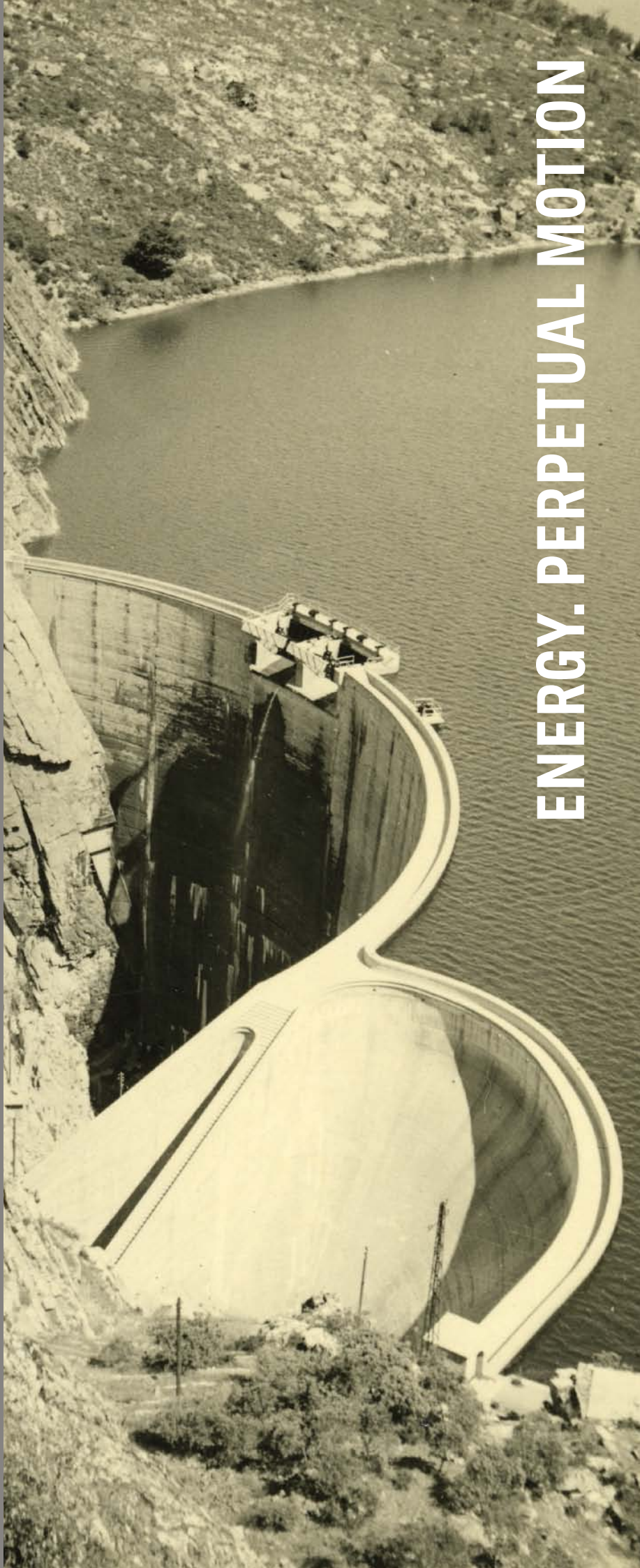


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ENERGY. PERPETUAL MOTION

Energy. Perpetual Motion brings together the collections of two museums, the National Archaeological Museum and the EDP Foundation. The physical setting, where cultural testimonies stretching from prehistory to the present day intertwine, is MAAT Central.

In two halls of Lisbon's emblematic industrial building, the Central Tejo, objects that evoke synergies, i.e. the exploitation of natural energy sources such as the sun, water, wind, and fire, are on display. These elements have influenced the course of human societies and are nowadays indispensable to the development of recent technological procedures based on renewable sources and on the path towards a common future, that of decarbonising the planet.

High Pressure Boiler Room

The objects displayed in this room are traces of various historical periods: they belong to the genesis of utilitarian stone-carving tools of prehistoric times, to the first and later explorations of metals and to the millennia-long accumulation of technological development experiences which, with the Industrial Revolution of the 18th century, reached unprecedented complexity and sophistication.

Hand axes, flint artefacts, stone axes, arrowheads and others demonstrate the innovative technology of polished stone and flint carving. Work tools from the mechanical, metalworking, forging and carpentry workshops of this early 20th century electricity production plant are some of the hallmarks of the industrial era of the late 19th century, born from the improvement of "iron and bronze and the drunkenness of metals" (Álvaro de Campos, *Triumphal Ode*, 1914) and record the mastery of fire.

Fire, a catalyst for endless change, capable of manipulating, melting and moulding metals, will play a decisive role in the production of energy, such as the steam that drives machines and generates electricity.

One example of the millennia-old accumulation of technological development experiences that stand out here are the great giants of water vapour production, the boilers. These are living documents of an energy used to create another energy, electricity, which has settled into a daily life that keeps reinventing itself, freeing humanity from darkness... and making sure that the world never goes back to the way it was.

While we highlight the water vapour generated by the steam engine, perfected in 1777 by James Watt, as the energy that allowed a series of inventions to emerge that would irreversibly transform the course of human history, we cannot fail to mention the sun, as the primordial energy source that has the most myths associated with it, due to its influence on the lives of communities.

Hail! I am mechanical heat and electricity!...

Hail and hurrah for me – everything and all, machines at work, hail!

Álvaro de Campos, *Triumphal Ode*, 1914.

Ashtray Room

We go down to the “crypt” of vapour production, the ashtrays.

Here the most important sources of energy throughout history and mythology intersect: water, wind, and, once again, fire.

We are confronted with the iconographic representation of the aquatic world and the winds of mythology in the mosaics of the Roman Empire.

Then we find examples of technological mechanisms that help energies flow through transmission lines.

From a very early age, human beings found and explored ways to conduct water through aqueducts, mills, pipes, taps, valves, and hydraulic pumps. For electricity, paths were traced from distribution substations to consumption centres, digging underground to run electrical lines and cables, connected to each other by equipment known as “submarines”.

The use of water resources has led to the development of technologies for storing water, such as the construction of aqueducts, and would gain greater vitality at the end of the 19th century, with new solutions for capturing and hydroelectric power stations on rivers, which in turn gave rise to unique engineering works such as dams and their associated power stations.

The action of wind and water as energy forces would provide, in the industrial age, new inventions such as fans, motors, rotors, steam engines, the windlass, the speed regulator, and others.

Vulcan, the Roman god of fire and the forge, a mythological figure from Classical Antiquity, symbolises ingenuity, labour and triumph over matter! Álvaro de Campos’ *Triumphal Ode* exalts technical progress, the triumph of the machine, and modern civilisation, while also celebrating the radical change that the advent of electricity brought to the world.

Here today, we are paving the way to raise public awareness of the urgent need to combat global warming.

When two physical systems interact with each other, changes occur in both.

This phenomenon is called energy - a word that comes from the Greek ergos and means work.

Law I: Every body remains in its state of rest, or of uniform rectilinear motion, unless it is compelled to change that state by the action of applied forces.

Isaac Newton, *Principia*, 1687.



Biface, Saint-Acheul, France. Coll. National Archaeological Museum.

Energy. Perpetual Motion

24/04 - 07/10/2024

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Santa Luzia hydroelectric facility, 1954
(detail). Coll. Ferreira Dias, CD-FEDP.

