

SÓlida

renewable**energies**



CONCENTRATED SOLAR POWER

BIOMASS

WIND

SOLAR PHOTOVOLTAIC

ELECTRICAL INFRASTRUCTURE





sólida

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Sólida is an independent company that gives high added value engineering and consulting services in the renewable energy sector.

Sólida provides comprehensive support to companies: from the initial conception of any kind of renewable energy project through to its commissioning.

Sólida successfully takes on complex projects related to different technologies.

Sólida can improve the success rate of renewable energy developments.

KEY CAPACITIES

Sólida's value lies in what it is capable of doing thanks to its partners' experience and the references accumulated for different clients.

Sólida's multi-disciplinary dynamism, flexibility and knowledge make it the ideal partner for renewable energy developers.

PROJECT FEASIBILITY ANALYSIS

- Technical/Economical Feasibility Studies
- Solar and Wind Resource Studies
- Energy Production Estimates
- Due Diligences

ADMINISTRATIVE PERMITTING

TECHNICAL OFFICE

- Grid Connection Applications
- Environmental Impact Assessment
- Basic / Preliminary Projects
- Construction and Execution Projects
- HV Lines and substation projects

ENGINEERING

- Conceptual Design
- Basic Engineering
- Tendering
- Owner's Engineering

CONSTRUCTION, ERECTION AND COMMISSIONING

OPERATION AND MAINTENANCE SERVICES



Sólida offers a personalised service adapted to client needs.

Project Feasibility Analysis

Sólida has long experience in making power plant feasibility studies both for new developments and for plant acquisition processes.

Sólida considers the feasibility study in the following phases:

Location analysis:

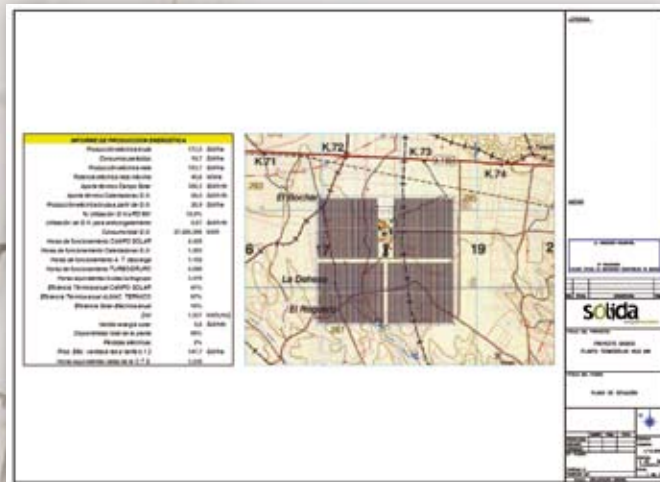
- Analysis of the most suitable technology for the location.
- Environmental restrictions of the location and associated infrastructures.
- Electrical evacuation alternatives
- Water supply and effluent disposal alternatives.
- Natural gas supply alternatives.
- Proposed optimal lay-out in line with the location.

Detailed quantification of the key elements of the project:

- Analysis of the solar and wind resource.
- Calculation of energy production of the unit by proprietor models.
- Calculation of costs of investment (CAPEX), operation and maintenance (OPEX) of the plant.
- Analysis of the plant profitability adapting to the financial features of each project and each client.

Due Dilligence

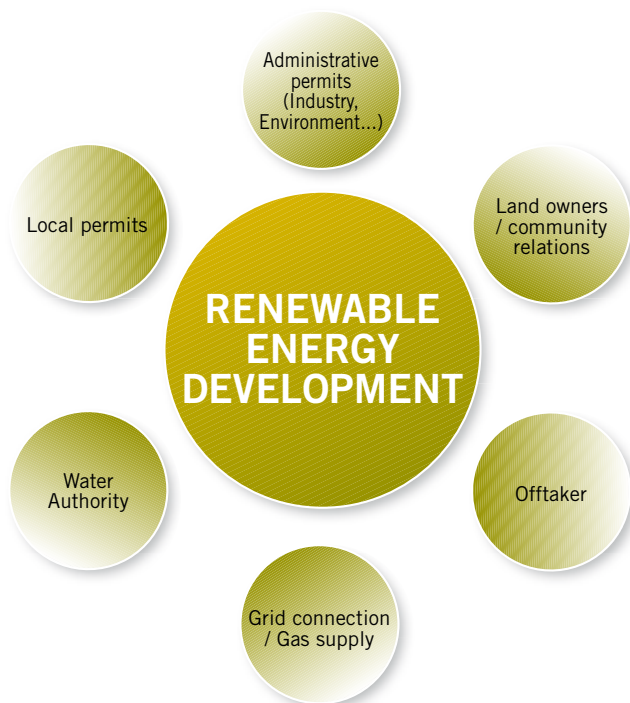
In Due-diligence processes, SÓLIDA adapts to the needs of each of our clients, giving a full service (technical, economic and legal) or focusing only on the technical part. SÓLIDA therefore has a team of highly qualified professionals and proprietor tools tested in many projects in recent years.



