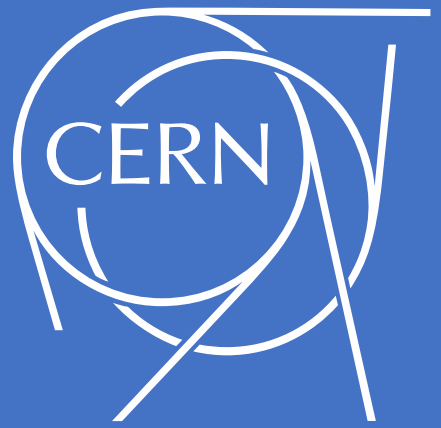


Industrial Opportunity Days 2022

Industrial opportunities in civil engineering at CERN

https://agenda.infn.it/event/30896/timetable

Alejandro Martínez (CERN, Site and Civil Engineering Department)

June 9th 2022

SCE MANDATE VISION

The Site and Civil Engineering (SCE) Department manages and develops CERN's real estate assets and infrastructures in agreement with CERN's scientific strategy, as well as all the services related to the caretaking and operation of the CERN site.

Creating an inspiring and welcoming environment for CERN's scientific community now and in the future.

SCE ORGANIZATION & COMPETENCIES

GROUPS

- Project Portfolio Management (PPM)
- Site Asset Management (SAM)
- Services and Supply Chain (SSC)
- Service Management and Support (SMS)
- Departmental Operation and Development (DOD)

