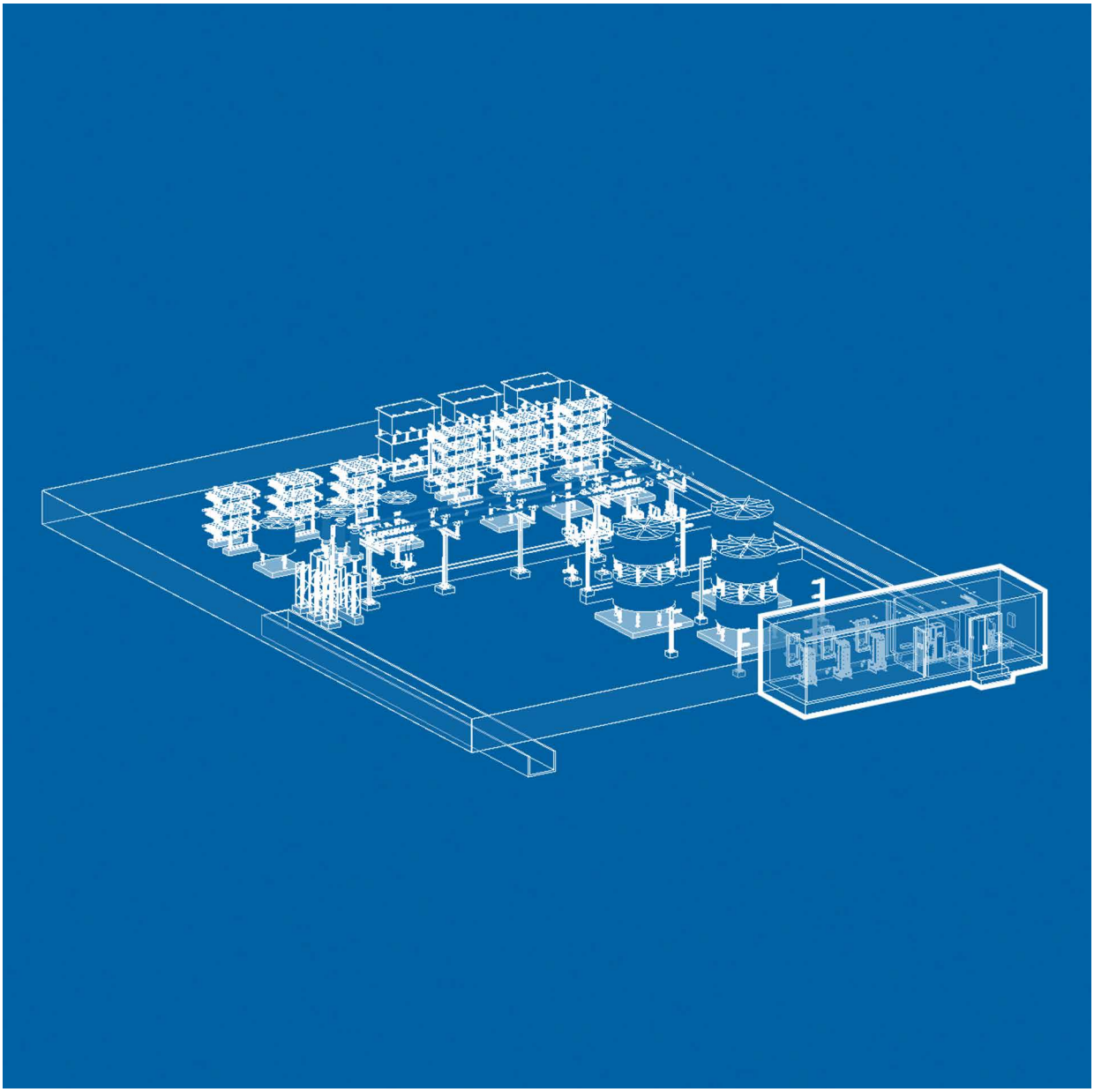
# SVC MODERNIZATION

MERUS POWER

## MERUS SVC MODERNIZATION SERVICES

Maximizing Return on Investment by modernizing an ageing SVC

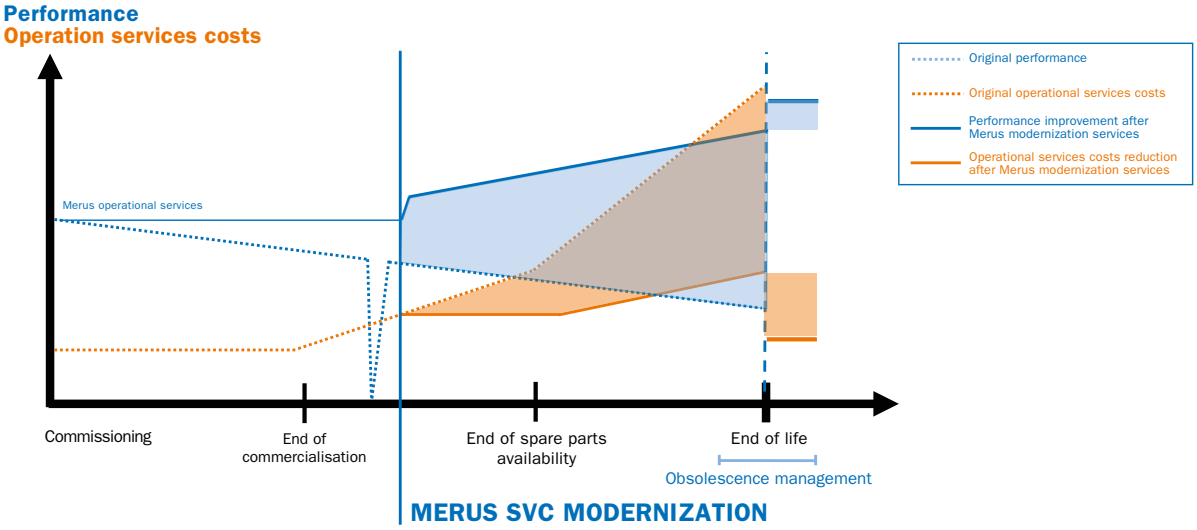


# AGEING STATIC VAR COMPENSATOR

## CAUSES HIGHER OPERATIONAL RISKS

Static Var Compensators (SVCs) built with thyristor-based power electronics technology have been in use since the 1970s. They continue being installed in demanding applications, such as electric arc furnaces, mining plants and transmission and distribution networks. High reliability and availability is required from these installations, as they play an extremely vital role in eliminating flicker, reducing voltage variation and increasing productivity in industrial facilities and extending transmission and distribution capacity in the electrical networks of utilities.

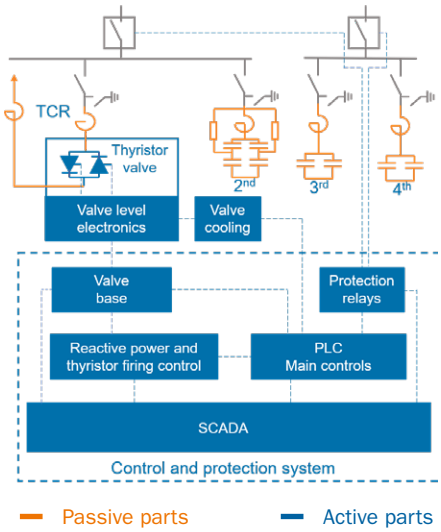
Keeping an ageing SVC up and running can be a challenge for several reasons, including shorter lifetime of active components versus passive components. The manufacturer's specific electronic control components may have become obsolete, and the electrical characteristics of new spare thyristors must be closely matched with the other thyristors in the valves. Thus, the reliable long-term operation of an ageing SVC system can be compromised leading to operational or safety risks.




