



Cuerva*



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What is the future of energy?



CENTRAL DE LA VEGA



6 Our track record

We would like to share Cuerva's past, present and future with you.

Innovating since 1939

“Let a mule walk the distance
trusting in the animal’s instinct to
always find the surest path. The route
the mule took was the route the cable
would follow”

José Cuerva Cobo

This is the beginning of our company’s history, a track record of nearly eight decades in which we have always dared to go beyond the conventional, to try new approaches, read nature’s script and find things in it that others fail to see. Innovation does not mean the same as it did in 1939 but our vision remains the same. Our way of understanding our surroundings and identifying the opportunities they provide us with is what has enabled us to harness the available resources, including our know-how and our own instinct to provide consumers with clean, efficient, reliable energy.



Renewable natives

“One day the major electric power companies will realise that they must take the road we, the small hydroelectric stations, are already travelling: the renewable energy route”

Gerardo Cuerva Vallet



Here at Cuerva we have been committed to renewable energy from the beginning.

To us, sustainability is not a future promise but a legacy we have managed to maintain over time and which enables us to meet the demands and challenges posed by future development of the sector.

Three generations, one sole commitment

“To us, leading development of renewable energy and of the electrical networks represents a cherished ambition and a constant challenge to be the best.”

Ignacio Cuerva Valdivia



With a track record of more than eighty years, talking about Cuerva inevitably means talking about transformation. But in spite of having grown and operating in more and more countries, we are still a company with family values devoted to finding the best energy-related solutions by innovation and understanding the needs of people, the sector and society in general.

Chronograph of the history
of Cuerva



1939

Foundation
A workshop that specialised
in mechanical and electrical
repairs and installation
of high and low-voltage
systems.

1959

Beginning of the energy distri-
bution activity.
Construction of networks for
electric power supply to remote
towns and villages in the provin-
ce of Granada, Spain.

1962

The Bermejales HPS comes
on line. Cuerva acquires
Eléctrica Alpujarreña and
sets up the company Eléc-
trica Luz del Temple.

1985

Incorporation of Distribuido-
ra Eléctrica Bermejales S.A.
Cuerva absorbs the dis-
tributors Eléctrica Luz del
Temple and Alpujarreña

1989

Distribuidora Eléctrica Ber-
mejales S.A. founded.
Absorbs distributors Eléc-
trica Luz del Temple and
Alpujarreña.

1990

HPS Bermejales reopens
with upgraded power after
being closed for several
years.



1992

Commissioning of the La
Vega
HPS.

1995

Commissioning of the
Arquillos (in Linares, Jaén)
and Cubillas (Granada) hy-
droelectric power stations.

2004

Acquisition of Eléctrica San
Buenaventura.
Power supply to the muni-
cipal districts of Alcadia de
Guadix and Exfiliana.

2006

Acquisition of Eléctrica
Guadalfeo. Electric power
supply to the Alpujarra
district of the province of
Granada.

2007

Acquisition of Eléctrica San
Gregorio. Power supply to
the municipal district of La
Calahorra, Granada.

Grupo Cuerva Panama is
founded. The Group's first
international subsidiary.

2008

Development y sale de 15
MW of solar photovoltaic
capacity.
Construction of the Escúzar
substation with the aim of
enhancing the power supply
in the area.

Chronograph of the history of Cuerva



2009

CHC Energía is founded. The Group enters the retail segment of the energy market.

Construction of the first Gabias-Escúzar high-tension overhead power line. Connection to e-distribucion at its transformer substation (TS).

2010

Grupo Cuerva is incorporated as a holding company.

2011

Construction of the Escúzar-Láchar high-voltage overhead power line.

2012

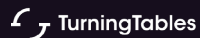
Grupo Cuerva Perú is founded. The Group's second international subsidiary.

2014

Connection of the San Lorenzo HPS to PANAMA's grid.

2015

Construction of hydroelectric stations in Peru.



2016

Turning Tables founded. Cuerva's innovation laboratory.

Commissioning of the 4.5-MW Alba de Tormes wind farm.

2018

Development of Living Lab with various partners in the distribution network.

2019

Commissioning of the 2.4-MW MAMUT wind farm.

Development of new business models for the retail energy sector: Energy Communities, PPAs, Peer 2 Peer, Virtual Communities, etc.

2020

220/132 kV 1x160 MVA Íllora TS distribution network investment plan: New substation in Íllora connected to the National Grid (REE)

Upgrading of the 132/66KV 1x100 MVA Escúzar TS as a consequence of the strong demand in the area.

2021

Investment by Cable Energía to highlight electrical mobility, EMS and VPP.

Connection between two distributors: Eléctrica Guadalfeo and Distribuidora Eléctrica Bermejales.

11-km, 132 kV D/C Íllora-Escúzar HVOL: Connection of the new substation to the Láchar area.

2022

Commissioning of the 3.5-MW Guadix experimental wind farm.

Construction and commissioning of the 5.6-MW Camino de Ácula photovoltaic solar plant.

