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Galeria Avenida da Índia

# Disquietude. Architecture and Energy in Portugal

Lara Almarcegui, ateliermob,  
Christoph Brünggel, Nuno Cera,  
Marina Pinsky, Nuno Vasconcelos

Galerias Municipais – Galeria Avenida da Índia  
Avenida da Índia 170, 1300-299 Lisboa

Tuesday to Sunday 10am-1pm and 2pm-6pm  
Free entrance

Guided tours by appointment  
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curated by common room  
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The exhibition “Disquietude. Architecture and Energy in Portugal” addresses the entanglement between architecture and energy in the 20th century. With a view to current transformations, and using Portugal as an example, this exhibition and publication project features artistic, architectural, archival, and creative works that address the relationship of architecture and energy in a broader sense.

In the age of the Anthropocene, in which humanity acts on cycles and systems with all its power and capital, the interface between architecture and energy concerns more than solely operational or even embodied energy, or active and passive solutions. In light of the climate crisis, the phase-out of fossil fuels and the abandonment of the internal combustion engine, architecture has a mediating role; with its focus on alternative energies, architecture is also about socio-cultural rethinking.

The work of the two Portuguese Pritzker Prize-winning architects, Álvaro Siza Vieira and Eduardo Souto de Moura, provides concrete instances of how access to energy has shaped the built environment. Siza’s early projects in Matosinhos/Porto, its waterfront with Casa da Chá da Boa Nova [Boa Nova Tea House] and Piscina das Marés, and the boulevard connecting them both commissioned by the oil industry, and Eduardo Souto de Moura’s design for the Foz Tua dam, are only a few examples. In addition, the exhibition venue Galeria Avenida da Índia itself and its urban surroundings in Belém testify to how architecture and energy were negotiated, implemented, represented, and received. The urban area exposes the intensification of urbanization and modernization processes, densification and land consumption, which also define the great acceleration since the 1950s.

In view of the steps needed on a global scale to mitigate climate disruption, and given the new European energy system, after Russia’s war on Ukraine, this exhibition deals with different forms of knowing about the relationship between architecture and energy. Through individual contributions, three intertwined themes are exemplified: Petroleum-Urbanism, the relationship between fossil fuels and urbanism; Hydropower-Infrastructure, the mediating role of architecture in energy landscapes; and Architecture-Metabolism, modern materials, processes, and technologies in buildings.

In Portugal, the architectural history of the 20th century cannot be thought without knowing both energy production and use of modernity, especially the notions of society and environment associated with the cultures of fossil fuels, nationwide electricity, and industrial materiality. This exhibition explores the question of how we can imagine the landscapes, architectures, and cities of energy transition in the 21st century.

## 1 Lara Almarcegui: *Lisboa Wastelands* (2007/2022)

The three photographs present wastelands along the Tagus river, currently belonging to the Port of Lisbon, which are part of the next large development project in Lisbon. The empty grounds and wastelands near Praia de Algés and at the former Pedrouços beach that later became Pedrouços docks, are today part of the Ocean Campus strategic development plan. Ocean Campus is an ambitious urban renewal project by the Port of Lisbon, the Fundação Gulbenkian and the Fundação Champalimaud to rehabilitate 64 ha, with a total investment of 300 mio. Euros, along the waterfront between Pedrouços and Cruz Quebrada.

Lara Almarcegui had visited these sites for her *Guide to the Wastelands of the Port of Lisbon*, realized in 2007. The project comprised ten of the most prominent and interesting empty lots in the city on the river, many belonging to the Lisbon port area, and site of former industrial uses, including circulation areas and energy landscapes. In her artistic practice Almarcegui produced guides to cities she has worked in, exploring material aspects of land, land use, and urban space. The 2007 Lisbon guide was prepared with the urgency of surveying those abandoned, unused, or forgotten sites before they disappear, thus examining the preconditions and foundations of contemporary transformation processes brought about by social, political, and economic change.

Almarcegui revisited one of these Lisbon wastelands fifteen years later. Renderings now imagine a bright future of sustainable Ocean Campus development built on the promise of the blue economy and communicate a circular economy approach of the port authorities and their collaborators with regards to sand mining and coastal design. Still the project includes the controversial plan to claim land in the coastal areas west of Praia de Algés. The photographic work of Almarcegui from 2022 points to the larger metabolism, that governs quarrying and construction and has been operated in Lisbon along the riverbank since the Expo ’98. The energy and material cycles unleashed for all the new construction projects, are often built on contaminated and polluted ground.

With the *Guide to the Wastelands* series, building materials have increasingly come into view in Almarcegui’s work, with the artist primarily focusing on gravel pits. In addition to the sheer volume being constructed, Lisbon’s waterfront is also about the companies that build the development, as the renewal is being carried out by the same players that work on the large infrastructure projects of the energy landscapes in the hinterland.

