



Implenia

SUSTAINABILITY PERSPECTIVES IN THE INDUSTRY

GUEST LECTURE
IMPLENIA REAL ESTATE
DEVELOPMENT

EPFL

Benoît Klein
10th december 2025
EPFL

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Implenia

IMPLENIA AT A GLANCE

IMPLENIA AT A GLANCE

WE DESIGN AND BUILD WITH AND FOR PEOPLE

CHF B.

7,778

Order backlog
HY1.25



CHF Mio.

~140

EBIT FY.25
Guidance



Medium-term goal

>4,5% EBIT-Margin

25% EK-Quote



FTE

~ 8,500

Juni 2025



3 Divisions

- Buildings
- Civil Engineering
- Service Solutions



1 integrated Model

Range of services
along the value chain



4 strategic priorities

- Portfolio
- Profitable growth
- Innovation
- Talent and organisation



5 Values

- Sustainability
- Excellence
- Collaboration
- Agility
- Integrity



SUSTAINABILITY PERSPECTIVES IN THE INDUSTRY – GUEST LECTURE EPFL – IMPLENIA REAL ESTATE

STRONG COMMITMENT TO A MORE SUSTAINABLE CONSTRUCTION AND REAL ESTATE INDUSTRY

Implenia strong in ESG-Ratings¹⁾



Score 2024: B



Commitment to C33
to promote engagement
in the field of circular
economy



Recent Highlights

Successful audit of key ESG metrics with limited assurance for Scope 1 CO₂ emissions and HR, safety, and compliance data

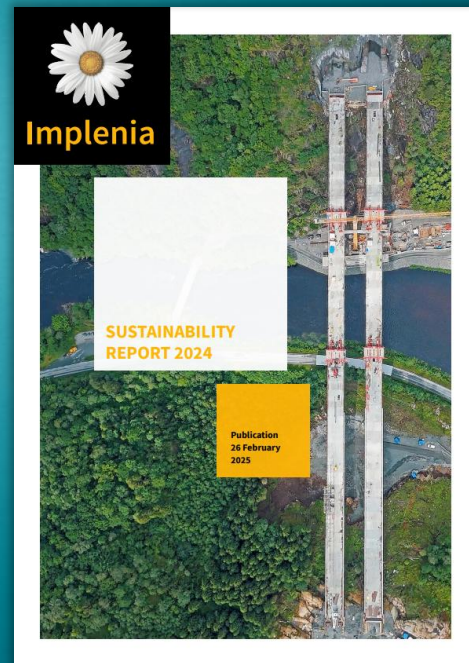
Updated TCFD-compliant report considers climate impacts and the influence of climate risks on business

Social roadmap for the real estate industry

Standards and measures for social sustainability in projects—from development to operation

New “Encira” offering for planning and consulting in building physics, acoustics, and sustainability

DGNB “Sustainable Construction Site” certifications²⁾ for first building construction projects according to new standard in execution



Note: 1) Assessment period 2024 for MSCI, Morningstar Sustainability, and EcoVadis; CDP: assessment period 2023; 2) DGNB = German Sustainable Building Council

LEADING END-TO-END SERVICE PROVIDER FOR DEVELOPMENT, PLANNING, REALISATION AND MODERNISATION

REAL ESTATE DEVELOPMENT



- Transactions
- Trader/Service Development
- Modular construction

NEW BUILDINGS



- End-to-end service provider
- Large and complex construction projects
- Special segments
- Façade Technology

MODERNISATION



- Renovation and conversion of existing large buildings at highest standards
- Standardized residential modernization

BUILDING PRODUCTION



- Realisation of technically demanding core and shell construction projects
- Timber Construction

F > 3.3 billion AuD ¹⁾

Portfolio market value after completion



CHF ~1'200 million



CHF ~200 million



CHF ~300 million

Revenue FY24 in million CHF (unconsolidated);
pie charts indicate share of revenue of each area

CHF ~1'700 million





1) AuD: Assets under Development

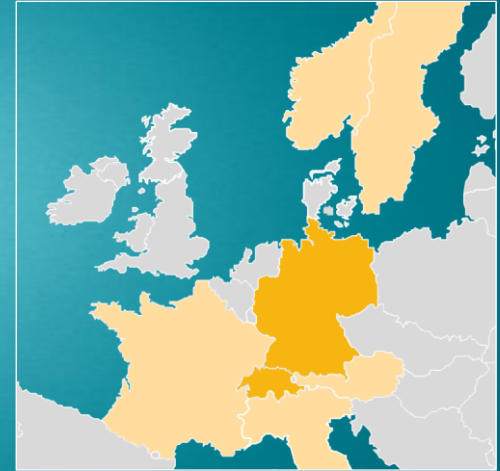
1 GEOGRAPHICALLY DIVERSIFIED ACROSS EUROPEAN MARKETS

Markets

-  **Integrated offering** of all divisions in **Switzerland** and **Germany**
-  **Focus on tunnel construction and related infrastructure projects** in other markets

Revenue by market in 2024

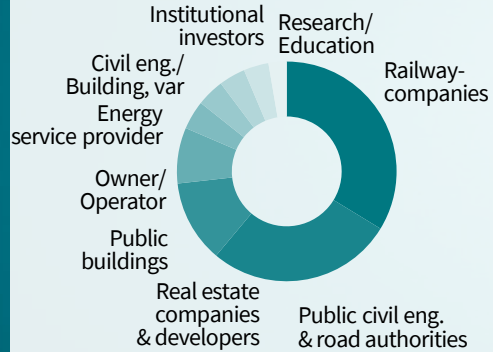
-  **~50%** **Switzerland**
-  **~27%** **Germany**
-  **~15%** **Sweden & Norway**
-  **~7%** **Others:** France, Austria, Italy, ...



DIVERSIFIED GEOGRAPHICAL PRESENCE

HIGHLY DIVERSIFIED CUSTOMER BASE WITH PRIVATE AND PUBLIC INSTITUTIONS

Order backlog by specialization



SwissLife	UBS	Allianz	Zürcher Kantonalbank	SWISS PRIME SITE	CHAM properties	STACK INFRASTRUCTURE	green
BASF	thyssenkrupp	United Nations	Grand Paris express	ETH zürich	Universitätsspital Basel	KSA Kantonsspital Aarau	KSB Kantonsspital Baden
DEGES	Die Autobahn	Statens vegvesen	TRAFIKVERKET	Verkehrs- und Infrastrukturbüro für SBB SBB ASTRA	SBB CFF FFS	DB	OBB

DIVERSIFIED CUSTOMER PORTFOLIO



GREEN VILLAGE USE CASE OF SUSTAINABLE ENGINEERING





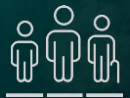
PROGRAMME AND DEVELOPMENT HISTORY



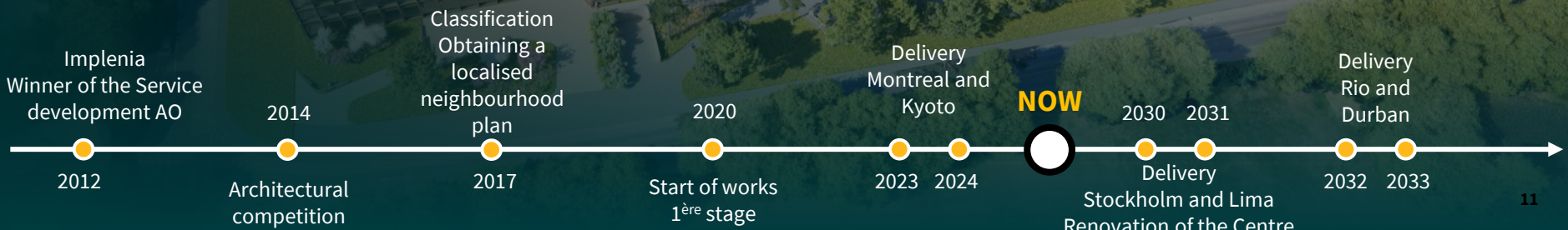
62,000 m² SBP



- 48 flats
- 1 hotel, 1 crèche, 1 cafeteria
- 1 school, 1 conference centre
- 1 chapel, several international missions









- 200 permanent residents
- 2,500 workplaces
- 1 neighbourhood activator
- 1 open landscaped park




SUSTAINABILITY ACTION PLAN



Panel of measures from the Green Village Sustainability Action Plan (tri-party agreement)

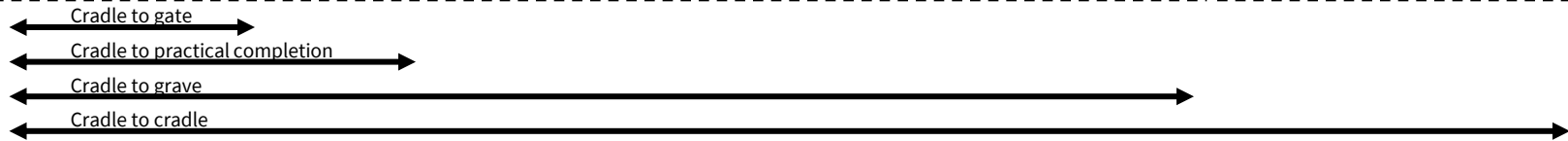
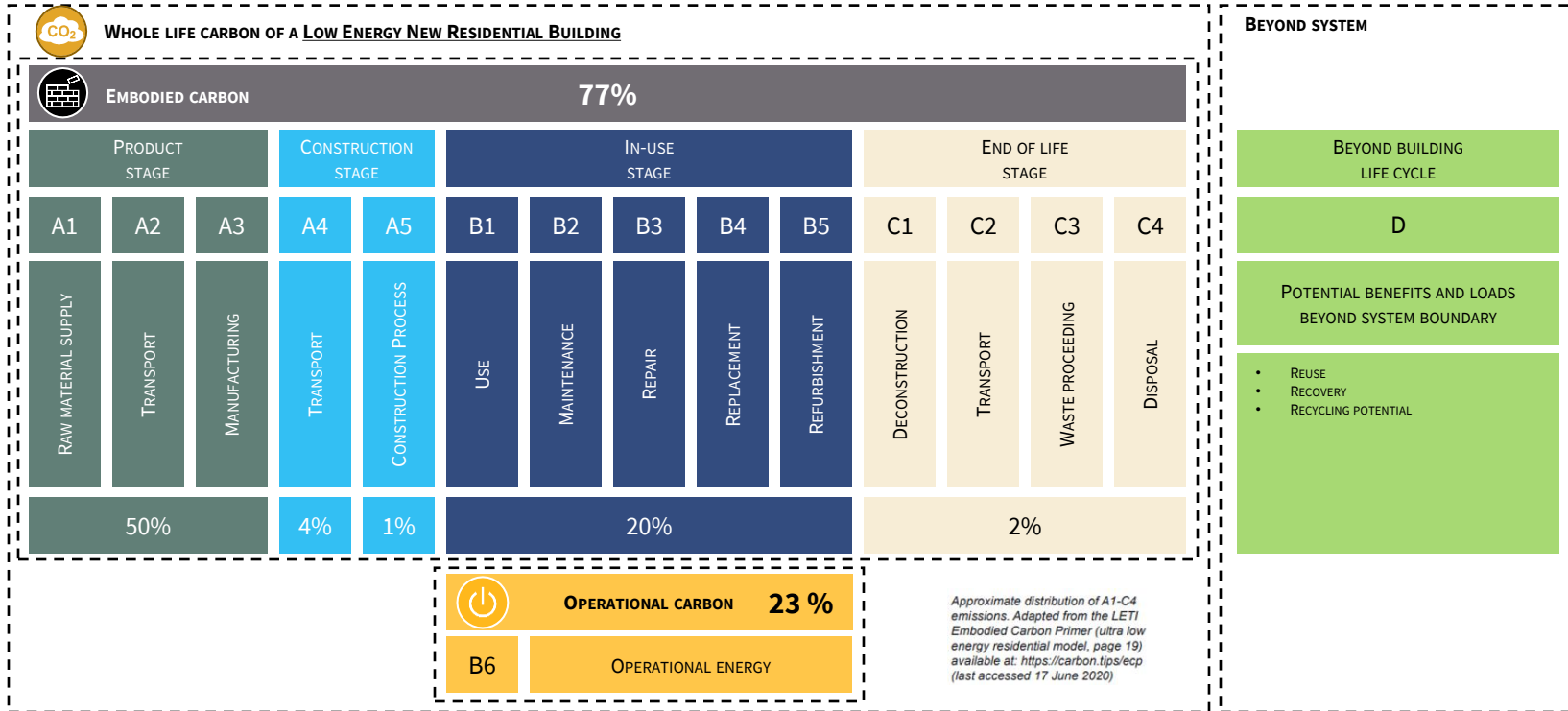
 Zero carbon energy	 Zero waste	 Travel and transport	 Materials and products	 Sustainable water	 Land and nature
<p>MINIMISING THE GREY ENERGY OF CONSTRUCTION CHOICES (SPECIAL WORK, SPANS, SLABS, DISTRIBUTION, LIGHTENING, FILLING, ETC.).</p>	<p>LIMITING EXCAVATIONS AND PROMOTING OPEN LAND (MAXIMUM TARGET 1.2 M3 EXCAVATED PER M2 BUILT)</p>	<p>80% OF TIM CAR PARKS PRE-ELECTRIFIED (9 ELECTROMOBILITY CHARGING POINTS PLANNED FOR THE DRIVEWAY)</p>	<p>LOW-CARBON CEMENT FOR REINFORCED BUILDING CONSTRUCTION (STOCKHOLM)</p>	<p>RAINWATER RECOVERY CONCEPT FOR STORAGE AND REUSE FOR OUTDOOR WATERING</p>	<p>CREATION OF 5 REPLACEMENT ENVIRONMENTS TO PROMOTE BIODIVERSITY, IN COORDINATION WITH AN ECOLOGIST</p>
<p>ARCHITECTURAL CHARTER LIMITED QUANTITIES OF GLASS/ALUMINIUM IN FACADES</p>	<p>REUSE OF PRODUCTS FROM THE IN SITU DECONSTRUCTION INVENTORY</p>	<p>EASY ACCESS TO INDOOR AND OUTDOOR CYCLE PARKING (INCLUDING CARGO BIKES)</p>	<p>USE OF NATURAL, LOCALLY-SOURCED MATERIALS, TIMBER FRAMING FOR LIMA</p>	<p>95% OPEN-AIR RAINWATER MANAGEMENT.</p>	<p>20% OF THE SURFACE AREA OF THE PLOT RESERVED EXCLUSIVELY FOR BIODIVERSITY</p>
<p>ZERO-CARBON SOURCE OF HEAT, COOLING AND HOT WATER PRODUCTION BY CONNECTING GROUNDWATER TO HEAT PUMPS</p>	<p>GOOD INTEGRATION OF 'ECO-POINTS' TO FACILITATE USE AND LOGISTICS</p>	<p>MAXIMUM 40% OF USERS USING MOTORISED MEANS OF TRANSPORT</p>	<p>INSTALLATION OF MISAPOR TO DRAIN THE LAND</p>	<p>REDUCING THE NUMBER OF IMPERVIOUS ROAD SURFACES (SURFACE PLANTED PARKING, FIRE ACCESS IN A MIX OF EARTH AND STONE)</p>	<p>PROTECTING BIRDS ON FAÇADES , SWIFT NEST BOXES DEDICATED SPACE FOR AN ORCHARD</p>
<p>LOW-INTENSITY EXTERIOR LIGHTING (BIODIVERSITY) WITH TIMER OR DETECTOR.</p>	<p>REUSE OF EXCAVATED MATERIALS TO RESHAPE THE LAND</p>	<p>FACILITIES TO FACILITATE URBAN LOGISTICS (AUTOMATIC PARCEL DISPENSER, DEDICATED SPACE FOR DELIVERIES, REMOVALS)</p>	<p>PRIORITY RECYCLING OF EXCAVATED MATERIAL</p>	<p>70% OF THE NEIGHBOURHOOD PERIMETER IS PERMEABLE</p>	<p>AT LEAST 45% OF THE PLOT TO BE PLANTED IN OPEN GROUND</p>