## OPTIMIZING THE LIFETIME OF AN AGEING STATIC VAR COMPENSATOR

A Static Var Compensator comprises of active and passive components. The active components are thyristor valves, control and protection system and cooling system. The passive components are thyristor controlled reactors (TCR), harmonic filter banks and transformers. The lifetime of the active components is shorter than that of the passive components. To maximize return on investment, the active components need to be upgraded to

## AN EXAMPLE OF AN SVC SYSTEM



# WORLD CLASS TECHNICAL KNOWHOW

## WITH FACTS SOLUTIONS

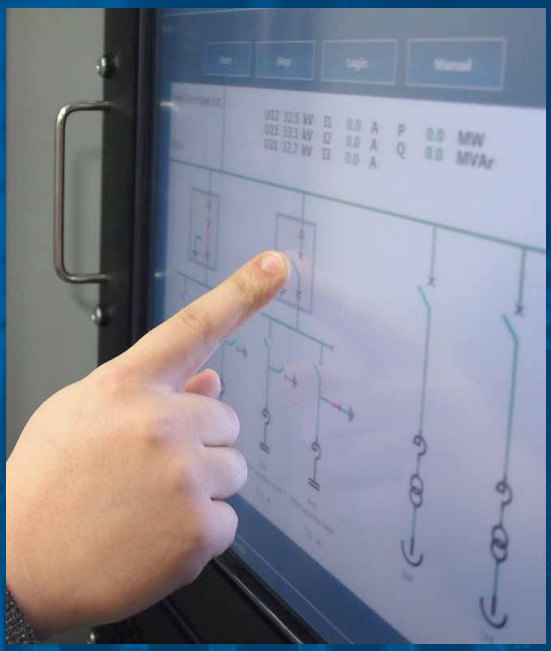
Merus Power is a world class expert in different FACTS solutions, such as Static Var Compensators (SVC), Static Synchronous Compensators (STATCOM), and energy storage solutions. Our team specializes in the design, manufacture, testing and commissioning of SVCs, ranging from a few MVArs dynamic reactive power compensation solutions to large scale utility level solutions.

- **Engineering & specifications of TCR &TSC valves, control and protection systems and other FACTS components**
- **Power electronics & control system design**
- **System & performance studies**
- **Layout design engineering**
- **Installation and commissioning**
- **Project management**

## MAXIMIZING RETURN ON INVESTMENT

Static Var Compensators are capital investments. The modernization of an ageing Static Var Compensator helps our customers to maximize ROI through a number of benefits:

- **Superior performance with access to modern technology**
- **Extension of SVC system lifetime**
- **Improved reliability and availability**
- **Standard & customized service provision to match requirements**
- **Reduced operational risk due to unplanned downtime**
- **Improved management of spare parts**
- **Remote monitoring**



# SVC MODERNIZATION SERVICES CUSTOMIZED TO YOUR OPERATIONAL REQUIREMENTS

## A. FULL SVC MODERNIZATION

**Replacement:**

- Complete replacement of active and passive parts
- Replacement of circuit breakers, transformers, etc. can be included

**Benefits:**

- Allows change of power range or filter configuration of the SVC system
- Upgrades the entire SVC
- Less downtime compared to building a new SVC
- Top class SVC performance in terms of flicker mitigation and response time
- State-of-the-art components, easy availability of spare parts
- Remote monitoring and analysis

## B. FULL ACTIVE PART MODERNIZATION

**Replacement:**

- Replacement of active parts and control & protection system

**Benefits:**

- Fully updated functionality
- Definitely less downtime compared to building a new SVC
- Top class SVC performance in terms of flicker mitigation and response time
- State-of-the-art components, easy availability of spare parts
- Remote monitoring and analysis