Roads

Buildings

Housing

Catering

Mobility

Cleaning & Waste

Electricity

Shipping

Goods reception

Civil engineering projects

Storage

Service desk

Reporting solutions

HVAC & fluids

Internal distribution

Galleries

Metallic structures

Infrastructures

Energy management

Architectural

Building shell

Building technology

Landscaping

Installation

Maintenance

Raw materials

Keys

Accesses

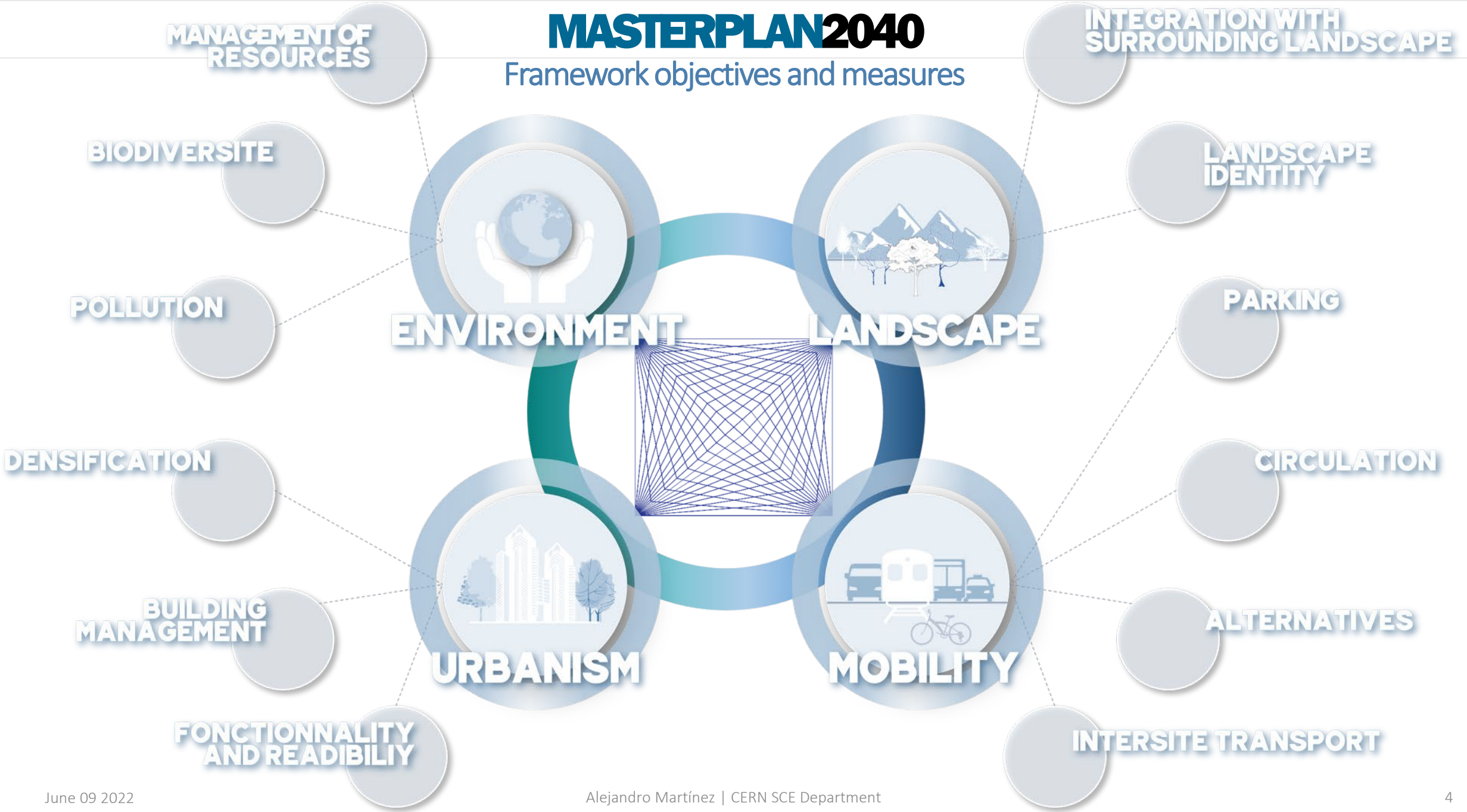
Site security

Mail

and so many others ...

MASTERPLAN2040

Framework objectives and measures



MASTERPLAN2040

DENSIFICATION

Densify land occupation by ensuring flexibility of use

- Identify the areas set aside for development and define priorities
- Continue to monitor CERN's development
- Draw up a land improvement plan
- Favour taller buildings where site conditions and building use so permit

BUILDING MANAGEMENT

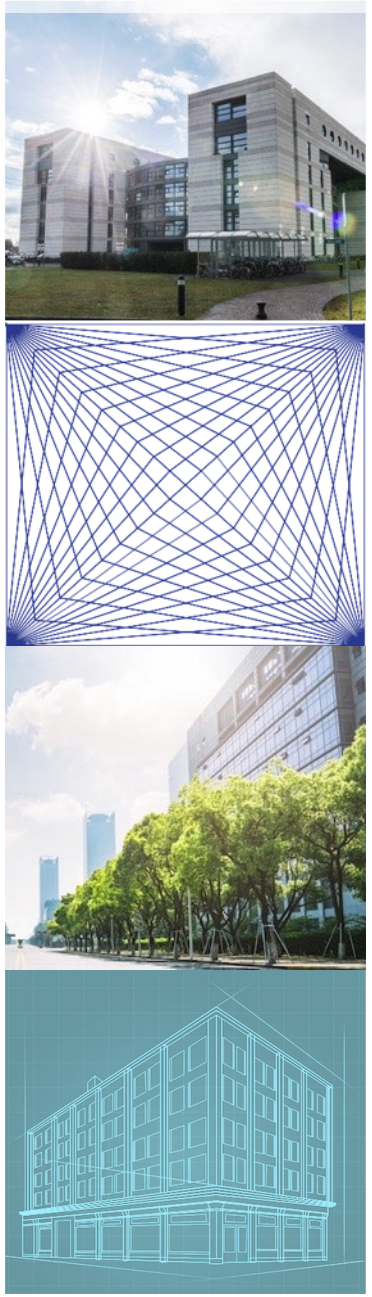
Standardise the use of built-up areas:

- Develop a policy for the management of built-up areas with a specific strategy for each purpose
- Continue monitoring existing buildings
- Continue the renovation programme
- Propose a specific land-use area on the Swiss side of the CERN site and define regulatory provisions

FUNCTIONALITY & READABILTY

Consolidate the functionality of the Meyrin and Prévessin sites and the experiment sites, and make the Prévessin site autonomous :