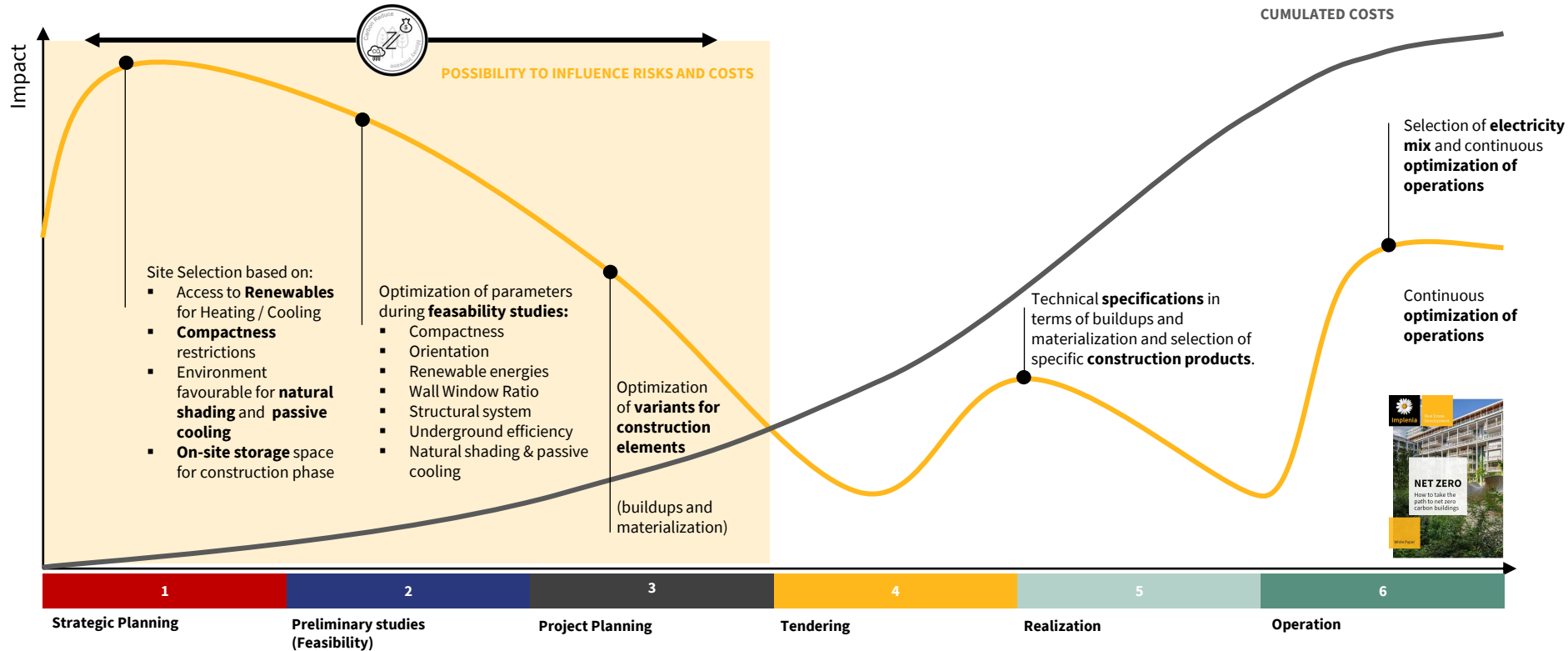
IMPLEMENTATION OF DECARBONIZATION STRATEGIES

«The fact that CO₂ is transparent and odourless is the greatest tragedy for humankind.»
Sobek 2020

