE LARGE ENERGY POTENTIAL OF THE WATER

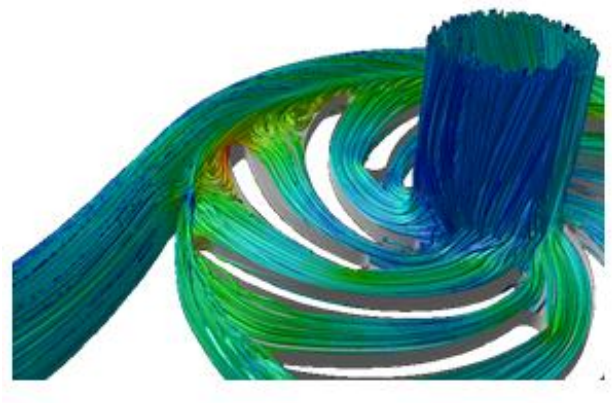
IRMP® PUMPS
DRAKOS·POLEMIS

Pump As Turbine

NOVEL SYSTEM







Research "Hydrovalys"

The continuous increase of cost of conventional fuels has made the development of small and mini hydroelectric plants financially viable. However, the specific cost per kW of such units can still be relatively large. A popular alternative, for the limitation of this cost has been the use of centrifugal pumps as turbines (PAT). The advantage of such an approach is the simple construction, the ability to use standard of the shelve components with minimal modifications and the benefit from decentralized electricity generation. These characteristics have increased their popularity over the years, especially when used in mini hydroelectric schemes in rural and developing regions, in which the success of a project strongly relies on the initial costs.

During our R&D's research called "Hydrovalys" The performance improvement and optimization of a typical pump, operated as a turbine was accomplished. Our engineers developed an efficient, innovative and, at the same time, cost effective solution for low output applications, such as energy recovery etc.

PAT operation

Pump works as a turbine when liquid flows in reverse mode.

The system can be inserted in pipelines transferring water or other fluids, exploiting the surplus or rejected kinetic and dynamic energy of the flow.

EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND
COMPETITIVENESS AND ENTREPRENEURSHIP OPC II regions at the centre of development
NSRF 2007-2013 programme for development
Ministry of Education and Religious Affairs, Culture & Sports
GSRT - Management and Implementation Agency for RTD and Innovation Activities
O.P. Competitiveness and Entrepreneurship (EPAN II), ROP Macedonia - Thrace, ROP Crete and Aegean Islands, ROP Thessaly - Mainland Greece - Epirus, ROP Attica

Research was co-funded by the Greece-National Strategic Reference Framework 2007-13 and the EU-European Regional development fund (PABET)

APPLICATIONS

- **INDUSTRIAL**
- **BUILDING**
- **RETROFITTING**
- **REVERSE OSMOSIS**
- **RESIDUAL WATER UTILISATION**

PRESALES & AFTERSALES SERVICES

As a result of our research, our engineers can offer consulting services in each phase of your project, such as:

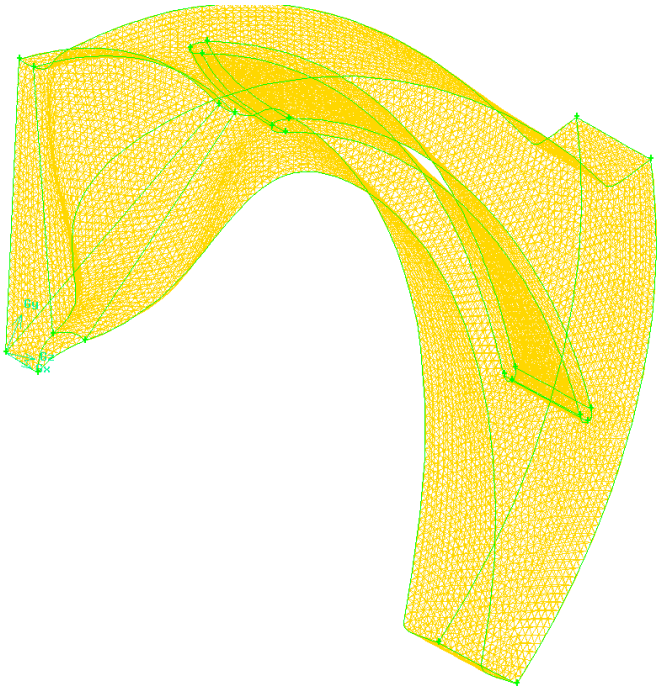
- Hydraulic parts parametric design (eg. Impeller, casing)
- Impeller modeling and numerical analysis of flow in impellers of various designs.
- Hydroelectric system design
- Mechanical Design and installation of systems (PAT)
- Maintenance of small hydropower plants
- Techno economical evaluation, installation and operation (PAT)

PUMPS SERIES AS PAT

- **LDP**
- **DP-BLOCK**
- **IN-LINE**
- **MULTISTAGE**
- **SPLIT CASE**

ADVANTAGES

- **INNOVATIVE DESIGN**
- **ENERGY RECOVERY**
- **HIGH EFFICIENCY**
- **LOW INITIAL COST**
- **FAST INITIAL CAPITAL RETURN**
- **DECREASE OF CO2 EMMISIONS**



PAT

DRAKOS·POLEMIS

Engineered Pumping Technology.

ISO 9001
BUREAU VERITAS
Certification

MEMBER OF Europump

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