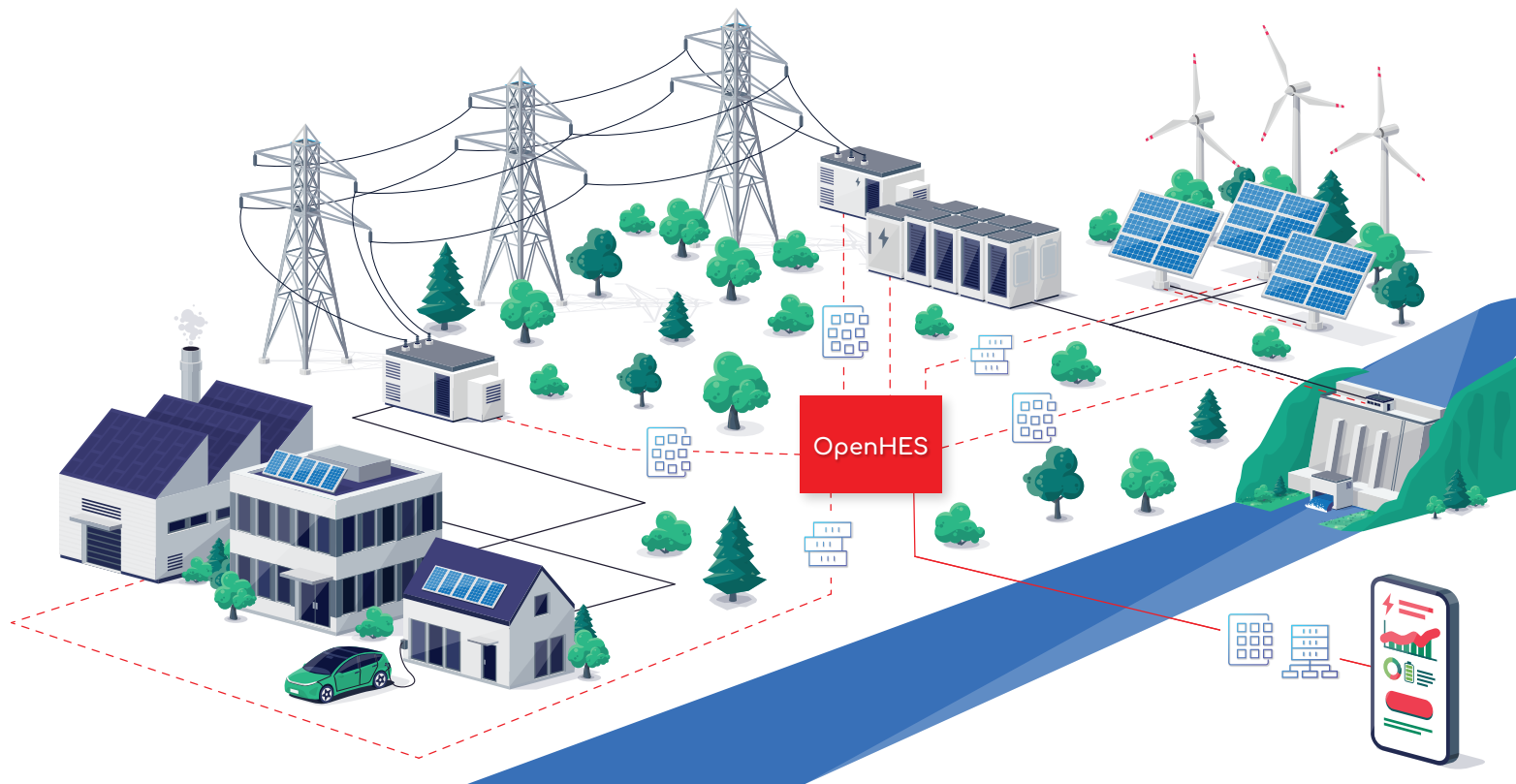




OpenHES

Scalable, Kubernetes-Native Head-End System for Smart Metering

OpenHES is a next-generation Head-End System designed for businesses that require high performance data acquisition and top-tier security.

With cutting-edge encryption and ultra-fast performance, **OpenHES** ensures seamless data collection, transmission, and analysis from remote devices — scaling effortlessly from tens to millions of endpoints.



Affordable Scalability

- From small deployments to national infrastructure — flexible growth without excessive costs.
- Any utility: electricity, gas, heat, and more, ensuring broad industry compatibility
- From legacy meters to modern smart devices, enabling seamless support across all technologies.



Inherent Assistance

- Full-spectrum support, from basic maintenance to custom integrations and new driver development.
- Proactive monitoring to ensure performance, reliability, and uptime.
- Future-proof architecture designed to adapt and optimize over time.



Future-Ready Security

- Continuously evolving protection against emerging threats.
- Meets FIPS 140-3 cryptographic security standards.
- Ready to adopt FIPS 203/204/205 to ensure security in post-quantum era.

OpenHES

Application Type

- Fully native Kubernetes application, optimized for cloud-native environments.

Deployment

- Designed for Kubernetes and rigorously tested on RKE2.
- Helm Chart available for seamless deployment via ArgoCD in GitOps mode.

Key Architectural Highlights

- Microservices-oriented architecture, leveraging Kubernetes-native services.
- gRPC-based synchronous interconnections with asynchronous queuing for efficient service-to-service communication.
- Dynamic driver scaling and intelligent load balancing for optimal performance for queued jobs.
- Fully parallel processing, designed for high throughput and reliability.
- Multi-tenant ready, with isolated namespaces and resource quotas for scalability.
- Future-proof API: All drivers connect via a standardized gRPC API, ensuring seamless integration with new devices and protocols.

Northbound Interface (External Integrations)

- HTTPS/ConnectRPC API for web-based GUI management and third-party integrations.

Southbound Interface (Metering & Device Communication)

- Flexible connection modes: Supports both system-initiated (pull) and device-initiated (push) communications.
- Broad protocol support, including IEC 62056-21 (DLMS/IDIS), IEC-61107, ANSI C12, ModBus, MBUS, and more.
- Multiple connection types, such as Direct IP, IP-to-serial (RS-232, RS-485), and modem-over-IP solutions (for example, RS-232 modems connected via Moxa converters).
- Cascaded device support, enabling complex hierarchical metering networks.