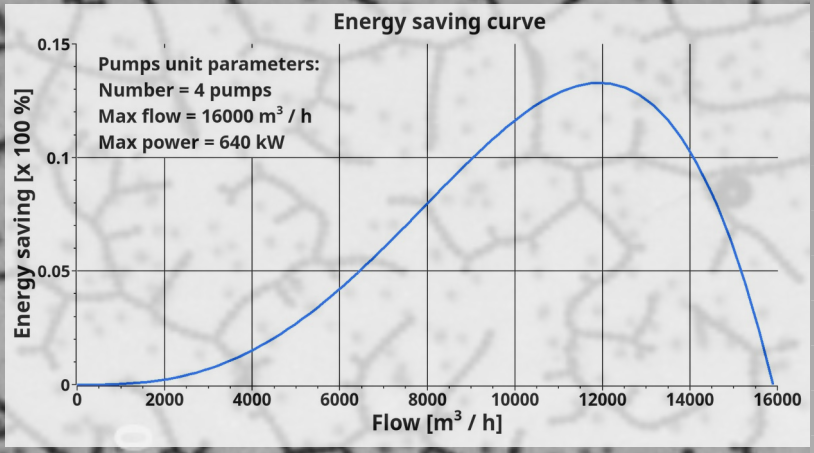
Master flow control with AI – AI4MFC™ system

The application of Artificial Intelligence (AI) methods in industry is the quintessence of putting the idea of Industry 4.0 into practice. AI, thanks to its ability to learn and process large sets of measurement data, allows for effective control and optimization, in a given aspect, of both entire production processes and their individual components. The AI4MFC tool presented in the leaflet, which uses AI, enables energy optimization of pump or compressor operation in industrial flow systems.

AI4MFC

It is a collection of algorithms and machine learning models that form an IT system to control and optimize the operation of pumps or compressors. AI4MFC can control individual gensets, genset assemblies, and systems of genset assemblies. The gensets can be from different manufacturers, be of different types and models.

AI4MFC learns from the measurement data the characteristics of the controlled system, and applies the acquired knowledge to the ongoing optimization of its operation. The result is the minimization of the system's energy consumption while maintaining all recommendations and technological constraints related to the implemented technological process.



Benefits of AI4MFC

- Lower operating costs: lower energy cost, up to 15%, and lower maintenance costs (Predictive Maintenance);
- Reducing the carbon footprint;
- Increased stability of the implemented processes in the production system and its technological safety;
- Increased stability and safety of pump and compressor operation.

AI4MFC applications

The technology can be used wherever the flow of fluids is forced by pumps or compressors:

- waterworks systems;
- melioration and maining;
- compressed air systems;
- sea transport (vessels);
- chemical and petrochemical systems;
- fluid pumping stations.

AI4MFC implementations

AI4SC has been successfully implemented at a wastewater treatment plant serving more than 1 million people daily. The level of savings achieved is shown in the graph above (links to article and movie of implementaion of the tool).

1 tool and 3 benefits

- Reduction of energy consumption
- Reduction of energy demand
- Saving resources
- Reduction of environmental load
- Reduction of carbon footprint
- Saving the climate
- Increase in market competitiveness
- Increase in energy efficiency and decarbonization level
- Positive ESG reporting