LIFE CYCLE PHASES OF A BUILDING

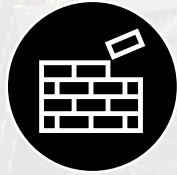


DECARBONIZATION: INFLUENCE OF STRATEGIES AND LEVERS



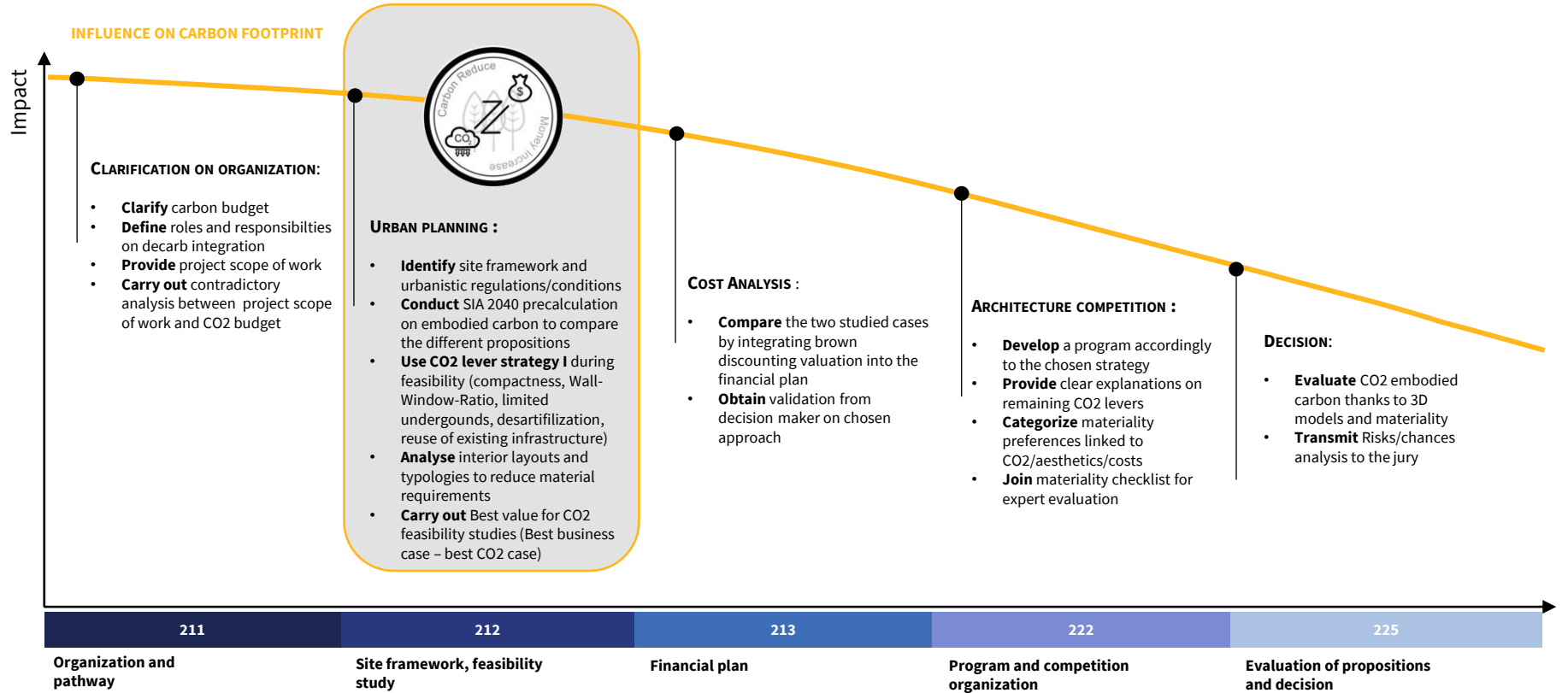


EMBODIED CARBON

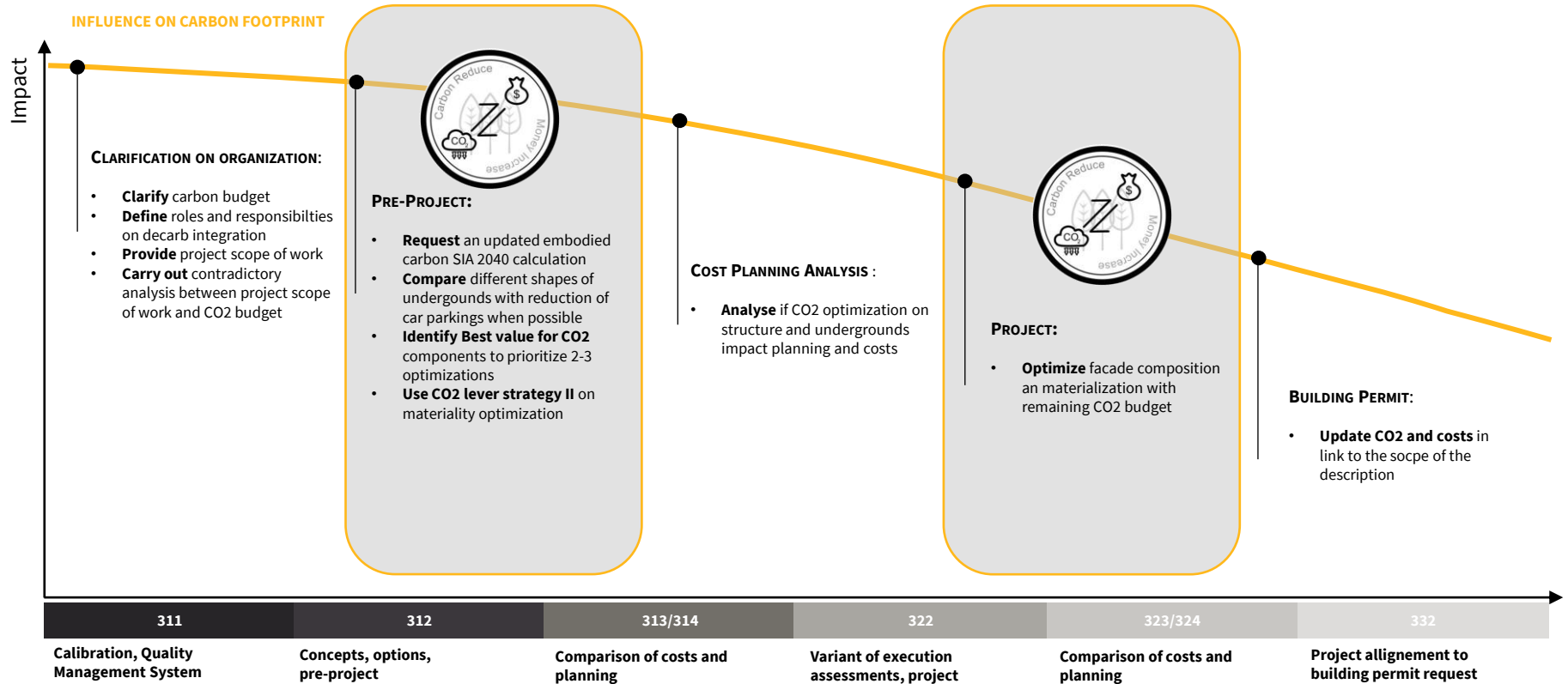


***METHODOLOGY TO
REDUCE
CONSTRUCTION
CARBON FOOTPRINT***

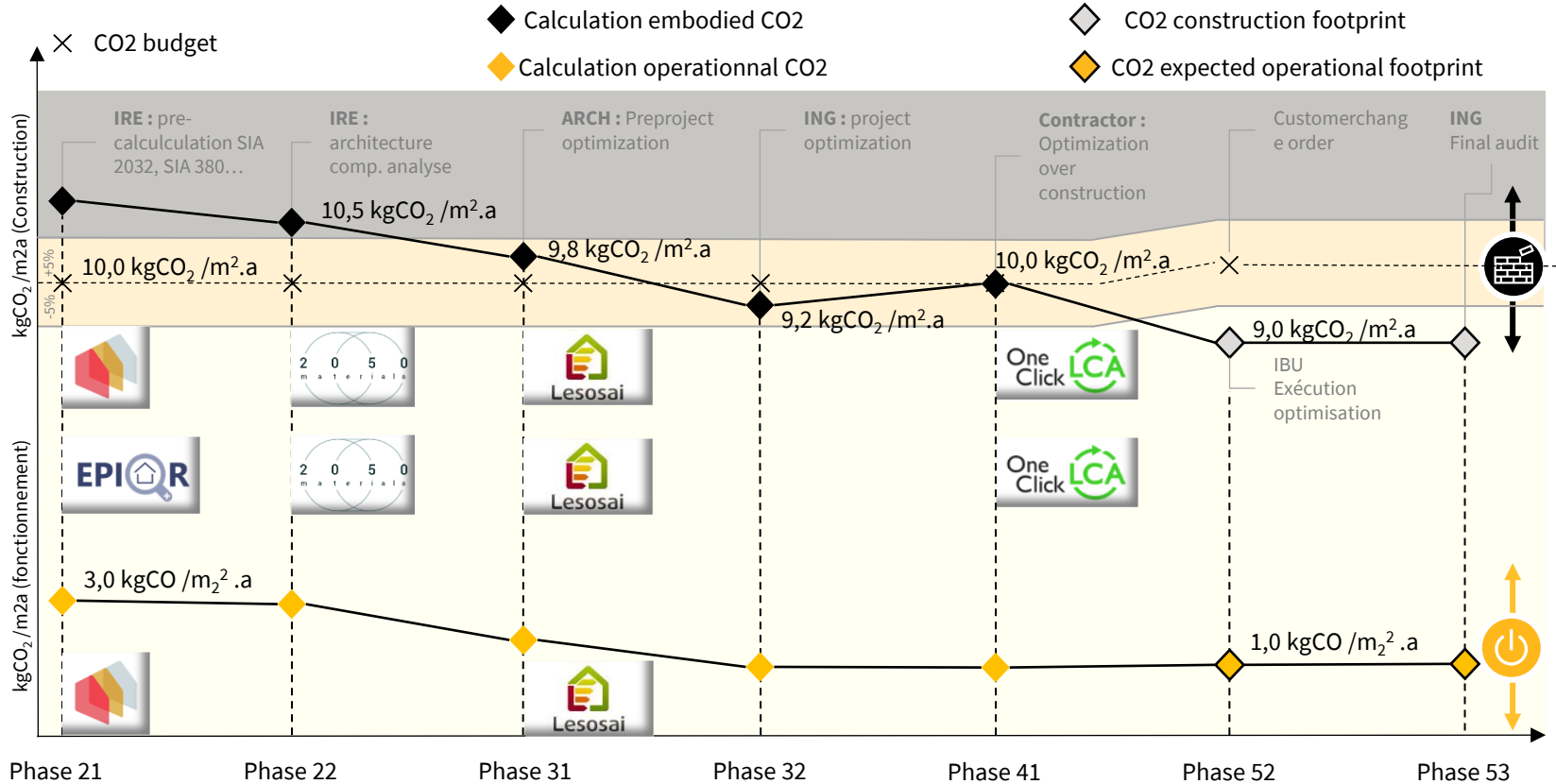
BEST VALUE FOR DECARBONIZATION



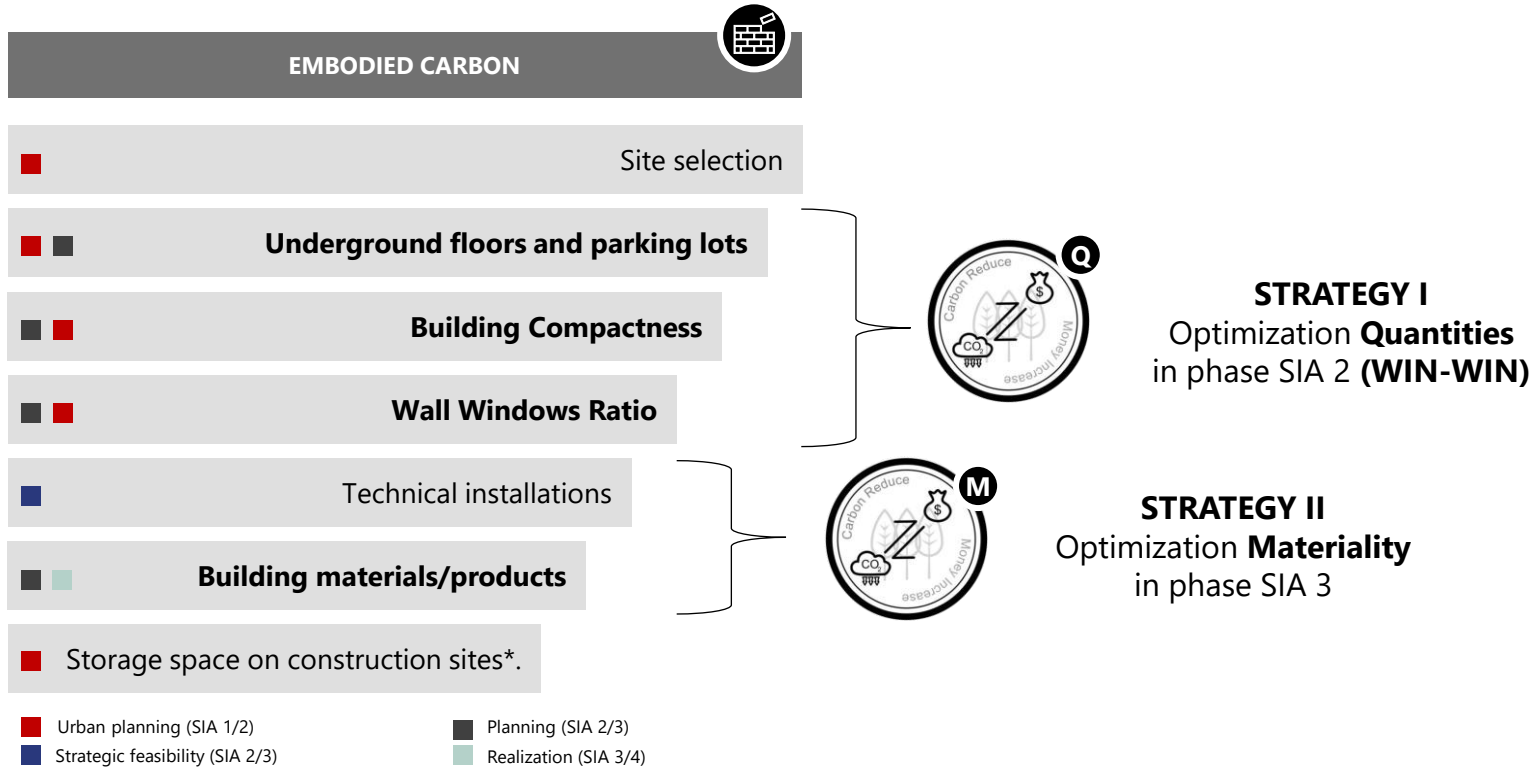
BEST VALUE FOR DECARBONIZATION



CARBON BUDGETS AND FOLLOW UP TOOLS

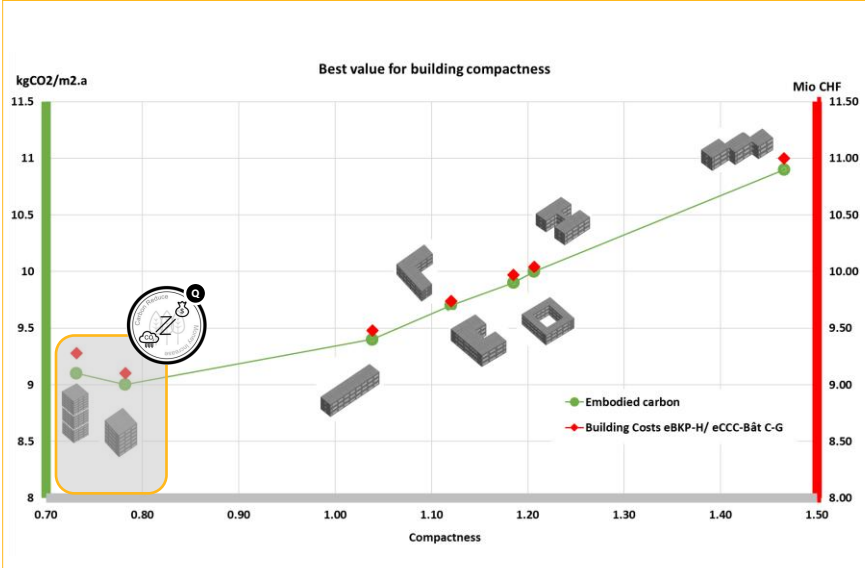


LEVERS AND STRATEGIES BY MEANS OF EMBODIED CARBON



STRATEGY I : PARAMETRIC DESIGN

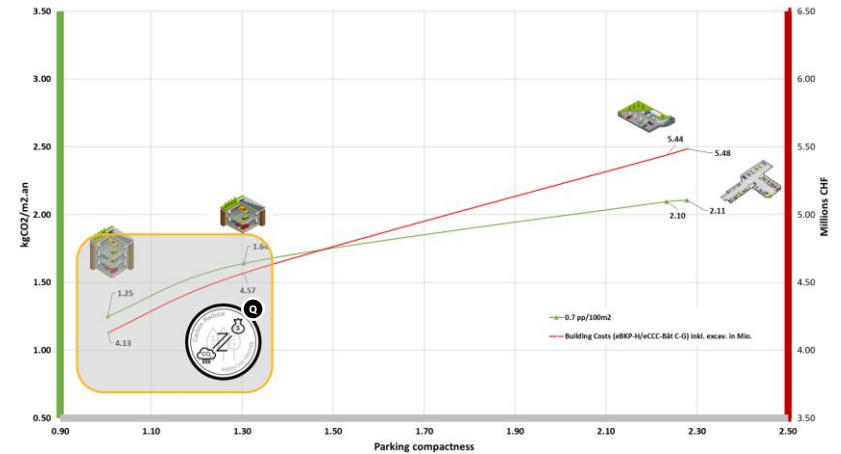
BUILDING GEOMETRY



- There is a **clear theoretical correlation** of CO₂ and costs as a function of compactness, with an optimum around 0.8
- **In Praxis**, compactness is also studied in correlation to zoning plan
- **Take away:** KPI to include in dashboards to steer best value for CO₂ efficiency of building geometry

UNDERGROUND GEOMETRY

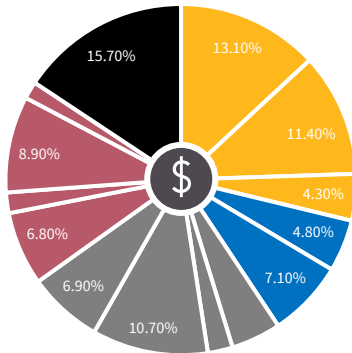
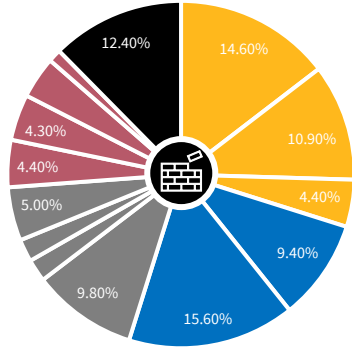
Embodied CO₂ and Construction Costs compared to Parking Compactness



- **In theory**, underground compactness optimum is found below 1.3, above this factor there is no longer «win-win» as far as cost and CO₂
- **In Praxis**, # levels, geometry design vs geotechnical, usage & accessibility
- **Take away:** KPI to use as a guidance to steer best value for CO₂ efficiency of undergrounds

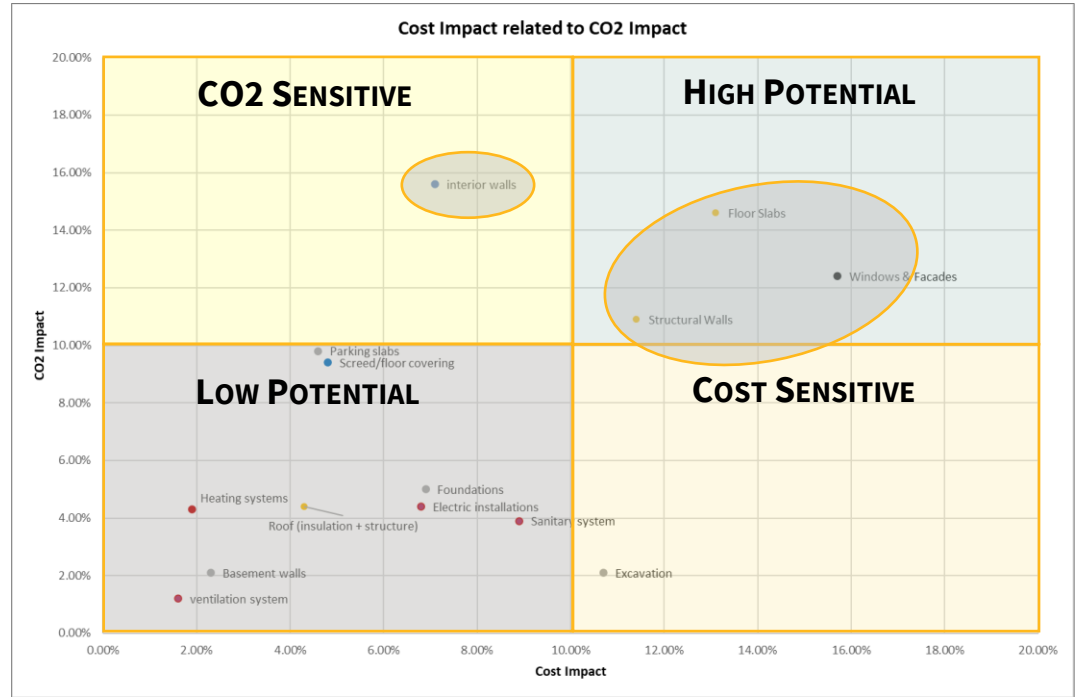
BEST VALUE FOR CO2 STRATEGIES – DEPENDENCY ANALYSIS

BREAKDOWN OF CO2 AND COSTS PER ELEMENT



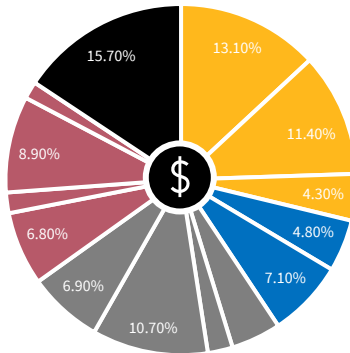
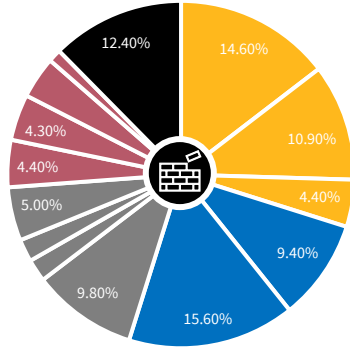
Superstructure Interior fittings Infrastructure Installations Facade

