



Boosting HPC and AI energy efficiency with a European software solution

OBJECTIVES

SEANERGYS designs and develops a production-quality integrated software suite for energy-efficient operation of European HPC and AI systems by:

- Creating a holistic monitoring infrastructure and common data repository for comprehensive operational HPC/AI data
- Developing an advanced AI-based data analytics framework for HPC and AI operational data
- Implementing a dynamic resource management system to optimise use of resources and energy efficiency in heterogeneous HPC/AI systems and to adapt to dynamic workloads
- Validating the SEANERGYS software suite in real operational environments and making it available under a permissive license

KEY COMPONENTS

COMPREHENSIVE MONITORING INFRASTRUCTURE (CMI)

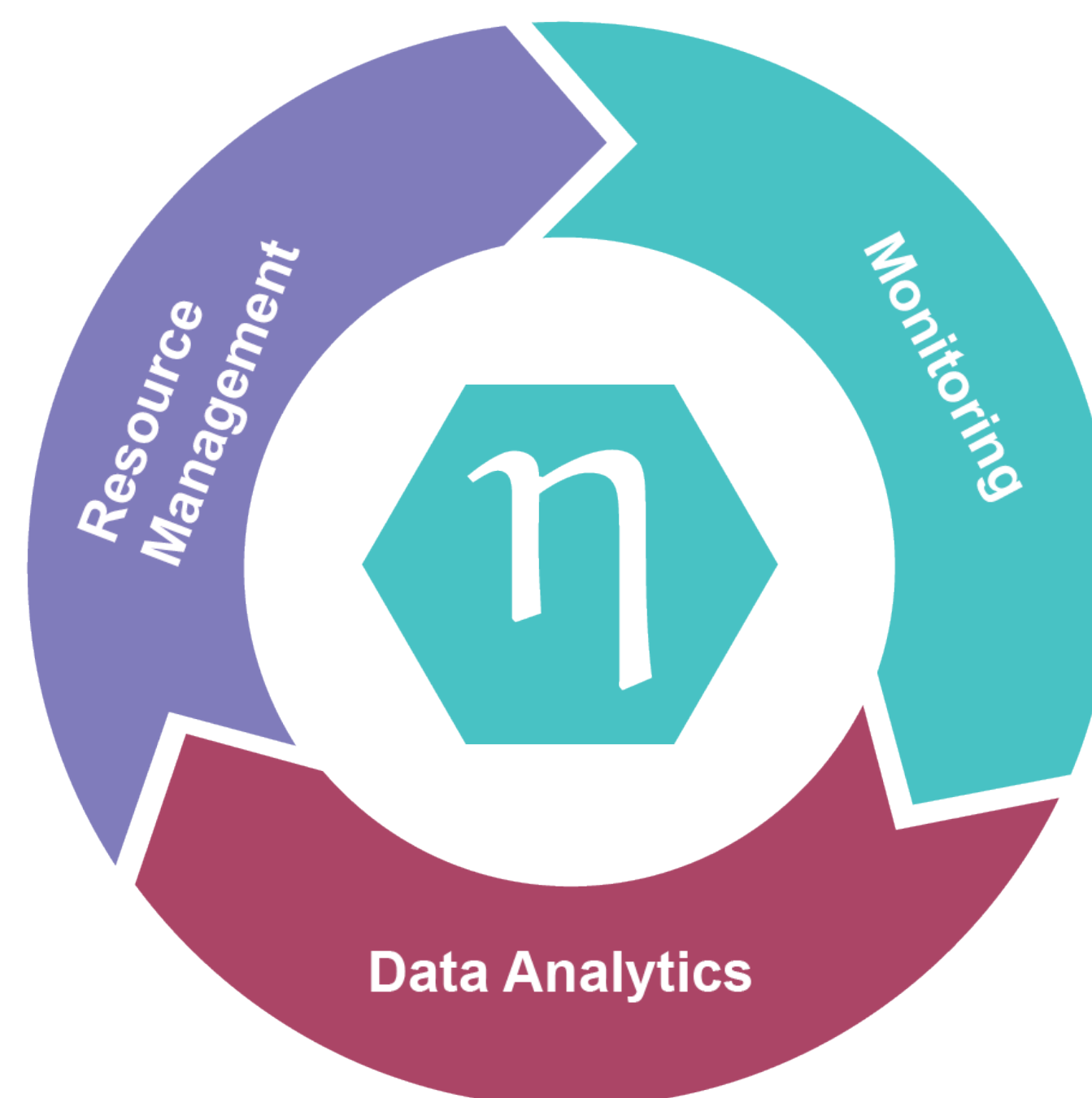
- Collects and consolidates data from sensors, nodes, control systems, and applications
- Supports structured and unstructured telemetry data (e.g., resource usage, cooling, scheduler metadata)
- Data flows through a standardized data plane - replacing fragmented tools with a unified source and interface for real-time and historical analysis