- Enhance the organisation and coherence of the sites by creating specific zones: visitor, academic, scientific–technological .
- Create one or more decentralised service hubs on the existing and future sites, notably bringing together amenities, restaurants, public spaces, lawns, gathering areas, etc



PREVESSIN OFFICE CENTER

MS and IT consultant: 2022

MS and IT Contractors: 2023

Beginning of Works: 2024

Key design information:

- Tertiary building (475 p.) + new restaurant (500 s.) + Parking
- Compliance Master Plan 2040
- Compliance RE 2020 (environmental regulation) ;
- Low embodied energy (mass timber structure)
- Preservation of near by forest
- Integrate soft mobility ;

2026 : end of works

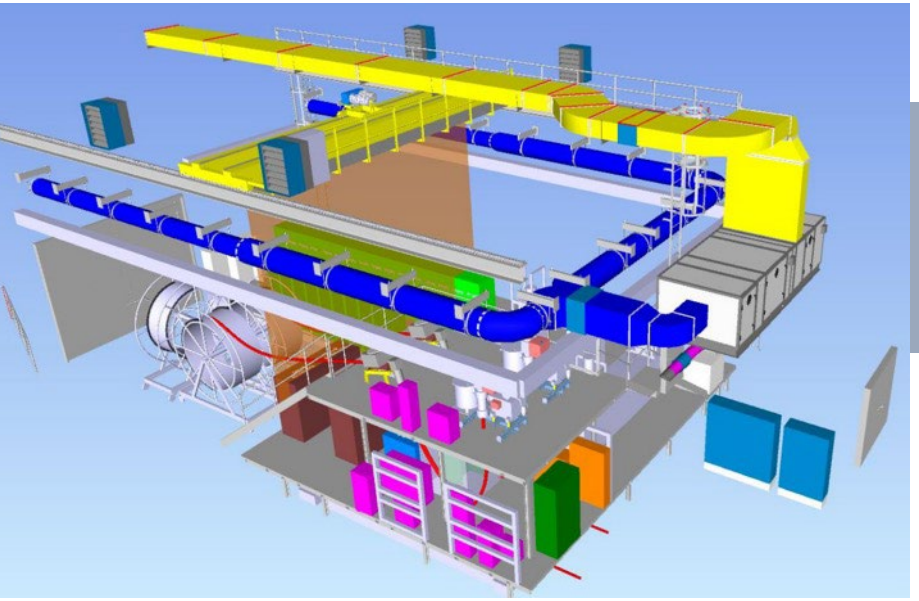
B140 (MEYRIN)

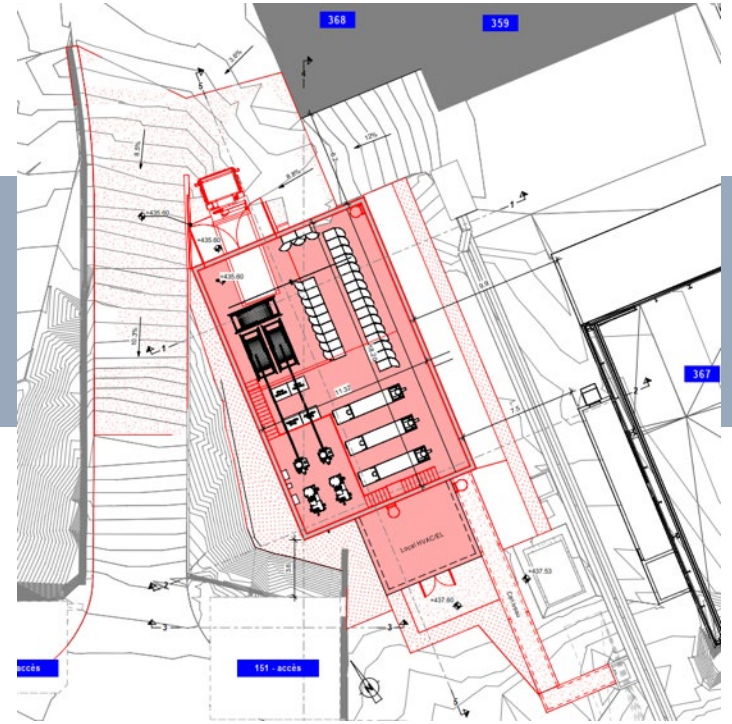
Base assumptions:

- 18000 m^2
- Office building, training center, light laboratories, cafeteria & parking
- Emphasis on sustainable design & construction

Tendering process to target beginning of works in 2027

B369 MTE KICKERS (MEYRIN)





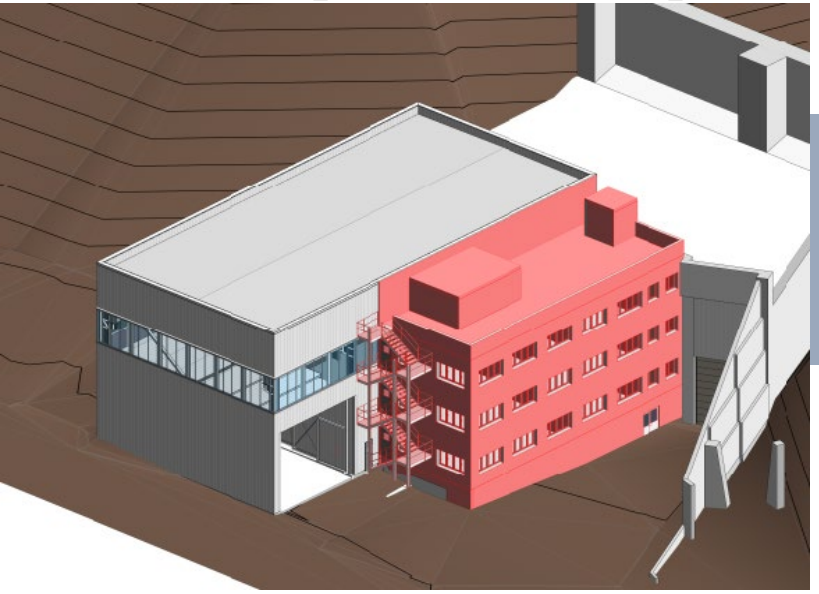
Base assumptions:

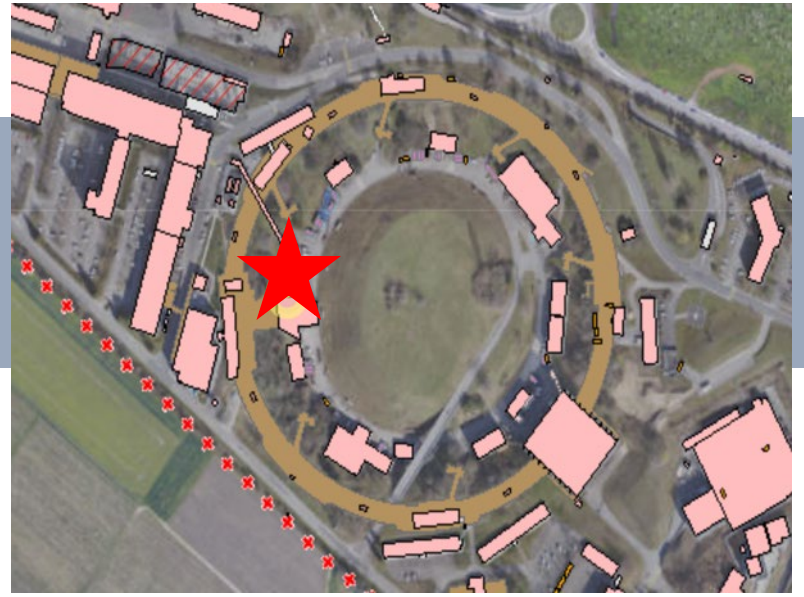
- Standard industrial building composed by a main hall (≈235m^2, including a mezzanine level), which will house the relocated kicker's system and its operational equipment
- Emphasis on sustainable design & construction

Procurement

- IT: Summer 2022 (FC on Dec22)
- Beginning of the works: January 2023
- Delivery: December 2023

B184 (MEYRIN)





Base assumptions:

- 315 m^2 extension and reconditioning of the Radioactive Waste Treatment Centre with offices and renovation of technical infrastructures
- Emphasis on sustainable design & construction