Administrative Permitting

Sólida has deep knowledge of the particular features of the administrative permitting of solar thermal projects in each region, giving our clients:

- Optimised guidance on the administrative processing based on the particular features of each project.
- Thorough knowledge of the requirements of the different administrations, electricity companies and water authorities
- Top class technical support to enable fast replies to be given to all unforeseen requirements posed by the administration.
- A range of alternative approaches based on previous experience in permitting, which allow administrative difficulties normally considered fatal flaws to be overcome.



Technical Office

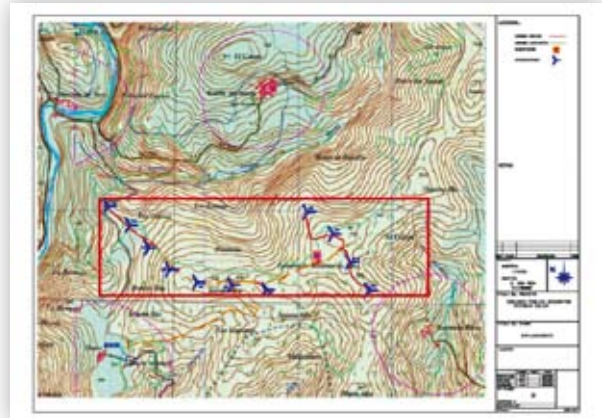
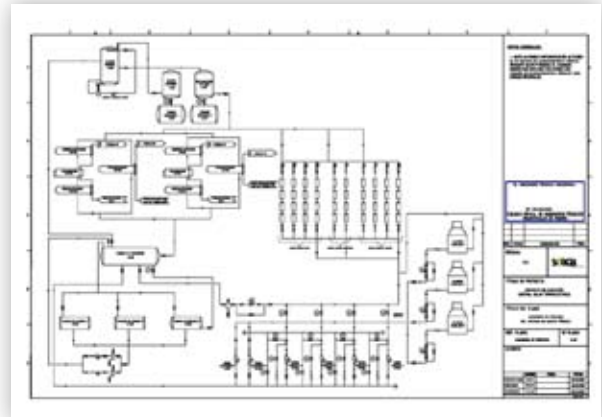
Sólida has a technical office department that allows it to give a fast, flexible service in all of the key areas in developing our clients' projects.

Projects associated with the power plant

- Environmental impact Studies.
- Basic -preliminary projects.
- Execution projects.
- Construction projects.
- Land permission reports..
- Water supply and effluent disposal projects.
- Road access project.
- Atmospheric dispersal studies

Projects associated with the electrical infrastructure for evacuating the power plant:

- Grid connection applications for all electricity companies.
- Analysis of electrical HV line routes.
- HV Line and substation Environmental impact Studies.
- HV Line and substation preliminary projects.
- HV Line and substation Execution projects.



Engineering / Concentrated Solar Power (CSP)

Sólida has an ISO-9001 quality certified engineering department with proven experience in developing engineering for CSP power plants currently under development, construction and operation. The range of services offered by **Sólida** includes:

Conceptual engineering:

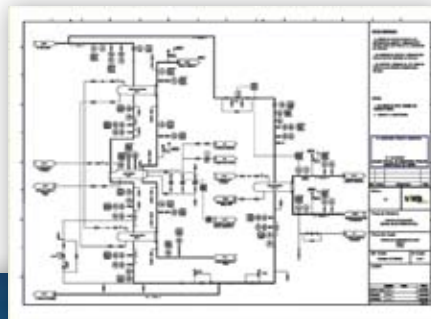
- Analysis of the solar resource of the location
- Design of solar field
- Calculation of energy production
- Process diagrams of main systems

Basic engineering:

- Definition of electrical, mechanical, civil and I&C design criteria
- Functional descriptions of the main systems of the power plant
- Mass and energy balances
- Process diagrams PIDs
- Developed single line diagrams

EPC Tender:

- Complete development of tender conditions:
 - Administrative conditions
 - Technical specifications (mechanical, electrical, civil, I&C)
 - Model contracts
- Technical support in the tender phase:
 - Contractor prequalification
 - Management of clarifications
 - Analysis of bids
- Technical, financial and legal support for reaching an EPC agreement.