Originally, Almarcegui had planned for the exhibition to visit one of the few river-bound sand works still in operation in Europe (upstream of the Tagus, near Santarém) and shut down the operation at intervals as an artistic

performance, which would have pointed out the importance of sand for concrete mixing and, on the other hand, the environmental impact downstream in estuaries, especially with rising currents. The three photographs now refer, rather ghostly, to the cultural and political, economic and ecological dimension of a construction project grounded on Lisbon land.

Thanks to Pamela Prado, Pedro Ignacio Alonso, Filipa Morado, Rita Aguilar Rodrigues, Ana Jara, José Mateus, and Margarida Ventosa

## 2 ateliermob: *When the Light Does Not Shine the Way* (2022)

What is exhibited is not an object, or a representation but a process and narrative about the use of electrical energy. When ateliermob started thinking about this project, they wanted it to tell a different story. They wanted it to tell the story of the arrival of electricity to the streets that run through the informal Terras da Costa neighborhood in Costa da Caparica and connect it to the formal city. The solar powered lamp posts ateliermob proposed to install would mean that all the families living in Terras da Costa would not only have access to legal electricity in their homes, but they would also have public street lighting we all take for granted, illuminating the paths we take, in the streets we walk.

ateliermob as an architecture practice usually situates itself within a zone of indefiniteness, working for marginalized population groups, providing housing or public infrastructures, acting simultaneously as facilitator, advocate, and agitator. They previously worked in the Terras da Costa neighborhood providing a community kitchen, where water supply was key, yet electricity became a concern. For the exhibition, they tried to expand on this, adding in this case solar street lighting to their range of measures to empower the disenfranchised. To do so is to summon basic rights that must be supplied in the present as a guarantee of a collective democratic construction, capable of tearing up capitalist paradigms internalized as the norm. Through their work they take a critical look at how urban space is constructed, discursively and from a material point of view, opening breaches where collective, aggregating, and emancipating models of existence can be rehearsed.

What is at issue here as elsewhere is that residents of informal neighborhoods are not completely denied rights that the residents of the so-called formal city are guaranteed. That even when housing precariousness manifests itself in daily life, minimums are guaranteed, whether it is access to drinking water or to electricity. However, the Terras da Costa neighborhood has yet to see any solution being implemented, despite a decree-law granting access to individual power supply contracts more than four years ago. In the Lisbon Region, informal neighborhoods are inhabited mostly by black and/or gypsy

people; the Terras da Costa neighborhood in Almada, which is considered illegal, is no exception.

This fact becomes relevant when the struggle for access to electricity is framed in the broader context – that is the claim for the right to the city. As Marxist urban geographer David Harvey argues, the urbanization process, to be just, needs to be reinvented in a radical way where exchange value is replaced by use value, framing housing not as a financial asset but as a specific object that has, above all, a social value. These informal territories, inhabited in a precarious way, must also be included in this re-design. In Terras da Costa, still today, the struggle for access to a formal contract to provide electric light for a precarious neighborhood means the transformation of an essential good into the broad discussion of what is political.

ateliermob's project is transforming electricity into a political object of discourse about urban space, about who shapes it and what tensions are manifested in that same space. Until the end, they believed that they would show the assembly of lampposts and the light emanating from them. But ultimately the municipality did not accept the project. Now as daylight fades, darkness takes over.

Thanks to the community of inhabitants of the Bairro das Terras da Costa

## 3 Marina Pinsky: *Mother Load* (2022)

The section shows the boulevard in Matosinhos, Porto, an early project by Álvaro Siza Vieira, on which he worked during the second half of the 1960s on behalf of the Sacor refinery and the local municipality. After the completion of the Boa Nova Tea House (1958-63), Siza worked on two studies in 1967 for the boulevard connecting the pipeline from the port to the new, expanded refinery site of Porto. As an infrastructure project, the Av. Liberdade opens up the newly developed waterfront towards the Atlantic Ocean, promotes a new urban planning in the immediate hinterland, and in the process makes accessible another of Siza's projects, the pool Piscina das Marés (1961-66). The section communicates not only the engineering and architectural knowledge of the time, but also the installation in several phases of the pipelines, which are literally concealed here, and its arrangement in relation to the street as well as the protection against any leakage. Marina Pinsky's redrawing of a section found in Siza's archives at the CCA, reproducing the original color coding and enlarged to a 1:1 scale, also depicts municipal utilities (sewer, water, electricity, telephone) and private land ownership issues, as property had to be expropriated for the double-lane boulevard of 13m, much too wide for the time.

This Anthropocenic boulevard section, continuing Pinsky's previous work on sections, takes up a form of representation that originated in Portugal (and not in France). Already in 1755, it was architect and military engineer Eugenio dos Santos de Carvalho who first drew up a street section in the wake of the devastating Lisbon earthquake and for the planning and reconstruction of the city (and not Pierre Patte for the Paris sewer system). Siza, in turn, saw his task in using photographs and models to plan in detail the course of the boulevard and its enclosure, as well as other facilities of a petroubanism, such as a refinery loading station or a gas station (which were designed in sketches, drawings, and models), but also the view of and access to the sea, for example through underpasses and stairs.