Procurement

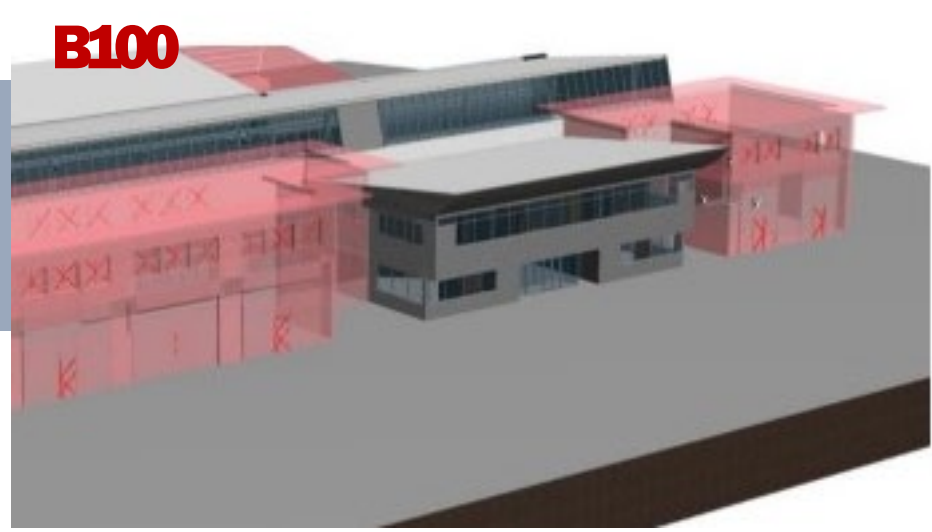
- Contractor IT: Q2 2022
- Contract: October 2022
- Works: Q4 2022 to Q4 2023

RENOVATION WORKS

- Global renovation of up to 2 buildings/y
- Densify consolidated space
- Emphasis on sustainable design & construction
- Demolish depreciated space

Procurement from Summer 2022

B36, design procurement phase from Autumn 2022, followed by construction



B100, procurement phase in 2023

RENOVATION WORKS

Demolish obsolete barracks at P1 (~400 m2) and replace it by a pre-fabricated building doubling the capacity within the same footprint

Procurement ongoing

Delivery expected end 2023

Pilot for future projects

Outdoor Spaces:

- Complete CERN working spaces with outdoors social and informal work areas;
- Give an urban identity to outside spaces;
- Exposition areas to share general knowledge.

MANAGEMENT OF RESSOURCES

Control the resource requirements for the operation of tertiary infrastructures:

- Improve energy consumption and reduce greenhouse gas emissions
- Promote new energy-generation technologies
- Limit the increase in water consumption.

BIODIVERSITY

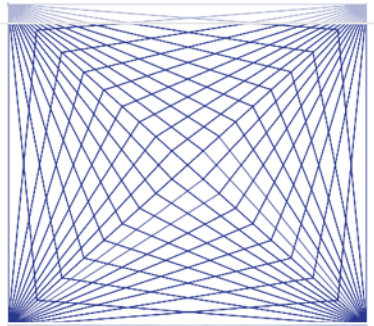
Initiate an action plan in favour of biodiversity, green spaces and protected species:

- Continue to implement the rainwater management strategy at CERN
- Draw up an inventory of the existing biodiversity, protected species and green spaces
- Continue the development of the ecological continuity of environments and wildlife corridors.