Construction and commissioning of the 1.5-MW Antonio Valverde wind farm, Aldeire.







22 Services

Here at Cuerva we understand energy as a channel through which we provide important useful services for people. That is why everything we do revolves around the users, enabling us to learn from real experience to fulfil their present and future needs.

We understand energy
as a process from
beginning to end

We are engaged in all the service areas
of the electrical sector:

Renewable energy generation

Electric power distribution

Energy retailing

Industrial and construction services

Energy-related services

Digitalisation of energy

Renewable energy generation

Gerardo Cuerva Vallet showed us how we could evolve towards a model of sustainable, ecological energy consumption, so that today we continue to implement his vision of clean energy production throughout the entire value chain from generation to installation and maintenance of infrastructures.

80 years later, we are specialists in the renewable hydro, wind and photovoltaic solar technologies.

We own and/or operate six hydroelectric plants in Spain and Panama, two photovoltaic solar plants (one wholly-owned asset and another under an O&M contract) and four wind farms in Spain.

Key data

+1,630 MW

of renewable generation currently under development.

+137 MW

of fully-developed generation capacity.

Construction, operation and maintenance of

+37 MW

in hydroelectric stations, photovoltaic solar plants and wind farms.

96.8GWh

approximate mean annual output.

International projects

San Lorenzo hydroelectric power station (Panama)

8.7 MW

Total power

38.3 GWh

Average annual energy production

Nueva Granada hydroelectric power station (Peru)

17.5 MW

Total power

115.39 GWh

Average annual energy production

San Lorenzo hydroelectric power station (Panama)



Las Joyas PVPP (Peru)

202.75 MW

Total power

459.26 GWh

Average annual energy production

Domestic projects

La Vega hydroelectric power station (Monachil)

2.4 MW

Total power

4GWh

Average annual energy production

Camino de Ácula photovoltaic solar plant (Ventas de Huelma).

4.8 MW

Total power

10.3GWh

Average annual energy production

Experimental wind farm (Guadix)*

3.5 MW

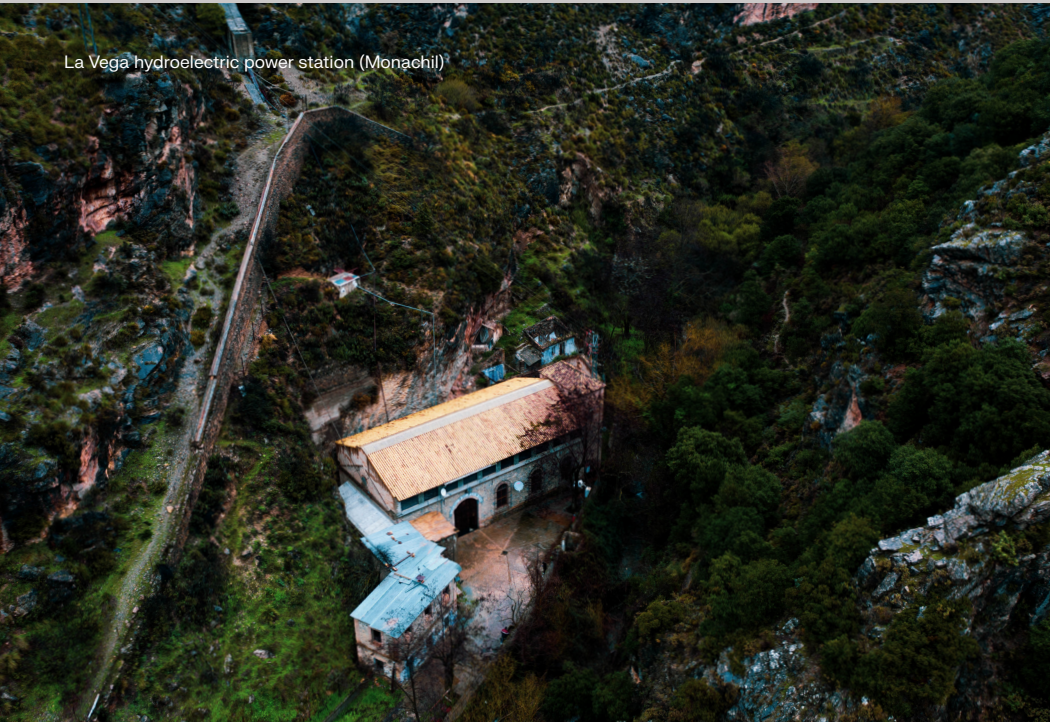
Total power

10.2GWh

Average annual energy production

* The most powerful wind turbine with a permanent-magnet synchronous generator installed in Spain.

La Vega hydroelectric power station (Monachil)



Electric power distribution

Taking energy to rural districts and thus fostering the progress of society as a whole has always been one of our main goals. That is why power distribution has been one of our key activities from the very beginning.

We also invest in the distribution zones in order to improve the supply conditions.

