



Technologies for Smart Green Electrification



Mission: Power and Decarbonization

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IPS Shareholders



Power Technology Investment Group (PTIG) is an investment management group which makes investments in future oriented, breakthrough power technologies and companies with global market potential.

joined 2014



PostScriptum Ventures is a US venture capital group which holds a broad portfolio of investments primarily but not exclusively in the energy sector.

joined 2015



BlackPeak Capital is a co-investment growth equity fund established under the European Investment Bank's JEREMIE initiative. The Fund makes investments in innovative, high-growth companies, which hold leadership positions in the global or domestic markets.

joined 2015



Mytilineos is a global leader in the EPC sector. The Company specializes in the construction of power plants from design and procurement through to construction and completion.

joined 2016



The governmental **Capital Investment Fund (CIF)** is a subsidiary of the Bulgarian Development Bank. CIF invests in technology companies with established business model and potential for growth and generation of high added value and for accelerated expansion in the domestic and international markets.

joined 2021

Background: 30+ years R&D, Engineering and Manufacturing



R&D and precision manufacturing of power technologies and solutions since 1989



Unique and patented technology (US, EU, GCC)



Highest reliability in extreme conditions, NATO approved



IPS systems in operation, in 58 countries on all 7 continents (incl. Antarctica)



IPS R&D Center & HQ
Sofia, Bulgaria



IPS Factory K1, 19000m²
Kardzhali, Bulgaria

IPS capabilities



R&D & Manufacturing

Power conversion hardware
and management software

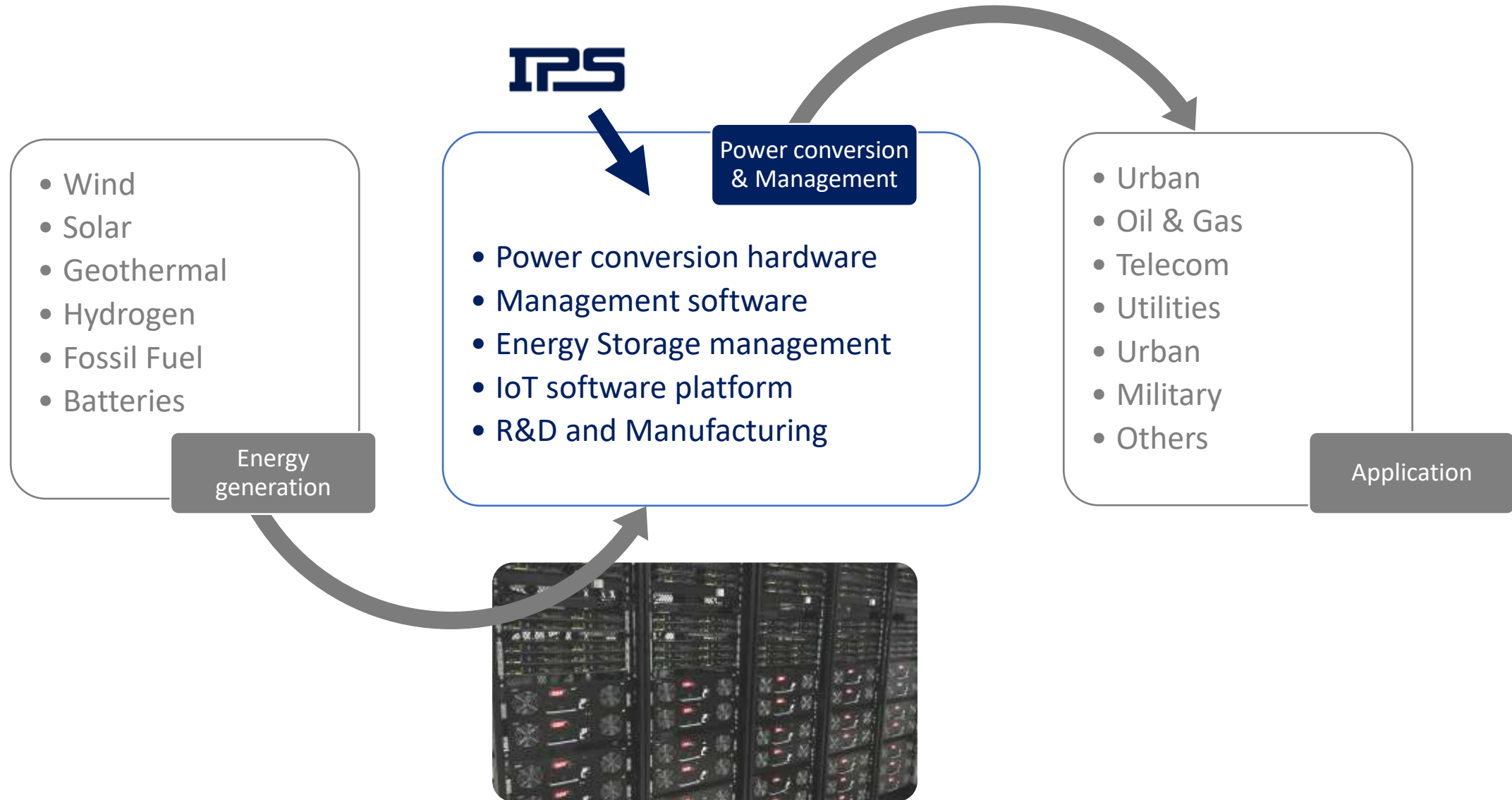


Turn-key EPC solutions

Development, integration, deployment and O&M
for specific applications



IPS Technology is part of the Midstream field



R&D and know-how with historical track record

- ✕ More than 6000 own hardware & software developments over 32 years
- ✕ International awards and recognition