If the Lisbon earthquake fueled the emergence of geology as a science in Europe, today the focus is on realizing and dealing with petroculture or petromodernism. Siza's design for Av. Liberdade, the teahouse as a restaurant for the oil industry executives, and the pool as a pastime for the people, is exemplary of how fundamental and pervasive oil has been and continues to be in Portugal. Oil is mediated through architecture, despite the dismantling of the industry across Portugal.

Thanks to Charlie Usher and Aya Salim

#### 4 Nuno Cera: *Sines 2000* (2000)

Nine photographs show different sites in Sines in 2000, among them the local oil refinery as visible infrastructure of the global petroleumscape. The refinery is one of the three sites of the oil industry in Portugal, besides Lisbon and Porto, active since 1978 and operated at the time by GALP. The work is documentation that Portugal did not stop petroleum processing with the closure of the Lisbon refinery with Expo '98. For these images, Nuno Cera sought out different sites of energy landscapes that developed in Sines with the refinery.

The photographs show variously the factory complex that makes modern life, automobility but also sub-urbanity possible; how the huge complex glows as a big promise, Oz-like in the darkness of the night; the permanent flame that burns off excess gas in petroleum processing in a controlled manner; pipelines that wind over the coastal fortifications; ruins in the surf; changes in the landscape; waste material; further enlargement of the site. One of the photographs features, in remembrance, a text by the late architectural theorist Diogo Seixas Lopes, with whom Cera collaborated repeatedly on joint publications. The text, with which the centrality of fossil energy is brought to the fore, demonstrates a better knowledge of social dependence and impact on the environment.

In the 21st century, Portugal has continued to invest in oil and gas exploration; German geologists, who have been proven to maintain contact with right-wing networks, provided the expertise. In the meantime, exploration of oil and gas fields, especially in the deep sea off the coast of Alentejo, has ceased, closing them to further exploitation. The photographs, the basis of both critique and action, make it clear that this is anything but an idyllic place. Even if the oil fields, as extractive zones, are not pictured, the refinery is the industrial site of the 20th century, marked by the responsibility for climate change.

*Sines 2000* was for Cera the beginning of an exploration of architecture and energy, which he continued through other photography and video works. This also included looking at the beach of Matosinhos, the most monitored in Portugal, due to the refinery in the background; or the construction of the new headquarters of EDP (Energias de Portugal), the Portuguese electric utilities company. More recently, Cera, for his new work *Distant Lights*, returned to Sines to film EDP's abandoned coal-fired power plant, which is now being converted into a data server complex, a building where huge amounts of energy are mediated, with its own solar power plant to fuel operation on a field adjacent to it. As Portugal closes its last coal plant, dependency on oil continues.

#### 5 DOING.pt (Nuno Vasconcelos): *Earth Cycles* (2022)

The samples of rammed earth and earth plasters, displayed here together with the rammed earth bench, result from different tests and experiments to transform soil excavation from building sites and demolitions aggregates, mainly from Lisbon, into new materials. The pieces systematically shown in analytical form, define soil as building material according to their properties. They intervene in the basic metabolic functions of construction and demolition in urban areas. Across Europe, the building trade is responsible for 30% of waste and 25% of carbon emissions. In the face of climate emergency, it is therefore urgent, to address the challenges and tackle embodied energy of materials, associated with the production (and demolition) industries related to the building sector, to reduce construction's environmental impact. Besides bio-based materials like wood, straw or hemp, earth provides a regenerative, low-emissive, and local solution.

Although excavated soil from building sites, as of 2021, is no longer considered a waste material in Portugal, as opposed to demolition waste, both are repeatedly taken to dumps around the cities, in this case Lisbon. Then again, in Portugal since 1 July 2021 (Decreto Lei 102- D/2020) the requirement to use recycled materials from excavations and demolitions has changed from 5% to 10% for public construction contracts. However, this requirement is frequently ignored.

Nuno Vasconcelos with DOING.pt looks at these earths from a circular development perspective, re-using and reorganizing the existing logistics around excavations and demolitions. It is shown that even in an urban context, it is possible to use materials and techniques with low embodied energy, such as earthen building techniques, and to integrate them into the current building system. This process happens, working directly with contractors, clients, and other stakeholders. DOING.pt starts by collecting different earth material and aggregates from excavation and demolition sites, to characterize, test and reformulate them. Then, the necessary logistics for mixing and preparing the collected material must be organized, so that they can be used in construction and integrated into the construction system, in the form of rammed earth, earth plaster, compressed earth blocks, etc.

Earth as a local building material has a long tradition. While rammed earth was displaced by other industrially produced materials throughout Europe in the modern era, first by bricks and later by concrete, this material returned in times of crisis, especially for housing and development projects. In Portugal, earth was used mainly outside of urban settlements. Unlike in other countries, where it had found its way into education since the 1970s, this building technique was not officially taught in architecture schools in Portugal. According to the building material pyramid, rammed earth is considered to have a low global warming potential (surpassed only by reused brick and all sorts of timber products). Earth construction is more economical and ecological when the entire material cycle is considered. In times of climate emergency, this energy-extensive and labor-intensive material promises a future of building that does not break with modern advancements, but proposes another modernity, of connectedness to the earth and of caring.