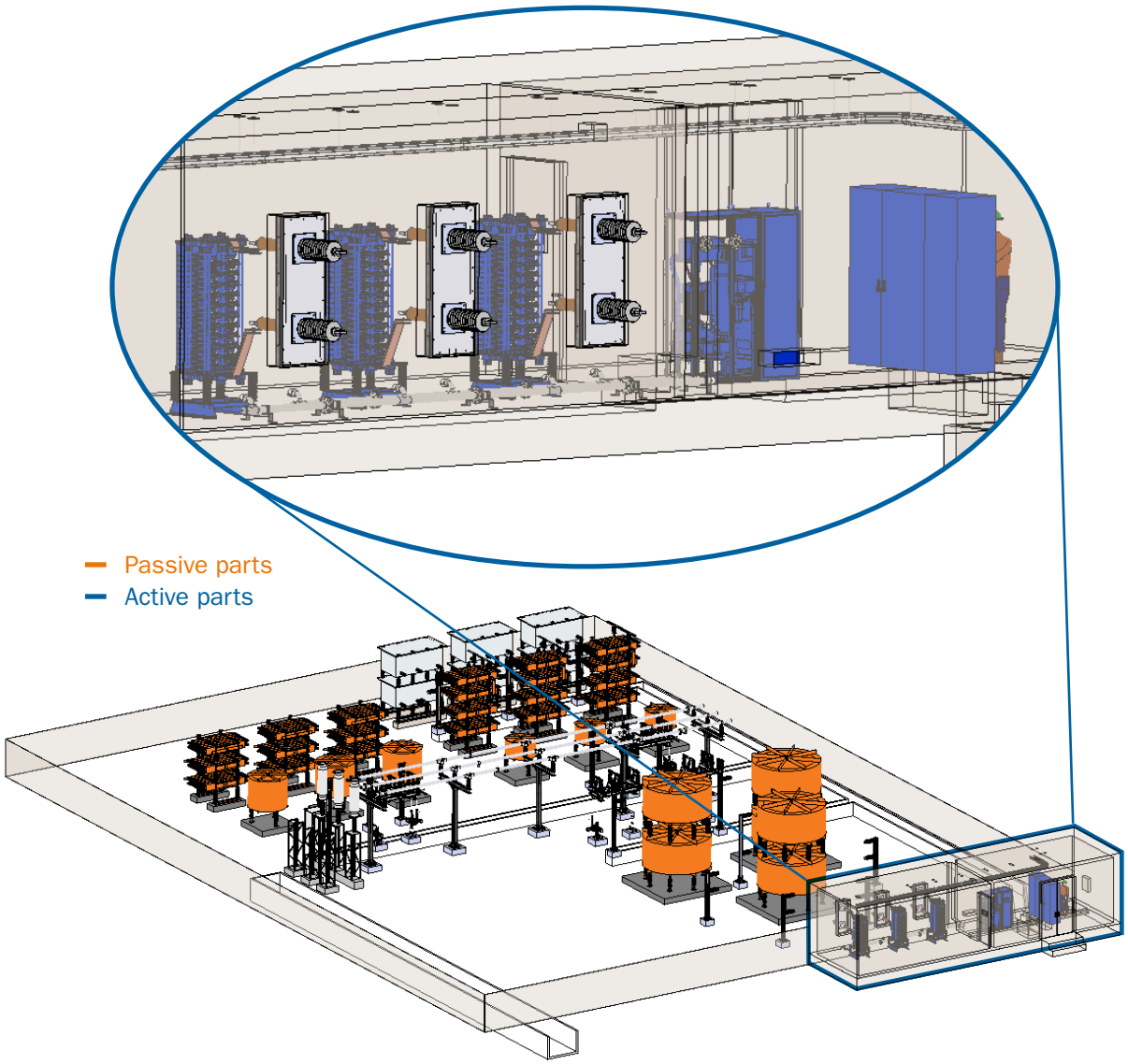
## C. PARTIAL ACTIVE PART MODERNIZATION

**Replacement:**

- Replacement of thyristor valves, valve base units and cooling system
- Possible only on certain preconditions

**Benefits:**

- Refurbished power electronics with state-of-the-art reliability, availability of spares and lower losses
- Complete set of valve protections including forward recovery protection (FRP)
- Temperature measurement of each thyristor valve for improved monitoring




## D. CONTROL & PROTECTION SYSTEM REPLACEMENT

**Replacement:**

- Replacement of existing control & protection system on certain preconditions

**Benefits:**

- Top class SVC performance in terms of flicker mitigation and response time
- State-of-the-art components, easy availability of spare parts
- Remote monitoring and analysis

## F. CUSTOMIZED MODERNIZATION SERVICES

On a case by case basis, Merus Power can also provide customized SVC modernization services. For more details, please contact us.

