SERCIB

Ce qui est vrai restera

solaris

LIBÉREZ VOTRE ÉNERGIE POSITIVE !

Press Pack

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ÉNERGIE POSITIVE

31,000 m²

48 bicycle spaces

882 car parking spaces including electric cars

90 motorbike spaces

Photovoltaic panels on more than 4,000m² of roof

Clearance height 2.7 m

Average floor level depth: 18 metres

116 geothermal probes going down to a depth of 100 m

Unit comprising three autonomous buildings

A & B & C

Up floor terraces

1,000 m² of interior garden

Largest photovoltaic roof in France for an office unit

Largest geothermal probe field in France

SUMMARY

I - PRESENTATION OF THE PROJECT AND ITS DESIGN METHODS

Solaris Clamart, the first reproducible positive energy building in an urban setting

Solaris is the result of a new commitment:
to make the reduction of energy consumption compatible with user comfort.

Reduction in consumption :
Solaris goes beyond Grenelle Environment Forum recommendations, it is a positive energy building which consumes less energy than it produces, and not the other way round!

User comfort :
Above all, Solaris is an everyday living environment, putting people at the heart of the building. It makes the fulfilment of human capital and increased productivity compatible. This is made possible thanks to its qualities: thermal and acoustic comfort, the presence of a central mist-sprayed garden, terraces, daylit staircases, refined and original decoration.
This ambition has directed all inputs for the conception of the project: the architectural design, the use of proven techniques and the exploitation of natural energies.

To succeed in achieving this performance, which required a full year's preparation, SERCIB brought together a multidisciplinary and highly experienced team: Architecture et Environnement for the architectural design, technical consultants for the thermal, static and thermodynamic features, fluid and structure specialists, together with cost-saving and innovation consultancies.

Solaris Clamart is a high-performance product which meets market demand in terms of rents and lower operating charges.

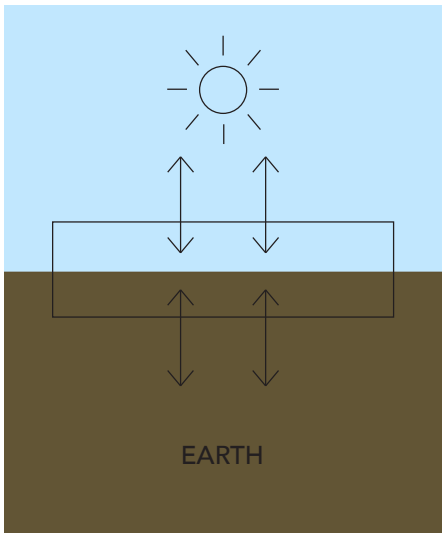
II - BEFORE PRODUCING ENERGY, SOME HAS TO BE SAVED

1 - The Solaris standpoint

The Solaris philosophy is not to transport energy.

Its footprint is all that is needed, be it underground or at roof level. The building consumes less energy than it produces, and not the other way round!

Of course, it may be easy to design an "energy-hungry" building, and to offset this consumption by putting vast areas of photovoltaic panels on the building and all around it.



With Solaris, SERCIB has wished to turn this concept on its head. The trickiest and most virtuous part was to reduce the energy consumption. The aim has therefore been to design a very energy-efficient building. To obtain this performance, one of the first criteria was the shape and orientation of the building. From then on, the production of energy became a secondary objective.

Only proven technologies are used in Solaris.

No leading-edge technique is used in the building, it is simply the way in which the various technologies are brought together which is innovative.

II - BEFORE PRODUCING ENERGY, SOME HAS TO BE SAVED

2 - Energy-saving parameters

The challenge for SERCIB: to succeed in integrating the environmental equation within an acceptable economic framework.

I - **A North/South organisation** of the building and shape optimisation. Optimising the facades in line with their orientation (shading devices, external blinds...). A garden that can breathe and which creates its own micro-climate, thereby contributing to the thermal optimisation of the building, in winter and summer alike, to provide maximum comfort and user-friendliness.

II - **Exterior insulation** breaking thermal bridges.

