

Solutions for Top 500 servers

high quality energy for climate control



The customer

Guaranteed no-break power for planning the future

The Euro-Mediterranean Centre for Climate Change (CMCC) is a major scientific research body that has been set up to broaden and deepen our knowledge of the causes and consequences of climate variability, using the techniques of high-resolution modeling with global Earth system models and regional models. Research is focused in particular on the Mediterranean area.

The organisation is structured as a network, with its main centre in Lecce and five peripheral centres in Bologna, Capua, Milan, Sassari and Venice.

The work is coordinated in six Research Divisions:

- SCO – Scientific Computing and Operations
- ANS – Numerical Applications and Scenarios
- CIP – Climate Impacts and Policies - Economic Assessment
- ISC – Impacts on Ground and Coast
- IAFENT – Impacts on Agriculture, Forests and Natural Earth Ecosystems
- FDD – Education, Documentation and Dissemination

Goals and needs

The CMCC has installed a supercomputer in the new **Top 500 supercomputer** centre on the University of Salento campus in Lecce. The installation, ranked amongst the Top 500 supercomputers in the world, consists of a series of vector and scalar parallel systems with integrated memory and has a total aggregate peak power of about 30 teraFlops, allowing the management of a database (tape library) of over one petabyte with a throughput of 1800 Mbyte/s. The two supercomputing clusters differ by their architecture: one is a vector system, the other scalar. The vector architecture system has 11 computing knots and the scalar system 30.

With such a concentration of computing power, the CMCC intends to take important steps forward in atmospheric and oceanic modelling at contained energy consumption levels, despite the considerable overall power usage. These high performance computers are used for simulating the impact of climate change on terrestrial, coastal and oceanic ecosystems and assessing the effects on the health of the human species, flora, fauna and the economy. For this purpose, an integrated structure is used for the calculation and data storage resources, based on advanced technologies, middleware, services and



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protocols. The CMCC grid infrastructure integrates the various constituent poles and guarantees data exchange with similar organisations working towards the same goals. Because of the importance of their studies, organisations of this kind need a

breakdown-proof, uninterruptable power supply to avoid losing essential data and jeopardising the work of hundreds of researchers.

The solution

An UPS for our future

The CMCC has opted for the experience of Socomec UPS to guarantee an uninterrupted power supply to its supercomputer and safeguard the data. Socomec UPS has installed a **DELPHYS MX Elite** 500 kVA static no-break system, together with the enclosure that houses the UPS and the entire set of batteries. Socomec UPS also produced the power supply and bypass panel, pre-designed for a second UPS installation in parallel and capable of providing total 1000 kVA protection for future extensions. The system is high quality, with a high power factor and with the advantage of being able to draw from a sinusoidal current network, even in the presence of distorting loads downstream. This makes it possible to optimise the entire electrical system. Thanks to the digital SVM (Space Vector Modulation) control, the output voltage is perfectly sinusoidal with any type of load. **MOREOVER, THE DELPHYS MX Elite** is suitable for powering units with a 0.9 leading power factor, typical of latest-generation servers. With this system, the entire CMCC computing