- ✕ Patented key technologies (Next Generation Networks, Smart Grid, desert power systems, battery life extension system)

Product portfolio



DC power systems

DC-AC inverter systems

DC-DC converters

Frequency converters

PV chargers

Cathodic protection

Hybrid & off-grid power systems

Turn-key power solutions

Technology recognition



SpaceX innovation Award
California, USA

"Modular power system EXERON for the pod of the Hyperloop competition"



ees Award
Munich, Germany

"Best innovative off-grid power system EXERON with electrical energy storage"



Innovation Award 2019
Sofia, Bulgaria

"Most Innovative company in Bulgaria for 2019 – state honorary award given by the President of Bulgaria"



TowerX industry Award
Johannesburg, South Africa

"Fastest Return on Investment (16 months) for a telecom OPEX reduction system (96%)"

Challenges that drive the innovation strategy of IPS



3.6 billion people have **NO** or only partial access to **electricity**



Very **high OPEX costs** in remote areas (diesel genset powered assets)



CO₂ pollution due to use of diesel generators



High electricity costs in urban areas



Impossible or very **difficult** and **costly** deployment of standard power infrastructure



Challenging environment with **extreme temperatures**, high level of **dust, sand** and **humidity**, that makes the operation of standard system solutions impossible

IPS technology applications



Independent, green electrification in remote areas and harsh environments—reliable, efficient and maintenance-free



Residential and Smart Grid solutions for areas with well developed electrical grids



Decarbonization and OPEX reduction for the Oil & Gas and other CO₂ intensive industries

IPS focus: turn-key smart electrification solutions for 6 key industries



Micro and Smart Grids: decentralized power generation and supply



Oil & Gas: oil, gas and water wells
RTU, TETRA, CP, Decarbonization



Telecommunications: remote towers,
OPEX reduction of DG



Defense & Security: radar systems,
special equipment, TETRA, camps



Agriculture: water pumps, remote
processing plants and facilities



Utility substations: Balance of System,
battery charging, power to critical loads