Deployment of new infrastructures in our Escúzar area to enable us to attend to future supplies is an example of this. Among these, projects as significant as the IFMIF-DONES particle accelerator, the Amazon and Lidl logistics centre or the ROVI Laboratories head office deserve special mention. Our activity in the area will convert the district into the driving force of the provincial economy.

* We distribute energy to more than thirty-five towns and villages in Granada.

Key data

+900km

of lines

+99M kWh

per annum

+16,500

consumption points supplied

Providing energy to

+25,000

people

Our distributors

San Buenaventura HPS

Electricity for more than

2,000

people

Urban area.
Valle del Zalabí municipal district.

Bermejales electric power distributor

Electricity for more than

28,000

people

Rural areas.
The Temple subregion.
La Vega y Costa Contraviesa.

Guadalejo PS

Electricity for more than

7,000

people

Rural area.
Alpujarra of Granada.

San Gregorio PS

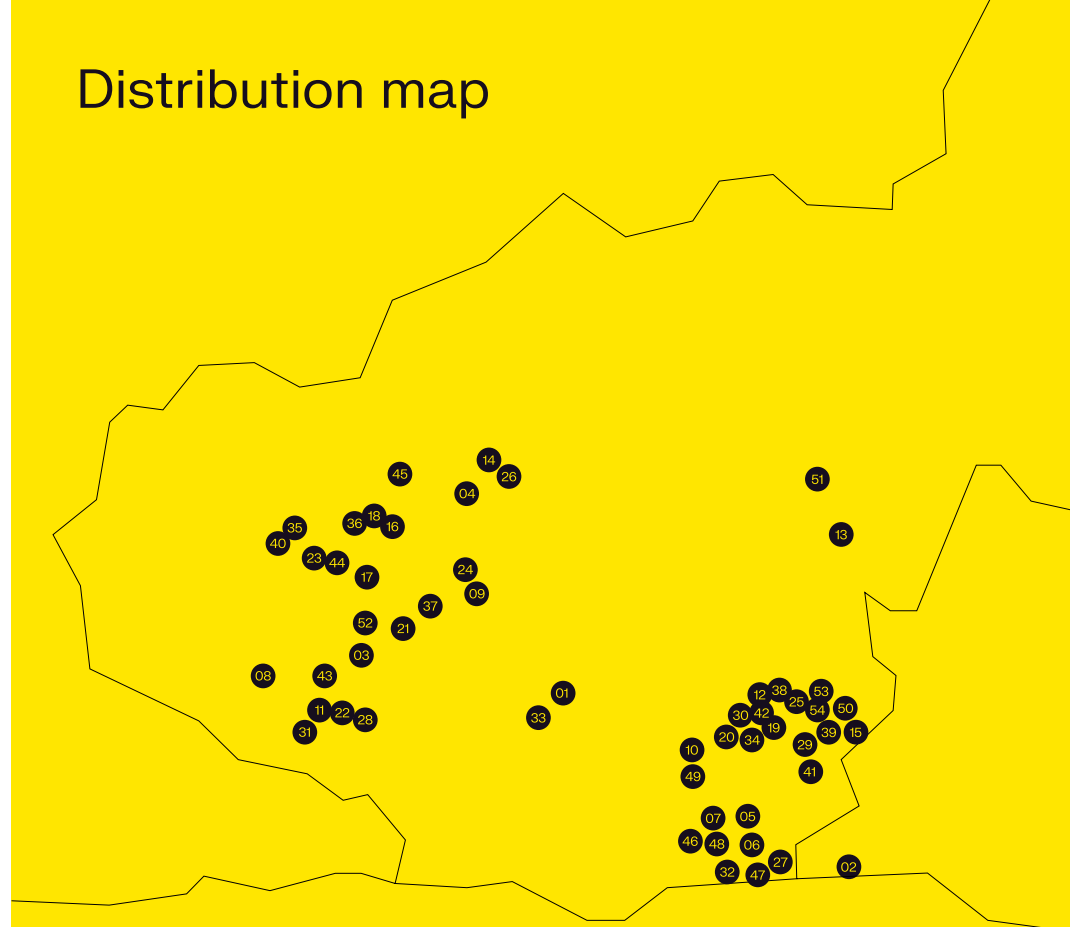
Electricity for more than

600

people

Urban area.
Calahorra municipal district.

Distribution map



01. Acequias

02. Adra

03. Agrón

04. Albolote

05. Albondón

06. Albuñol

07. Alforñón

08. Alhama de Granada

09. Alhendín

10. Almegíjar

11. Arenas del Rey

12. Bérchules

13. Calahorra (la)

14. Calicasas

15. Canteras

16. Chauchina

17. Chimeneas

18. Cijuela

19. Cádiar

20. Cástaras

21. Escúzar

22. Fornes

23. Fuensanta

24. Gabias (las)

25. Golco

26. Güevéjar

27. Huarea

28. Jayena

29. Jorairátar

30. Juviles

31. Játar

32. La Rábida

33. Lecrín

34. Lobras

35. Loreto

36. Láchar

37. Malahá (la)

38. Mecina-Bombarón

39. Montoros

40. Moraleda de Zafayona

41. Murtras

42. Narila

43. Pantano Bermejales

44. Peñuelas

45. Pinos Puente

46. Polopos

47. Pozuelo (el)

48. Sorvilán

49. Torvizcón

50. Ugíjar

51. Valle Del Zalabí

52. Ventas De Huelma

53. Yegen

54. Yátor

Key projects

Transformer substations (TS)

