



ISSÉANE

THE FUTURE ISSY-LES-MOULINEAUX HOUSEHOLD WASTE SORTING
AND ENERGY PRODUCTION CENTRE





ISSEANE, A TECHNOLOGY SHOWCASE SERVING A PROJECT OF PUBLIC VALUE*

An ultra-modern household waste treatment centre to replace the current unit.



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In accordance with the Hauts-de-Seine departmental plan for waste management (PDED), the current facility at Quai Stalingrad in Issy-les-Moulineaux will be replaced in 2007 by a new household waste processing centre, 500 metres further along on Quai Roosevelt at the gates of Paris. It will maximise the value of household waste from over a million residents in 17 communities in Hauts-de-Seine, 3 communities in Yvelines and 3 west Paris quarters. This project is being managed by SYCTOM, Syndicat Intercommunal de Traitement des Ordures Ménagères (household waste processing committee) that represents 85 local government bodies from the greater Paris area who have joined to benefit from a joint approach to the management of their waste.

Twin activities: energy generation and sorting

This new centre will process 460,000 tonnes of waste produced by a population of 1 million residents by generating energy. In parallel, the sorting centre will process 20,000 tonnes per year of household packaging and 35,000 tonnes per year of bulky waste. SYCTOM can thus satisfy the needs of the selective refuse collections in the 23 member communities in the centre's catchment area.

The latest equipment for minimal disturbance

Thanks to its very modern and sober architecture and the technologies and equipment used, the new centre will be perfectly integrated into the landscape: the building will be buried at 31 metres under the current ground level and its height limited to 21 metres (equivalent to a 6 story building), the white plume of water vapour will disappear as will the chimneys which will become part of the building, no industrial waste water discharges into the Seine, reduction of noise, smells and atmospheric pollution: dioxin emissions will be divided by 20 and nitrous oxide by 5.

Construction and operation that satisfy an environmental quality charter

An environmental quality charter was signed on December 20th 2000 with the town of Issy-les-Moulineaux. This document specifies and guarantees the conditions of environmental quality, safety and protection that will be used during the building phase - 4 years - and during the 40 years the centre will be operated.

* Project declared being of 'intérêt général' (public value) by an Order on March 6th 2000.



CREATING VALUE OR HOW TO GET A BENEFIT FROM OUR WASTE

ISSÉANE WILL TRANSFORM OUR WASTE INTO HEAT AND/OR ELECTRICITY (ENERGY PRODUCTION CENTRE) AND INTO RECYCLABLE MATERIAL (SORTING CENTRE)

THE ENERGY PRODUCTION CENTRE

Waste is converted into energy and recoverable material (clinker) by incineration
460,000 tonnes of household waste per year (consisting of 425,000 tonnes of household waste and 35,000 tonnes of sorted selective refuse collections and bulky items) will be treated by the energy production process.

ENERGY PRODUCTION CAPACITY

- 460,000 tonnes
- 2 lines of oven/boiler with a combined capacity of 61 tonnes per hour
- Steam production:
200 tonnes per hour at 50 bars and 400°C

Energy production

The principle of energy production is to produce steam and electricity using an oven/boiler system that ensures the waste is incinerated and converts the resulting energy into steam. In the future centre, high pressure steam will turn the turbines of a group of 50 megawatt electricity generators (equal to 50 million watts) which will be used to meet the centre's needs. The excess steam will be sold to CPCU (Compagnie Parisienne de Chauffage Urbain - the paris urban heating compagny) to supply their central heating network where it will provide the heating needs of 79,000 homes. The ISSEANE energy production centre will save the equivalent of 110,000 tonnes of petrol and reduce pollution from individual or shared heating (reduction in green house gas emissions).