## E. SVC UPGRADE TO STATCOM

**Replacement:**

- All active parts and control system replaced with STATCOM

**Benefits:**

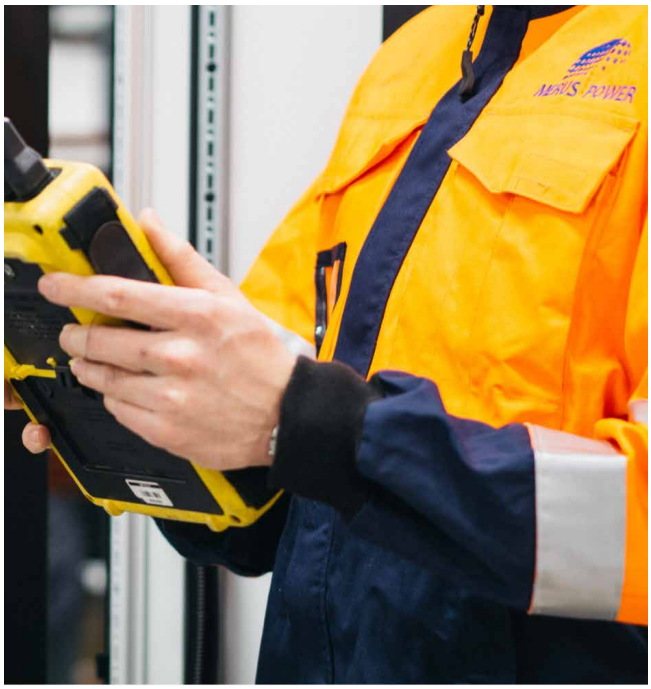
- Cost effective change to latest STATCOM technology
- Superior response time and flicker reduction performance
- Smaller footprint to free up space
- In some cases, old filter banks may be utilized in the new STATCOM
- Remote monitoring and analysis
- Readily available spare parts

# SMOOTH PROJECT EXECUTION

**WITH MINIMUM DOWNTIME**

Our experienced team of competent engineers takes a consultative approach to find out the right solution for the modernization of an aging Static Var Compensator. A typical SVC modernization project starts with a site survey, where our team evaluates the current status of the SVC installation. At this stage we ascertain the long and short term operational goals of our customer.

The site survey allows us to benchmark the condition of the installed SVC against the desired or optimal SVC operational performance. The site survey leads to recommendations for the further maintenance and modernization of the SVC. Regardless of whether the proposal is standardized or customized, we make an effort to keep downtime to a minimum. This allows the optimization of investment cost and reduces lifecycle costs.