Illora TS connected to the national grid (REE)

220/132 kV 1x160 MVA

TS in Escúzar

66/20 kV 2x30 MVA

Upgrading of the Escúzar TS

132/66 kV 1x100 MVA

High-voltage lines (HVL)

Construction of a 66-kV HVL
to Las Gabias

Construction of a dual circuit HVL to
connect the Íllora and the
Escúzar TS.

Implementation of systems

Implementation of a Scada, remote
control and communications system
with the distribution centres

LAT Láchar-Escúzar



Energy retailing

Deregulation of the energy market in 2009 posed a new challenge and an opportunity. Cuerva took the opportunity to begin working with CHC Energía* to engage in the sale of electric power as an active agent and therefore forge an even closer relationship with our customers.

* CHC Energía is the seventh largest electricity distributor in Spain. CHC Energía's shareholding is partly made up of members of the CIDE association, made up of more than 200 energy distributors, in which Cuerva is one of the main shareholders.

Key data

14,786

customers

18.97 GWh

B2B consumption

80%

market share in the area

1,719

customers outside the area



Industrial and construction services

The experience accumulated over eight decades working, investing and innovating in our own infrastructures has endowed us with expertise in design, development and execution of all kinds of electrical facilities for both for large construction companies and for end users, from industrial premises to singular residential buildings and large tertiary sector constructions.

In addition, society demands more sustainable and efficient mobility methods and electricity enables us to provide this kind of solution.

Here at Cuerva we are happy to place both our knowledge and our specialists at the disposal of other industries to provide a service that we are convinced contributes to optimizing energy consumption, thus reducing its detrimental impact of on the planet.

Our activity:

EPC (Engineering, Procurement Integrated maintenance: and Construction) projects for:

- high and low-voltage electrical networks, electrical substations, control systems, smart grid systems, hydroelectric plants, photovoltaic solar plants and wind farms.
- Industrial premise self-supply.
- Special audio, video, data and communications and automation for both major construction companies and for the end user.
- Implementation of domotic systems in dwellings and process automation for industries.
- Installation of EV chargers
- Of photovoltaic power plants, electrical facilities, preventive and corrective maintenance and management of periodic audits in hotels, residential and office buildings, hospitals, shopping centres, of public lighting, electric vehicle chargers, etc.

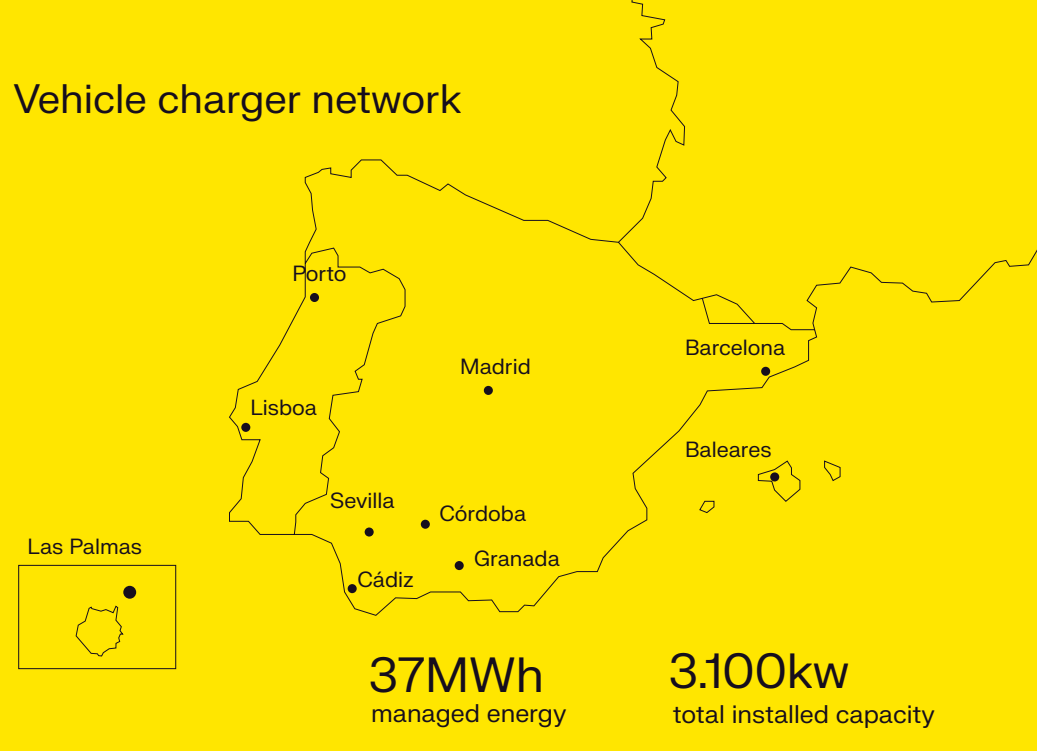
Electrical mobility:

- Deployment of public and private recharging point network infrastructures at destination and en-route locations.
- Technology applied to management of micro-networks with V2G capacity. In order to optimize electrical systems, we have developed an EMS* composed of solar self-supply, bidirectional vehicle chargers and consumption.