POLLUTION

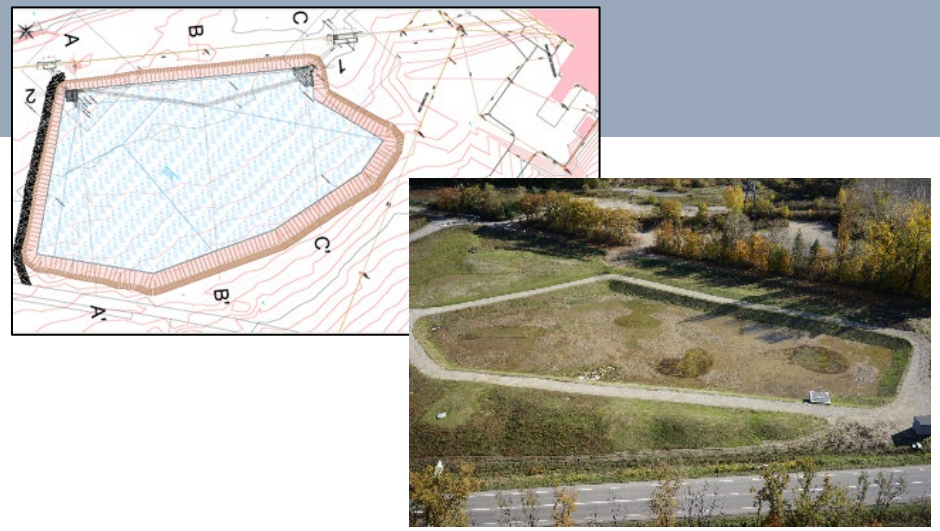
Control and mitigate CERN's environmental pollution:

- Limit noise pollution
- Increase the recycling rate and reduce waste production