METHODOLOGY TO IDENTIFY FOCUS PRIORITIES



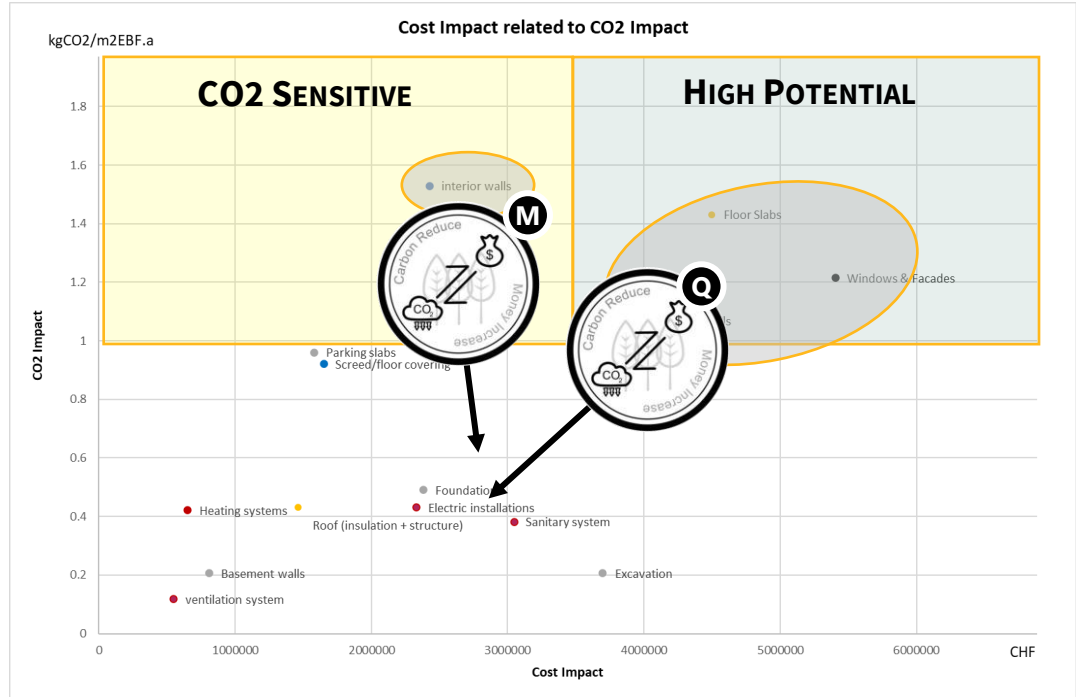
BEST VALUE FOR CO2 STRATEGIES – DEPENDENCY ANALYSIS

BREAKDOWN OF COSTS AND CO2 PER ELEMENT



- Superstructure
- Interior fittings
- Infrastructure
- Installations
- Facade

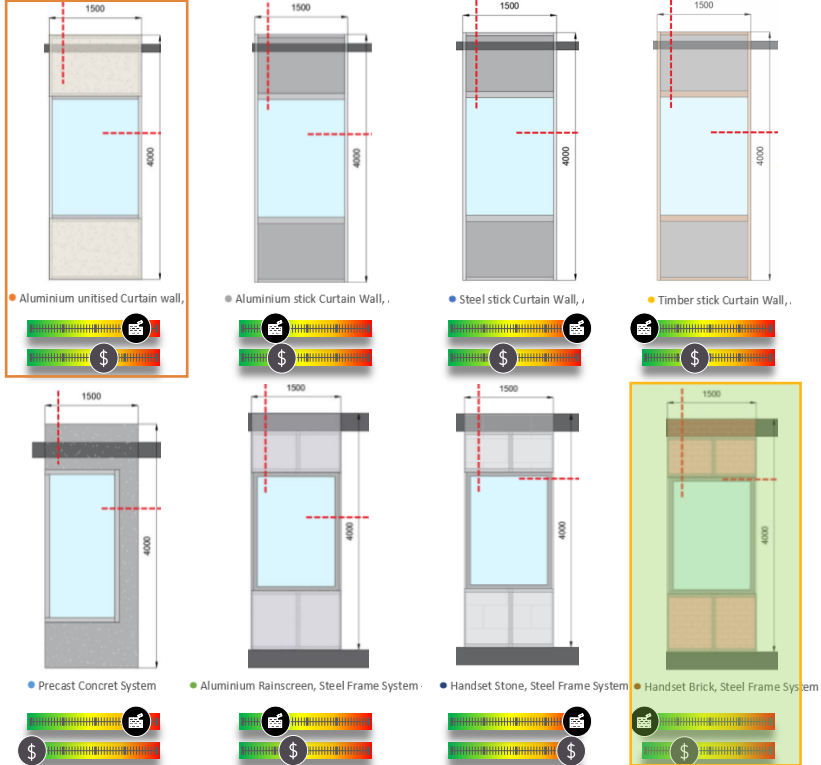
IDENTIFICATION OF APPLIED STRATEGIES



SUSTAINABILITY PERSPECTIVES IN THE INDUSTRY – GUEST LECTURE EPFL – IMPLENIA REAL ESTATE

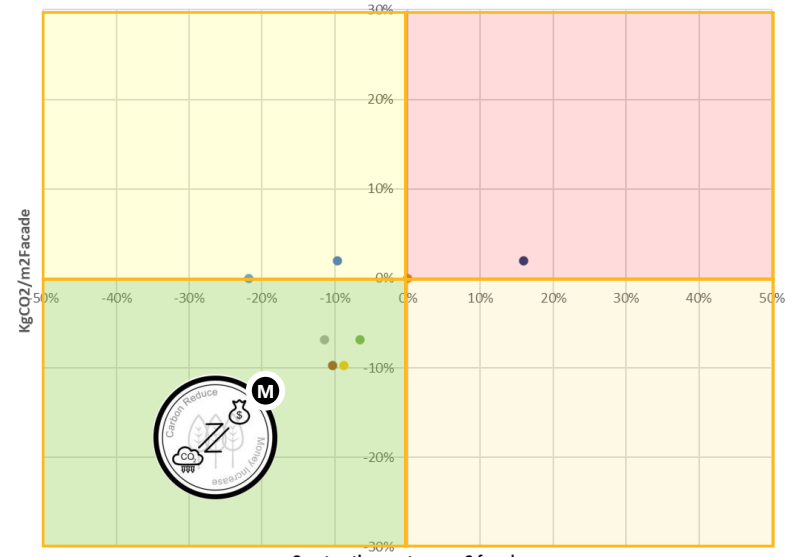
STRATEGY II : OPTIMIZATION BY COMPONENTS

FACADE COMPOSITION



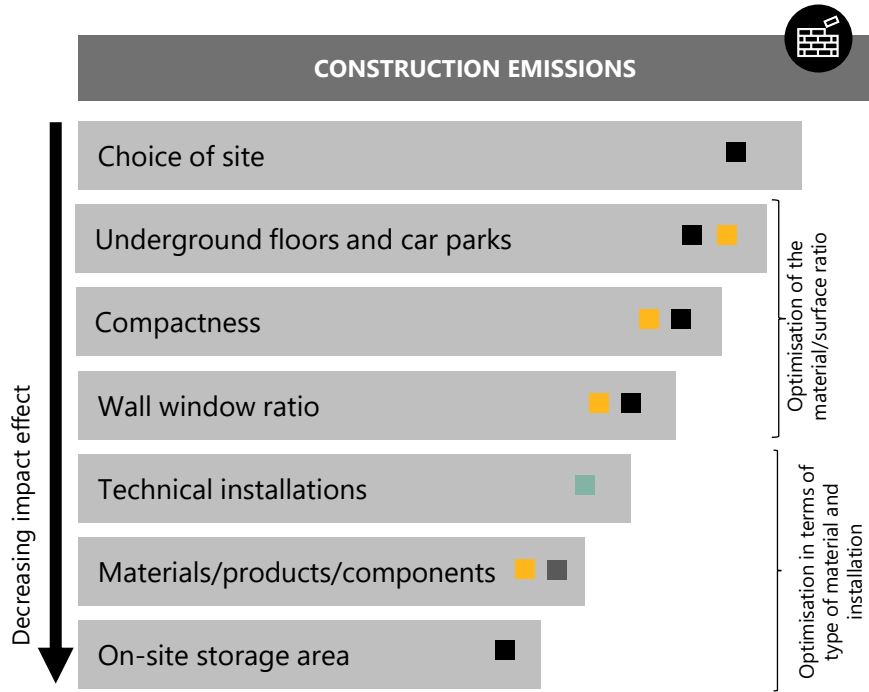
BEST VALUE FOR CO2 COMPARISON

Facade materiality - Construction costs and Embodied CO2



- Aluminium unitised Curtain wall, GRC Cladding - DGU
- Aluminium stick Curtain Wall, Aluminium Cladding - DGU
- Steel stick Curtain Wall, Aluminium Cladding - DGU
- Timber stick Curtain Wall, Aluminium Cladding - DGU
- Precast Concrete System - DGU
- Aluminium Rainscreen, Steel Frame System - DGU
- Handset Stone, Steel Frame System - DGU
- Handset Brick, Steel Frame System - DGU

OPTIMIZATION OF EMBODIED CARBON



CONSTRUCTION EMISSIONS

SIA 2040 study, SIA 2 phase = **10.5 kgCO₂/m².year**

- ➔ Limiting basements
- ➔ Optimising the structure
- ➔ Architecture optimisation
- ➔ Simplification of technical distribution
- ➔ Low-carbon materials

SIA 31 phase = **8.0* kgCO₂/m².year** without parking

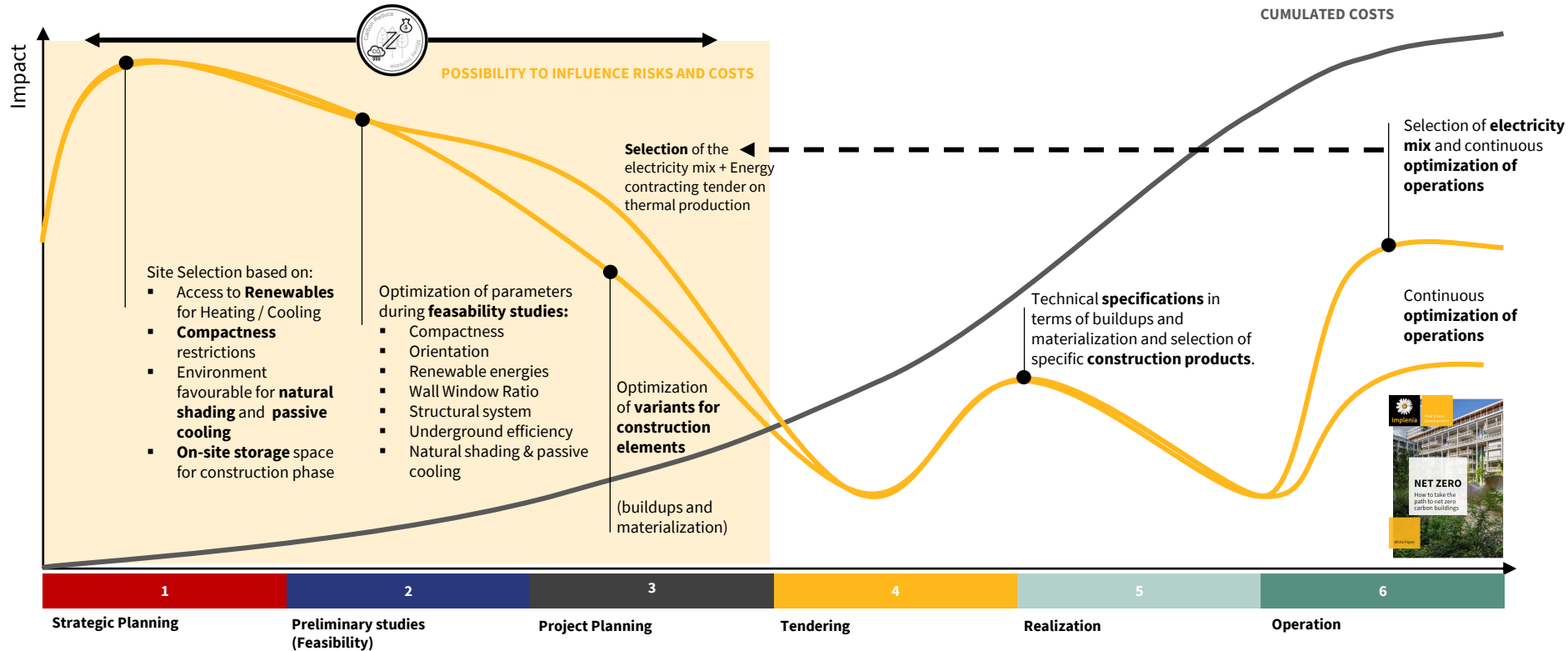


**OPERATIONAL
CARBON**



***HOW TO DESIGN
YOUR ENERGY
STRATEGY***

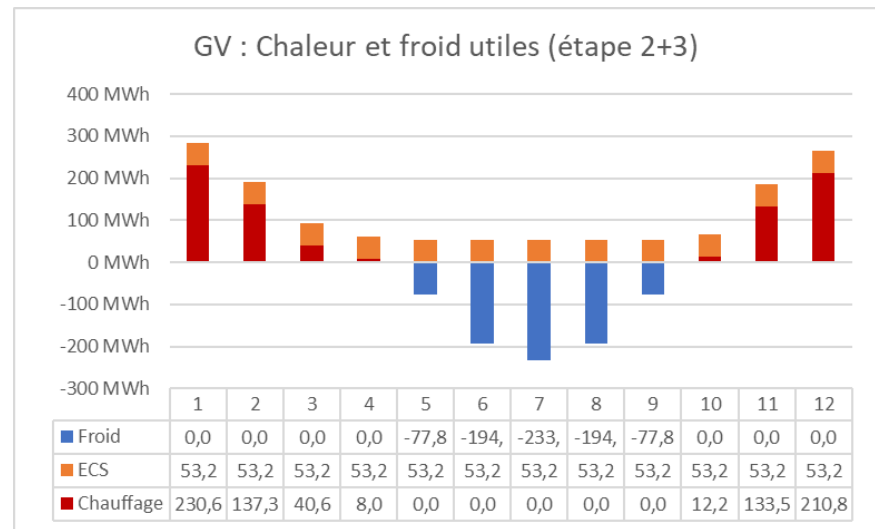
DECARBONIZATION: INFLUENCE OF STRATEGIES AND LEVERS



THERMAL REQUIREMENTS

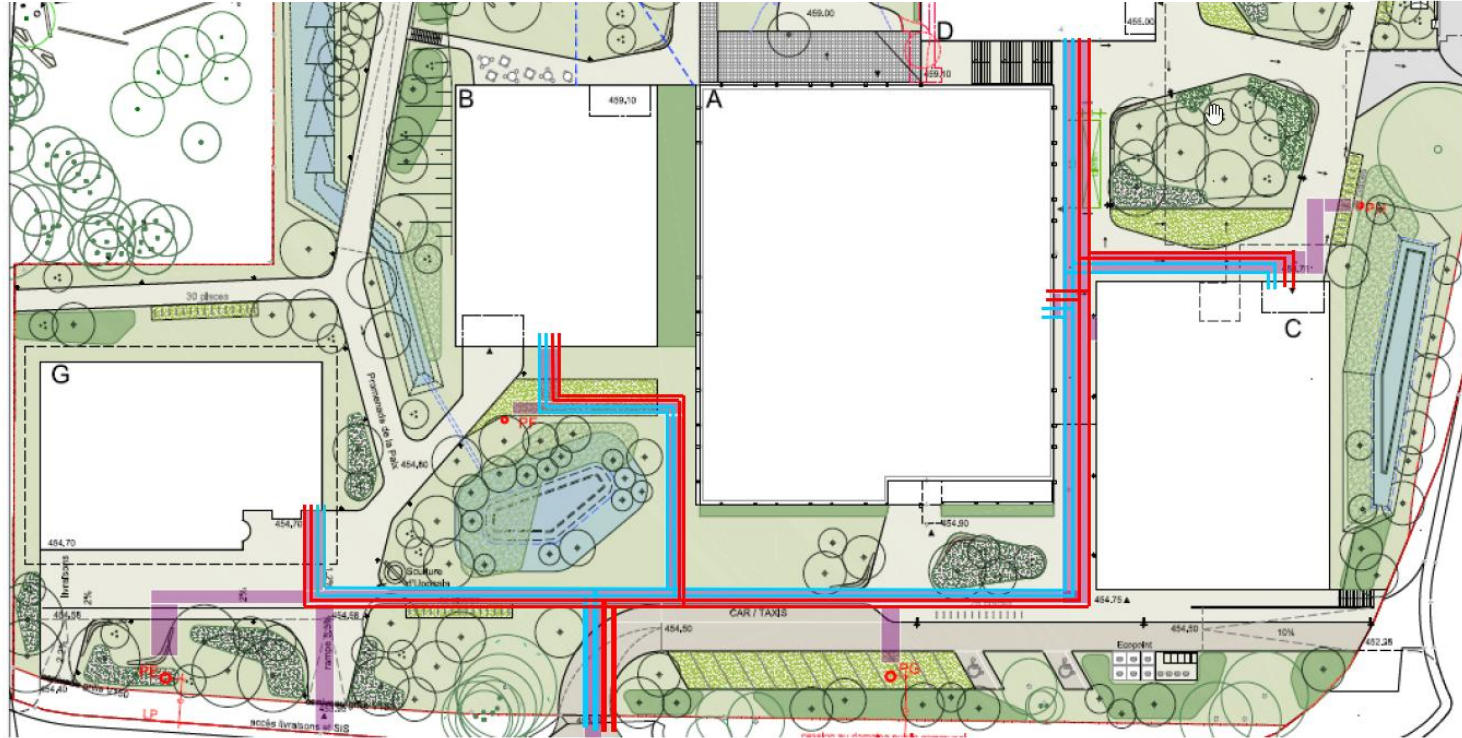
According to Concept Energétique Territorial - Green Village 2023