Company presence and markets

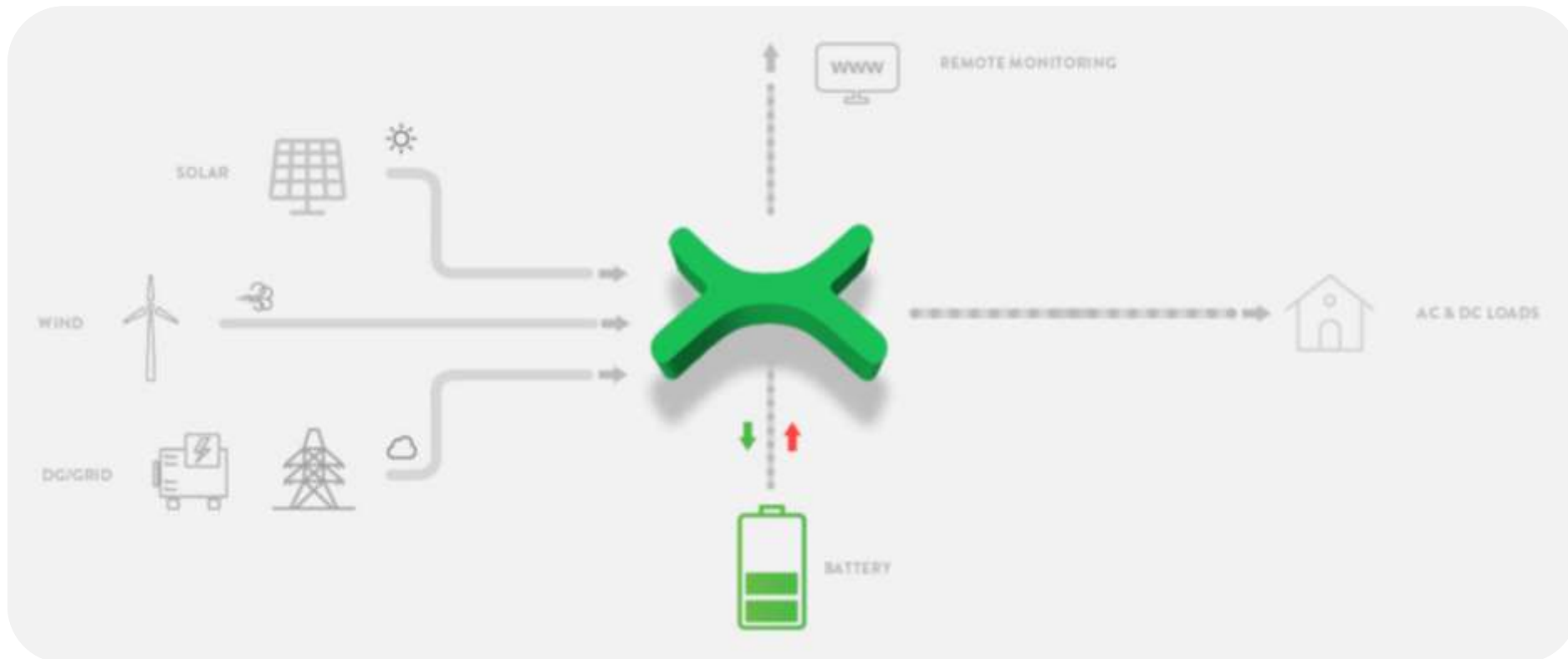




EXERON - the Masterpiece in the portfolio

About EXERON *(or just X)*

- ✕ IPS has developed the EXERON technology to independently generate, store and supply electricity in
 - remote or rural areas, off-grid or bad grid locations
 - urban areas with well developed grid infrastructure in the form of Smart Grids



EXERON essentials

The Key: unique and patented modular architecture

- ✘ Scalable from 2 kW up to 65 MW
- ✘ Smart Grid ready
- ✘ Unique modular architecture
- ✘ Cloud-based remote monitoring platform
- ✘ Rapid deployment
- ✘ Maintenance-free
- ✘ OPEX costs reduction up to 98%
- ✘ Patented in US, EU, GCC
- ✘ NATO certified
- ✘ Extreme operation from -40°C up to +80°C
- ✘ Patented battery life extension software