III - **New design concrete structures,** aimed at reducing the supply of heating and cooling, and increasing daytime autonomy with the use of thermal inertia, conduction and radiation.

IV - **Night time ventilation.**

V - The introduction of technologies which guarantee substantial leverage effects on renewable energies: **use of geothermal energy.**

VI - **Efficient technical facilities,** which use systems that are easy to maintain, be it for heating, cooling, natural ventilation, glass surfaces or LED lighting…

VII - **Intelligent BAS control (Building Automation System).**

The target set has not been to have a profusion of costly technological resources but, conversely, only to be more selective in the choice of proven techniques, solutions which are easy to manage and maintain.

2 - Energy-saving parameters (cont.)

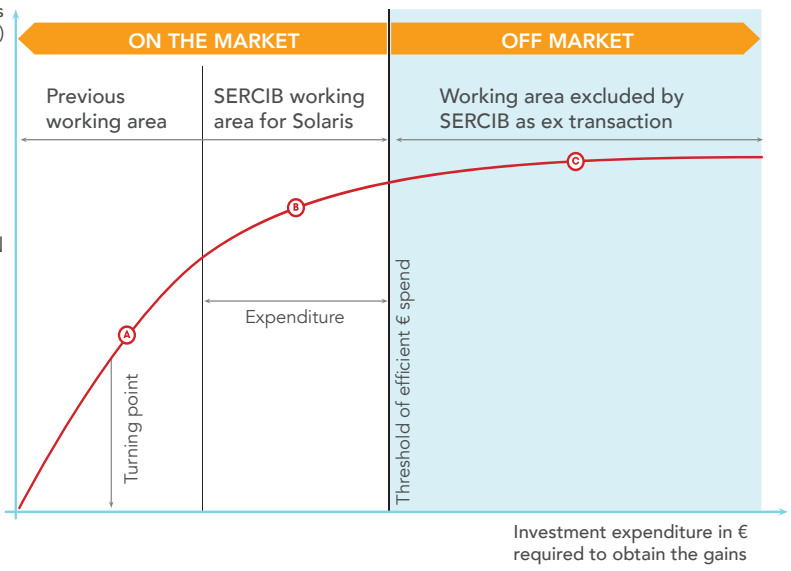
The challenge for SERCIB...

... to succeed in integrating the environmental equation within an acceptable economic framework

WORKING FRAMEWORK

I - SHAPE OF THE BUILDING
II - INSULATION
III - INERTIA
IV - NIGHT TIME VENTILATION
V - GEOTHERMAL ENERGY
VI - TECHNICAL CHOICES (GLASS SURFACES, LIGHTING)
VII - BAS CONTROL
VIII - PHOTOVOLTAIC

Sercib's choice:
a homogenous approach across the most parameters possible, at the lowest cost to achieve maximum results



(A) Part where little is spent to obtain substantial efficiency.

(B) Part chosen for the design of Solaris.
The expenditure made generates energy efficiency but remains within the market average.

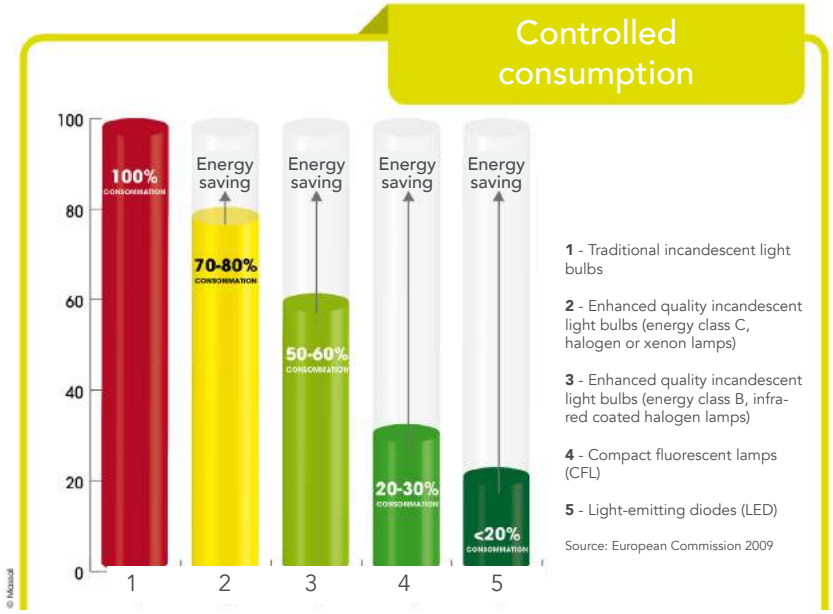
(C) Off-market part. Considerable expenditure for the gains obtained.