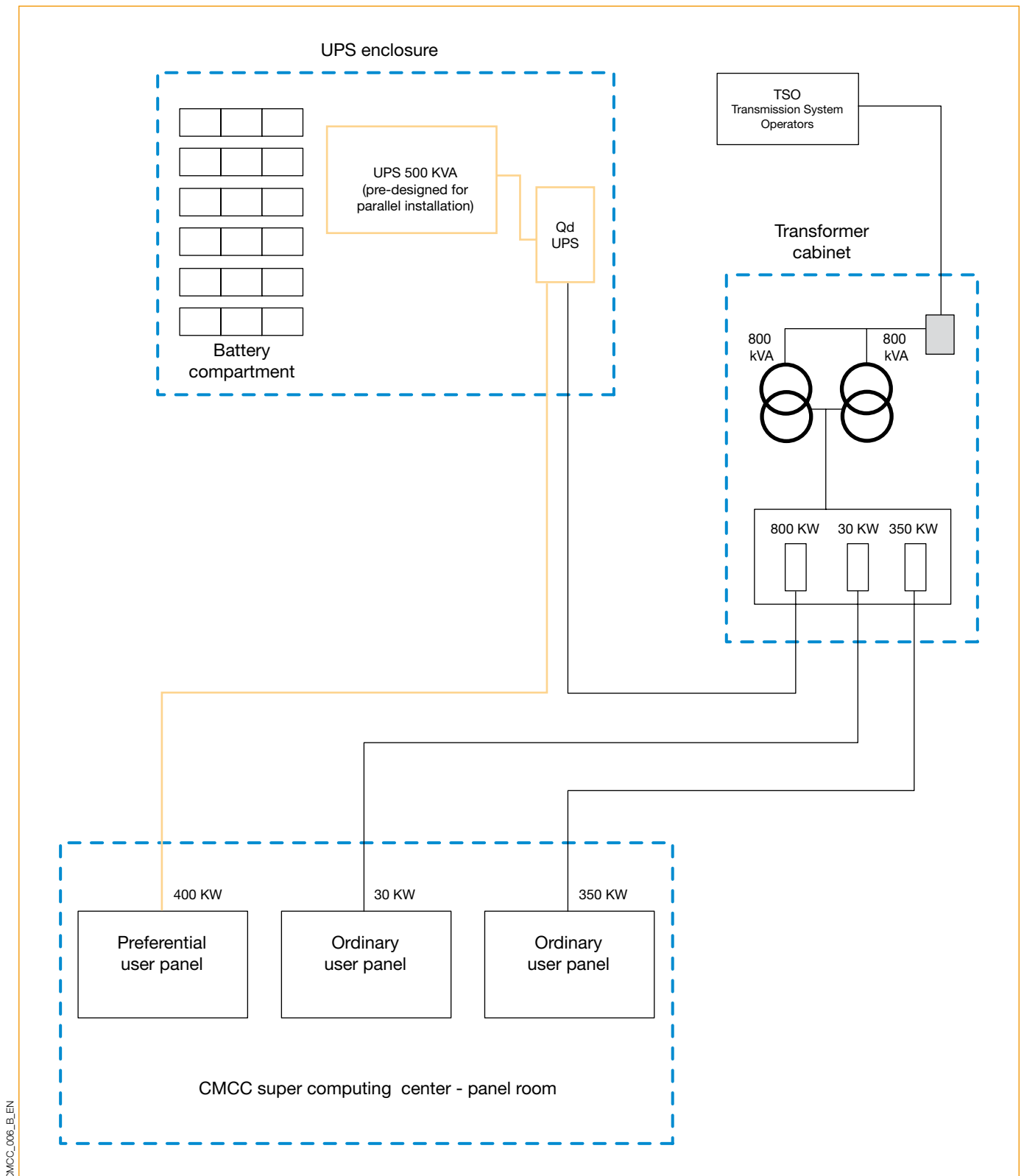
centre is able to perform excellently, thus guaranteeing good results in its important

research work.



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The architecture



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Advantages of the system

DELPHYS MX Elite, designed for maximum quality and maximum protection

Given the latest-generation servers installed, the following characteristics of the **DELPHYS MX Elite** were contributory factors in the choice made by the CMCC:

High quality power supply

- High quality output voltage thanks to the digital control
- Operation at full power up to a power factor of 0.9 leading

High reliability

- Fault tolerant architecture with built-in redundancy
- Choice of redundant parallel configurations
- Excellent battery management

Heightened network integration

- Sinusoidal input current, also for non-linear loads
- High input power factor
- Current draw with harmonic content below

4.5%

Competitive in management

- High efficiency with energy saver function
- Scalar architecture for optimisation of power supply in relation to computing power

Easy to use

- Intuitive synoptic display
- Net Vision communication interface for LAN with management of HTTP, SNMP and SMTP protocols suitable for remote alert monitoring.
- Set for round-the-clock remote **T.SERVICE** monitoring.



Focus on

CMCC

- Ranked amongst the Top 500 supercomputers in the world
- 30 teraFlops of calculation power
- Tape library database of over one petabyte with a throughput of 1800 Mbyte/s
- vector system with 11 computing knots
- scalar system with 30 computing knots

SOCOMECS UPS

- **DELPHYS MX Elite** 500 kVA
- VRLA batteries
- System development consultancy
- Architecture
- Round-the-clock remote surveillance
- Scheduled and preventive maintenance service

Advantages

- High availability solution
- Environmental compatibility
- Protection against all power breaks, both micro and prolonged
- Maximum system compatibility
- Lasting investment value over time



Osvaldo Marra

Head of the CMCC's System Management Supercomputer Centre

The NEC and IBM systems have different architecture characteristics with major electrical power consumption. We were looking for a reliable solution and a reliable partner. The modular solution is a result of the joint work of CMCC engineers and Socomec UPS.

Given the satisfying results, we decided to sign a maintenance contract so that the Socomec UPS engineers could continue to be involved, with the capabilities they have always demonstrated".

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