Engineering / Biomass

Sólida has an ISO-9001 quality certified engineering department with proven experience in developing engineering for biomass power plants currently under development, construction and operation. The range of services offered by **Sólida** includes:

Conceptual engineering:

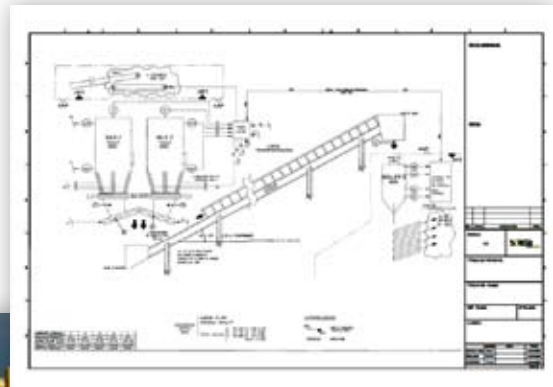
- Analysis of the biomass resource of the location
- Definition of the biomass supply logistics
- Identification of the most suitable technology
- Calculation of energy production
- Process diagrams of main systems

Basic engineering:

- Definition of electrical, mechanical, civil and I&C design criteria
- Functional descriptions of the main systems of the power plant
- Mass and energy balances
- Process diagrams PIDs
- Developed single line diagrams

EPC Tender:

- Complete development of tender conditions:
 - Administrative conditions
 - Technical specifications (mechanical, electrical, civil, I&C)
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 - Management of clarifications
 - Analysis of bids
- Technical, financial and legal support for reaching an EPC agreement.



Engineering / Wind

Sólida has an ISO-9001 quality certified engineering department with proven experience in developing engineering for wind farms currently under development, construction and operation. The range of services offered by **Sólida** includes:

Basic engineering:

- Wind resource
 - o Measurement campaign design
 - o Installation of weather towers
 - o Energy assessment of the location
- Wind farm lay-out
- Electrical infrastructure lay-out

Detailed engineering:

- Civil work
 - o Design of roads, accesses and drainage to the wind farm.
 - o Wind generator foundation design.
- Electrical:
 - o Design of medium voltage network
 - o Control and protection detailed engineering.

EPC Tender:

- Complete development of tender conditions:
 - Administrative conditions
 - Technical reports (electric, civil, control)
 - Technical specifications (electric, civil, control)
 - Model contracts
- Technical support in the tender phase
- Technical, financial and legal support for reaching an EPC agreement.



Engineering / Electrical Infrastructure

Sólida has an ISO-9001 quality certified engineering department with proven experience in developing engineering for a wide variety of substations and High Voltage lines. The range of services offered by **Sólida** includes:

Detailed engineering:

- Substations.
 - o Civil work:
 - Foundations and channels
 - Drainage network
 - Grounding network
 - Roads
 - o Electromechanical:
 - Metal structure
 - Assemblies
 - o Protections:
 - Scada parameterization.
 - Protection adjustment

o Control:

- Single line electrical diagrams
- Detailed control diagrams
- Wiring diagrams
- Electrical interconnections

• HV Lines.

- o Construction Projects (Mechanical, electrical and civil Design)

EPC Tender:

- Complete development of tender conditions:
 - Administrative conditions
 - Technical specifications (electric, civil, control)
 - Model contracts
- Technical support in the tender phase
- Technical, financial and legal support for reaching an EPC agreement.