Thanks to Oficinas do Convento – Associação Cultural de Artes e Comunicação

## 6 Christoph Brünggel: *Turbulent Currents* (2022)

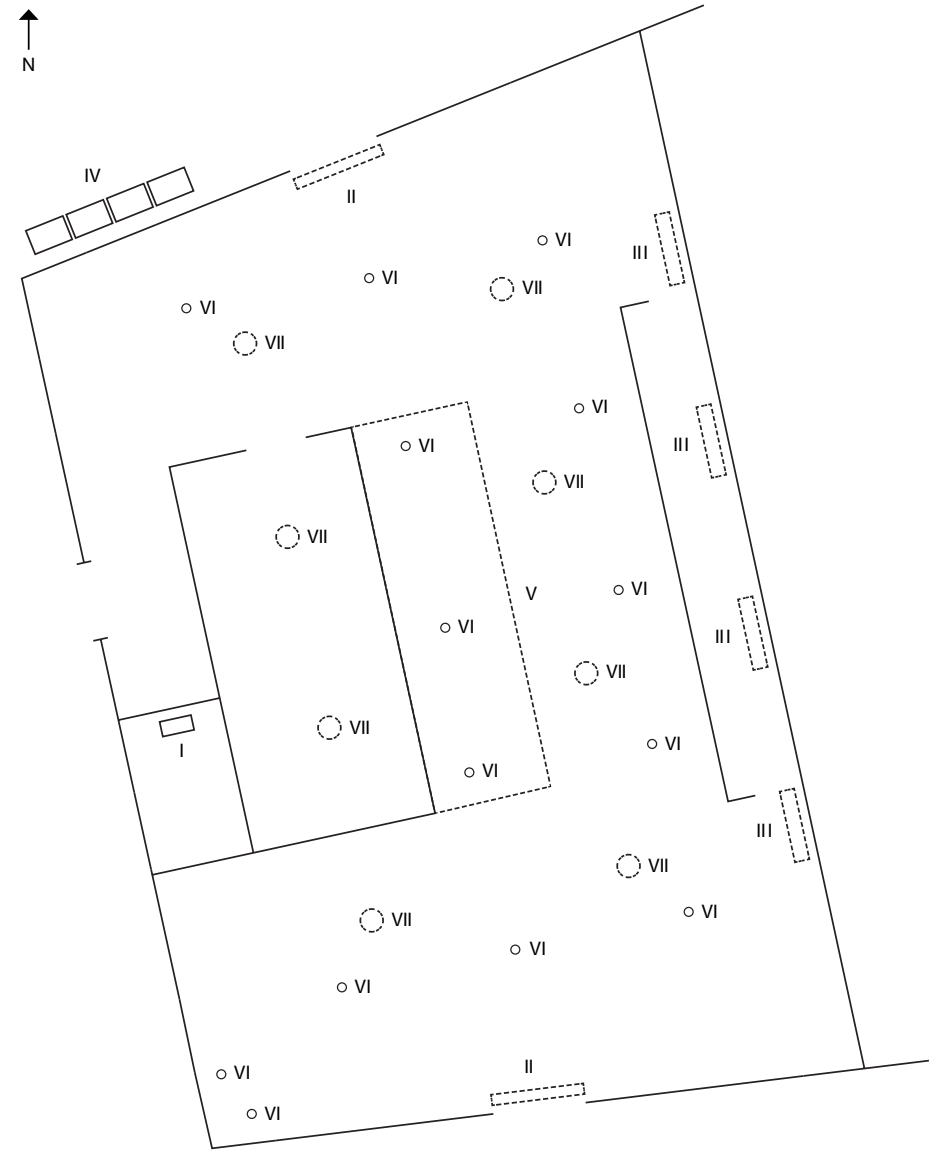
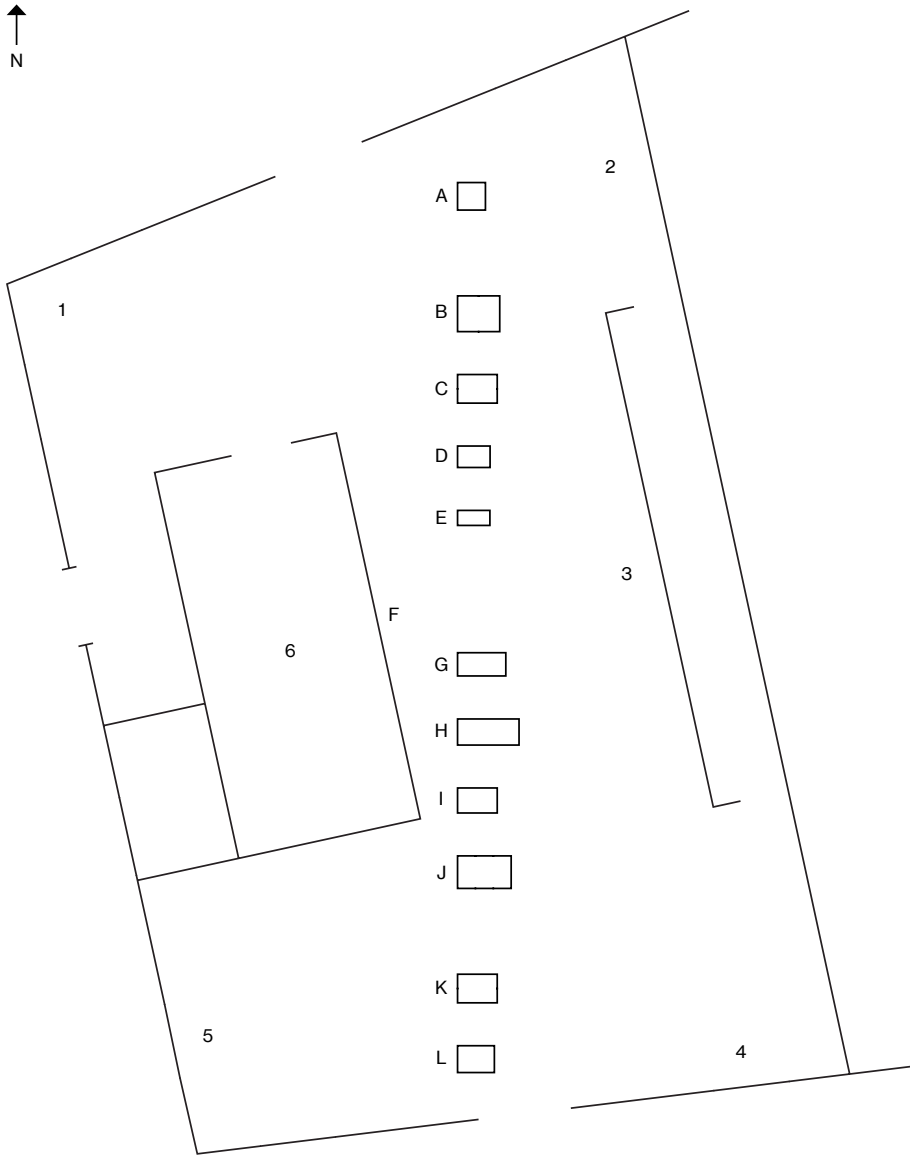
The sound installation allows the audience to enter a space-encompassing sound field; playing in the room is a composition based on the sound emissions of hydroelectric energy infrastructures in the Douro Valley, mixed with the natural ambient sounds. Sound artist Christoph Brünggel together with sound researcher Patricia Jäggi traveled to the hydroelectric power plants of Bemposta and of Tua, as well as the ruined construction site of Côa. There they recorded these energy landscapes consisting of a network of architecture, technology and nature with different microphoning technologies. In particular, they focused on the workings of the infrastructures and their sound, energy flows in pipes and machines; they also explored the complex architectures as echo chambers for sound.