THE SORTING CENTRE

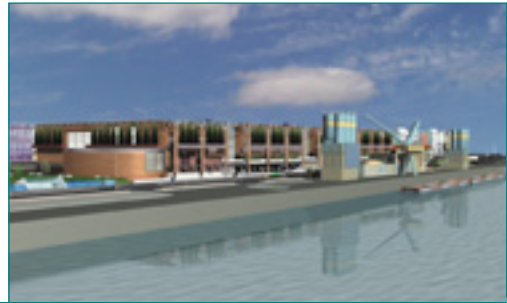
Local recycling solution
*55,000 tonnes of waste per year will be sorted in the future centre. Rate of recovery of material: 75% for selective collections and 15% for large items. Following sorting, 15,000 tonnes from the selective collections initiated by the communities in the centre's catchment area and 5,000 tonnes of bulky items **will be recycled in their different industry sectors.***

SORTING CAPACITY

- 55,000 tonnes
- 2 lines for selective collections with a capacity of 3.5 tonnes per hour
- 1 line for bulky items with a capacity of 3 tonnes per hour

An incentive for selective collections in the communities

In order to promote the development of sorting, SYCTOM has offered communities very favourable conditions for a number of years. Any member community that provides selective collections receives a financial return based on their weight.



Exhaust gas treatment

The exhaust gas from the heater is treated before being expelled into the air. It is exhausted by two extraction towers with only 5 metres above roof level (and consequently not visible from the street) and a speed of about 30 metres per second and a minimum temperature of 200°C in order that the purified gas disperses quickly.

The treatment consists of:

- Dust removal
- A dry route treatment
- Catalytic reduction of nitrous oxides.

The results of these treatments are below the limits imposed by the European Directive 2000/76/CE (December 4th 2000) of 0.1ng/Nm³ for dioxins.

Getting value from the material produced by incineration

108,000 tonnes of clinker will be recovered from the ovens after incinerating the waste. They will be taken to a storage area with a waterproof floor. The liquid effluent that comes from this storage will be collected by the centre's residual water system and will be subjected to a physico-chemical treatment before being disposed of via the drainage system. The clinker will then be used as hard core for road construction. Additionally, any steel or aluminium will be recovered and sent for recycling. Solid residues will be removed by river transport and a tender will be issued prior to the centre becoming operational.

Sorting selective collections

This is done in two stages.

Mechanical sorting is used for an initial separation of the waste:

- Identification of flat objects (newspapers, magazines, cartons) and hollow objects (plastic bottles)
- Extraction of ferrous and non-ferrous material

Then a manual sorting to improve the quality of the recovered material.

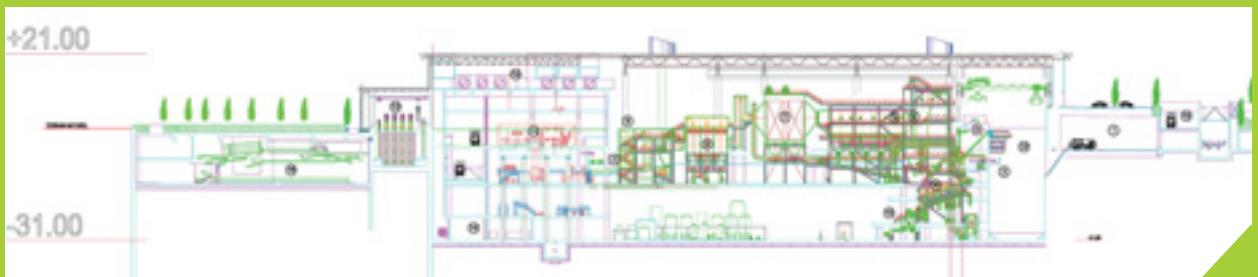
Installation of dust removal and ventilation

The sorting centre creates dust. The machines involved are located together in an isolated area which is fitted with an air extraction system. Before being expelled to the exterior, the air is purified and the dust that is collected is removed for incineration.



A GREEN FACTORY DESIGNED ACCORDING TO HIGH QUALITY ENVIRONMENTAL CRITERIA

Lanscaped to ensure minimal visual impact



The height of the buildings is limited to 21 metres: 2/3 of the facilities are underground



No chimneys visible from outside



The sorting centre is hidden under a ground level garden and lit by daylight



The access to the unloading bay will be covered by plants



The facade will have wooded areas and the facade will ensure that the site has a harmonious appearance



Refuse trucks will descend directly into the underground floors of the future centre in order to eliminate all noise and visual impact

State of the art smoke treatment

- Environmental protection is important for the ISSEANE centre and it will be fitted with treatment techniques that remove over 99% of the dust from the smoke.
- The future waste treatment centre will guarantee the absence of unpleasant smells thanks to using negative pressure, by air extraction, in the unloading pit and a special treatment of ammonia fumes emanating from the storage containers. All the smells from the waste or their treatment will be destroyed.
- Thanks to a system that allows the smoke to be measured (condensation and/or reheating

the smoke), the white plume (caused by steam emanation) will not be visible.