- Heat for **heating (773,000 kWh/year)**
 - Project values for buildings under construction
 - 70% Qhli of SIA 380/1 2016
 - 40% of heating can be paused for Hot Water production
- Heat for **Hot Water (638,000 kWh/year)**
 - Based on SIA 380/1 2016
 - HVAC assessment for hotel building G (Rio)
- **Cooling (512,000 kWh/year)**
 - Administrative areas: in accordance with simulation for administrative building E (Kyoto)
 - Hotel building G (Rio), commercial, catering and assembly areas



Annex to the call for tenders . XLS file of monthly consumption data by building

View of the district with the principles of introduction of thermal networks

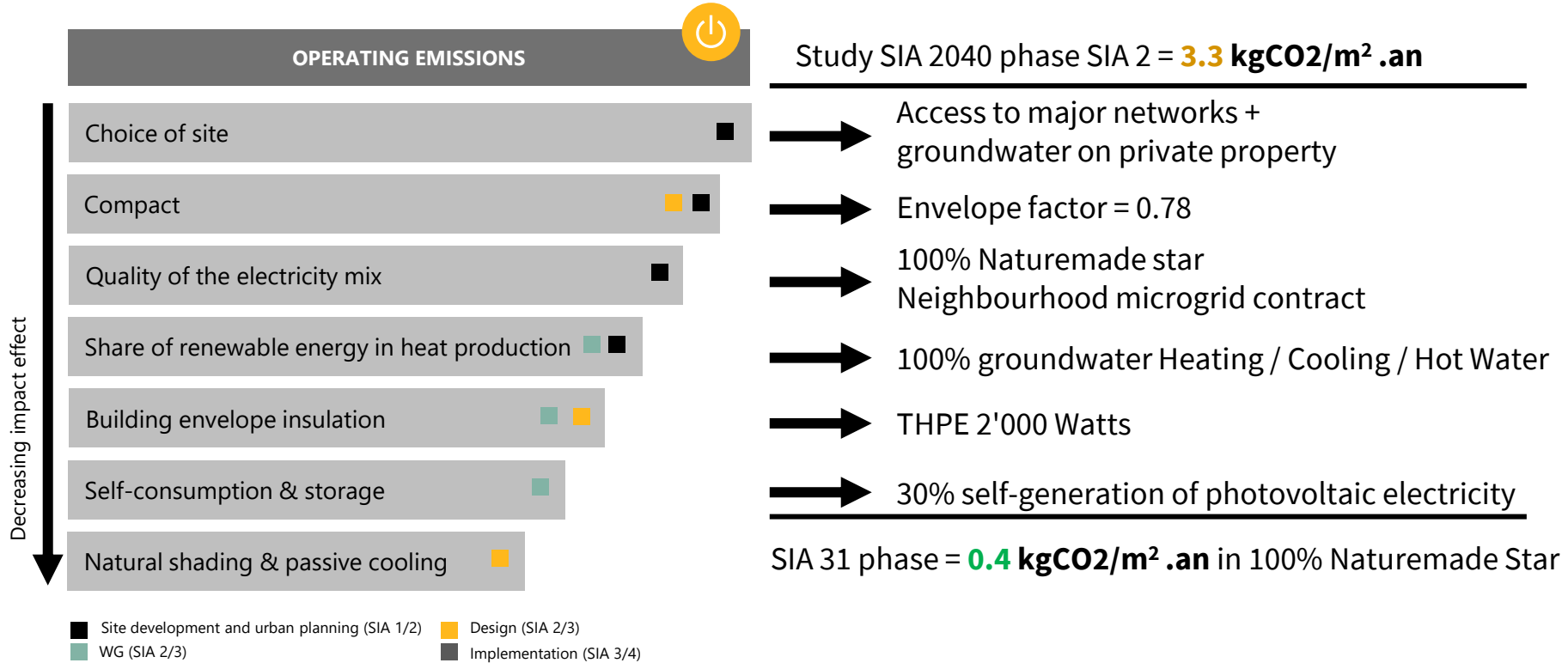


Introduction commune GeniTerre et
GeniLac, sous conditions de faisabilité

TENDER PHASE : THERMAL OPERATORS MARCH 2023

SRE (41,469 m ²)	Operator A			Operator B	Operator C	
Proposed variant Appro	V1	V2	V3	Did not wish to respond to variants 1,2 and 3	Decentralised	Centralised
Compliance with carbon and AO targets	Legal?	Legal?	Compliant	/	Compliant	Non-compliant
Investment boundaries	Wells, connections, networks, heat pumps and electricity consumption, heat exchangers			/	Connections, networks to buildings, exchangers	Connection, networks to main power station, exchangers
Annual heating costs (CHF/m ²) dated 06.03.23	14,3	21,1	13,9	/	22,4	19,1
Additional services included	Hot Water charging and storage, + distribution group			/	/	/
Delta investment for developer	/			/	+ 700 kCHF	+ 1,000 kCHF
Annual heating costs (CHF/m ²) offer dated 16.03.23	16,1	22,6	15,5	/	22,4	19,1

OPTIMIZING THE CARBON LINKED TO OPERATIONS



An aerial photograph of a city, likely Zurich, showing a mix of modern and older buildings, green spaces, and a lake in the distance. A semi-transparent white rectangular box is overlaid on the left side of the image, containing text. A solid orange square is positioned above the white box. The background shows a cityscape with mountains under a cloudy sky.

**DECONSTRUCTION
PLANNING**

**CIRCULAR
STRATEGIES**

CIRCULAR CONCEPT : IMPLEMENTATION PATHWAY

Legitimacy and Vision
Sustainability Action
OPL SEED KPIs

1

2019

Labels audit
Recommendations for
decarbonization / Reuse

2

2021

**Search reemployment
consultant**
Invitation to tender
and contract

3

2022

Inventory
Materials diagnostics
Draft strategy

4

2022

Request/Instruction
Demolition permits

7

2024

Deconstruction Task Force
Tender drafting
Diagnosis of pollutants

6

2023

Strategy definition
Planning dialogue
Reuse objectives

5

2023

Deconstruction tender
Site visit and Q&A
Clarification sessions

8

2024

Comparative analysis
Costs,
Methods, Variants

9

2025

Scenario analysis
Budget/planning impact
Feasibility/logistics

11

2025

Recommended scenario
Quantity, price, availability
Reuse materials

12

2025

Inventory online

NOW



SUSTAINABILITY PERSPECTIVES IN THE INDUSTRY – GUEST LECTURE EPFL – IMPLENIA REAL ESTATE INVENTORY PHASE – DIAGNOSIS OF EXISTING ELEMENTS



Implenia Suisse SA
M. Rastello, M. Klein
Chemin de l'Echo 1
1213 Onex

Propriétaire : Centre œcuménique des églises (COE)

Bâtiment : Ailes du bâtiment A
Route de Ferney 150, Grand-Saconnex
N° cadastral : Bât. 395 sur parcelles 2448-2449-2450-2451-2455

Inventaire de réemploi/réutilisation : Diagnostic et stratégie



Responsable : Jenny Rey

Route de Renens 4 Rue des Cèdres 12
CH-1008 Prilly CH-1203 Genève
00 41 21 624 64 94 00 41 22 345 13 30

www.lebird.ch

le Bird
Bureau d'ingénieurs en ressources
& construction durable

Éléments de planning (intentionnels) :

Diagnostic polluants : printemps 2023
Dépôt autorisation de démolition ailes : mai 2023
Travaux de démolition des ailes : mi-2024
Possibilité de stockage sur site (à confirmer) : 2024-2025
Travaux rénovation bâtiment A : 2025-2026
Travaux de construction bâtiment B et D : fin 2024 - 2026
Aménagements extérieurs : 2025-2026

Identification du rapport :
Diagnostic_reemploi_GV_baTA_vf_20230306
Version finale pour diffusion
Nombre de pages : 59
Date d'émission du rapport :
6 mars 2023

2. Liste des éléments réutilisables

Le réemploi ou la réutilisation de matériaux de construction permet l'économie de matériaux neufs et évite des frais d'élimination (transport et traitement des déchets). Dans le cadre de la solution C-BAT, ces avantages sont mis en évidence par le calcul d'un poids équivalent CO2 par unité de matériaux selon méthode de calcul de la base de données INIES. Pour les coûts d'élimination, les coûts sont calculés selon prix moyen au m³ de transport et traitement des déchets évacués via les déchèteries de chantier gérées par Bird en 2021-2022.

N°	Description	eCBA	Matériau (rec1, REFS)	Unité	Quantité	kg CO2 eq.	Total kg CO2 eq.	m3 non fossilifère	Coûts d'élimination estimés (CHF)
LB0-2208-0001	Murs en béton armé (abris, pignons)	C.02	Voiles en béton armé (ép. 20-40cm)	par m2	2800	1 095-02	3 051-05	840	63000
LB0-2208-0003	Dalles en béton prétre (abris, Saïvux, radiers)	C.04	Béton pleur armé pour dalle (ép. 30-40cm)	par m2	5800	2 365-01	1 375-05	2030	152250
LB0-2208-0005	Dalles à casson (Jura, Rhône, Lac)	C.04	Béton pleur armé pour dalle (ép. 35cm sans L2 pleur)	par m2	8000	2 265-01	5 811-05	1600	120000
LB0-2208-0004	Panneaux de façade métallique	E.02	Barottage en acier	par m2	700	4 295-01	3 006-04	14	0
LB0-2208-0005	Panneaux de façade métallique	E.02	Barottage en acier	par m2	255	4 295-01	1 095-04	5	0
LB0-2208-0006	Panneaux de façade métallique	E.02	Barottage en acier	par m2	205	4 295-01	4 295-03	5	0
LB0-2208-0007	Éléments de façade en béton préfabriqué	E.03	Barottage en béton	par m2	236	2 058-02	4 844-04	20	2000
LB0-2208-0008	Éléments de façade en béton préfabriqué	E.04	Barottage en béton	par m2	90	2 058-02	1 851-04	8	800
LB0-2208-0009	Escalier de secours en béton	L.05	Escalier droit en béton armé	par ml	50	7 712-02	3 864-04	18	2700
LB0-2208-0010	Escalier de secours, structure métallique	L.05	Escalier droit en acier	par ml	50	7 626-02	3 811-04	6	0
LB0-2208-0011	Porte de garage	G.03	Porte de garage en acier massive	par m2	16	3 805-02	3 785-03	2	120
LB0-2208-0012	Châssis portes coupe-feu E10	G.01	Porte acier	par m2	35	1 166-02	4 064-03	2	120
LB0-2208-0013	Portes abris anti-atomes	G.01	Porte blindée béton acier	par m2	25	1 095-02	2 731-03	4	460
LB0-2208-0014	Portes métalliques simples	G.01	Porte acier	par m2	3	1 166-02	3 486-02	1	60
LB0-2208-0015	Portes E10	G.01	Porte en bois	par m2	20	9 846-01	1 978-03	1	60

N°	Description	eCBA	Matériau (rec1, REFS)	Unité	Quantité	kg CO2 eq.	Total kg CO2 eq.	m3 non fossilifère	Coûts d'élimination estimés (CHF)
LB0-2208-0016	Portes en bois	G.01	Porte en bois	par m2	3000	9 846-01	9 846-04	50	3600
LB0-2208-0017	Portes en bois	G.01	Porte en bois (aggloméré)	par m2	250	9 846-01	2 466-04	13	780
LB0-2208-0018	Portes vitrées E10	G.01	Portes vitrées isolantes acier	par m2	225	1 211-02	2 731-04	18	3600
LB0-2208-0019	Portes vitrées E10	G.01	Portes vitrées isolantes acier	par m2	49	1 211-02	7 871-03	5	2000
LB0-2208-0020	Escalier en béton préfabriqué	G.01	Portier droit en béton armé	par ml	105	7 712-02	7 712-04	21	2100
LB0-2208-0021	Escalier en béton préfabriqué	G.05	Escalier droit en béton armé	par ml	105	7 712-02	8 106-04	23	2300
LB0-2208-0022	Chemins de câbles métalliques	G.05	Chemins de câbles dalle acier	par ml	100	5 345-01	5 345-03	2	0
LB0-2208-0023	Faux plafond métallique	G.04	Plafond suspendu en métal avec suspente métallique	par m2	2000	3 415-01	6 821-04	80	0
LB0-2208-0024	Faux plafond perforé	G.04	Plafond suspendu en plâtre	par m2	400	1 476-01	5 885-05	12	2880
LB0-2208-0025	Panais vitrés	G.01	Cloison démontable en profils aluminium à renfortage bloc optique	par m2	35	1 211-02	4 245-03	3	600
LB0-2208-0026	Lumières	G.05	Plafonniers, suspension intérieur linéaire pour éclairage tertiaire ou industriel	par él.	30	1 191-02	3 576-03	1	60
LB0-2208-0027	Lumières	G.05	Plafonniers, suspension intérieur linéaire pour éclairage tertiaire ou industriel	par él.	250	1 191-02	2 984-04	5	300
LB0-2208-0028	Lumières	G.05	Plafonniers, suspension intérieur linéaire pour éclairage tertiaire ou industriel	par él.	1000	1 191-02	1 191-05	20	1200
LB0-2208-0029	Lumières	G.05	Encastres intérieurs non linéaires pour éclairage tertiaire	par él.	9	1 331-02	1 201-03	1	60
LB0-2208-0030	Lumières	G.05	Encastres intérieurs linéaires pour éclairage tertiaire	par él.	40	1 511-02	6 048-03	1	60
LB0-2208-0031	Signétique protection incendie	G.05	Alarme	par él.	200	3 971-00	1 191-03	1	60
LB0-2208-0032	Baignoires	G.05	Baignoire à eau chaude sanitaire	par él.	580	1 764-01	1 031-05	43	0
LB0-2208-0033	Santaires (WC+vaabois)	G.05	Céramique	par él.	88	8 111-02	5 991-04	7	1400
LB0-2208-0034	Santaires (WC+vaabois)	G.05	Céramique	par él.	26	4 476-02	1 166-04	2	600
LB0-2208-0035	Ventouses motorisées	E.03	Ventrière	par m2	12	6 145-02	7 376-03	1	200
LB0-2208-0036	Gravier	F.01	Gravier	par m3	110	3 056-01	3 368-03	110	12000

Diagnostic_reemploi_GV_baTA_vf_20230306

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LBD-2209-0001 Murs en béton armés (abris, porteurs)




Localisation	Abris anti-atomiques, murs porteurs (piliers non considérés)		
Etat d'usure	Evaluation à faire par spécialiste (carbonatation, RAG)		
Quantité	Env. 2'800 m ²		
Catégorisation selon eCCbat	C.02		
Matériau	INIÉS : Voile en béton armé		
Dimensions	Epaisseur entre 20 et 40 cm (30 cm en moyenne).		
Poids (masse)	2'500kg/m ³		
Accessibilité, démontabilité, modularité	Sciage ou concassage		
Réemploi/réutilisation	In situ	Ex situ	Filières de traitement
	OUI	OUI	17 01 01 Béton
Remarques/compléments d'information :	Priorités de réemploi :		
	1) Réemploi comme éléments pleins (sciages - voir exemple en annexe 2) ;		
	2) Réemploi comme granulats dans des bétons classés/de structure ;		
	3) Réemploi comme granulats dans bétons maigres ou de propreté (limiter le décyclage).		