3 - The two main areas of energy consumption: lighting and temperature.

Lighting represents 30 to 40% of the electricity consumption of a traditional building. Solaris has been able to reduce this item by opting to use LED technology.

LED LIGHTING THROUGHOUT THE WHOLE BUILDING:

- Number of LED luminaires: 5,000
- Lighting is turned on according to the time of day and when users are present.
- Lighting (piloted by a DALI bus) depends on the input of outside light. The graduation is calculated using a group of luminaires connected to presence detectors and light sensors.
- The luminaires are sited based on the positioning of work stations.
- Floor lighting uniformity coefficient: 0.602 for an average 250 Lux with the latest LUCIBEL approved light fixtures for a consumption of 3.74 W/m^2.



4 - Temperature management: an interactive building.

- **Energy storage** (hot and cold) in the floors thanks to the inertia of the building's structure.

- **Absorption of heat release** from usage during the day by the structure's masses. It is evacuated by ventilation at night and by cold water circulation during the day.

- In winter, **heat is taken from the block of earth under the building** (120 x 80 x 100 m, equating to 960,000 m^3) and injected back into the building. In summer, the reverse takes place, with the heat being taken from the building and injected into the earth. In this way, the building is kept cool.

- **Controlled consumption** thanks to the installation of TV screens, in each building lot, showing the levels of energy consumption and other relevant information about the management of the site: nearly 70 screens in total.

- **A computer system linked to a weather station** pilots this dual control system enabling the temperature of the fluids recovered in the probes to be optimised.

The roof-sited weather station

5 - Providing information to be able to act effectively

Solaris benefits from a global energy management process.
It is based on:

- **The anticipation of weather conditions.**
- **The civic education of users involving regular information updates.**

- All users are informed in real time of the energy consumptions for their specific lots for lighting, electrical outlets as well as heating and cooling. This information will be visible in the form of a graph clearly highlighting whether consumption is above or below the levels projected in the energy charter.

- The following day's weather forecast will be communicated together with any other information relevant to conditions in the building and its environment such as urban traffic or the various activities available within the building.

- In order to update users as regards best practices, pictogram charts will be circulated on a regular basis showing the habits and gestures that can help save energy, such as whether to open the windows or not.

- Solaris shows users that this type of energy-saving building can improve the comfort and quality of life, while at the same time respecting the environment.

Display examples

Energy consumption levels by zone

The weather forecast for the region

Traffic in real time

III - ONCE THE CONSUMPTION REDUCTION HAS BEEN OBTAINED, RENEWABLE ENERGY HAS TO BE PRODUCED

Energy drawn from the sun and the earth

1 - The sun

Some 3,000 m^2 of photovoltaic panels are installed on the roof, south-facing at an angle of 17° (in order to get the best perpendicular alignment at our latitude's equinoxes). 1,791 monocrystalline solar panels produce
653 MWh annually.

30% of the hot water requirement is produced by solar panels.

2 - The earth

Solaris uses the earth as an energy storage area.
In **winter**, heat is taken from the block of earth under the building and is then injected back into the building.
In **summer**, as the earth's temperature is at 13°C on average, the cooler temperature is taken out, and the heat from the building is re-injected back into the earth.