- The smoke treatment guarantees that pollution will be 50% less than the future European limits:

	Future Issy-les-Moulineaux energy production centre	European regulations (applicable from 2005)
Dusts	3 mg/Nm ³	10 mg/Nm ³
HCl (Chlorine)	5 mg/Nm ³	10 mg/Nm ³
SOx (Sulphur dioxide)	17 mg/Nm ³	50 mg/Nm ³
HF (Hydrofluoric acid)	0.8 mg/Nm ³	1 mg/Nm ³
Hg (Mercury)	0.03 mg/Nm ³	0.05 mg/Nm ³
Cd (Cadmium)	0.04 mg/Nm ³	0.05 mg/Nm ³
NOx (Nitrous dioxide)	65 mg/Nm ³	200 mg/Nm ³
Dioxins+Furans	0.07 ng/Nm ³	0.1ng/Nm ³



Water quality: no waste water will be discharged into the Seine

- The centre's needs in water will be provided by the town supply for domestic uses and drawn from the Seine for industrial uses.
- After use, the waste domestic water will be evacuated by the departmental sewerage system. The industrial water will go to an effluent treatments station within the centre which will ensure it meets the limits imposed for discharge into the sewerage system.
- The water drawn from the Seine for cooling the generator group will be returned to the river at the temperature defined by the regulations (maximum: 28°C).
- Liquid effluents will be monitored internally by the operator and there will also be external audits by SYCTOM and the public authorities.

Maximum sound insulation

- The future building will be buried 30 metres below the ground. All the noisy equipment will be installed in this buried section of the centre.
- The walls of the building will be made of sound absorbent and soundproofing materials.
- The vehicle access ramp will be covered.

Controlling traffic and its nuisances

The future centre will reduce the impact of transports by using alternative means of transport to the roads (the river):

For the energy production centre, river transport will eliminate 26 twenty ton vehicles per day for removing added value products after waste incineration (clinker, metals).

As a result, all the needs of the new centre will be met by 320 vehicles circulating six days per week (mainly refuse trucks) compared to 426 for the current facility. In other words a 25% reduction in annual traffic.



CONSTRUCTION WORK AND OPERATION THAT SATISFIES AN ENVIRONMENTAL QUALITY CHARTER

In order to ensure respect for the **ENVIRONMENTAL QUALITY, SAFETY** and **PROTECTION** during construction and operation of ISSEANE, SYCTOM has agreed to an **ENVIRONNEMENTAL QUALITY CHARTER**. This Charter was formalised on December 20th 2000 when it was co-signed by the SYCTOM Chairman and the Mayor of Issy-les-Moulineaux.

A **MONITORING COMMITTEE** (consisting of staff from the two signatory organisations and the Communauté d'Agglomération Arc-de-Seine) will ensure regularly that the principles of the Charter are being correctly applied.



ISSEANE operations under close watch

As soon as it starts operations, everything is planned to ensure the quality and security of operating ISSEANE:

- by taking all types of risk into account - especially flooding (in the event the river is excessively high);
- by recruiting qualified staff with the experience that will allow abnormal functions to be detected rapidly;
- by implementing a quality process such as ISO 9002 and ISO 14001.

Several performance measures are used for monitoring and to ensure maximum

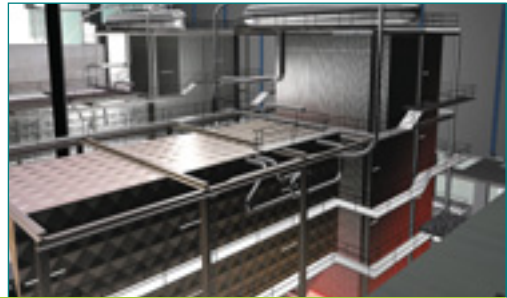


The ISSEANE construction work under close watch

Throughout the different phases of the work, which will be spread over 4 years, SYCTOM agrees to use all measures to reduce nuisances.