Performance monitoring:

- Energy management systems (EMS) for monitoring, supervising and controlling the performance of the service.
- Data intelligence applied to the charger management platform for the maintenance entity and end users and optimization of charging points by means of geolocated data with CartoDB.

Vehicle charger network



Industrial photovoltaic facilities

- Aceites Maeva
- Nordwik
- Grupo Cariño
- Emasagra
- Herogra Fertilizantes
- Industrias Espadafor

Electrification of photovoltaic solar plants

- Los Arroyos
- Parque Metropolitano Solar
- Cueva del Negro
- Capitanes

Integrated maintenance of electrical systems

- Renfe Granada
- Knauf Escúzar
- Nuestra Señora de la Salud de Granada Hospital
- Neuron Biopharma
- IIDF Cabrera PTS building, Granada
- EMASAGRA transformer station network

Special facilities (telecommunications)

- Hotel Catedral 4*
- Residencia LIV Student Granada
- I+D Building, Parque Tecnológico de la Salud de Granada
- Higuerón West 217 luxury apartment building
- Vithas Xanit Internacional Hospital
- Caña Nature

EPC projects in high, medium and low voltage electrical networks

- Amazon Logistics distribution and transformer station
- Alcázar Genil Station (Granada Metro)
- Torre Pelli shopping centre
- Gabia-Escuzar overhead line
- Escúzar substation
- Public lighting
- Metro Campus de la Salud-Armilla

