Lithium Call
Solar District Project

Collaborates:

CORFO
InvestChile

FOREIGN INVESTMENT PROMOTION AGENCY

Gobierno de Chile
SOLAR

ENERGY PROGRAM
CONTEXT
NORTHERN CHILE | OUR ADVENTAGE → “A SINGULARITY”
This singularity is an opportunity of synergetic development: solar energy and mining industry
SOLAR DISTRICT PROJECT

OBJECTIVES

- Solar District Project (DTS)
- Promotion of local industry
- Human Capital
- R+D
- Clean energy

- Chilean technological development adapted to the conditions of the Atacama Desert
- Local value capture and job creation
- Several solar generation technologies, energy storage and solar fuels
- More than 750 MWe of solar power, avoiding more than 1,000,000 Ton de CO2 eq. per year

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SOLAR DISTRICT PROJECT
EXPECTED IMPACTS

TOTAL INVESTMENT
4,000 MM US$

EMPLOYMENTS
3,000 Direct jobs during construction phase
300 Direct jobs during operation phase
~12,000 Indirect jobs during the project lifecycle

EMISSIONS REDUCTION
1,000,000 TON CO₂ EQ./YEAR (COAL)
600,000 TON CO₂ EQ./YEAR (NATURAL GAS)
**SOLAR DISTRICT PROJECT**

**PROJECT OVERVIEW**

- The concept of **Solar District Project (DTS *)** takes into account:
  - Development, implementation, operation and maintenance of large-scale solar parks (between ~750 MWe – 1.0 GWe) located on fiscal lands.
  - Preparation of land and get the mining concession divided up in into plots of land, proper for development of solar projects.
  - The lands can be used by developers and/or investors to place their solar projects.
  - Enable a shared electrical infrastructure for every plot of land in each DTS Project, considering:
    - Internal transmission lines (220 kV, reference).
    - Transformer substation (220/500 kV, reference).
    - Dedicated transmission line in high voltage (500 kV) to connect in an existing substation.
    - Connection to the main transmission system.
  - O&M of the shared electrical infrastructure, which will be done by a “DTS Operator”.
  - Incentives for capturing local value in DTS Projects implementation.

*Distrito Tecnológico Solar.*
SOLAR DISTRICT PROJECT

PROJECT DESCRIPTION

- The Solar District Project contemplates the following tendering process:
  - Solar Projects to be develop onto the District Location.
  - EPC of the common infrastructure (electrical and non electrical).
  - Water Supply Infrastructure to supply the projects needs.
  - Management, operation and maintenance of the Solar District Project and its common infrastructure.

- For a suitable definition of the plants locations, and also to define the solar technology mix to tender, the following aspects are being considered among others:
  - Fitting out the location for solar developments.
  - Modularity of the Solar District expansion restricted mainly by the electrical demand growth rate.
  - Solar District Business Model.
  - Feasibility Studies (topography, geotechnical, hydrological and hydrogeological)
  - Solar Resource Study and Database.
  - Water Supply Model.
  - Environmental Baseline for the whole District Project Location.
The costs of the awarded developments, will be proportional to:

- The total area in each plot of land.
- The electrical generation in each plot of land.
- Value addition based on local resources in construction, operation and/or maintenance of the project in each plot of land result in economic benefits → negative costs.

There are two DTS Projects in evaluation located in:

<table>
<thead>
<tr>
<th>Location</th>
<th>Substation (connection point)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern Atacama Desert</td>
<td>Three options in evaluation (Domeyko, Laberinto, Nueva Zaldivar)</td>
</tr>
<tr>
<td>Diego de Almagro city</td>
<td>Cumbres 500 kV</td>
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</tbody>
</table>

Stages of entry into operation (reference):
SOLAR DISTRICT PROJECT
CONCEPT SCHEME
<table>
<thead>
<tr>
<th>Solar District Project</th>
<th>Value Chain Opportunities</th>
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<tr>
<td><strong>Planning and Feasibility</strong></td>
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<tr>
<td>Solar irradiance and location</td>
<td>Topographical and geophysical studies</td>
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<tr>
<td><strong>Equipment and Construction</strong></td>
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<tr>
<td>Raw materials</td>
<td>Wafer</td>
</tr>
<tr>
<td>Mirror/ receiver</td>
<td>Mounting structure</td>
</tr>
<tr>
<td><strong>Operation and Maintenance</strong></td>
<td></td>
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<tr>
<td>Operation and management</td>
<td>Capacity building and training</td>
</tr>
</tbody>
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**TOTAL INVESTMENT**

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SOLAR DISTRICT PROJECT
SYMBIOTIC PARK

POTENTIAL INDUSTRIAL DEVELOPMENT
- Industrial gas
- Solar fuels
- Storage
- Solar metallurgy
- Water treatment
- PV module assembly
- Metalmechanical industries
SOLAR DISTRICT PROJECT
SINGLE-LINE DIAGRAM

Energy Storage in Solar District Project:

- TES ➔ Thermal
- BESS ➔ Electrochemical
- \( \text{PH}_2 \) ➔ Chemical
The Solar District Project in Diego de Almagro, is being assessed on a surface of 26,477 hectares.

For which a special reserve decree has been issued by the Ministry of National Assets to secure the land to study national strategic solar project developments in the area.

- **5.262** hectares have been selected to develop of the Solar District Project.

- Solar energy costs Solar 24/7 US $ 50 per MWh approx. and falling.

The project area is approximately to 18 km to the north of Diego of Almagro sector, and 1.5 km to the north of the future electrical substation Cumbres.
This location has been selected due to its appropriate conditions to develop projects.

5.262 hectares have been selected to develop of the Solar District Project.

• Land Topography.
• Easy access trough roads and available infrastructure.
• It is near electrical transmission infrastructure.
• It is near the urban center of Diego de Almagro which can provide products and services for the construction and operation staff.
Under Study Location
- Latitude 26.20 °S.
- Longitude 69.91 °W.
- Elevation: 1,251 meters.

Source:
Engineering Department of University of Chile.
# SOLAR DISTRICT PROJECT

**DIEGO DE ALMAGRO – STATE OF PROGRESS**

## Feasibility Studies

### Done

- Technical and Electrical Feasibility Studies
  - Proven
- Strategic Assessment: land availability and mining rights situation
  - Location detected and reserved
- Functional Project Design and International Experience
  - Baseline and preliminary business model

### In Progress

- Definition of technology mix to tender
  - Service currently in execution
- Topography study
  - Service completed
- Geotechnical study
  - Service completed
- Hydrology, hydrogeology studies
  - Service completed
- Solar resource, soiling and meteorological measurement
  - Elaboration of thecnical rules of tendering process
- Water supply model
  - Elaboration of thecnical rules of tendering process
## SOLAR DISTRICT PROJECT

### DIEGO DE ALMAGRO GANTT CHART

<table>
<thead>
<tr>
<th>Activities / Studies / Tasks</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
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<td></td>
<td>Q3</td>
<td>Q4</td>
<td>Q1</td>
<td>Q2</td>
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<tr>
<td>Technical and Electrical Feasibility Studies</td>
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<td>☢️</td>
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<td>Functional Project Design and International Experience</td>
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<tr>
<td>Strategic Assessment: land availability and mining rights situation</td>
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<tr>
<td>Milestone: Project location secured</td>
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<tr>
<td>Topography study</td>
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<tr>
<td>Solar District tendering process</td>
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<tr>
<td>Milestone: Solar District tendering award</td>
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