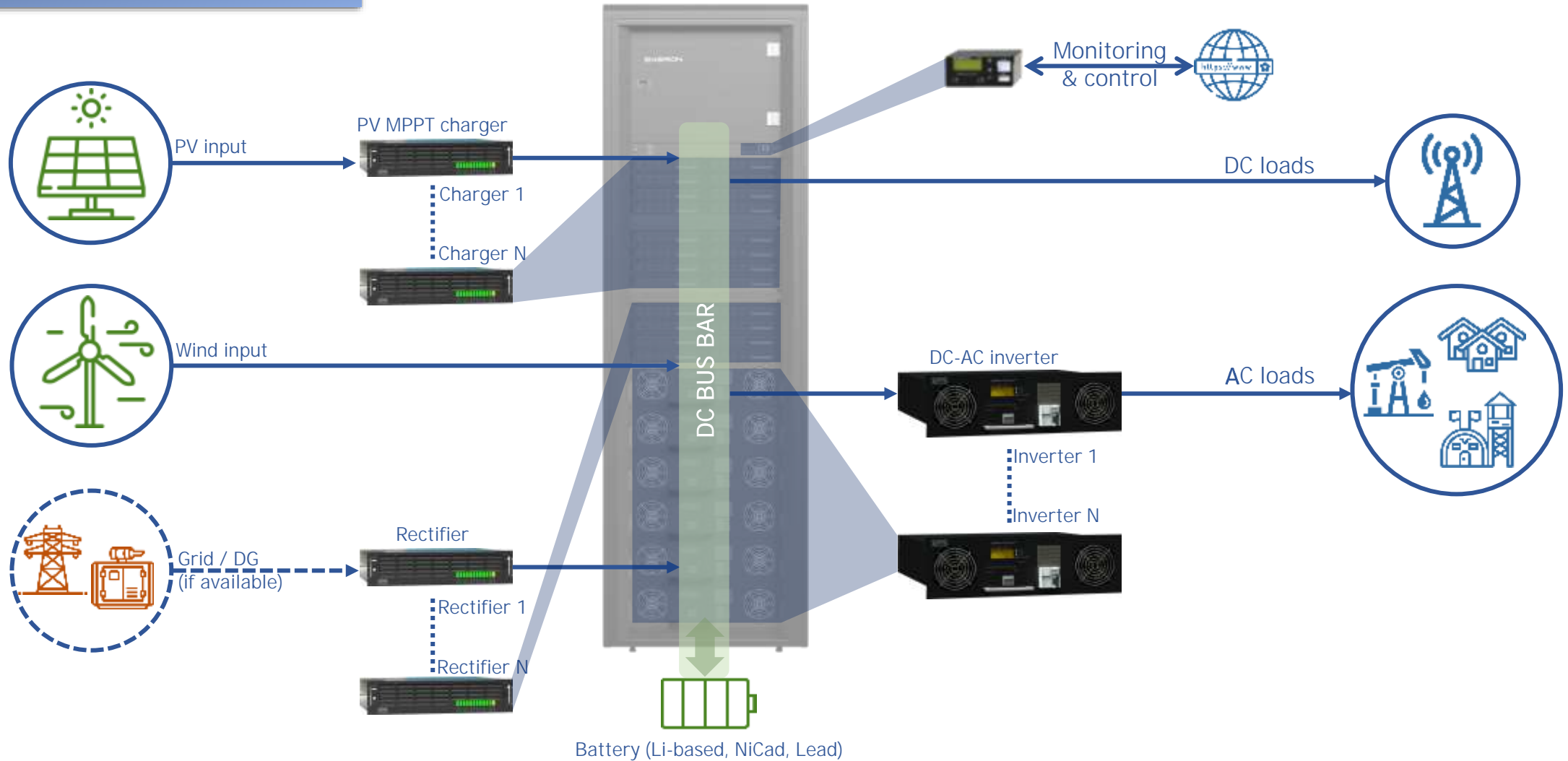


The 7th continent. Conquered.