AI-BASED DATA ANALYTICS (AIDAS)

- Analyzes system behavior at node, job, and system level based on the CMI monitoring data
- Offers real-time insights and modelling for power, energy, and performance optimization
- Utilizes a shared “Model Zoo” for adaptive model selection
- Includes powerful visual tools for administrators, SW developers and system end-users to assist in efficient use and operation of HPC and AI supercomputers

DYNAMIC SCHEDULING & RESOURCE MANAGEMENT (DSRM)

- Ingests AIDAS analytics to manage and optimize workload scheduling and execution across system, node, and job layers
- Can adapt resource allocation and configuration to dynamic workload behaviour
- Integrated feedback loop with AIDAS will enable intelligent, self-adjusting operations



INTEGRATED SOFTWARE STACK

For the three core components to effectively interact, SEANERGYS defines, documents and standardises a series of interfaces and shared data models/formats. They will allow a clear compartmentalisation, smooth integration, streamlined testing and deployment and ultimately efficient execution across the different European HPC and AI sites.

IN A NUTSHELL

BUDGET:

Overall budget € 33 Million,
EuroHPC JU funding € 16.5 Million

PROJECT TERM:

June 2025 – May 2029

CONSORTIUM:

Coordinator:
Forschungszentrum Jülich
16 Partners, 7 European countries

MISSION:

SEANERGYS delivers a cutting-edge European software solution that boosts HPC systems efficiency by optimizing resource use and minimizing energy consumption.

FUNDING

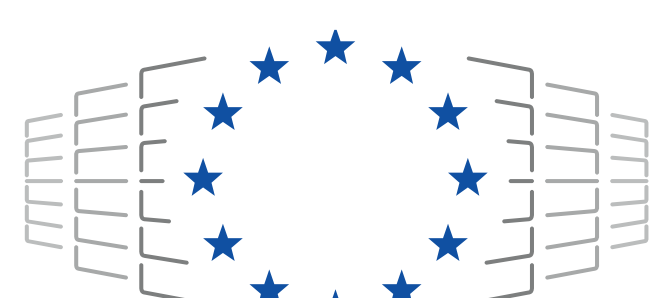
The SEANERGYS project has received funding from the European High Performance Computing Joint Undertaking (JU) under grant agreement No101177590. The JU receives support from the European Union’s Horizon Europe research and innovation programme and from the Czech Republic, France, Germany, Greece, Italy, and, Spain.

Views and opinions expressed are those of the author(s) only and do not necessarily reflect those of the European Union or of the granting authority. Neither the European Union nor the granting authority can be held responsible for them.

GET CONNECTED

seanergys-pmt@fz-juelich.de
www.seanergys.eu

FOLLOW US



EuroHPC
Joint Undertaking

bpifrance

With funding from the:
Federal Ministry
of Research, Technology
and Space

MSMT
MINISTRY OF EDUCATION,
YOUTH AND SPORTS