ENVIROMENTAL INITIATIVES

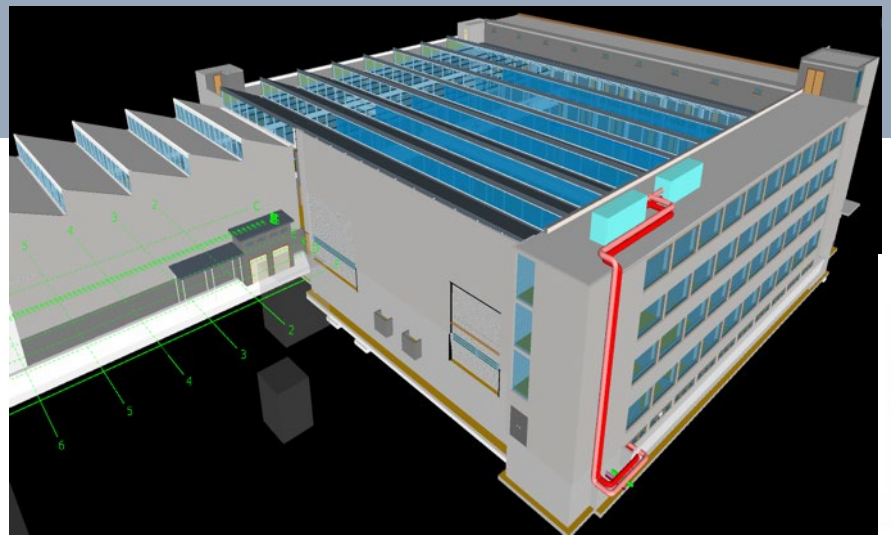
Retention basins

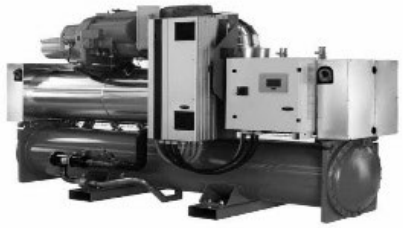


3 Projects under discussion
Ad hoc tendering for studies and construction:

- *France in 22-23*
- *Switzerland 23-24*

Upgrade of Cooling and Heating networks





Tendering 2022

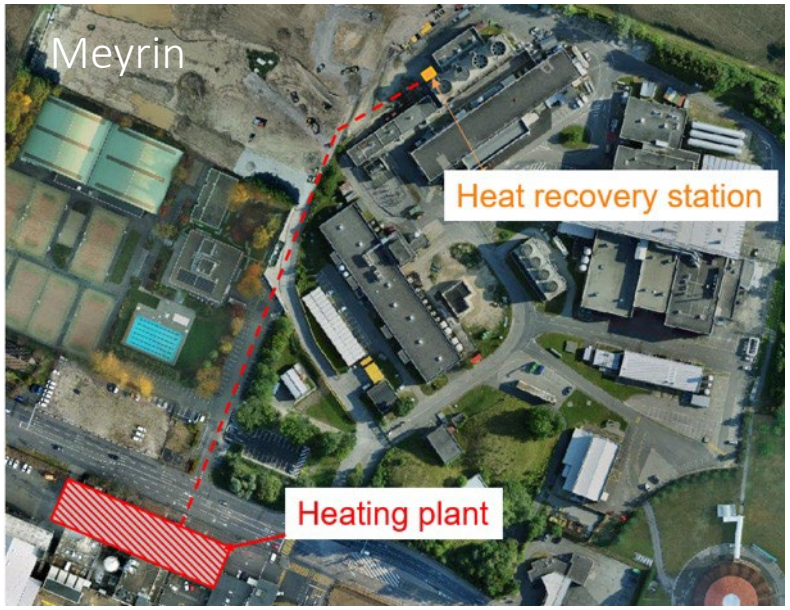
ENVIROMENTAL INITIATIVES

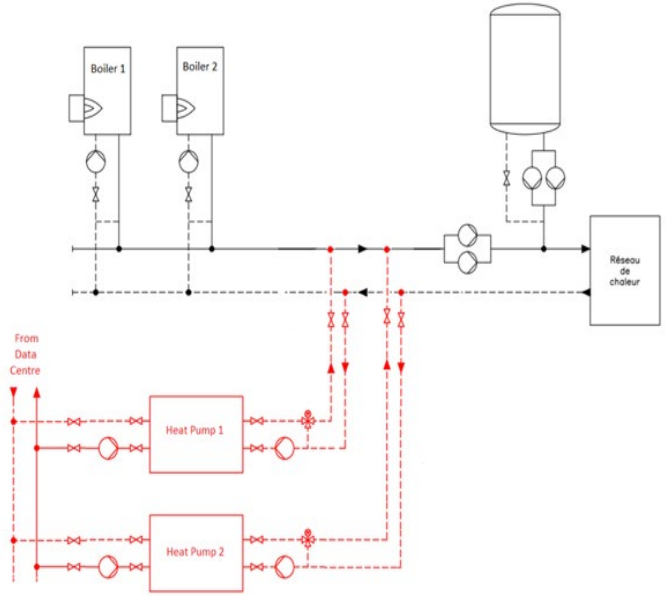
Sustainable Heating Plants

Main power via renewable energy sources to cover the major part of the current heating needs in Meyrin & Prevessin sites

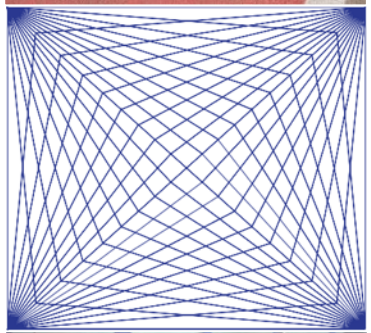
Projects under discussion

Tendering 2023





MASTERPLAN2040



PARKING

Optimise the car-parking facilities and their management :

- Limit car parking
- Privilege car parks close to the main road network in the context of new developments
- Continue the development of facilities for soft-mobility
- Develop communication promoting a reduction of the impact of people's mobility at CERN

CIRCULATION

Promote efficient and fluid access to and circulation on the CERN sites :

- Optimise the fluidity of access to the CERN sites.
- Improve the hierarchy of the road network inside the CERN site.
- Continue developing accessible facilities for people with reduced mobility.

ALTERNATIVES

Encourage alternatives to individual motorised transport for commuting :

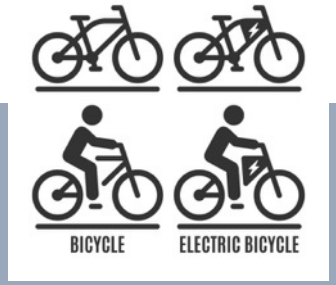
- Encourage car sharing.
- Improve the continuity, safety and comfort of soft-mobility routes and provide parking for bicycles.

INTERSITE TRANSPORT

Promote alternatives for travelling between the CERN sites :

- Continue developing facilities associated with collective transport on site.
- Optimise the management and supply of CERN vehicles
- Expand and diversify CERN's bicycle fleet.
- Continue developing the network of footpaths and cyclepaths on site.

