

YPF
LUZ

LOMA CAMPANA THERMAL COMPLEX

**SOCIAL AND ENVIRONMENTAL IMPACT
COMMUNITY INFORMATION**



1. Introduction

This document is a non-technical summary of the social and environmental impacts of the construction and operation of the Loma Campana Thermal Complex, which includes the Loma Campana I (LC1), Loma Campana II (LC2) and Loma Campana Este (LCE) Thermal Power Plants, of YPF Energía Eléctrica S.A., hereinafter "YPF Luz".

The document describes how the construction of the complex was developed and the potential environmental and social impacts that may be generated during its operation.

In addition, it clarifies the company's actions aimed at preventing, controlling and minimizing these impacts, and explains how environmental and social aspects are managed.

This document is part of the community relationship plan, which aims to keep employees, authorities and the community in general informed of all stages of the operation of the Loma Campana Complex. The plan details the communication actions with the different stakeholders, as well as the tools available for people to channel their doubts and concerns about the project.

2. Project design and construction

From the early stages of the development of new projects, YPF Luz is committed to acting responsibly with the communities. To this end, potential socio-environmental risks and impacts that may be related, directly and indirectly, to each of the stages of their projects are identified, evaluated and managed.

In 2015, YPF Luz planned the installation of two thermal power plants for the generation of natural gas-fired electricity of approximately 100 MW each, with the aim of supplying YPF's local demand and providing electricity to the Argentine Interconnection System (SADI).

As part of the project, the following were contemplated:

- The laying of a gas supply pipeline from the Pacific Gas Pipeline.
- An aqueduct to feed from YPF's fracturing water pools.
- An aqueduct transporting the water used in the thermal power plant that is used for the irrigation of the Green Lung located 4.5 km from the Complex.
- A double power line for the transport of the energy generated to the Loma Campana Transformer Substation.

The Loma Campana 1 and 2 Thermal Power Plants were inaugurated in November 2017.

Loma Campana Este was built in 6 months and opened in July 2017. The design, provision, construction, assembly and commissioning of the facilities was in charge of YPF Luz.

3. Description of the complex and impacts identified

3.1. Resort Description

The Loma Campana I and II Thermal Power Plants are located in the town of Añelo, in the Province of Neuquén. They are located on Provincial Route 17, 9 km from the intersection with Provincial Route 7, heading east, in the heart of the oil field called Loma Campana.

The plants are two independent simple cycles, with a gas turbine each, and with installed powers of 105 and 107 MW respectively. Part of the energy they generate is provided to YPF S.A. and the other is injected into SADI in 132 kV. The energy provided is equivalent to the annual consumption of 530,000 homes.



Loma Campana Este is located 16 km from the Loma Campana Complex. It is made up of 12 natural gas engines with a total capacity of 17 MW. This plant supplies energy to the 13.2 kV Unconventional Field called Loma Campana.



3.2. Operation and Maintenance

Loma Campana I and II are operated by YPF Luz. Both plants share the use of the gas pipeline, feed aqueduct, effluent aqueduct and the interconnection system for the evacuation of energy. The rest of the auxiliary systems are independent of each other.

Loma Campana East is operated remotely from the operations room of Loma Campana 1 and 2. The selected technology is modular and compact in design, with quick start-up, allowing maximum power to be available in less than 10 minutes. The high efficiency in the order of 44% and the control of NOx emissions positions the plant as one of the most efficient in the country.

For all assets, maintenance strategies are implemented aligned with equipment manufacturer recommendations.

3.3. Environmental and social impacts

Construction stage

The work of Loma Campana I and II required the mobilization to the site of workshops, machinery and component equipment. For the transport of the main equipment, companies specializing in heavy transport were subcontracted. These companies were in charge of the study of the transport route with identification of interferences and possible affected communities. They were also in charge of managing the corresponding permits.

One of the relevant environmental aspects during the work was the generation of hazardous and non-hazardous waste, so companies authorized by the province were hired to carry out its proper management.

The project as a whole required a total investment of approximately US\$200 million. The construction of both units required 500 direct jobs at the peak of the work. Loma Campana Este was built in 6 months, required 70 direct people in the construction stage and an investment of AR\$ 100MM for its construction.

Operation Stage

The main environmental impacts at this stage are related to liquid and gaseous effluents, and waste generation. For its proper management, the Loma Campana Generation Complex has an Environmental Monitoring Program agreed with the applicable environmental authorities (ENRE at the national level and the Ministry of Environment of Neuquén) with which its environmental performance is monitored through the presentation of monitoring reports.

- **Gaseous effluents**

The atmospheric impact study of the Loma Campana Thermal Power Plant indicates that there will not be a significant negative impact on air quality with respect to emissions of nitrogen oxides and suspended particles.

Periodically, the measurements in the chimneys yield results in accordance with the emission limits set by Resolution No. 108/01 of the Ministry of Energy of the Nation for thermal generation plants.