By acting on their causes:

- The movement of machinery (and their parking) will be organised according to a precise schedule. The river will be used to remove excavated soil, deliver equipment, etc.
- Dust and dirt will be eliminated (wetting machinery work areas, road sweeping);
- the waste from the worksite will be sorted, treated and recycled; the staff will be made aware of a better management of waste;



transparency Monitoring indicators, derived from the Environmental Quality Charter, are published on-line on the ISSEANE website:

- **Nuisances:** results of noise, smell and dust level measurements and soil analysis.
- **Emissions:** measurements of gas emissions, heavy metals, dioxin and discharges into the Seine.
- **Waste:** volumes recorded for each type of waste treated.
- **Consumption:** monitoring of costs of utility supplies used by the centre.

Corrective steps will be implemented in the event that predetermined limits are exceeded. These indicators can be understood by anyone and may be changed as regulations and the expectations of the local population develop.

Finally, alongside the daily operation of the centre, a whole series of measures are being coordinated:

- in the event of a peak of atmospheric pollution, appropriate measures can be taken at the request of the authorities;
- SYCTOM and the operator will give priority to the reintegration of local people with difficulties: mainly by giving them priority for work in the sorting centre;
- an 'open day' will be organised for the centre every year and other actions aimed at increasing public awareness of the need to protect the environment; a special room will be equipped for this in the centre.



- the Seine will be protected (the boom parts will be assembled on land, it will be forbidden to spill any product in the underground levels, floating barricades will be available);
- noise, smell, and vibrations will be limited (strict respect for the worksite hours, attenuation of propagated waves, odour treatment and neutralisation) and closely managed (movement plan for the noisiest machinery).

By informing the public and getting them to participate in the life of the site:

- The website will publish the nuisance performance indicators during the work phases and will be regularly updated.
- 3 records of observations will be opened,

one on the site, another at the Municipal Administration Centre and a third at the Communauté d'Agglomération Arc de Seine; SYCTOM will participate in local meetings, a 'Questions and Comments' will be specifically reserved for the project on the website.

- involvement of local residents with the implementation of a systems of sentinels. A panel of local residents will be responsible for monitoring and alerts in the event of nuisances (noise, smells, disturbances) during the work phases and when in operation.



THE ISSEANE WORKSITE 2001 TO 2007

Construction cost*
527 Millions Euros excluding VAT

*Value June 2004

Conception, architecture, suivi technique :

Architects: DUBOSC-LANDOWSKI, AAE,
SECHAUD ET METZ

Assistant Clerk of Works: JACOBS

Technical certification: VERITAS

S.P.S. Coordination: PRESENTS

Document management: PROSYS

Landscaping: EYZAT

Site and works 2004 :

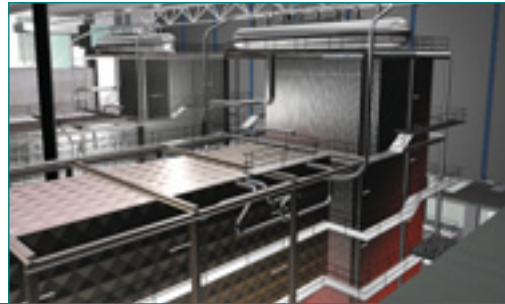
Worksite perimeter : COUGNAUD

① The site on the banks of the Seine, Quai Roosevelt, will be home to 600 people working on the site and visitors.