LBD-2209-0005 Panneaux de façade métallique (petites dimensions)



Localisation	Façade, ailes Jura, Lac, Rhône		
Etat d'usure	Usagé		
Quantité	255 éléments (env. 385m ²)		
Catégorisation selon eCCbat	E.02		
Matériau	INIÉS : Bardage en acier		
Dimensions	L 110 cm P <1 cm H 135 cm		
Poids (masse)	Env. 6 kg		
Accessibilité, démontabilité, modularité	Vis apparentes		
Réemploi/réutilisation	In situ	Ex situ	Filières de traitement
	NON	OUI	17 04 05 Acier
Remarques/compléments d'information :	A mettre sur le marché du réemploi, par exemple pour des constructions industrielles, constructions temporaires, aussi pour des particuliers.		

LBD-2209-0018 Portes vitrées EI 30



Localisation	Ensemble des ailes, tous les étages sauf sous-sols		
Etat d'usure	Bon état		
Quantité	30 éléments		
Catégorisation selon eCCbat	G.01		
Matériau	Porte vitrée isolante acier		
Dimensions	Environ L 300 cm P 8 cm H 250 cm		
Poids (masse)	300 kg		
Accessibilité, démontabilité, modularité	Pose ultérieure en rénovation, facilement déposable		
Réemploi/réutilisation	In situ	Ex situ	Filières de traitement
	OUI	OUI	Séparation verre, aluminium
Remarques/compléments d'information :	Voir exigences AEAI : Même fonction dans la partie du bâtiment à transformer ? Réutilisation dans d'autres bâtiments neufs ou à mettre en conformité ?		

SUSTAINABILITY PERSPECTIVES IN THE INDUSTRY – GUEST LECTURE EPFL – IMPLERIA REAL ESTATE

DIALOGUE WITH ARCHITECTS AND ENGINEERS

le Bird Bureau d'ingénieurs en ressources & construction durable

Exemples

REPAR

est de sol-pavé béton... (text describing the material and its benefits, including water and energy savings)

edms

le Bird Bureau d'ingénieurs en ressources & construction durable

Exemples

MEYRIN

BCRarchitectes
Beyeler Coloquio Roesli eptl fhbb sia

edms

le Bird Bureau d'ingénieurs en ressources & construction durable

Exemples

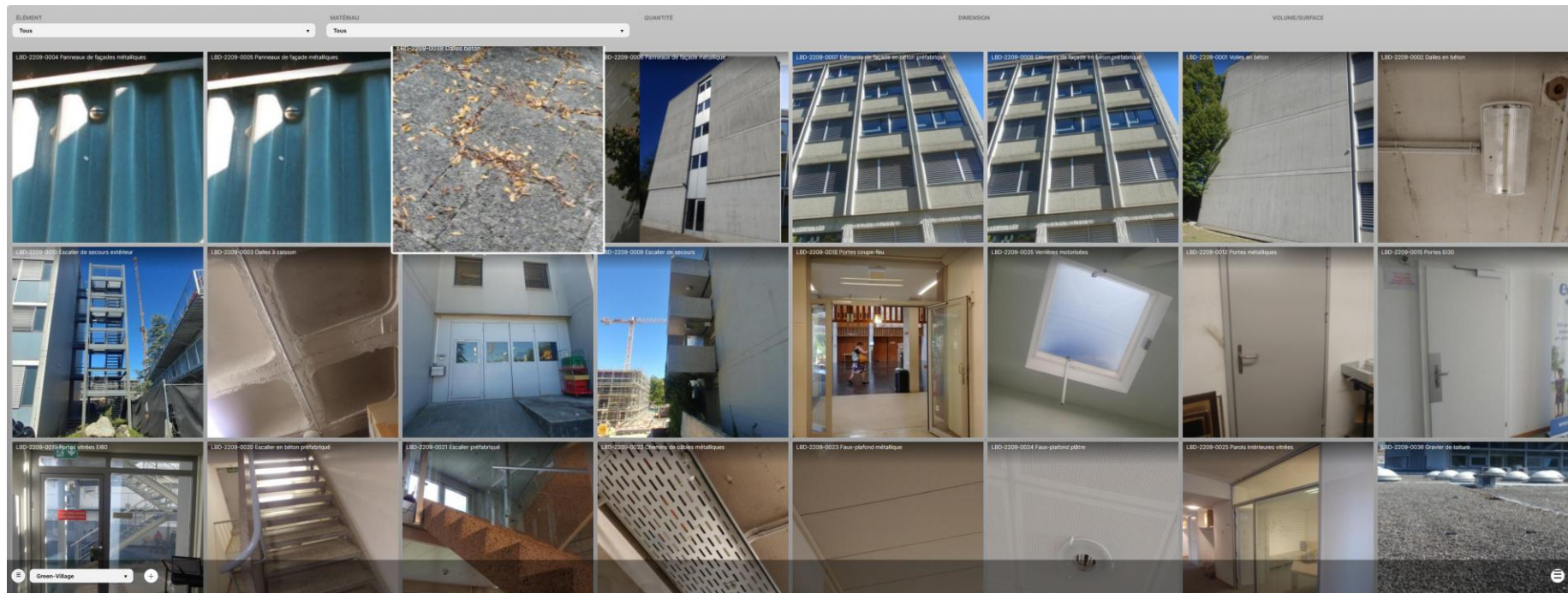
FAI ARCHITECTES

le Bird Bureau d'ingénieurs en ressources & construction durable

entrepreneurs!
Fédération vaudoise

Centre de formation des métiers de la construction, Fédération vaudoise des entrepreneurs, Echallens
Architecte : Detting Péleaux, Lausanne / ing. civil : Giacomini & Joliet Ingénieurs SA

GREEN VILLAGE REUSE INVENTORY POSTED ON [REUZI](#)



Accès :	REUZI Inventaire
Nom d'utilisateur :	INVENTAIRE REEMPOI GREEN-VILLAGE
Mot de passe :	GreenVillage

TENDERING WITH OPTIONS

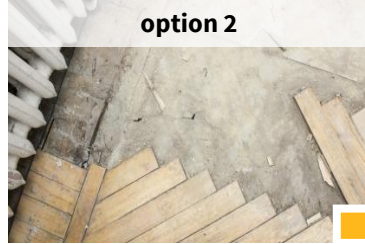
Chapter CAN 117 demolition and dismantling is organised as follows:



option 1

Demolition

Demolition-evacuation-transport-landfill **Articles 117.** 124, 125, 215, 223, 228, 311, 333, 453, 461, 513, 631



option 2

Dismantling

Dismantling-transport-storage on site
117.223.001



option 3

Dismantling + demolition variant

Dismantling-transport-storage on site
117.225.001

- **Non-added variant Demolition** cost
117(224.001) Disposal cost
117(725.001) Landfill cost
117(734.001)
- **Articles** 225 (224) - 322 (323) - 336 (335) - 342 (341) - 352 (351) - 412 (412.003) - 556 (555)



option 4

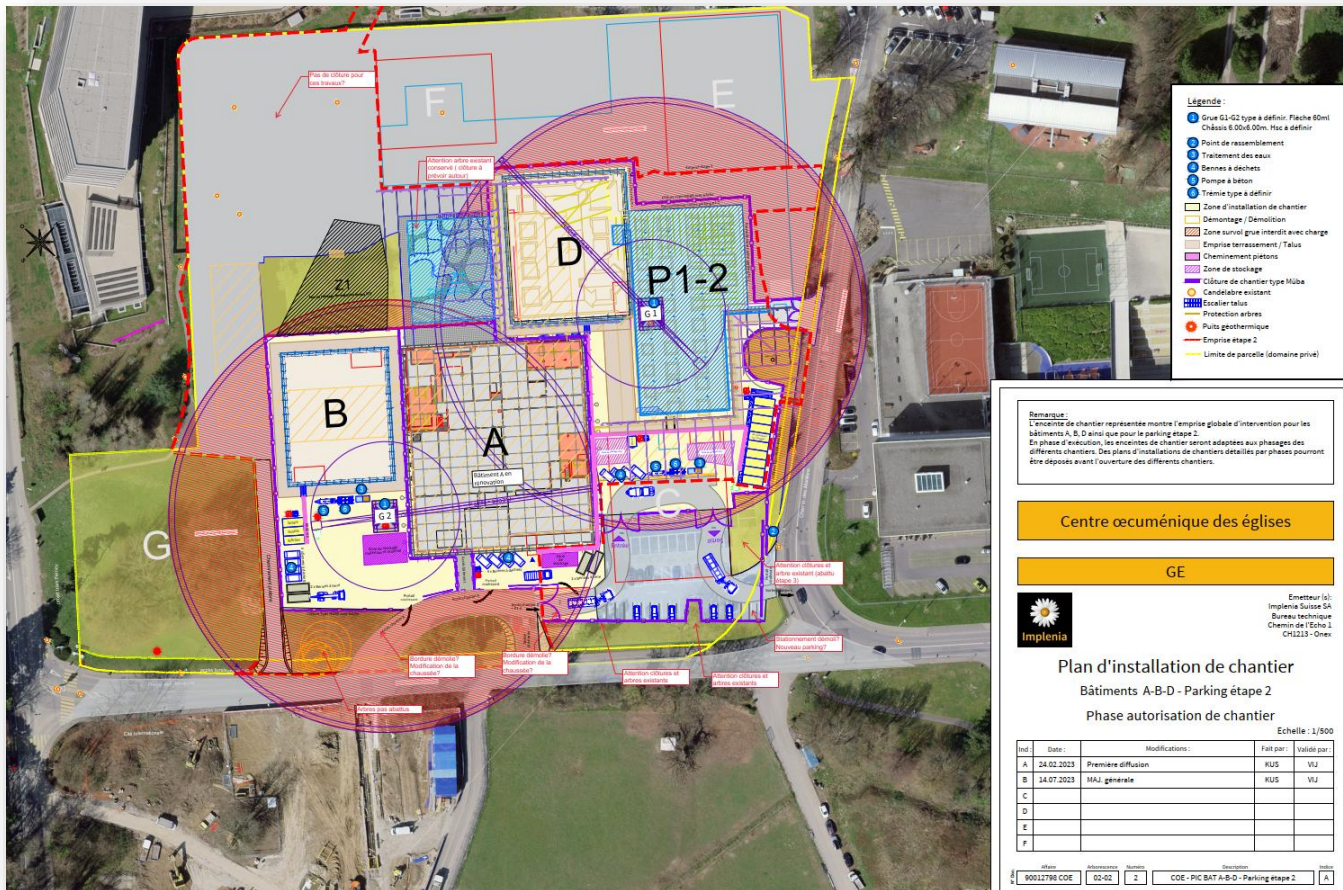
Demolition + dismantling variant

Single demolition 117.233.011

- Cost of **dismantling** services
117(234.001) Cost of removal
117(728.001) Cost of landfill
117(731.001)
- **Articles** 233 (234) - 411 (411.003) - 423 (424) - 445 (446) - 531 (532)

SUSTAINABILITY PERSPECTIVES IN THE INDUSTRY – GUEST LECTURE – IMPLENIA REAL ESTATE

SITE INSTALLATION BY IMPLENIA BUILDINGS



SUSTAINABILITY PERSPECTIVES IN THE INDUSTRY - GUEST LECTURE EPFL - IMPLERIA REAL ESTATE

REUSE SUPPLY AND DEMAND ANALYSIS



SUPPLY QUANTITIES

Allée Rhône					
Surfaces m2	murs en BA		murs en BA		Dalles pleines (ép. 22cm)
	ép.20cm	ép.25cm	ép.40cm	ép. 20cm	
sous-sol (hauteur d'étage 2.41m)					
rez-inf (hauteur d'étage 3.10m)	164	117	236	183	342
rez-sup (hauteur d'étage 2.60m)	52				525
2ème étage (hauteur d'étage 2.60m)	52				525
3ème étage (hauteur d'étage 2.60m)	52				525
toiture					525
Total bât Rhône (m2)=	320	117	236	183	2'442

Allée Saïève					
Surfaces m2	murs en BA		murs en BA		Dalles pleines (ép. 22cm)
	ép.20cm	ép.25cm	ép.40cm	ép. 20cm	
rez-inf (hauteur d'étage 3.10m)	474				
rez-sup (hauteur d'étage 2.60m)	187				705
2ème étage (hauteur d'étage 2.60m)	198				705
3ème étage (hauteur d'étage 2.60m)	198				705
4ème étage (hauteur d'étage 2.60m)	213				705
toiture					705
Total bât Saïève (m2)=	1'270	-	-	-	3'525

Allée Lac					
Surfaces m2	murs en BA		murs en BA		Dalles pleines (ép. 22cm)
	ép.20cm	ép.25cm	ép.40cm	ép. 20cm	
sous-sol (hauteur d'étage 2.41m)					
rez-inf (hauteur d'étage 3.10m)	113	199	231	183	368
rez-sup (hauteur d'étage 2.60m)	49				550
2ème étage (hauteur d'étage 2.60m)	49				550
3ème étage (hauteur d'étage 2.60m)	49				550
4ème étage (hauteur d'étage 2.60m)	49				550
toiture					550
Total bât Lac (m2)=	311	199	231	183	3'118

Allée Jura					
Surfaces m2	murs en BA		murs en BA		Dalles pleines (ép. 22cm)
	ép.20cm	ép.25cm	ép.40cm	ép. 20cm	
sous-sol (hauteur d'étage 1.10m)					
rez-inf (hauteur d'étage 3.10m)	166	95			600
rez-sup (hauteur d'étage 2.60m)	57				600
2ème étage (hauteur d'étage 2.60m)	57				600
3ème étage (hauteur d'étage 2.60m)	57				600
4ème étage (hauteur d'étage 2.60m)	57				600
toiture					600
Total bât Jura (m2)=	395	95	-	-	3'600

Synthèse					
Surface totale (m2)	murs en BA		murs en BA		Dalles pleines (ép. 22cm)
	ép.20cm	ép.25cm	ép.40cm	ép. 20cm	
	2'296	410	468	3'991	9'160