Together, these are complex sound ecologies, with interesting sound events occurring particularly at the points of contact between technology and nature. Depending on one's perspective on the history of technology or the environment, these infrastructural structures are powerful instruments of progress for some, destructive agents of doom for others. Bemposta and Tua, formerly owned by EDP, were sold to an international consortium consisting of Engie, Crédit Agricole Assurances, and the Mirova-Natixis Group, which was fiscally prosecuted for exploiting loopholes, and yet they now supply electricity to the liberalized European and domestic markets. Even in the case of relatively emission-free hydropower, energy production by private corporations is not unproblematic according to ecological-political readings, since here "nature" is organized by dams in a capitalist system with increasing demand for electricity.

In Brünggel's composition, electricity becomes audible not just through dams as part of a large technological system and the electricity grid, but through the use of a modular synthesizer, an instrument that generates and shapes sounds from electricity flows. The piece is composed of field recordings in the Douro Valley and sprinklings of synthetically created "electric sounds" that use the produced electricity. In the gallery's Black Box, the multi-perspectival composition, combining the complex sound ecologies with a purely electric instrument, is spatialized through different speaker systems.

In this way, the soundscapes of electricity generation and use, which today are associated with the promise of survival in the climate emergency, are made to be experienced physically and sensorially. These sounds of the system defined by power generation can also be heard throughout the gallery space, as a background noise, so to speak, of our increasingly digitalized living, building, and dwelling. Thus, the sound composition offers possibilities for auditory processing and perception of "green" energy production and use through hydropower, or a "green" extraction, and its acoustic intertwining of nature and infrastructure. With increasing aridity affecting hydropower generation, the question is how to expand electrification in Portugal, as elsewhere, while shutting down coal-fired power plants. Situated in this context, Brünggel's installation raises questions about what other renewable energies (solar, wind, tidal, geothermal), what a "just extractivism", might sound like.