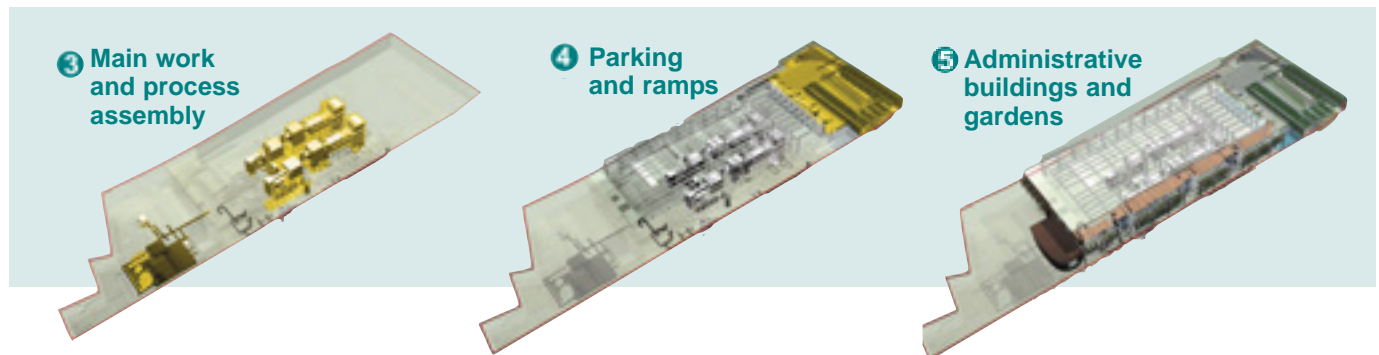
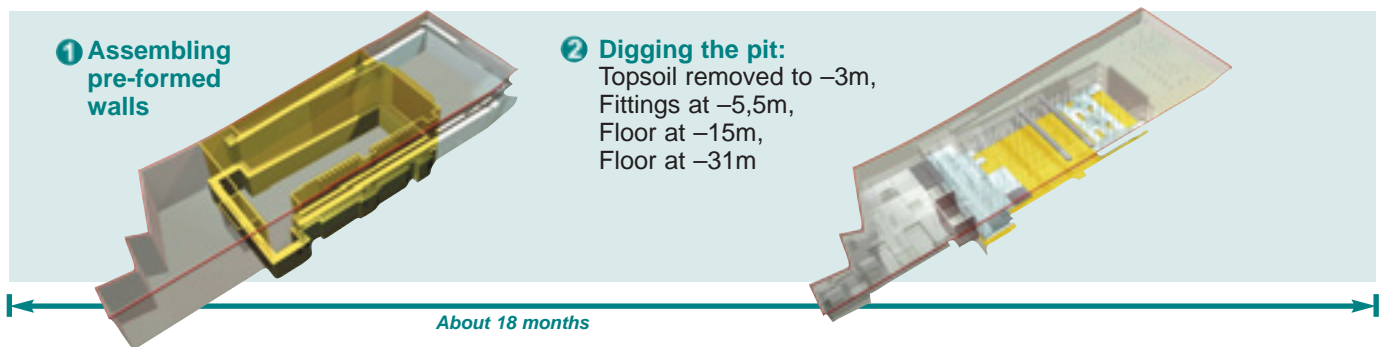


② View of the Isséane worksite in April 2006.





The different phases of the work from May 2003 to December 2007 (at the latest):



- Thermal treatment and smoke treatment: INOVA
- Turbine generators: ALSTOM
- High-tension electricity: SDL-GTIE-GARCZYNSKI
- Control room ergonomoy: PIXYS
- Wooden construction/ facades/roofing: BARBOT JOSEPH, PARIS-SMAC ACIERFROID
- Rolling bridges: REEL
- Clinker handling: BRESCHARD
- Control & Command Instrumentation: EMERSON PROCESS MANAGEMENT - GIFT INTI
- Pipe work: AMAL
- Ventilation: ELYO-AMEC SPIE
- Civil engineering cooperative: Groupement d'Entreprises RAZEL
- - Génie Civil : RAZEL - DEMATHIEU ET BARD - URBAINE DE TRAVAUX
- - Foundations: BILFINGER BERGER SOLETANCHE BACHY SEFI SPIE FONDATIONS



FOR FURTHER INFORMATION

A team at the service of residents and companies

MILIDIS, a local information centre, is present on the site.
In addition to listening to everyone, its mission is to reply to questions,
receive groups and organize guided tours

An exhibition and information room, opened to the public on the site

View models, consult the plans
or watch films on three themes

- What happens to household waste? ①
- The architectural project ②
- What is the environmental project? ③



A dedicated ISSEANE website: www.syctom-isseane.com

Understand the project, follow its daily
progress, consult the disturbances tables,
request documentation or answers on-line.

MILIDIS

MISSION LOCALE D'INFORMATION
DÉCHETS D'ISSY-LES-MOULINEAUX

100, QUAI ROOSEVELT - 92130 ISSY-LES-MOULINEAUX
TEL: +33 (0)1 58 88 31 51 / FAX : +33 (0)1 58 88 31 72
E-MAIL : MILIDIS@SYCTOM-PARIS.FR
ISSEANE WEBSITE:
WWW.SYCTOM-ISSEANE.COM