COSTS PER SURFACE

Hors démolition/démonta
TOTAL CAN
683 K

Démolition démontage
CAN 117
Mieux disant 2'162K

TOTAL surface d'éléments BA
16'225 m2

4'007 éléments

TOTAL gisement béton recyclé
8'596 Tonnes

117.119.001	Consignation des réseaux	1 up	1'299	1'299
119.002	Dératisation	1 up	1'856	1'856
124.001	Spécification	1 up	10'020	10'020
125.001	Spécification	1 up	6'091	6'091
125.002	Spécification	50 up	95	4'740
125.003	Spécification	1 up	6'254	6'254
125.301	Spécification	300 m3	95	7'594
223.123	Couche de mm 101:150	65 m	7	438
223.213	Couche de mm 101:150	2200 m2	5	11'446
224.111	1 tonnage	38 m		
224.231	Sur lit sable/gravillon	175 m2		
224.301	Drivers	200 up		
225.111	1 tonnage	26 m	7	243
225.231	Sur lit sable/gravillon	180 m2	10	1'800
225.241	Spécification	400 up	10	3'920
225.242	Spécification	175 up	10	1'715
225.243	Spécification	200 m3	10	1'960
228.101	Spécification	3 p	152	377
233.122	h m 1.21-2.30	24 m	17	293
233.122	h m 1.13-1.50	28 m	9	246
234.122	h m 1.21-2.00	24 m		
234.222	h m 1.01-1.50	28 m		
234.501	Drivers	5 up	65	323
234.501	Spécification	470 up	22	10'434
311.002	Spécification	26 up	24	751
311.003	Spécification	305 up	24	9'400
311.004	Spécification	2105 up	21	43'153
522.001	Déconstruction murs BA	450 up	45	20'160
522.002	Déconstruction murs BA h<=2.60	1902 up	45	85'210
522.003	Déconstruction murs BA h<=3.10	919 up	49	41'171
522.004	Déconstruction murs BA ép.40cm	568 up	49	27'342
522.005	Déconstruction	7289 up		
522.006	Déconstruction	1888 up		
523.113	Démolition murs BA h<=2.00	1902 m2	0	0
523.118	Démolition murs BA h<=3.10	919 m2	0	0
523.117	Démolition murs BA ép.40cm	558 m2	0	0
523.212	Démolition murs Macconerie	7289 m2	17	119'932
523.212	Démolition murs Macconerie	1888 m2	20	36'788
533.112	Démolition piliers	629 p	57	35'979
535.121	Démolition escalier BA	9.5 m3		
535.122	Démolition escalier BA	8.5 m3		
535.123	Démolition escalier BA	26 m3		
535.201	Démolition escalier acier	4.7 t		
536.121	Déconstruction escalier BA	9.5 m3	36	338
536.122	Déconstruction escalier BA	8.5 m3	36	303
536.123	Déconstruction escalier BA	26 m3	36	997
536.201	Déconstruction escalier acier	4.7 t	1'809	8'504
541.001	Démolition dalle BA	6255 up		
541.002	Démolition dalle BA	395 up		
541.003	Démolition dalle BA	2820 up		
542.001	Déconstruction dalles BA	6255 up	42	259'843
542.002	Déconstruction dalles BA	625 up	38	23'813
542.003	Déconstruction dalles BA	2820 up	38	107'442
551.001	Démolition dalle BA	1675 up		
551.002	Démolition dalle BA	825 up		
552.001	Déconstruction dalles BA	1675 up	38	63'818
552.002	Déconstruction dalles BA	825 up	38	31'433
611.001	Enveloppe bâtiment	390 up	13	4'634
611.002	Enveloppe bâtiment	2100 up	17	35'280
611.003	Démolition enveloppe façade	400 up	0	0
612.001	Spécification	360 up		
612.002	Spécification	2100 up		
612.003	Spécification	400 up	44	17'560
623.101	Spécification	4544 up	20	92'698
644.101	Spécification	4544 up		
648.101	Spécification	4544 up	8	36'806

STORAGE & STRATEGY



Scénario	Allées	Résultat	Total Net HT Sous-Traitant
Déconstruction	Jura	Déconstruction Jura	
Déconstruction	Lac	Déconstruction Lac	
Déconstruction	Saïève	Déconstruction Saïève	
Déconstruction	Rhône	Déconstruction Rhône	
Nombre de dalles à Ecouler			4007 Dalles de 4m2
Stockage Max à un Instant T			792 Dalles de 4m2

DEMAND

Windows for Ukraine

Green Village Needs 450 m2 AMEX

SOREVA Needs 500 to 800 m2 MEYRIN

DRIZE Needs 2'005 m2

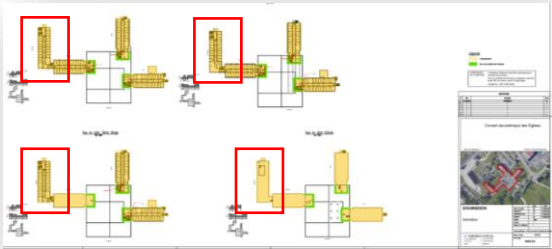
Interest Implenia - Bike rack - Kitchen

RECYCLE FEASIBILITY ANALYSIS

DEMOLITION PROJECT



SUPPLY QUANTITIES



REUSE – RECYCLE - HELP TO DECISION

Budget : xx Mio	Scenario I	Scenario II	Scenario III
DESCRIPTION	Demolition + Evacuation (Lake, Jura, Rhône, Salève) Deconstruction 450 m2 for reuse in situ	Demolition + Crushing (Salève) Demolition + Evacuation (Lac, Jura) Deconstruction (Rhône)	Demolition + Crushing (Rhône) Demolition Evacuation (Jura) Deconstruction (Salève+Lac)
TOTAL COSTS (BKP 1-6)			
BEST BIDDER	xx CHF EXCL. TAX	xx CHF EXCL. TAX	xx CHF EXCL. TAX
AVERAGE COST (4 BIDS)	xx CHF EXCL. TAX	xx CHF EXCL. TAX	xx CHF EXCL. TAX
PLANNING	6 months - 25 weeks	7 months - 30 weeks	8 ½ months - 36 weeks
BENEFITS	Budget and planning under control Low storage impact on stage 2 GV	Alignment to (authorities) demand : concrete recycling in GV	Increased visibility, demonstrator
RISKS	Missalignment to (authorities) demand : concrete recycling in GV	Management of the insitu crushing process	1st experience, reuse costs, planning
PREREQUISITES	N/A	Storage area (320 m2) Reuse storage (1'200 m2)	Recycled storage (320 m2) Reuse storage (1'750 m2)
CRUSHING SAVINGS	N/A	15'000 CHF EXCL. TAX	xx CHF EXCL. TAX
RE-EMPLOYMENT INCOME	N/A	xx CHF EXCL. TAX	xx CHF EXCL. TAX

SUSTAINABILITY PERSPECTIVES IN THE INDUSTRY – GUEST LECTURE EPFL – IMPLERIA REAL ESTATE

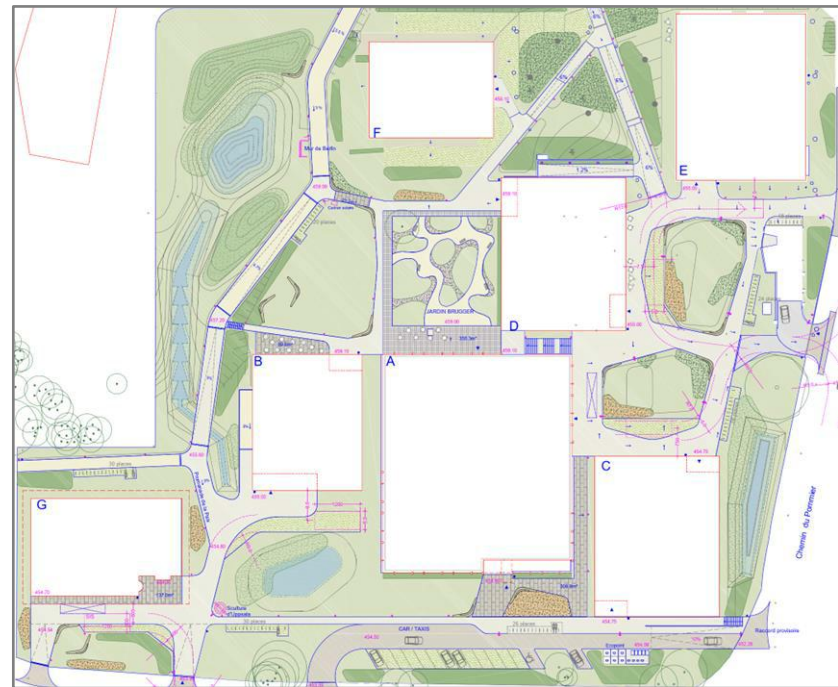
WATER SYSTEMS



Objectives:

- Evaluate the feasibility of rainwater recycling while preserving the original concept
- Develop an initial integrated water management system that supports biodiversity and soil irrigation
- Calculate potential self-sufficiency rates for irrigation
- Propose a design layout along with the required water storage capacity
- This study is based on **hydrodynamic modelling** of historical rainfall data spanning the past 30 years, incorporating the site's infiltration and evapotranspiration processes, and considering the landscape project's configuration.

Autonomous watering rates calculated on the basis of **water requirements for watering** supplied by landscapers depending on number and species planned planting

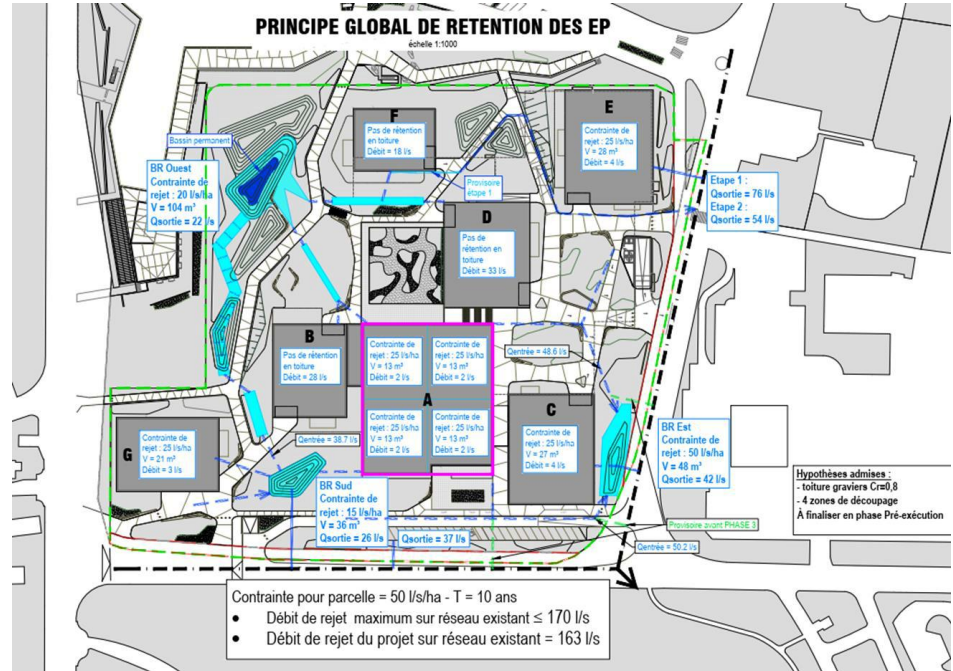
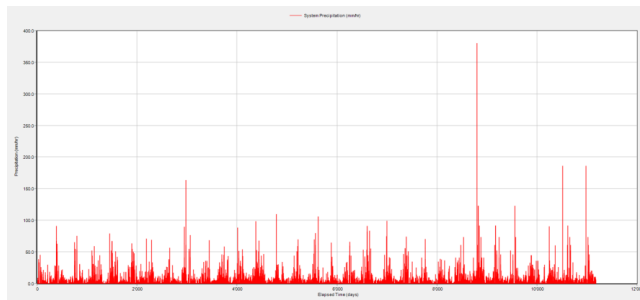


Landscaping plan, ADR architects, version of 21.03.2023

Sizing of hydraulic structures (reservoir permanent, ditch, open ditch) based on the water management concept drawn up by civil engineers and landscape architects

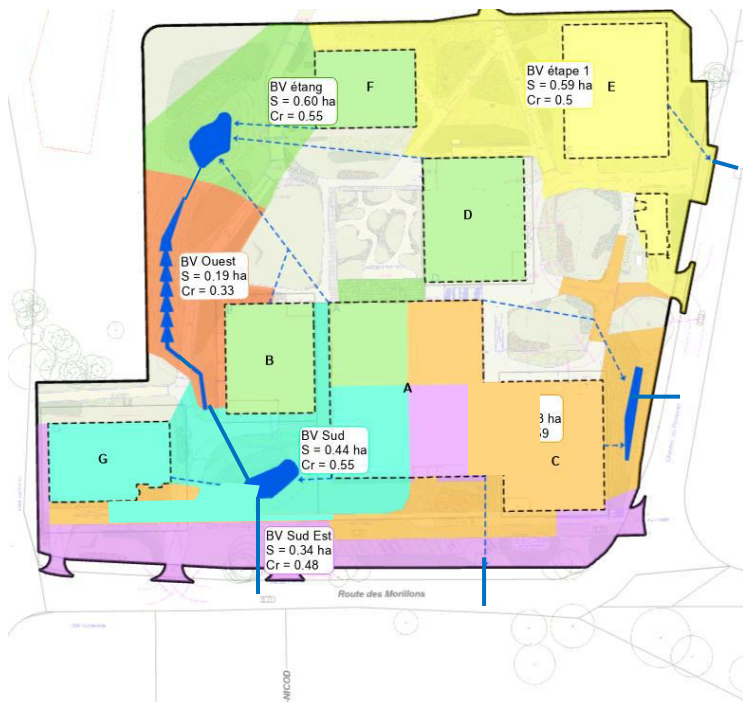
Climatic data :

- **Precipitation:** continuous rainfall series measured at the Bachet-de-Pesay station (Plan-les-Ouates) over a 30-year period (1989 - 2019)
- **Evapotranspiration:** defined according to temperature daily rates (max / min) over the last 3 years data from Cointrin station



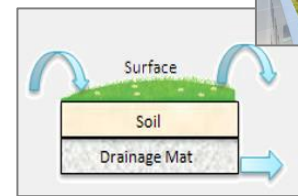
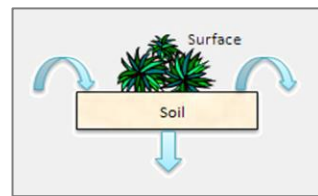
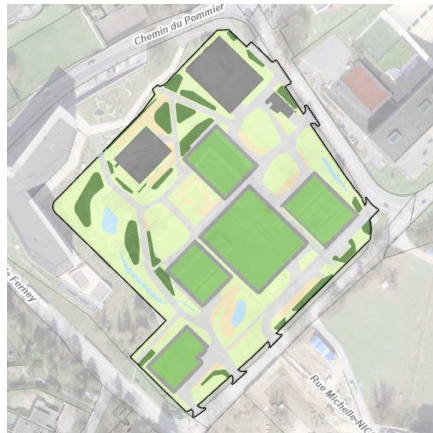
Plan of the overall water retention principle, EDMS Ingénieurs, version of 10.12.2019

WATER SYSTEMS – CHARACTERISTICS OF SOIL AND ROOFS



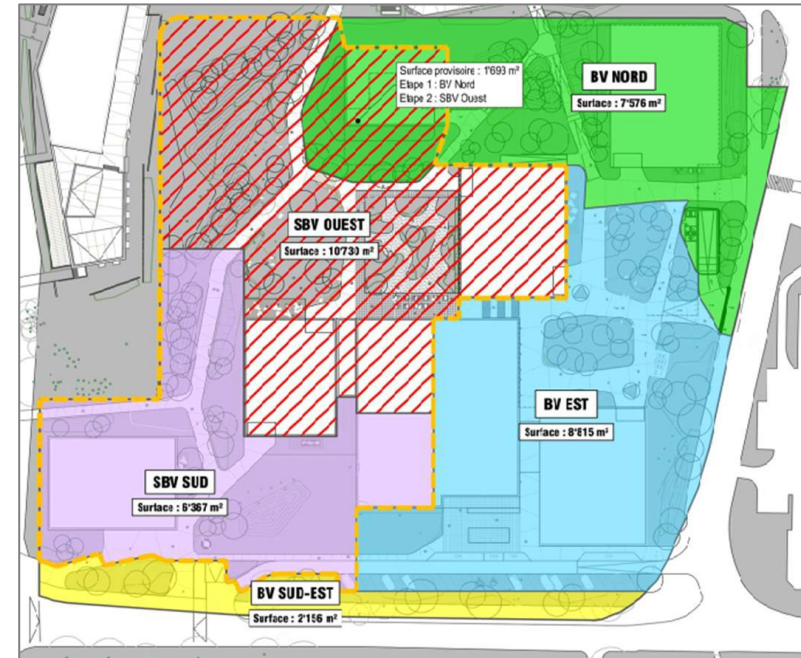
Légende

Périmètre de l'étude	10m	BV nouvelle sud est
Parcelles	Collecteurs projetés	BV nouvelle est
Bâtimens projetés	Ouvrages de rétention projetés	BV nouvelle
Courbes de niveaux	Bassins versants	BV étape 1
1m	BV nouvelle sud	
2m	BV nouvelle est	



Results for all the areas concerned (BV West, South and East):

- 26.1 m of rainfall over 30 years, i.e. ~ 900 mm / year
- Average rainfall on the studied perimeter ~ **15,400 m³ / year**
- Available prior evacuation to city networks ~ **3,500 m³ / year**
- At the scale of the project, around **80% of rainwater** is either evaporated or naturally infiltrated into the spaces greens / pond



Catchment plan, EDMS Ingénieurs, version of 19.01.2018

WATER SYSTEMS – WATERING REQUIREMENTS

Watering requirements: Estimated requirements for the 2 construction stages combined

The estimated watering requirements for the two stages of construction combined must take into account the evolution of needs over time, which will tend to decrease over the years (growth and the trees' natural water autonomy).