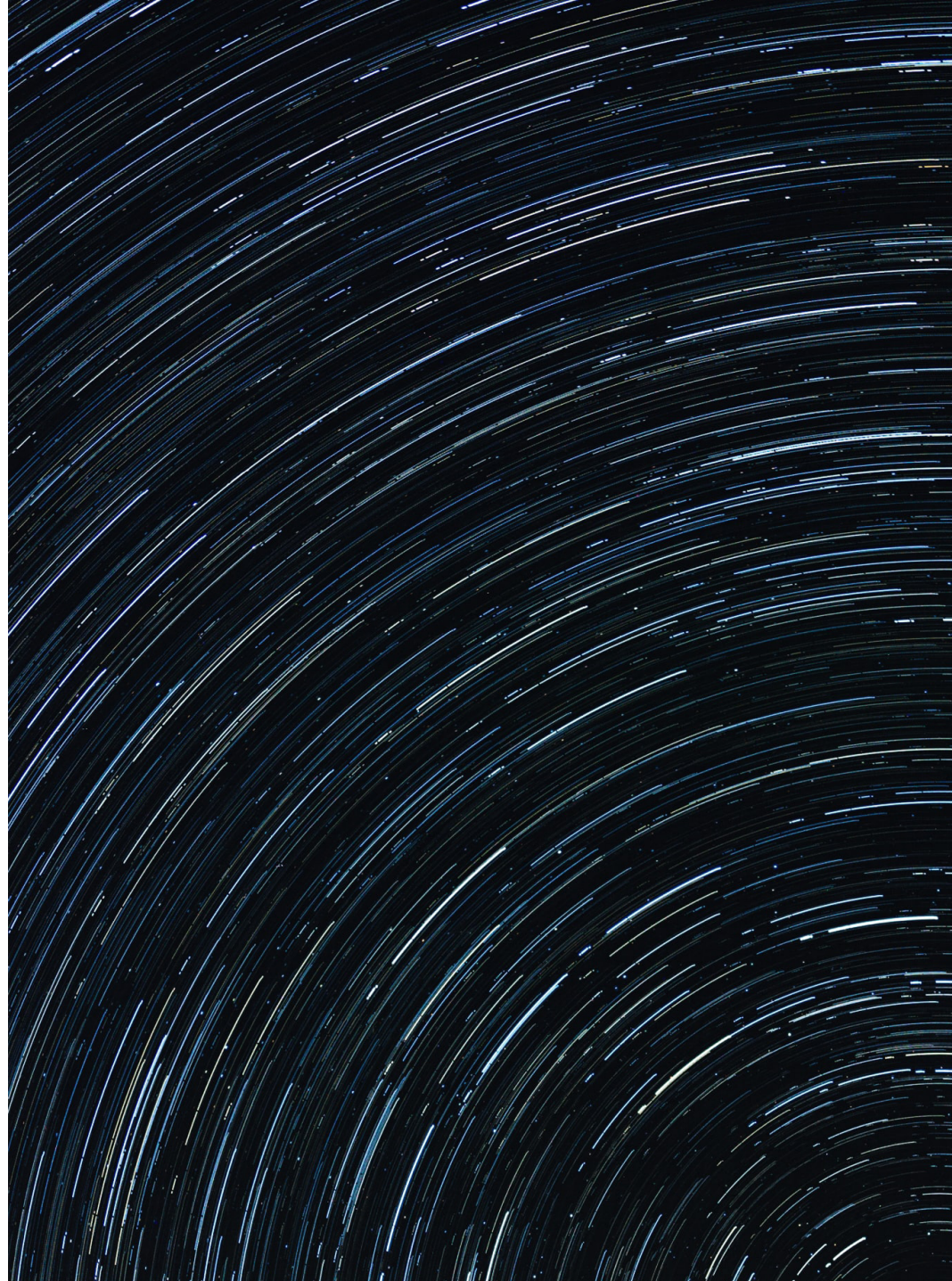


Energy-related services

Energy services are a gateway to innovation and, rightly understood, all innovation focusses on the end user. Here at Cuerva we never lose sight of the user's needs or of the importance of data.

We can only really understand the user's relationship with energy if we have access to quality data that enable us to improve the services we provide today and innovate for tomorrow.

We operate at all stages of the energy value chain from start to finish and, thanks to our in-house data analysis capacity, we have developed new services that go far beyond acquisition or disposal of facilities.



Our services

Shared self-supply.

We deliver energy to the user by deploying DERs* to provide support to groups of people and communities that intend to generate and consume shared energy.

New energy retailing models

Retail models based on PPA* contracts under which we certify provision of sustainable energy.

Efficiency 4.0 by means of energy management systems

We provide new demand response models and energy systems by implementing smart solutions and optimizing energy efficiency.

New business models for the new electric power demand

We create models that respond to the new electric power demand, enabling us to optimize the processes involved by monitoring, supervising and controlling the performance of the service.

New services in addition to supplying energy

We are engaged in projects in which energy is not the end but the means to create value.

The following are some examples of our work along these lines:

- “Comunidad Energética Senda”. Creation of energy communities in schools with the goal of educating the students.

Energy consultancy

- Studies of the technical-monetary feasibility and optimal dimensioning of power generation plants.
- Design of decision support systems (DSS) in management of energy resources.

New business models for the new electric power demand

Generation portfolio management, electricity market analysis, revenue optimization and implementation of energy sales strategies in the long, medium and short terms.

* DERs (distributed energy resources): mainly include small and medium-scale renewable energy plants, energy efficiency, physical and virtual storage systems, demand management and electric vehicles.

* PPA (power purchase agreement): long-term contract between a renewable power developer and a consumer.

Digitalisation of energy

We are committed to the development of energy. That is why we work to acquire, process and integrate data for the construction of a digital, electrical and energy-related model that enables us to obtain information on the behaviour of the network with the ultimate goal of applying the lessons learned to enhance the end-user's experience.

We innovate and think about what is in the offing, predict new roles for the distributor and network operator and prepare the Group to respond to future needs.

Our scope of operation:

We provide consultancy for smart electrical distribution networks from four different areas:

- Sensorization, acquisition and integration of measurements through the Internet of things (IoT) platforms with different data-availability options (real time or historical)
 - Development of digital models of MV and LV networks.
 - Advanced monitoring and analytics applications that enable us to enhance the network supply and operation
 - Digitalisation of private, closed and micro-networks
- quality and efficiency and increase the network's resilience.



1. Smart Grids & Micro Networks

We develop smart networks based on sensorization and unit selection in order to obtain real-time information about our network.

Digitization of Inpecuarias Villaralto's distribution networks (Grupo Industrias Pecuarias de los Pedroches)

2. Algorithm development

We work with advanced algorithms based on artificial intelligence and machine learning in order to improve the operation and use of our networks by creating digital twins, studies and optimizations that enable us to minimize all kinds of loss and to help us to detect and locate fraud.

Implementation of nodal capacity calculations based on digital models for the distribution company Sercide.


3. A user-oriented DSO

The role of the user in electric power distribution is more and more important. The electricity distribution sector is undergoing a paradigm shift in due to the impact of the consequences of focussing on users and their consumption patterns on its networks.

We are working on initiatives to connect physical reality with the virtual digital world in order to address the individual needs of each user in a friendly, transparent manner. This enables us to operate efficiently and provide users with the option to form an active part in decisions that affect their distribution network.

Interactive platform for network users.





54 What is the future of energy?

If the future is a question then we – as an essential actor in the development of the sector and of society in general – must work to be part of the answer.



As we have in the past and as we continue to do on a daily basis, we must go beyond what we have learned until now. We must build new roads, understand the why of things and endow energy with a true purpose.

Here at Cuerva we know what must be done; our mission is to take energy to the next level*. To listen to our surroundings and make a firm commitment to innovation to provide the best solutions to the needs of users and of the sector as a whole. We know that the way to accomplish this is to share the knowledge we have and connect with other organisations to achieve a beneficial energy transformation based on collaboration.