Thanks to Davide Ferreira, Christian Fürholz, Patricia Jäggi, Francisco Marcos, Jorge Martins, Pedro Oliveira, Nuno Pinto, Carlos Rosário, António Rosas



- I circuit breaker
- II solar shades
- III a/c units
- IV a/c condensers

- V skylight shade
- VI outlets
- VII lighting

## A

Agostinho da Silva's *Cadernos de Informação Cultural* (Cultural Information Notebooks) are self-published issues, produced in eight series by the educator in a fortnightly rhythm during the early 1940s and meant to be distributed cheaply to a broad readership. Following the publishing of *O Cristianismo*, the Salazar regime labeled Agostinho a communist and forced him to exile in South America. Two of the issues are related to modern energy and material: *O Gás*, and *O Ferro* (1941). In the 18-page *O Gás* issue, da Silva narrates the history and technology of gas production, describes the development of street lighting in England, includes images of a "belt-driven coal throwing furnace", details piping or researches alternative energies such as "so-called gasogenic gases—water gas, air gas, oil gas, which are either cheaper or offer greater facilities for local production." Also presented here is da Silva's edition of Michael Faraday's, *Experiências de Electricidade*, published in the series *Antologia – Introdução aos Grandes Autores* from 1942.

## B, C, D, E

This set of maps, which are kept in the archives of the Calouste Gulbenkian Foundation, show the development and exploitation of oil fields in Kirkuk, now Iraq, during the interwar period and before the growth of the industry which accelerated after the Second World War in North America and Europe. The maps, powerful instruments of the organization of land, show the geographies of extraction and transshipping, the petroleumscapes of the drilling and pipelines; oil was shipped from the Middle East through ports in Palestine at the time. Gulbenkian was himself involved in the exploitation of the oil fields during this period as an oil trader. In the post-war period, his fortune provided the basis for the construction and operation of the museum, and the urbanism it propagated. As archival documents, these maps are an expression of commodity globalism; they provide a basis for finding a vantage point from which to view everything, postwar architecture and the city, through oil.

## F

Panoramic photo of spherical gas tanks. Storage infrastructures like these at the Matinha Gas Factory at Cabo Ruivo in Lisbon were employed by the industry to regulate the supply of fossil fuels on the market, and were demolished for Expo '98, while oil continued to flow into Portugal.

Panoramic photo of the construction site of Av. Calouste Gulbenkian. The extensive road infrastructure of the post-war decades, which here connects the Gulbenkian Foundation with the highway, was an expression of the transnational oil industry, while car culture promoted Western myths of individual freedom and self-direction.

Interior shot of the Central Tejo power station, Lisbon, Portugal, active from 1908 to 1972. The electrification of household, industry, and office work in *Portugal* through power plants as these, fueled by coal, long imported by ship from the UK, and equipped with machinery from Germany, created new relationships with the natural environment.

Side view of the Pavilhão de Portugal at Expo '98, designed by architect Álvaro Siza Vieira, and located in Parque das Nações, Lisbon, Portugal. Despite the impression of lightness, the amount of material used in the reinforced concrete roof structure, resting on massive plinths is noteworthy.

## G, H, I

Since its foundation in 1946, the Laboratório Nacional de Engenharia Civil (LNEC), a national engineering institute located in the modernist Lisbon district of Alvalade, has been conducting scientific and technical research on hydroelectric dam structures and their behavior, in addition to civil engineering projects such as road, airport, railroad and bridge construction. In the laboratory halls, experiments with water pressure and altered hydro conditions were carried out on dam models. A selection of three representative dam models from Aguieira, Alvito and Venda Nova, usually exhibited on the corridors of the laboratory building, show different structural designs of arch dams for reservoir hydroelectric power plants. In their own quality and materiality the plaster models are representation of energy and architecture concepts. From the perspective of an environmental understanding of technology, hydro dams have shaped nature, not only as large infrastructures of environmental management, but already as models.

## J

In Portugal, too, the oil industry was the subject of a parlor game for young and old. Simply titled *Petroleo*, this board game, following the example of *Monopoly*, is about building and expanding an oil empire, with all the components of extraction, transportation, and production. If the game

board shows a fictitious place, the manufacturers make the geographical reference clear with the cover of the game box. In the picture is the refinery in Matosinhos/Porto, which in architectural and urban history through the lens of energy features as a main site of Portugal's petroleum modernity. Also in the picture, obscured behind the title text, is Alvaro Siza Viera's Boa Nova Tea House, which turned the gaze towards the sea, resulting in the blotting out of the fossil fuel industry. In the end, architecture and urbanism, not only as consumers but as mediators, like other cultural forms, literature, film, toys and games, have driven and legitimized oil capitalism.