Contact

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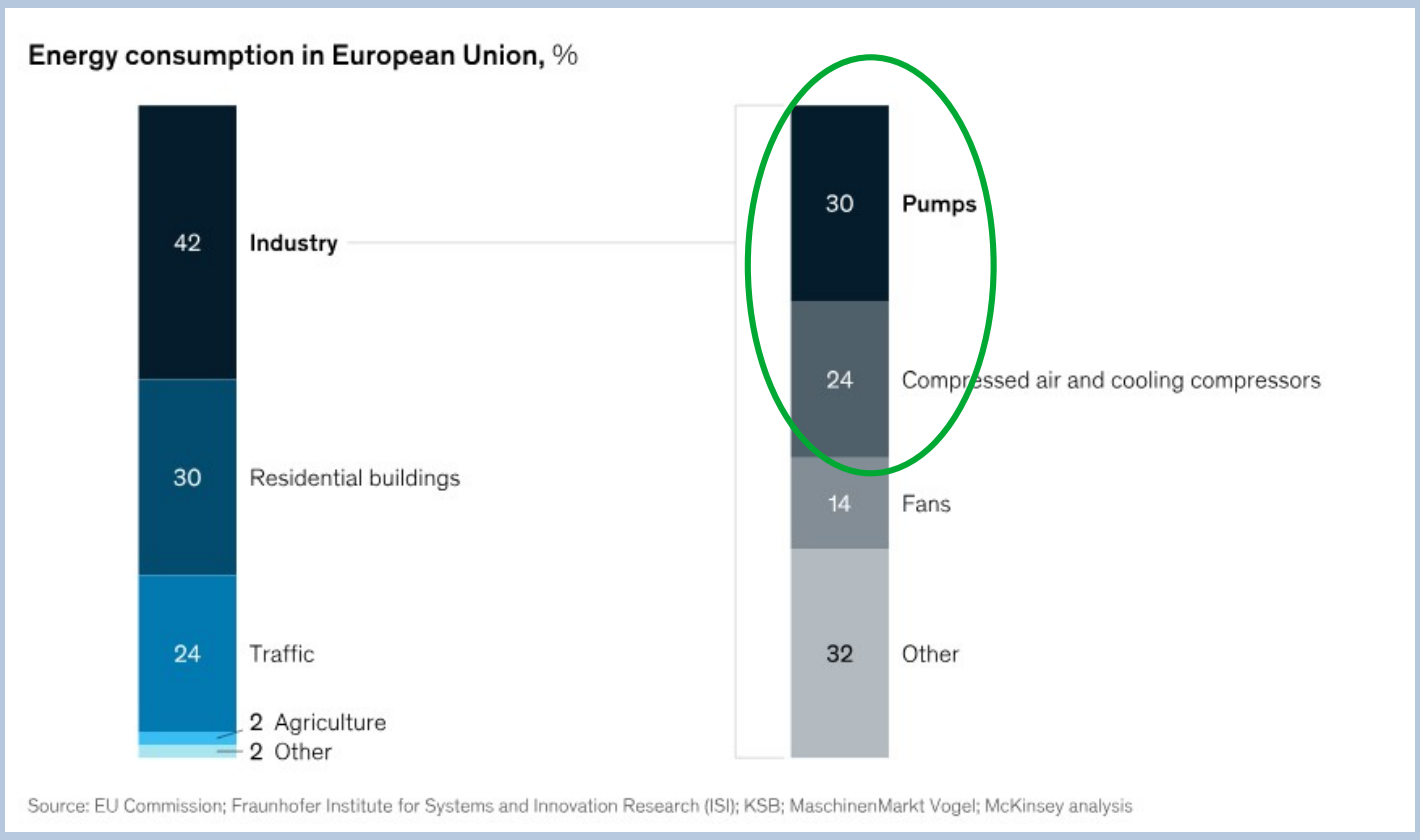
The chart shows that AI4MFC addresses optimization needs for 54% of the energy consumed by EU industry, which translates into 25% of the EU's total energy consumption. The same is true in other developed economies. For ships, the need is between 15% and 50%, depending on their size. The tool has great application potential and could be important for increasing energy efficiency and decarbonizing the installations where it is used.



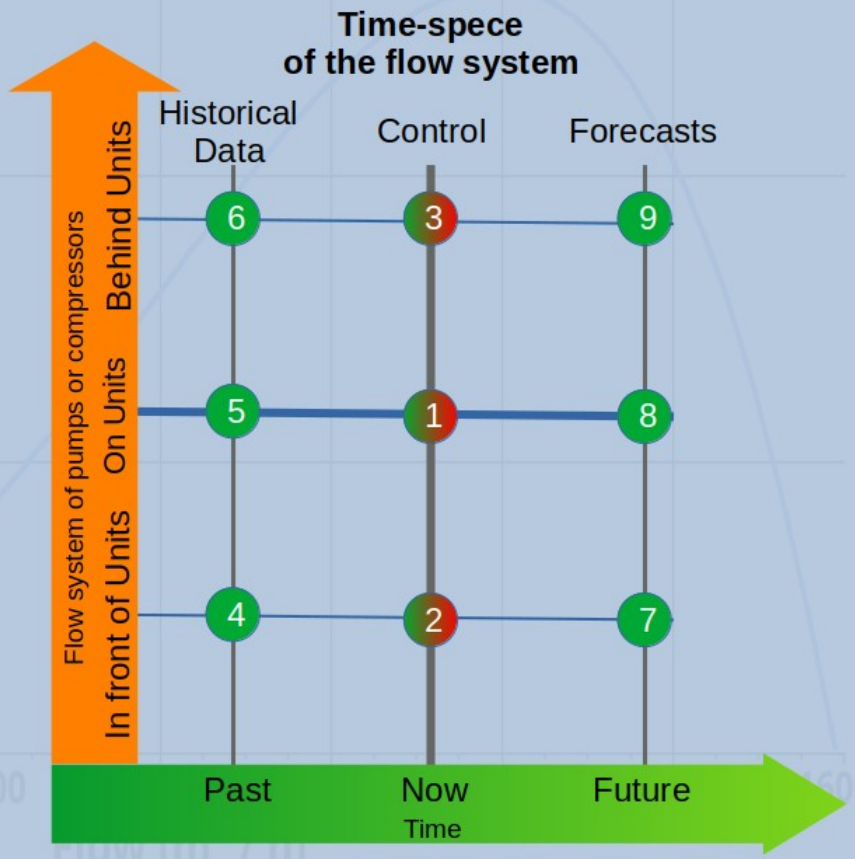
AI4MFC™

Master Flow Control tool driven by AI

Control logic

- **AI4MFC** looks **at the entire flow system** and collects and integrates **data from all 9 points** in the system's space-time continuum to optimize the operation of pumps and compressors and maximize their energy efficiency.

- Standard automation systems VFD class that control the operation of pumps or compressors analyze a maximum of 2 points of a set of points (1, 2, 3). This approach only allows them to perform a production task, but not to optimize energy efficiency.



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