Modular architecture scalable from 2 kW up to 65 MW

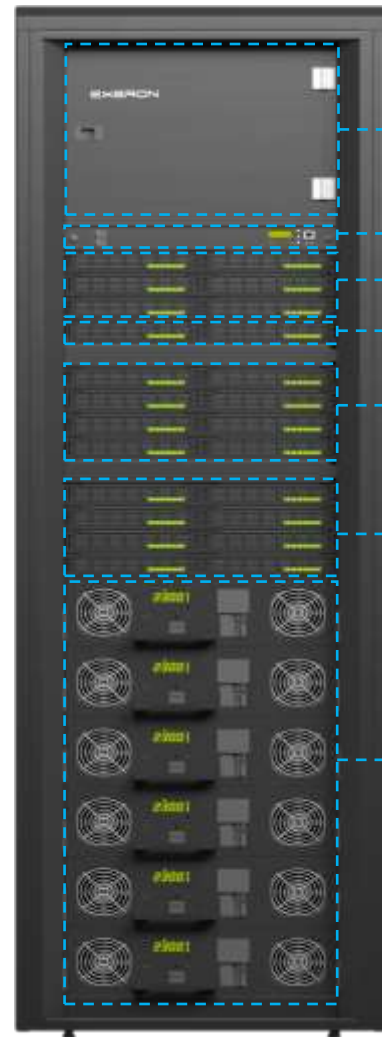
A unique modular hot-plug design



Modular architecture scalable from 2 kW up to 65 MW

A unique modular hot-plug design

- ✘ EXERON consists of Plug&Play power modules with different functions – solar charge controllers, rectifiers, inverters, DC-DC converters, CP controllers, etc.
- ✘ The number (of each type) of power modules connected into the EXERON is unlimited and depends on the system design, customer's requirements and application. Power range is from 2 kW up to 65 MW.
- ✘ All power modules are monitored and controlled through the EXERON's main brain – the MCU (Monitoring and Control Unit).
- ✘ All power modules are operating in a load sharing mode, thus a complete power outage is almost impossible.
- ✘ EXERON is battery technology agnostic. X' own battery management system typically operates with Li-based, NiCad and Lead Acid batteries.
- ✘ A cloud-based remote monitoring platform provides a complete overview over the system's operation.



Example for system configuration:

PDU (Power Distribution Unit)
incl. all I/O connection and protections

MCU (Monitoring and Control Unit) incl. BMS

Cathodic Protection Controllers

DC-DC Converters (48/24/12 VDC)

MPPT Solar Charge Controllers

Rectifiers

Inverters

Scale and type

- ✕ Scalable from 2 kW for small/single applications up to 65 MW for large industrial or smart grid power projects
- ✕ IPS is designing and fabricating the appropriate housing solution based on client's requirements for indoor or outdoor application
- ✕ Complete integration with battery storage (any chemistry) and various energy sources (conventional and/or renewables)



Small/Mid/Large size capacity
for indoor applications



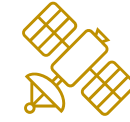
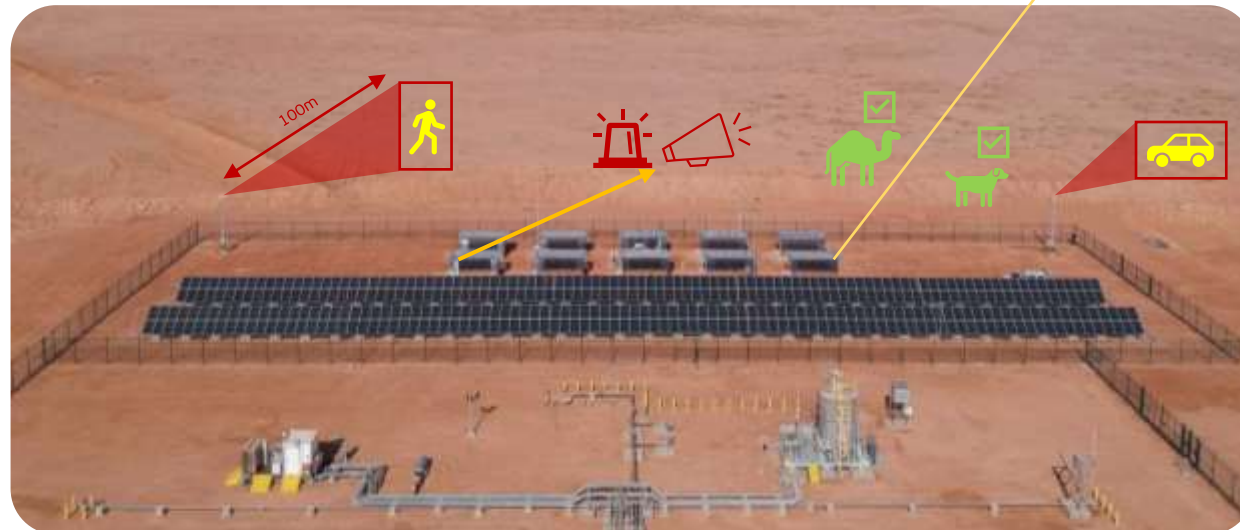
Small and compact size capacity
for outdoor applications