- **Liquid effluents**

The most important effluent in the generation process is that from cooling towers. It is estimated that 70% of the make-up water used in the cooling towers evaporates and the remaining 30% is taken to a retention basin located within the Thermal Power Plant premises. This effluent is then directed to the Green Lung for reuse. The quality of this effluent is monitored periodically verifying suitability for irrigation.

- **Household and special solid waste**

Thermal power plants require programmed activities that allow for proper operation and less wear and tear on the equipment used. In these activities, waste is generated that is classified as household waste (generation of paper, wood, plastics) and on the other hand, special waste is generated (used oils, solids with oils, paints, solvents). In the case of this special waste, YPF LUZ has registered as a generator of special waste with the Undersecretary of the Environment and has contracts with companies authorized for treatment and final disposal. Regular monitoring of waste management is carried out.

4. Green Lung

At YPF Luz, sustainability is our way of working, and in this framework the idea of reusing the liquid effluent in conditions suitable for irrigation for the development of a Green Lung in a property near the Loma Campana Generation Complex arose.



The green lung takes advantage of the 1,440 m³ per day of effluents generated by the thermal complex to drip irrigate 25,000 poplars, planted in an area of more than 132 hectares.

To prevent forest fires, firebreak areas were placed within the forested properties at the points and places of greatest risk, prioritizing those areas where more interference occurs (perimeters, roads, highways, areas in contact with production land, urbanizations, power lines, etc.).

The benefits of afforestation are as follows:

- Effluent reuse
- Positive visual impact
- Creation of a local wildlife shelter ecosystem
- Wind mitigation
- CO₂ fixation in biomass and soil
- Decrease in soil erosion.

5. Social Investment

The Company's social investment and donations policy establishes the guidelines for the development of social responsibility initiatives and includes donations, volunteer activities, community relations and any social investment associated with environmental, social, community or institutional projects.

The social investment strategy is aligned with different United Nations Sustainable Development Goals (SDGs) to contribute to the global agenda.

The objectives of the social and environmental investment strategy are:

- To improve the quality of life and infrastructure of the communities where we operate.
- To contribute to improving the quality of education and the environment.

- Promote the efficient use of energy and renewable energies.
- Collaborate with other organizations to achieve sustainable change.

6. Quality, safety and environment

At the national level, the electricity generating industry is regulated by the ENRE (National Electricity Regulatory Entity), an entity that ensures compliance with strict environmental, health and safety standards specific to this industry. The complex complies with applicable national and provincial legal regulations, recommendations from equipment manufacturers and following the company's safety, health and environmental standards.

YPF Luz implements the following monitoring plans at the plants:

- POAMS: Plan of Objectives and Actions Environment and Sustainability (includes Environmental Impact Assessment and Monitoring Plans)
- POASS: Health and Safety Objectives and Actions Plan (Includes Occupational Risk Assessment and Hygiene and Safety Plans)
- POAC: Quality Objectives and Actions Plan (includes audits and the implementation of the Integrated Management System)

The Loma Campana I and II plants also comply with the International Finance Corporation (IFC) Environmental and Social Sustainability Performance Standards.

6.1. Environmental Impact Assessment

The Environmental Impact Assessment studies of Loma Campana were developed in compliance with the provisions of the Law of the Province of Neuquén No. 1875, Resolution ENRE 13/1997 "Practical Guide for the Assessment of the Atmospheric Environmental Impact" and through the Conesa Fernández Vítora methodology.

The environmental impact assessment was approved by Provision 702/16.

6.2. Certifications

The Loma Campana Complex has an Integrated Management System certificate, which includes the following standards:

- ISO 14.001: Environmental Management System.
- ISO 9.001: Quality Management System.
- ISO 50.001: Energy Management System.
- ISO 45.001: Occupational Health and Safety Management System.
- ISO 55.001: Asset Management.

7. Inquiries and complaints

The available consultation channels are listed below:

- Suggestion book in the control room of Loma Campana I and II.
- Email: sugerenciasypfluz@ypf.com
- Contact form on website: www.ypfluz.com

8. Ethics and Compliance

YPF Luz has a Code of Ethics and Conduct that guides the actions of all personnel on a day-to-day basis. It is applicable to directors and collaborators of YPF LUZ, as well as to third parties related to the Company.

Likewise, all employees and related third parties may make inquiries or report situations and/or behaviors that could constitute a real or potential breach of the provisions of the Code of Ethics and Conduct through the YPF LUZ Compliance Channel. YPF LUZ adopts the necessary measures to maintain the anonymity and confidentiality of all communications received.

Access to the Compliance Channel is done through the following tools:

- Página Web: www.canalcomplianceypfluz.lineaseticas.com
- Correo electrónico: canalcompliance.ypluz@kpmg.com.ar
- By phone: 0800-122-0278
- In person (only YPF Luz employees): through your boss or the Compliance and Audit management

9. Learn more

To access environmental, social and governance performance information, we invite you to read YPF LUZ's sustainability reports: YPF [Luz](#)