Engineering / Solar Photovoltaic (PV)

Sólida has an ISO-9001 quality certified engineering department with proven experience in developing engineering for PV plants currently under development, construction and operation. The range of services offered by **Sólida** includes:

Basic engineering:

- Analysis of the solar resource
- Photovoltaic generator layout design
- Electrical design to the connection point
- Optimised implementation of the photovoltaic generator
- Calculation of the performance ratio (PR) of the installation

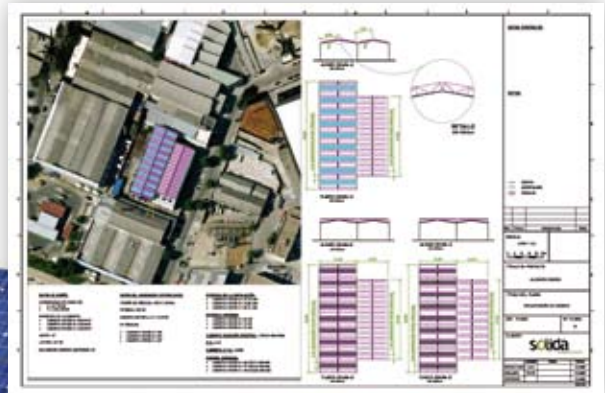
Detailed engineering:

- Civil work Design
 - o Ground installations
 - o Rooftop installations

- Electrical Design:
 - o DC low voltage network
 - o AC low voltage network
 - o Medium voltage network
 - o Substation
 - o Electrical connection line

EPC Tender:

- Complete development of tender conditions:
 - Administrative conditions
 - Technical reports (electric, civil, control)
 - Technical specifications (electric, civil, control)
 - Model contracts
- Technical support in the tender phase
- Technical, financial and legal support for reaching an EPC agreement.



Construction and O&M Services

Construction, erection and commissioning

Sólida's team has long experience in project management and site supervision, which allows the client to guarantee the correct execution of the project.

- Owner's Engineering
 - Project planning
 - Supervision of specifications of main equipment
 - Supervision of EPC engineering
 - Quality control of manufacturing of main equipment
 - Site supervision during construction, erection, commissioning, reliability and performance testing

Operation and maintenance (O&M)

Sólida has a team specialised in operation and maintenance consultancy of electrical generation plants, which allows the client to optimise the operating costs of the plant.

- Comprehensive O&M service
- Technological consultancy relative to O&M services
- Definition of O&M specifications and contracts
- Advice in organising O&M teams and definition of staff profiles
- Preparation of training programs for O&M staff
- Definition of Preventive Maintenance Manuals
- Preparation of working procedures
- Definition and Programming of large overhauls required by the installation. Preparation of estimates
- Establishment of O&M performance indicators