Mid and large size capacity
for outdoor applications

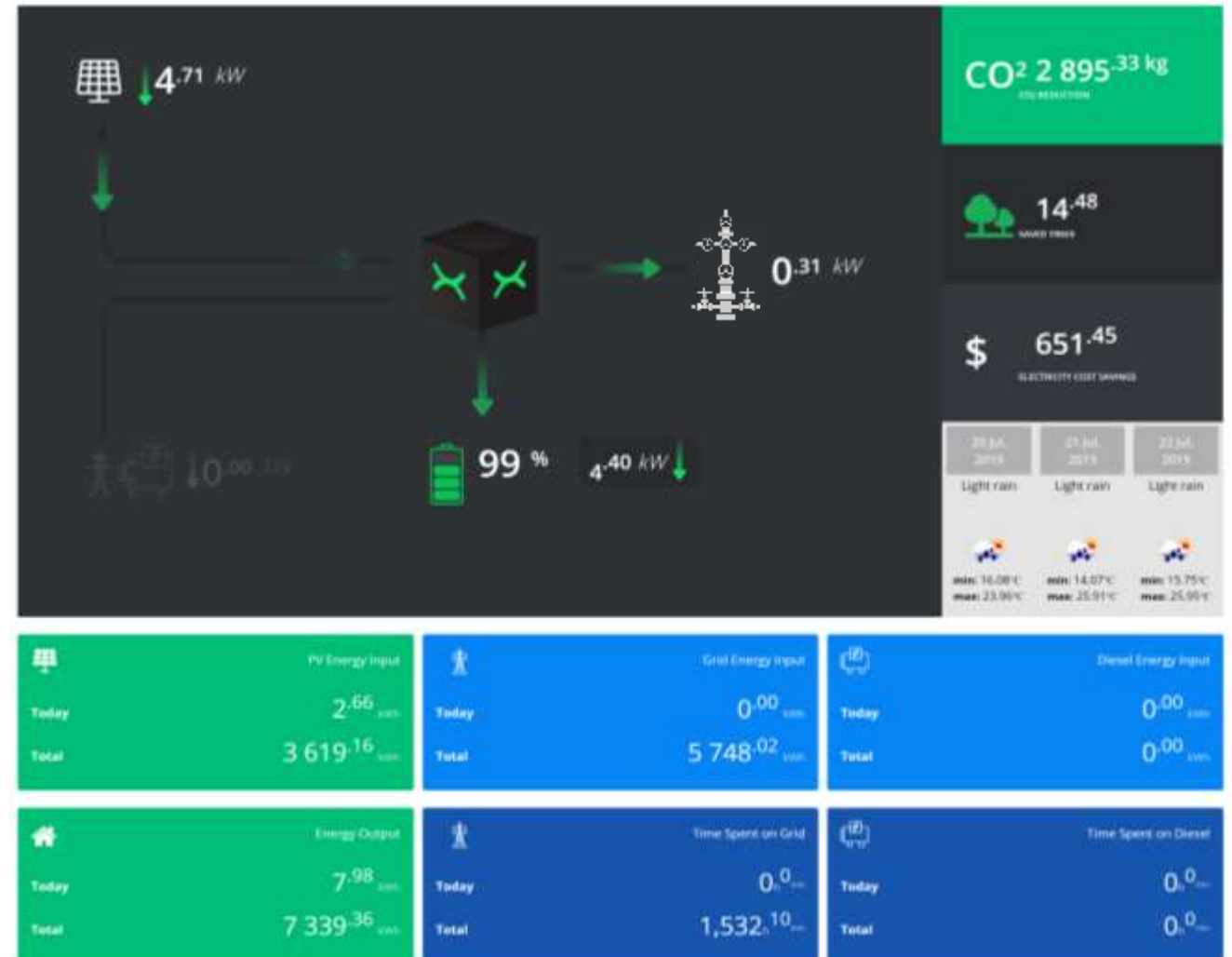
Turn-key solutions features

- ✕ Intelligent site security
- ✕ IPS patented anti-theft solution
- ✕ IoT monitoring and control integration
- ✕ Environmentally-controlled system behavior
- ✕ IPS patented filter-less air filtering system (maintenance-free)
- ✕ IPS patented non-compression-based cooling system (maintenance-free)
- ✕ Many others



Remote monitoring and management platform

- ✘ Comprehensive monitoring of all system parameters
- ✘ Real time monitoring
- ✘ Data logging
- ✘ Cloud or local based
- ✘ Optional connection of additional sensors
- ✘ Weather data integration
- ✘ Wired or wireless data transfer (FOC, 3G/4G, satellite)




An aerial photograph of an industrial facility, likely a refinery or chemical plant, situated in a vast, flat, arid desert landscape. The facility is enclosed by a perimeter fence and features a complex network of pipes, storage tanks, and processing units. A large, dark, rectangular structure, possibly a solar panel array or a covered storage area, is prominent on the right side of the site. The sky is clear and blue, and the ground is a mix of light brown sand and darker, possibly wet or mineral-rich, patches.