## K, L

On May 5, 1923, the daily newspaper *Diário de Notícias* reported on the completion of Portugal's first modern cement works in Leiria. The factory was equipped, at the time, with the latest technology of the German machine manufacturer Polysius from Dessau, market leader for turnkey cement works since 1904, which were shipped worldwide. An illustrated company brochure of the Leiria cement works showed mainly the equipment of the factory, built and operated with foreign expertise, including the diesel power plant, which clearly shows the combination of material, energy, and labor, but also electricity production, while coal storage, the basic fuel in the kiln, was omitted. In the local *Arquivo Fotográfico Empreza de Cimentos de Leiria*, however, there are other photographs of the cement works in Leiria, the laying of the foundation stone and the construction of the factory, but also the different dwellings, barracks for the workforce, foreign engineers and the villa of the company director. Also documented was the urbanization process, the expansion of the city and the construction of dams, all unthinkable without concrete.

### **We thank the following archives for their generous collaboration:**

Arquivo Histórico Fábrica Secil Maceira-Liz (AHFML)

Arquivo Municipal de Lisboa – Arquivo Fotográfico

Associação Agostinho da Silva, Lisbon

Fundação Calouste Gulbenkian, Lisbon

Laboratório Nacional de Engenharia Civil, I.P. (LNEC), Lisbon

Landesarchiv Sachsen-Anhalt, Dessau



1.  
Lara Almárcegui  
*Guide to the Wastelands of the port of Lisbon, 2007*  
Project realized on the occasion of TERRITÓRIOS DE TRANSIÇÃO #3\_ GALERIA LUÍS SERPA PROJECTOS, Lisboa  
Artist's book  
Courtesy the artist
- Lara Almárcegui  
*Lisboa Wastelands, 2007 / 2022*  
Three inkjet prints on matte paper, 75 x 50 cm  
Courtesy the artist
2.  
ateliermob  
*When the Light Does Not Shine the Way, 2022*  
Video, colour, no sound, 7'  
Courtesy ateliermob
3.  
Marina Pinsky  
*Mother Lode, 2022*  
Acrylic paint on wall, 14,64 x 3,60 m  
Courtesy the artist
4.  
(from left to right, and top to bottom)
- Nuno Cera  
*Sines 2000 Portsines #1, 2000*  
Photographic print mounted on PVC, wooden frame, 100 x 70 cm  
Courtesy the artist
- Nuno Cera  
*Sines 2000 A.P.S #1, 2000*  
Photographic print mounted on PVC, wooden frame, 100 x 70 cm  
Courtesy the artist
- Nuno Cera  
*Sines 2000 A.P.S #3, 2000*  
Photographic print mounted on PVC, wooden frame, 100 x 70 cm  
Courtesy the artist
- Nuno Cera  
*Sines 2000 Petrogal #1, 2000*  
Photographic print mounted on PVC, wooden frame, 100 x 70 cm  
Courtesy the artist
- Nuno Cera  
*Sines 2000 D.S.L., 2021*  
Photographic print mounted on PVC, wooden frame, 100 x 70 cm  
Courtesy the artist
- Nuno Cera  
*Sines 2000 A.P.S #2, 2000*  
Photographic print mounted on PVC, wooden frame, 100 x 70 cm  
Courtesy the artist
- Nuno Cera  
*Sines 2000 Pedreira #1, 2000*  
Photographic print mounted on PVC, wooden frame, 100 x 70 cm  
Courtesy the artist
- Nuno Cera  
*Sines 2000 E.D.P. #1, 2000*  
Photographic print mounted on PVC, wooden frame, 100 x 70 cm  
Courtesy the artist
- Nuno Cera  
*Sines 2000 Transgás #1, 2000*  
Photographic print mounted on PVC, wooden frame, 100 x 70 cm  
Courtesy the artist
5.  
DOING.pt (Nuno Vasconcelos)  
*Rammed earth and earth plasters tests, 2022*  
Five framed earth plaster boards, 60 x 60 x 2 cm, 10 kg (each)  
Three framed rammed earth paintings, 60 x 60 x 6 cm, 40 kg (each)  
Courtesy the artist
- DOING.pt (Nuno Vasconcelos)  
*Rammed earth bench, 2022*  
Rammed earth, 200 x 45 x 52 cm  
Courtesy the artist
- Nuno Vasconcelos  
*DOING.pt in acts, 2022*  
Video, colour, no sound, 7'  
Courtesy the artist
6.  
Christoph Brünggel  
*Turbulent Currents, 2022*  
Multichannel composition of field recordings and analogue modular synthesizer sounds, 30'  
Courtesy the artist
- A.  
Agostinho da Silva  
*O Ferro [The Iron], in Col. "Iniciação: Cadernos de Informação Cultural" [Initiation: Notebooks of Cultural Information], Lisbon: Ed. by the author, 1941*  
Book, 24 x 16 cm  
Courtesy Agostinho da Silva Association, Lisbon
- Agostinho da Silva  
*O Gás [Gas], in Col. "Iniciação: Cadernos de Informação Cultural" [Initiation: Notebooks of Cultural Information], Lisbon: Ed. by the author, 1941*  
Book, 24 x 16 cm  
Courtesy Agostinho da Silva Association, Lisbon
- FARADAY – Experiências de Eletricidade [FARADAY – Electricity Experiments], in Col. "Antologia: Introdução aos grandes autores" [Anthology: Introduction to the great authors], Lisbon: Ed. Agostinho da Silva, 1942*  
Book, 24 x 16 cm  
Courtesy Agostinho da Silva Association, Lisbon
- B.  
*Alignment and pumping stations as per 1929 report*  
*Alignment and pumping stations as proposed September 1930*  
Inkjet print on matte paper, 72 x 30 cm  
Courtesy Calouste Gulbenkian Foundation
- C.  
*Map No. 1 – Proposed Alignment Palmyre / Kirkuk, n.d.*  
Inkjet print on matte paper, 70,8 x 23,5 cm  
Courtesy Calouste Gulbenkian Foundation
- D.  
*The Tigris–Euphrates Delta (to illustrate a paper by Sir William Willcocks K.C.M.G.), Royal Geographical Society, 15.11.1909*  
Inkjet print on paper, 40,5 x 35,5 cm  
Courtesy Calouste Gulbenkian Foundation
- E.  
*Baba Gurgur Area – Plan 'B', n.d.*  
Inkjet print on matte paper, 36,5 x 23 cm  
Courtesy Calouste Gulbenkian Foundation
- F.  
*Industrial installation, Portugal, panoramic view – gas deposits, n.d.*  
Photograph: Estúdio Mário Novais  
Inkjet print on vinyl, 40 x 30 cm  
Courtesy Calouste Gulbenkian Foundation
- Calouste Gulbenkian Avenue under construction, 1966*  
Photograph: Armando Maia Serôdio  
Inkjet print on vinyl, 40 x 30 cm  
Courtesy Arquivo Municipal de Lisboa – Fotográfico
- Power station, Lisbon, Portugal, n.d.*  
Photograph: Estúdio Mário Novais  
Inkjet print on vinyl, 40 x 30 cm  
Courtesy Calouste Gulbenkian Foundation
- Portugal Pavilion, 11.12.2003*  
Photograph: Gabriele Basilio  
Inkjet print on vinyl, 40 x 30 cm  
Reference code: PT/AMLSB/BSL/000011  
Courtesy Arquivo Municipal de Lisboa – Fotográfico