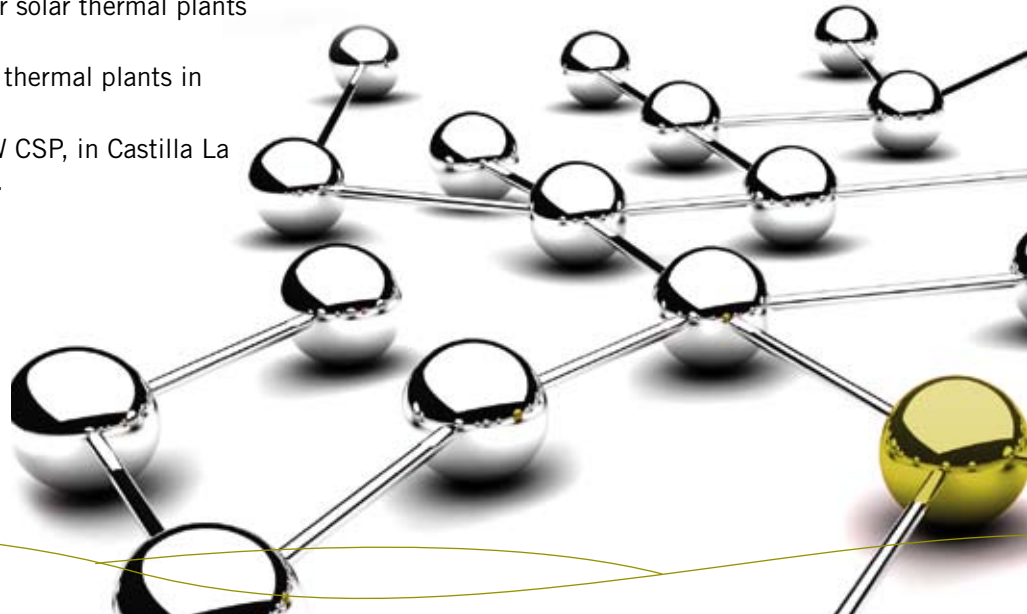
Leading References

SOLAR THERMAL

- Construction project of a 50 MW CSP in Castilla La Mancha, Spain.
- Basic engineering at a 50 MW CSP in Castilla La Mancha, Spain.
- Preparation of the EPC tender specifications at a 50 MW CSP in Castilla La Mancha, Spain.
- Conceptual engineering of a 50 MW solar CSP in Aragon, Spain
- Energy production model of a 15 MW biomass hybridized with CSP
- Preparation of the direct solar radiation map in the Aragon Region, Spain
- Basic project for a biomass hybridized with CSP
- Basic projects for CSP with thermal storage systems in Spain.
- Execution projects for CSP with thermal storage systems in Spain.
- Environmental Impact Reports for solar thermal plants in Andalusia, Spain.
- Definition of the location of solar thermal plants in Spain
- CAPEX / OPEX analysis at 50 MW CSP, in Castilla La Mancha and Extremadura, Spain.

WIND

- Construction and execution projects in Spain, Brazil and Turkey
- Analysis of wind resources on wind farms in Spain, Brazil and Turkey.
- Study of the lay-out of wind farms in Spain, Brazil, Poland and Turkey.
- Preliminary projects and implementation projects for wind farms in Spain, Brazil and Turkey.
- Environmental Impact Reports for wind farms.
- Preparation of the bases for the EPC Tender in Brazil and Turkey
- Standardization of electrical substations for wind farms.



Leading References

BIOMASS

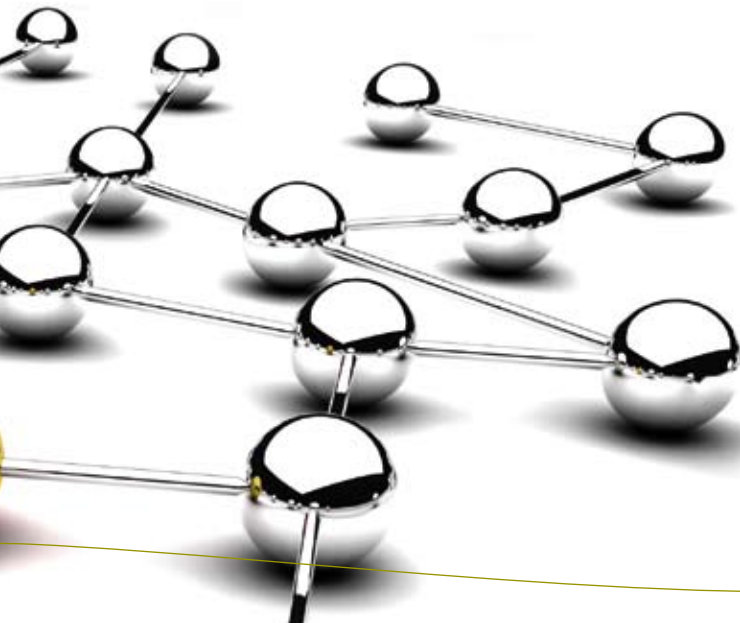
- Construction project of a 10 MW Biomass plant in Galicia, Spain.
- Basic engineering at a 10 MW Biomass plant in Galicia, Spain.
- Study and analysis of the available resource in Murcia Region, Spain
- Basic projects for 3 MW biomass power stations in Castile La Mancha.
- Energy production model for biomass plant.
- Hybridization of biomass plants with solar thermal plants.

PHOTOVOLTAIC

- Construction project of 10 MW ground-mounted PV project in Extremadura, Spain.
- Construction project of 1,5 MW rooftop PV projects in Murcia
- Feasibility Study of photovoltaic plants on industrial rooftops in Castilla La Mancha.
- Analysis of the rooftop carrying capacity in the Community of Madrid.
- Rooftop photovoltaic plant property engineering in Castile La Mancha

ELECTRICAL INFRASTRUCTURE

- Construction project of 400, 220, 132, 115, 69, 45 kV substations in Spain, Poland, turkey, Brazil
- Basic projects of substations in Spain, Poland, Turkey, Brazil, USA, Mexico, Chile.
- Preparation of documentation to request connection to the utilities in Spain, Poland, Brazil, Turkey.
- Standardization of wind farm electrical substations.
- Electrical substation implementation projects.
- Preliminary projects and implementation projects for electrical HV lines (45, 69, 115, 132, 220 kV) in:
 - Spain
 - Brazil
 - Poland
- Property engineering in wind farm substations in Spain
- Study of renewable plant evacuation alternatives.
- Environmental Impact Reports for electrical substations



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