## DEPENDABLE TECHNICAL SUPPORT AND READILY AVAILABLE SPARES

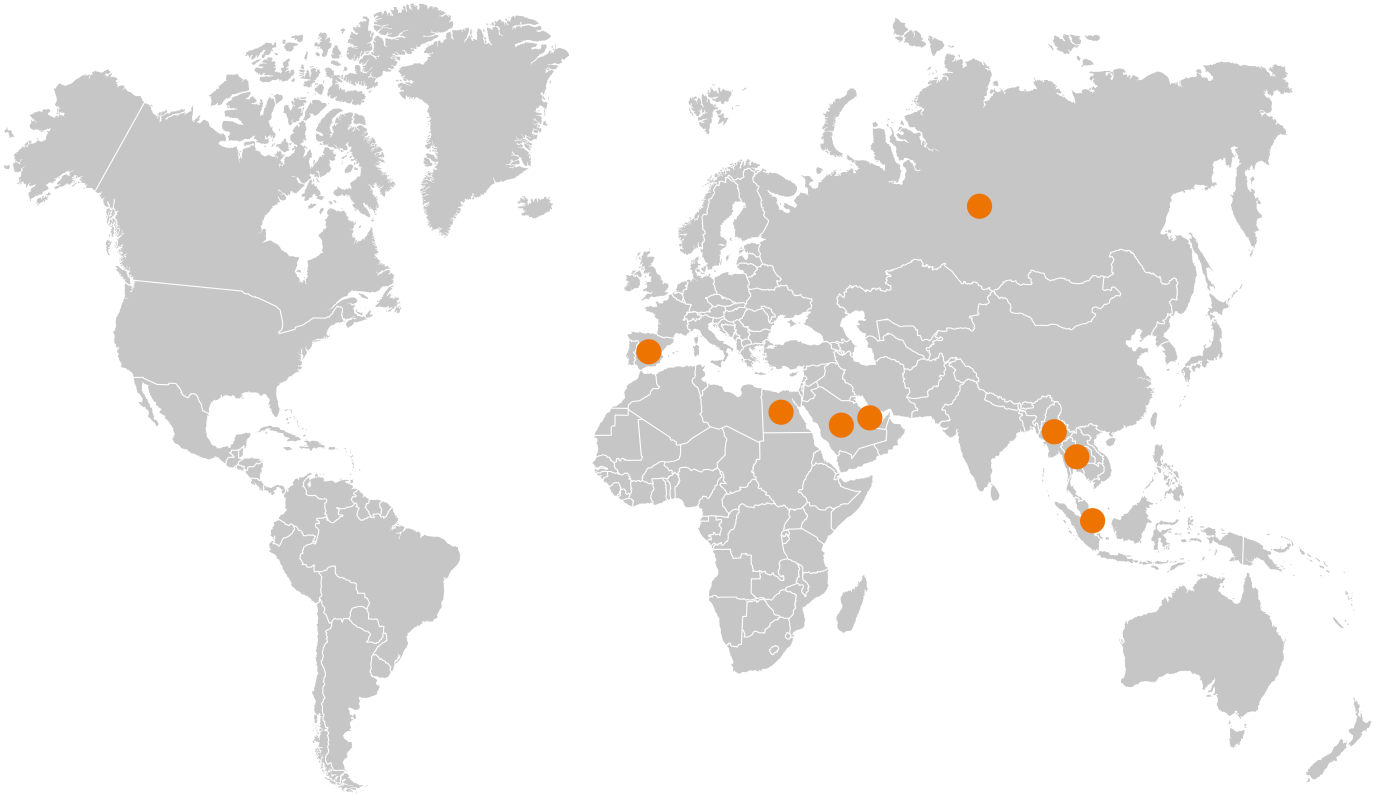
Effective Static Var Compensators are critical to achieving smooth operation of user facilities. Thus, high levels of reliability and availability are expected from the installed SVC systems. Merus Power, as a dependable service partner, gives you world class service both in terms of technical support and a timely delivery of spare parts. We secure smooth operation of your critical plant asset with timely feedback and easy access.

- **24/7 Access to hotline**
- **Agreement on intervention time**
- **Spare parts management**
- **Engineering and consulting**
- **Remote monitoring**
- **Remote assistance and diagnostics**
- **Training**

# SELECTED GLOBAL REFERENCES

Customers all over the world have benefited from our technical knowhow of FACTS solutions and have successfully extended the lifetime and performance of their existing Static Var Compensators.

Merus Power has offered wide range of our services to our global customers, including site visits and condition evaluations, full or partial replacement of active parts, and upgrading of obsolete analog based control and protection systems to modern digital control and protection systems.



# WINNING BUSINESS WITH POWER QUALITY

Merus Power offers world-leading clean technology to improve power quality, energy efficiency and environmental performance. Our dynamic compensation solutions- active harmonic filters, UPQs, energy storage systems, STATCOMs and SVCs – solve your power quality problems in no time. You will enjoy a swift payback on your investment: our solutions save energy, increase productivity and lifetime of the facility.

We also offer a service portfolio which spans the whole product lifecycle from power quality surveys to after-sales services. We provide our clients with world-class products, reliable Finnish technology, dependable and flexible service and true co-operation.

*Merus Power is a member of Cleantech Finland.*

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