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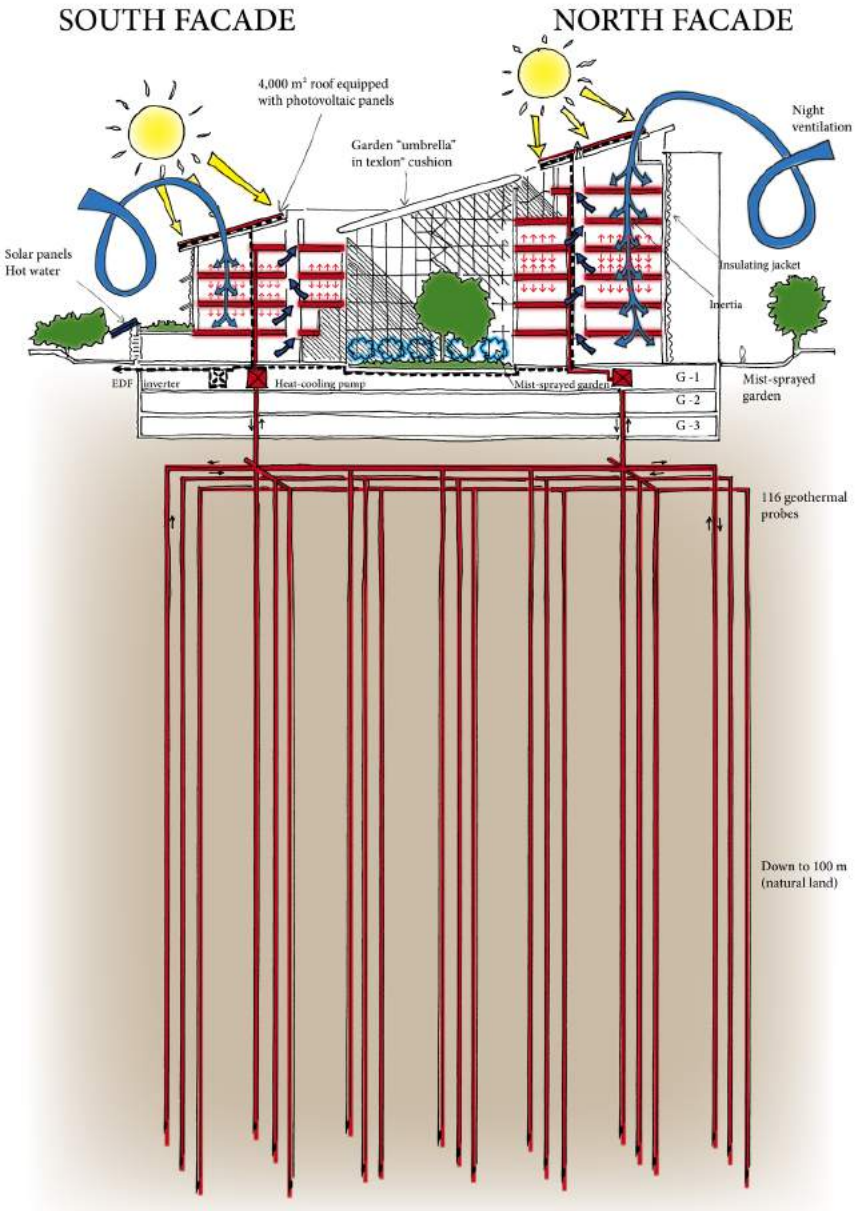
How Solaris works



2 - The earth (cont.)

How it works

116 geothermal probes are sunk to a depth of 100 metres under the building and capture the temperature of the mass of earth to heat or cool the building (120mx80mx100m equates to 960,000 m^3 of earth).

The calories captured in this way by the probes are transmitted to a circuit of water pipes set in the concrete thereby making the floors "active". These water coils, 15 cm apart, run through all the floors in the building, representing 4.5 linear metres of pipes per m^2 of floor.

This density provides heating comfort and/or optimal and efficient air-conditioning (in total, the building comprises more than 126 km of floor-sunk coils).

2 heat-cooling pumps (water/water heat pumps) can, if required, accentuate the heat or coolness in the active floors in the event of periodic extreme weather conditions. The COP (Coefficient of Performance) is 6 (1 kWh used to produce 6 kWh).

A computer system linked to a weather station pilots this dual regulating process depending on the temperature required and the outside temperature.