* To engage in innovation, focus on the user in everything we do and foster advances and collaboration within the sector itself. To conceive of energy in a manner beyond its traditional utility to continue adding value through the services we offer.

European

Projects

GreenMotril
Development and operation of a green energy community in the port of Motril.

Interpreter
Interoperative tools for efficient, effective planning management in the electrical network.

Parity
Improvement of the efficiency, durability and flexibility of the energy we supply.

Beyond
Benchmark platform for big data analysis and artificial

Domestic

TSN Smart Grids
Certain communications for industry 4.0. TSN for Smart grid.

intelligence analytics.
Synergies
Creation of a series of algorithms and tools to assess the flexibility capacity from the demand side and help to create new energy models in the context of energy communities.

Synergy
A highly-energetic data platform and artificial intelligence analysis market accompanied by major data applications for all participants in the electric power value chain.

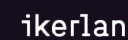
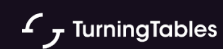
DT4Flex
Digital twin of the low voltage network engaged in providing electrical flexibility services

Efort
Cybersecurity against the main vulnerabilities and threats facing critical infrastructures for development of "secured by design" technologies, strategies and procedures.

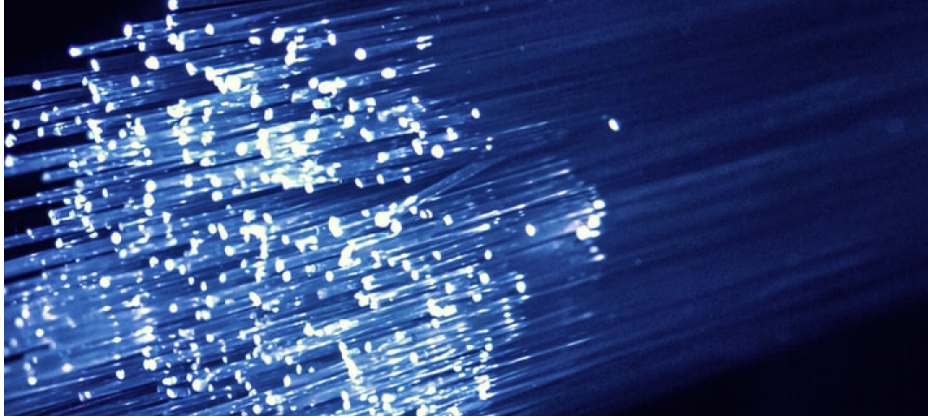
Enflate
An initiative focussed on providing network flexibility services oriented to the data-driven aspects of energy, health and mobility for consumers.

Audit-Holosen 4.0
Smart auditing in electrical maintenance and technical inspection tasks using new mixed reality and sensorization methods.

Partners in the ecosystem



Partners in the ecosystem



Adaion by Turning Tables. The platform for reading, integrating and analysing data in the energy sector.

The energy sector urgently needs access to real, homogenous data that helps distribution companies to make operational and planning decisions. In this context we have developed Adaion, an interoperable cloud platform capable of reading and

understanding the various network metering information sources to provide distributors with high-value data* with which to optimize processes and resources and make intelligent decisions that minimize risk.

* Homogenous, real, transparent, optimized, comprehensible data.