Reference projects

TETRA telecommunication site


Telecommunications



DC AC
2 kW
 Output power, average


Location: United Arab Emirates


Client: شرطة أبوظبي
ABU DHABI POLICE




4 kWp
 PV


100 kWh
 Battery


NA
 Electrical grid


34 kVA
 Diesel genset

TETRA telecommunication site

Telecommunications



DC AC

6 kW

Output power, average

Location: Saudi Arabia

Client: **أرامكو السعودية**
saudi aramco



PV

74 kWp



Battery

1.2 MWh



Electrical grid

NA



Diesel genset

34 kVA



RTU data transmission site

Oil & Gas

DC AC
 1 kW
 Output power, average

Location: Saudi Arabia

Client: **أرامكو السعودية**
saudi aramco

7.2 kWp
 PV

100 kWh
 Battery


NA
 Electrical grid

NA
 Diesel genset



Gas well site


Oil & Gas



 DC AC
 5 kW
 12 kVA
 Output power, average


Location: Saudi Arabia


Client: **أرامكو السعودية**
saudi aramco




 122 kWp
 PV


 2 MWh
 Battery


 NA
 Electrical grid


 NA
 Diesel genset



Cathodic protection site

Oil & Gas



DC AC

1 kW

Output power, average

Location: Saudi Arabia

Client: **أرامكو السعودية**
saudi aramco



8 kWp

PV



64 kWh

Battery



NA

Electrical grid



NA

Diesel genset



Oil well site

Oil & Gas



DC AC

24 kVA

Output power, average

Location: Australia

Client: **Santos**



36 kWp

PV



105 kWh

Battery



NA

Electrical grid




30 kVA

Diesel genset



Mini-grid installation for a college city


Rural electrification



DC AC
600 kVA
 Output power, average


Location: Nigeria


Client:




625 kWp
 PV


1.7 MWh
 Battery


NA
 Electrical grid


700 kVA
 Diesel genset



3G telecommunication site

OPEX reduction



DC AC
2 kW
1 kVA

Output power, average

Location: Bulgaria

Client: **TELEKOM
AUSTRIA
GROUP**



8 kWp

PV



36 kWh

Battery



NA

Electrical grid



24 kVA

Diesel genset



Energy substation

Utilities



DC AC
15 kW
12 kVA

Output power, average

Location: Kosovo

Client: **SIEMENS**



8 kWp

PV



28 kWh

Battery



35 kVA

Electrical grid



24 kVA

Diesel genset



Energy substation

Utilities



DC AC
24 kW
6 kVA

Output power, average

Location: Kosovo

Client: **ABB**



8 kWp

PV



32 kWh

Battery



42 kVA

Electrical grid




24 kVA

Diesel genset





Micro-grid installation for a private lodge


High-end residential



DC AC
120 kVA
 Output power

Location: South Africa
 Client: Safari lodge, private


148 kWp
 PV


432 kWh
 Battery



NA
 Electrical grid


80 kVA
 Diesel genset




Micro-grid installation for a private residential facility


High-end residential



DC AC
60 kVA
 Output power


Location: Greece

Client: Residence, private


30 kWp
 PV


130 kWh
 Battery



30 kVA
 Electrical grid


NA
 Diesel genset



Micro-grid installation for a military base


Defense & Security



DC AC
36 kVA
 Output power


Location: Paraguay


Client:  Min. of Defense




42 kWp
 PV


240 kWh
 Battery


NA
 Electrical grid


64 kVA
 Diesel genset



Micro-grid installation for a municipality

Infrastructure

DC AC
 132 kVA
 Output power

Location: Indonesia

Client: Min. of Transportation

120 kWp
 PV

480 kWh
 Battery

150 kVA
 Electrical grid

NA
 Diesel genset



Largest clients

ENERGY



TELECOM



DEFENSE & SECURITY



A photograph of a server room. In the foreground, a technician in a dark shirt is working on a server rack, pulling a bundle of cables. The rack is filled with server units, each with multiple fans and indicator lights. The background shows more server racks and a person sitting at a desk. The overall scene is dimly lit, with the primary light source being the server components and the technician's work area.

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