Some key data on geothermal probes:

- Independence in relation to price fluctuations for fossil fuels
- Very low operating costs
- No CO_2 emissions

Detail view of an "active" floor

- No risks of legionellosis, unlike "open" circuit systems
- No impact on groundwater (closed circuit)

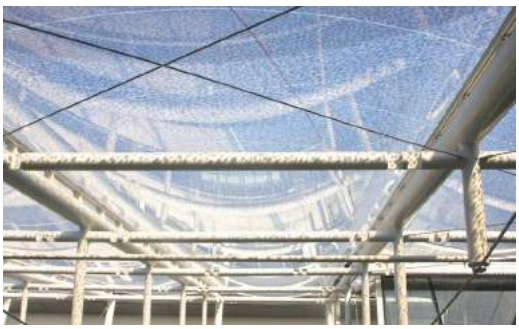
IV - AN INGENIOUS TECHNICAL CONTRIBUTION: THE TEXLON® ROOFING SYSTEM

Transparent, self-regulating Texlon® covering helps to create a garden area micro-climate and to make energy savings.

Texlon® Roofing: this "umbrella" type of covering is made up of pneumatic cushions, sorts of bubbles enabling better temperature regulation and optimum light filtering between the transparency of the envelope and the partial silk-screen printing.

Acting as a genuine climatic envelope, Texlon® generates energy savings. The cover breathes on the north and south sides and creates natural convections: as a result, the space inside is neither heated nor cooled.

This has enabled a low consumption covered space to be created. In winter, a slight warming reduces the need from the internal facades of the garden. In summer, convection creates a cooling draught, eliminating naturally any greenhouse effect.



V - USER COMFORT AND GOOD HEALTH, A CONSTANT CONCERN

Thanks to the unique facilities for a tertiary building of this size, comprising geothermal probes and active floors, **Solaris offers a comfortable and user-friendly living and working environment.**

Low-temperature floor heating/cooling reconciles energy performance, comfort and healthcare.

This is because surface radiating heating/cooling (as opposed to convection) guarantees better thermal comfort in all seasons and healthier air. Not producing any forced air, **there is neither air displacement, nor displacement of dust;** ideal for people's health and especially for asthma or allergy sufferers.

This radiating technique gives the feeling of a temperature 3°C above the actual temperature. 1°C of heating less means 7% of energy saved!

Linked to a high-performance building automation system and connected to a weather station, the Solaris floor heating system means that the temperature can be adjusted to user conditions and requirements, by eliminating the "heavy legs" sensation which earlier generations associated with underfloor heating.

The breathability of the 1,000 m^2 interior garden provides an additional source of enjoyment for users and creates a micro-climate all year round.

Mist-spray watering offers an adiabatic cooling solution for enhanced summer comfort.

Two impressive decorative staircases allow users to circulate vertically in full daylight without having to resort to the lifts, and to benefit from the greenery of their surroundings all day long.

All the HQE targets associated with health and comfort are treated with the greatest attention.

V - USER COMFORT AND GOOD HEALTH, A CONSTANT CONCERN (cont.)

Solaris North facade

Solaris East facade – Entrance

Breathing garden under Texlon® covering

Water-filled coils running through the "active" floors, 15 cm apart, giving 4.5 m of pipes/m²

Detail of the East facade

VI - PRESENTATION OF SERCIB

Founded in 1986 by Dominique Lebel, the SERCIB Group is mainly involved in the areas of business property.

Since its creation, SERCIB has always focused its efforts on the criteria affecting Well-Being and Health in the workplace. From a very early stage, the environment, energy savings, the quality of design and completion have been the core values incorporated into its buildings.

Listening to and understanding the needs of businesses, their satisfaction over time as they evolve, are the key factors for successful collaboration.

Since the outset, the levels of thermal demands set for its buildings far exceed the regulatory requirements.

In 2009, SERCIB became the first developer to receive an energy label. Keen to preserve its ecological footprint, the SERCIB group is involved and sensitive to the civic duty to "give back to our children the earth we have borrowed from them".

SERCIB supports the 10 principles of the UN Global Compact and has been awarded the LUCIE label by VIGEO.

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