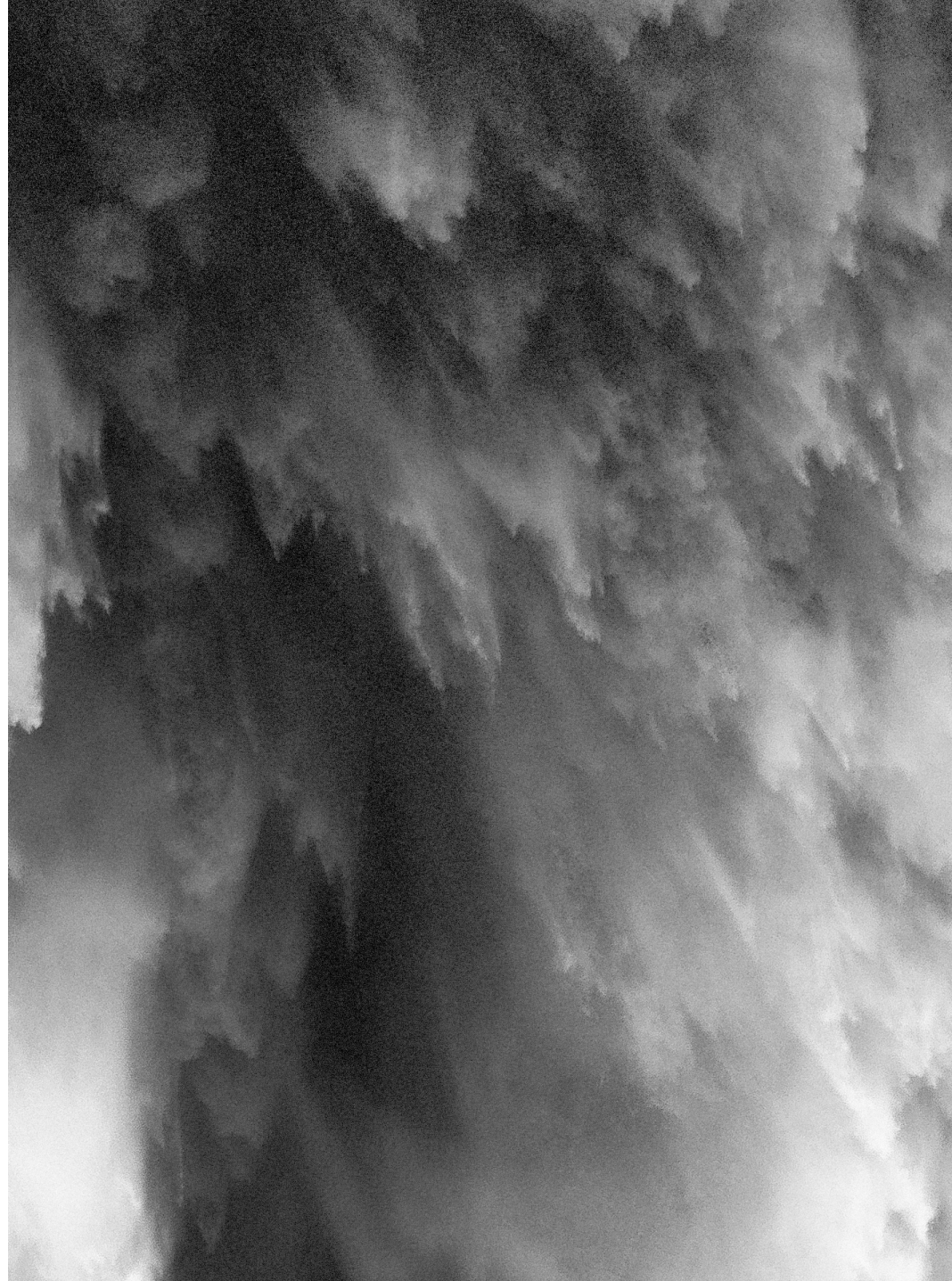
Vergy, the driving force for energy community management

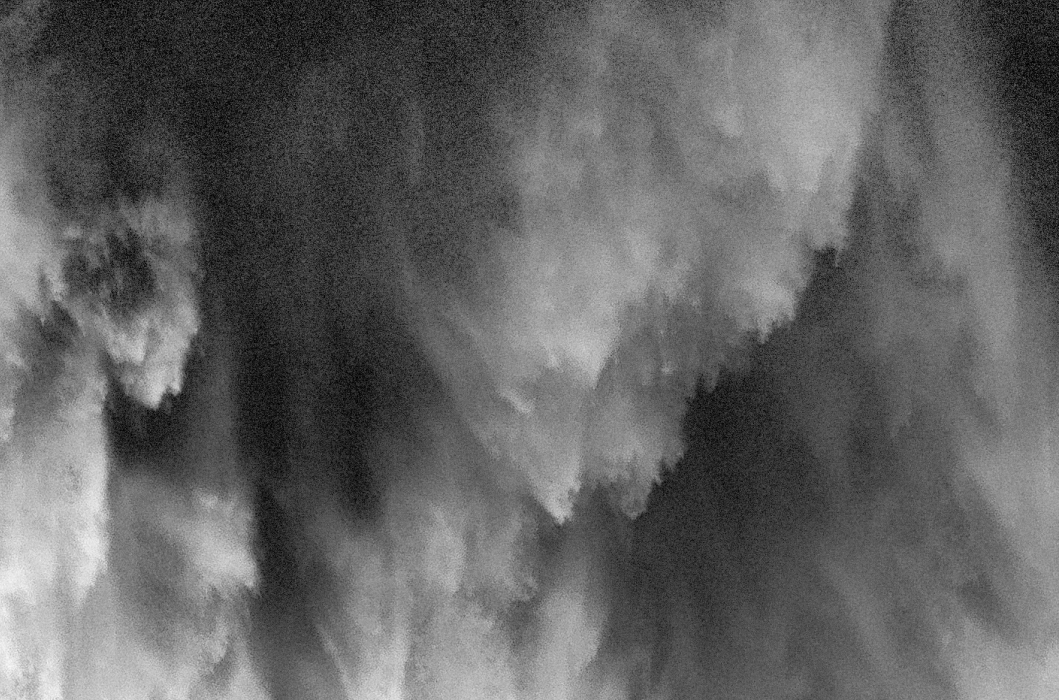
Vergy was created to make clean energy accessible to all through collaborative generation and consumption models.

Leveraging shared self-supply as a first step, Vergy fosters and manages energy communities in the residential, municipal and industrial spheres. It does this in order to identify the main

opportunities provided by this new figure and the role the end-user will play in the energy transition and the impact it will generate.

In a nutshell, Vergy is the indispensable nexus between the community and the sector to face the challenges of the future of energy together.





Cuerva*

*Beyond energy

cuervaenergia.com