MOBILITY



Electric vehicles

- Small cars

Car sharing

- Car sharing system satisfying CERN requirements
- Virtual key with cell phone
- 4G network cross border (FR/CH)
- Free floating scheme

Autonomous shuttle

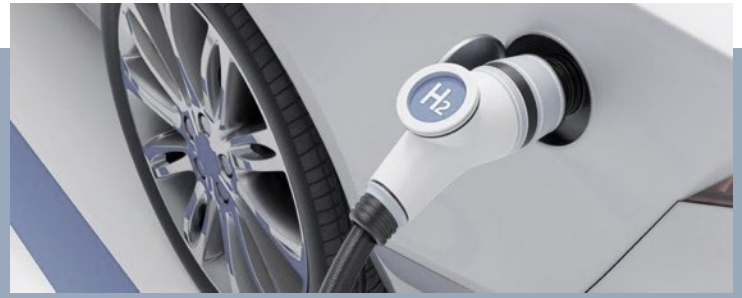
- Exploration of new way of moving from A to B on demand

Bike sharing

- E-bikes
- Standard bikes
- E-scooters
- Station to station scheme
- Charging stations

Exploration phase: 2022-2023

MOBILITY



Charging stations for electric/hydrogen vehicles

- Installation of terminals (Quick plug)

Exploration phase: 2022-2023

Professional cars fleet contract (hundreds of cars)

Procurement phase in 2023

CERN SITE KEY FIGURES

- 590 ha (220 fenced)
- 2 main sites and 15 satellite sites
- 670 building from 10 m^2 to 20.000 m^2
- 65% built before the 70s
- 70 km tunnels and 80 caverns
- 30 km roads
- 1000 km technical galleries and trenches

- 9000 persons/daily
- 490 hostel rooms
- 8500 working places
- >5000 parking places
- 25000 daily movements to- and inter-sites
- Public transport links in CH, not in FR

GREEN VILLAGE

FROM SOCIETY TO CERN TO SOCIETY

- Enabling rapid access to CERN campus as a test site for technologies linked to environment and sustainability
- Accelerating the commercialization of ideas, technologies and prototypes
- Involving Young Innovators (new ideas for unforeseen applications)

Ideasquare: The Innovation Space @ CERN

Green.Village@cern.ch

CHALLENGES

- Waste management
- Mobility
- Energy efficiency for tertiary activities on campus
- Space management, IoT, urban analytics…
- Zero-waste

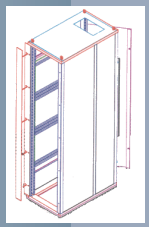
SUPPLIES

- **Fluid handling process and control valves:** pressure control valves, safety valves, pressure transmitter (3y~ 190 kCHF)
- **Instrumentation fittings** (3y~500k CHF)
- **Punchout** Industrial supply and tools (~1,4 MCHF/y)
- **Metallic gaskets** for UHV applications (3y ~ 3 MCHF)
- **Coaxial connectors** (3y ~500 kCHF) – from 2023
- **Flexible single core copper cables** (2y ~1,2 MCHF) – **CPR**
- **Industrial wood** products: engineered wood panels, plywood, MDF, etc. (3y contract ~500 kCHF)
- **Stainless steel tubes,** grades 1.4307/1.4404/1.4435 (280 kCHF/3y)
- **Oxygen-free copper** "Cu-OFE" forged round bars (200 kCHF/3y)





- 19 inch instrument **rack & accessories** (3 y ~ 600 kCHF)
- **Safety signs and labels** (3y ~ 170 kCHF)




Raw Materials store

New cutting machines:

- Circular and band saw machine
- Hydraulic shears
- Flame cutting machine

New storage system:

- Pallet racks (W:50m, H:4m)
- Sheet metal/plastic storage (up to 200 references)

CONTRACTS

Frame contracts

Gas supply (2022)

Cleaning CH (2022)

Green spaces (2023)

Light vehicles (2023)

Drilling and boring (2023)

Waste collection (2023)

Service Desk (2023)

Bus rentals (2024)

1-shot contracts, Invitations to Tender

CE, Vertical Cores HL-LHC (8/22)

Car washing station (7/22)

Landscaping CERN Perimetry (7/22)

Installation of fences CERN Perimetry (7/22)

Contact: SCE-DH-Office@cern.ch

Non exhaustive list
Subject to change