- G.  
Model of the Venda Nova dam (realized project), 1949-1950  
Mixture of plaster and diatomite,  
135 x 65 x 76 cm  
National Laboratory for Civil Engineering  
Collection
- H.  
Model of the Alvito dam (study version),  
1956-1957  
Mixture of plaster and diatomite,  
171 x 73 x 94 cm  
National Laboratory for Civil Engineering  
Collection
- I.  
Model of the Agueira dam (study version),  
1968-1969  
Mixture of plaster and diatomite,  
111 x 70 x 92 cm  
National Laboratory for Civil Engineering  
Collection
- J.  
Board game "Petróleo", 197?  
Edited by Karto, 46,5 x 33,5 x 5 cm  
Private collection, Lisbon
- K.  
*Cimentos de Leiria company*, Diário de  
Notícias, 5.05.1923  
Inkjet print on matte paper, 64 x 44 cm  
Landesarchiv Sachsen-Anhalt, I 414  
Polysius AG Dessau, Nr. 6 fol. 150  
Courtesy Landesarchiv Sachsen-Anhalt,  
Dessau
- L.  
*Foundations*, 192?  
Inkjet print on photographic paper,  
16 x 12 cm  
Courtesy Arquivo Histórico Fábrica Secil  
Maceira-Liz
- Construction of the Diesel Power Plant*,  
19??  
Inkjet print on photographic paper,  
16 x 12 cm  
Courtesy Arquivo Histórico Fábrica Secil  
Maceira-Liz
- First factory workers*, 192?  
Inkjet print on photographic paper,  
16 x 12 cm  
Courtesy Arquivo Histórico Fábrica Secil  
Maceira-Liz
- Rotary Kilns I and II*, 19??  
Inkjet print on photographic paper,  
16 x 12 cm  
Courtesy Arquivo Histórico Fábrica Secil  
Maceira-Liz
- Kiln flame*, 19??  
Inkjet print on photographic paper,  
16 x 12 cm  
Courtesy Arquivo Histórico Fábrica Secil  
Maceira-Liz
- "Madeira Island" neighbourhood*, 1920  
Inkjet print on photographic paper,  
16 x 12 cm  
Courtesy Arquivo Histórico Fábrica Secil  
Maceira-Liz
- Construction of the Directors' Houses*,  
19??  
Inkjet print on photographic paper,  
16 x 12 cm  
Courtesy Arquivo Histórico Fábrica Secil  
Maceira-Liz
- View of hydro dam construction*, 19??  
Inkjet print on photographic paper,  
16 x 12 cm  
Courtesy Arquivo Histórico Fábrica Secil  
Maceira-Liz