



We work hand in hand with our worldwide clients to shape the future of electricity through innovative and ad-hoc solutions.

White a legacy of more than 60 years of experience, CESI operates in 70 countries around the world and supports its global clients in meeting the energy transition challenges. Through its Division KEMA Labs, CESI is the world leader for the independent Testing, Inspection and Certification activities in the electricity industry. CESI also provides civil and environmental engineering services. The company's key global clients include major utilities, Transmission System Operators (TSOs), Distribution System Operators (DSOs), power generation companies (GenCos), system integrators, financial investors and global electromechanical and electronic manufacturers, as well as governments and regulatory authorities. In addition, CESI works in close cooperation with international financial institutions. CESI is a fully independent joint-stock company headquartered in Milan and with facilities in Arnhem, Berlin, Prague, Mannheim, Dubai, Rio de Janeiro, Santiago de Chile, Knoxville (USA) and Chalfont (USA).

CONSULTING SERVICES

TESTING & CERTIFICATION

SPACE SOLAR CELLS





#### **Deliver practical solutions that help to interpret** and shape a world that is becoming more and more interconnected and complex.

Our expertise covers almost every aspect of the Energy and Infrastructure sectors:

- Power transmission and distribution: HVDC/HVAC infrastructure, distribution infrastructure and smart grids
- Renewable energy and storage: hydropower, solar and wind generation and storage systems
- Conventional power generation: open and combined cycle gas turbine, coal-and oil-fired thermal power plants, industrial facilities
- Infrastructure: roads, bridges and cultural heritage

With more than 1,000 consultants worldwide, we provide technical assistance to utility, energy & infrastructure investors, governments, regulators and financial institutions in more than 50 countries throughout Europe, the Middle East, Asia, Africa, The United States and Latin America. Our services cover the entire life cycle of infrastructure projects, from early stage feasibility studies to the complete support during construction, commissioning and operation.

### Application Fields



Energy

Advisory services **Engineering Consulting** Operation Optimization

Water & Infrastructure Civil Engineering Monitoring

Environment

Studies & Permitting Monitoring & Diagnostic Permitting

Testing & Inspection

## **KEMA** Labs

**CESI** Group

#### KEMA LABS is CESI's world-leading testing, inspections and certification division

With sites across the globe, we offer a combination of tradition and experience allied to state-of-the-art testing equipment. This enables us to test all kinds of grid equipment from low- to ultra-high-voltage so that our clients can meet today's increasingly demanding performance and safety requirements. Utilities have the challenging task of ensuring that their grids operate reliably, while product manufacturers need to ensure their equipment performs to the highest standards. KEMA Labs offers vast expertise, impartiality and a long history of technical experience gained through our testing activities and

participation in technical committees.

It makes us the ideal partner and the benchmark for testing in your sector. KEMA Labs has test locations around the world and has been testing products for more than 100 years. We have the strongest facilities ever built and we test more than 200,000 products every year. It is no surprise we are the market leader. As the energy business undergoes a deep transformation towards greener, smarter grids, KEMA Labs is focused on the new technologies that are emerging. We play a crucial role supporting our customers during the R&D phase at our state-of-the-art facilities, including our Flex Power Grid Laboratory.

Services and Labs

Testing Labs

On-site Testing

Product inspections,

certification & training

#### More than 30 years of experience in the research, development and production of high efficiency space solar cells for civil applications.

Our standard triple junction space cells (InGaP/InGaAs/Ge) are state of the art with a typical efficiency of 30%. They are qualified for both Low Earth Orbit (LEO) and Geostationary Orbit (GEO) satellites according to standard ECSS E ST20-08C. We continuously seek to make our cells more efficient and our research suggests we will be able to produce four junction cells with space efficiencies beyond 35%. We manufacture space solar cells at our facilities in Milan using our proprietary technology. CESI has manufactured more than 200,000 solar cells that have powered more than 70 civil satellites for clients from over 25 different countries. CESI has developed close and lasting links with international space agencies and players around the world. Our investments in research in this field have been supported by funding from the Italian National Space Agency (ASI) and the European Space Agency (ESA). CESI is well regarded for its expertise in the development and manufacturing of advanced and proven space solar cells within the ESA European space program frames. Additionally CESI has contributed to many interplanetary missions (e.g. to Mercury, Mars and Jupiter).



- junction space cells With a typical efficiency of 30%
- Low Cost Triple and GEO missions
- for LEO missions

## **CESI Expertise**

Our expertise reaches almost every corner of the energy sector

#### Products Expertise

**Cables and Accessories High and Medium Voltage Switchgear Assemblies** and Switching Devices **Low Voltage Switchgear** 

**Assemblies and Switching Devices** 

Insulator and bushings Transformers

**Surge Arresters Power Electronics** 

Measuring relays, and protection equipment

**Battery Storage systems** 

E-mobility

Transmission & Distribution Renewables & Green Hydrogen Storage & E-mobility Conventional PP, Industrial & Oil&gas

Industries Expertise

#### Water & Infrastructure

Water Infrastructure **Civil Infrastructure** Natural hazards

Air Water

Waste & Wastewater Soil & Groundwater Physical agents



# CESI Space

# Space product



- junction solar cells Fully qualified for LEO
- Thin Triple junction solar cells Fully qualified

#### Our Offices

#### CESI

#### Centro Elettrotecnico Sperimentale Italiano Giacinto Motta S.p.A.

Via Rubattino, 54 I-20134 Milan – Italy T +39 02 21251 Fax +39 02 21255440 Employer/Tax ID: 00793580150

#### Istedil Istituto sperimentale per l'edilizia S.p.A.

Via Lago dei Tartari 3D 3E 00012 Guidonia Montecelio (Roma), Employer/Tax ID: 00422780585

#### **CESI USA. Inc.**

The Corporation Trust Center, 1209 North Orange Street, Wilmington, 19801 Delaware, EIN Letter No. 81-1465653

#### Enernex, LLC

620 Mabry Hood Road, Suite 300, Knoxville, TN 37932, USA EIN letter No. 27-2301508

### CESI Middle East FZE

Building 5WA – Office 326 Dubai Airport Freezone – Dubai United Arab Emirates, DAFZA License: 2176, VAT no. 100362429100003 CESI do Brasil

Consultoria LTDA

Rua da Quitanda, 191 sala 1101 Centro- Rio de Janeiro RJ CEP 20091-005, Brazil, CNPJ/MF n. 15.644.793/0001-59

## IPH Institut "Prüffeld für elektrische Hochleistungstechnick" GmbH

Landsberger Allee 378A 12681 Berlin, Germany, registered with the commercial register of the local court of Charlottenburg under registration no. HRB 34753B, VAT no. DE137211121

#### CESI S.p.A. Agencia en Chile

Av. Raul Labbé 12613, Lo Barnechea – Santiago, Chile Ph +56 934 175 718

### FGH Engineering & Test GmbH

Hallenweg 40 68219 Mannheim, Germany registered with the commercial register of the local court of Mannheim under registration no. HRB 8138B, VAT no. DE202994469

#### KEMA B.V.

Klingelbeekseweg 195 6812DE Arnhem, the Netherlands, Trade Register number 73117455 VAT code: NL859361809B01

#### ZKUSEBNICTVI A.S.

Podnikatelská 547, 190 11 Prague 9 – Běchovice, Identification No.: 452 74 355, registered in the Commercial Register maintained by the Municipal Court in Prague, File No. B 1563 VAT: CZ45274355

#### **KEMA Powertest. LLC**

4379 County Line Road, Chalfont, PA 18914 EIN Letter No.: 32-0225276