A reduction of 20% per year allowed, i.e. $\sim 10\text{m}^3$ /year for stage 2 and $\sim 4\text{m}^3$ /year for stage 3

The table below assumes that stage 3 will be completed 2 years after stage 2.



Plan of planting stages, ADR,
version of 25.04.2023

Phase of project	Watering needs per year							
	année 1	année 2	année 3	année 4	année 5	année 6	année 7	année 8
Étape 2	50	40	30	20	10	-	-	-
Étape 3	non réalisée		20	16	14	10	6	4
Étape 2 + 3	50	40	50	36	24	10	6	4

We can therefore define a maximum overall watering requirement (stages 2+3) of approximately 50m^3 per intervention (10/year).

WATER SYSTEMS – IMPLEMENTATION OF WATER TANK



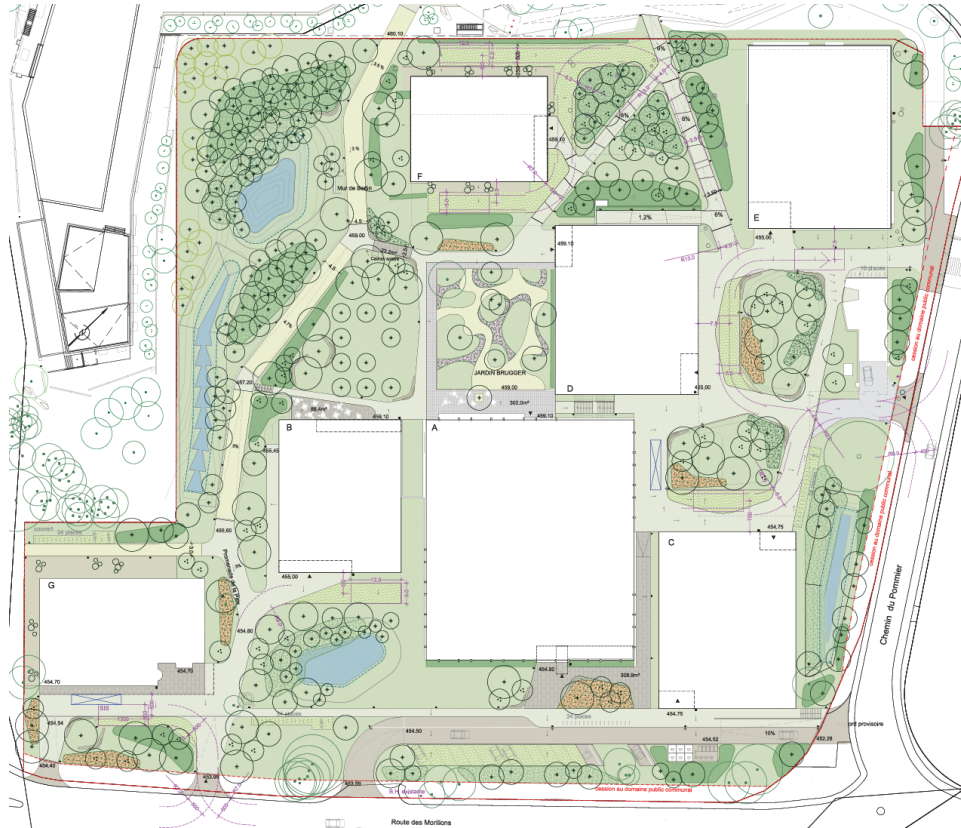
SUSTAINABILITY PERSPECTIVES IN THE INDUSTRY - GUEST LECTURE EPFL - IMPLERIA REAL ESTATE

URBAN PLANNING, LANDSCAPING & BIODIVERSITY



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1 Identification of areas suitable for conversion into substitute medium (minimum of 5 media)



Create biological connections for the transit of small wildlife.



SEED 6 environments identified, several of which are represented several times on the site

- Prairial
- Pioneer
- Bocage
- Wooded
- Wet

Qualité des connexions biologiques entre les principaux milieux aménagés

- Bonne à très bonne
- Moyenne
- Médiocre

SEED Overall, the environments are well connected. Concrete pathways, particularly between wooded knolls, remain a weak point in the project.

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2

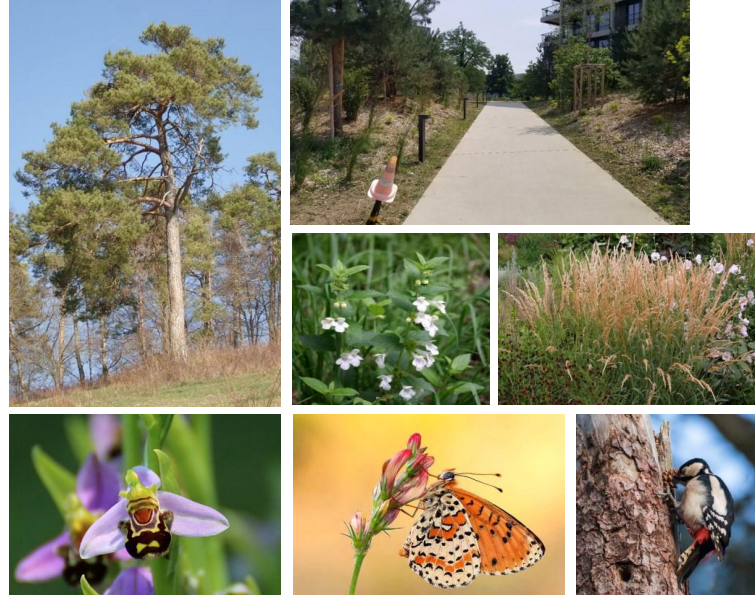
Drawing up lists of plants to recreate environments that correspond to a target pool of animal and plant species.



Converging biodiversity, landscape and technicality (sustainability (climate), maintenance, economic aspects, etc.)



Pine forest on mesobromion hillock



3 Choice of ground features for small fauna to be placed in the green spaces created.

- ➔ Creating a neighbourhood-wide network of micro-habitats.
Establish a sufficient density of networked structures in the environments created.

Assessed under theme 1 "environmental structure".

This criterion reaches the OPL level.



Wooded hills of
Stage 1



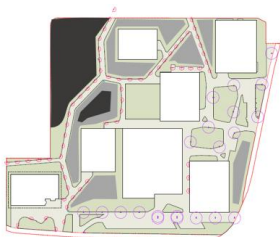
Sand-stone niche within wooded knolls (stage 1) Other developments under study (stage 2)

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4 Minimising the impact of buildings on flora and fauna (theme 2)

Wildlife-friendly lighting plan

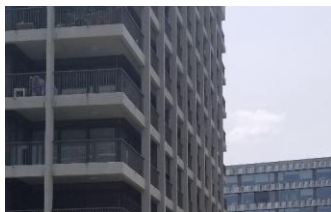
low markers (1 m) aligned with the aisles, on one side of the linear layout only



- + Large surfaces in unlit substitution (low residual brightness)
- + "night in the western sector preserved"

Facades that pose little danger to the birds

- + Choice of low-reflective glazing
- Large areas of glazing on ground floor
- Glazing surfaces on upper floors at the recommended 4 m^2
- + Metal railings (Montréal)
- + Blinds



Stage 1 (Montreal)

Permeable coatings small invertebrate fauna

- The paths are exclusively in concrete which offers no possibility of passage for some of the small fauna land. The use of grass grids is only available on SIS lanes.



This criterion is rated at an average level at this stage

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5

Including facilities in construction (theme 2)

Installation of nesting boxes for small colonies of swifts on buildings in Lima and Stockholm



Length of open-air water management system open vegetation (majority)



N o u e s e t basins (stage 2 project underway)

High proportion of trees honey and fruit trees



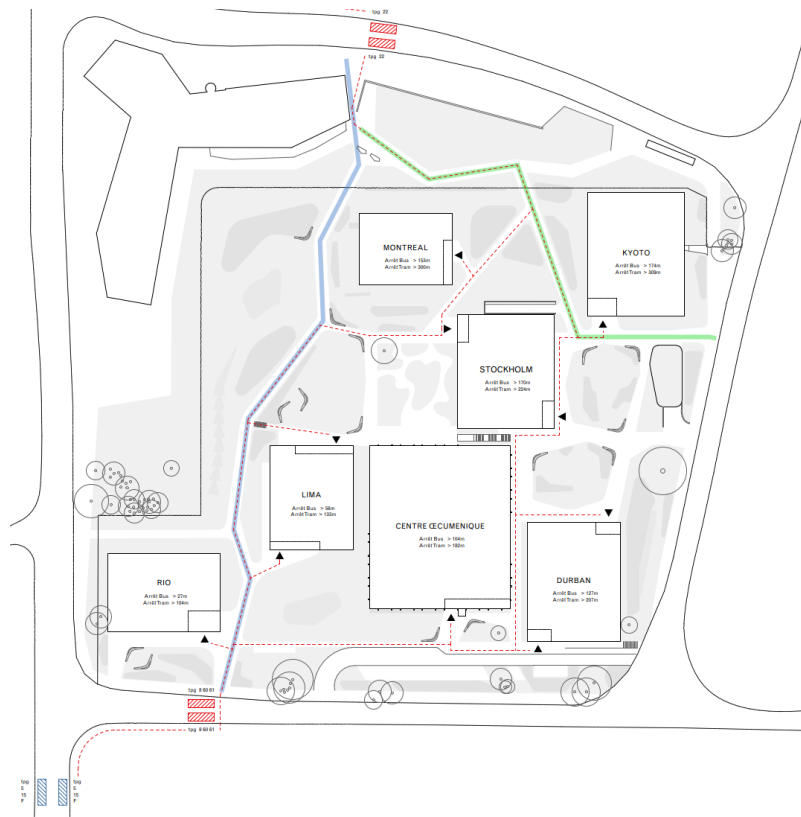
This criterion is rated as good at this stage.

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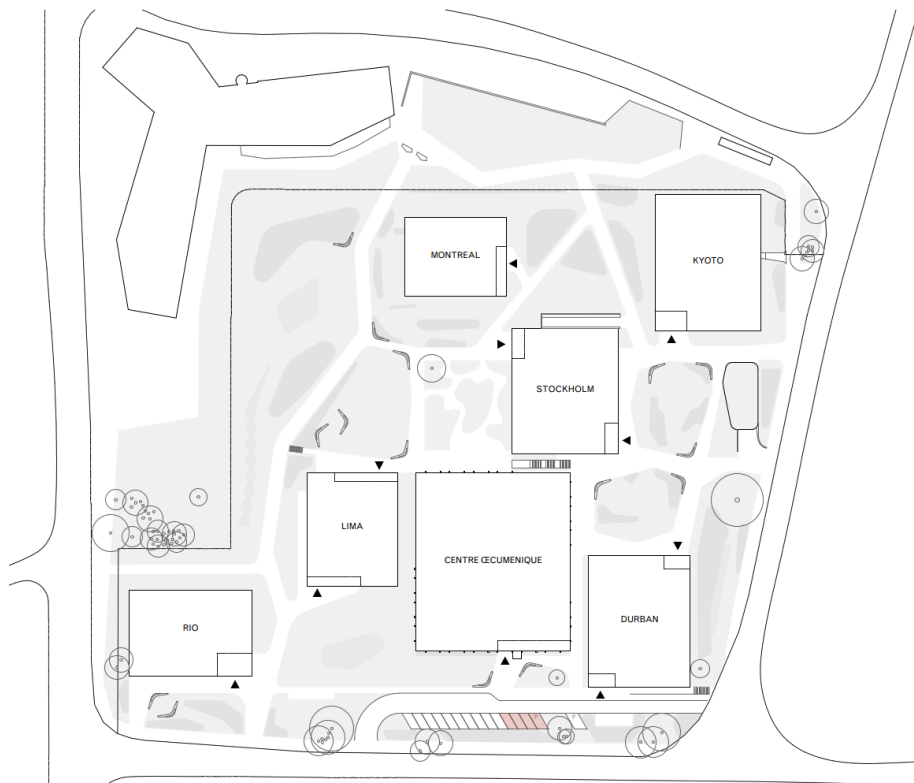
MOBILITY ASPECTS, WASTE MANAGEMENT PLANIFICATION



MOBILITY ASPECTS – LOGISTICS ACCESS TO PUBLIC TRANSPORTS



MOBILITY ASPECTS – PARKINGS & ELECTRIFICATION



DECOMPTE PLACES TIM : SS01 + SS02 + AMEX

PLACES TOTALES

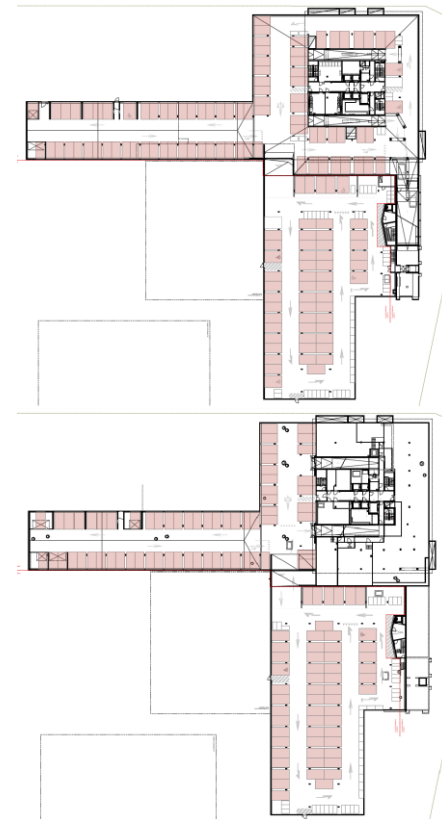
Places voitures	275
Places moto	102

PLACES ELECTRIFIES

Places voitures raccordés	264
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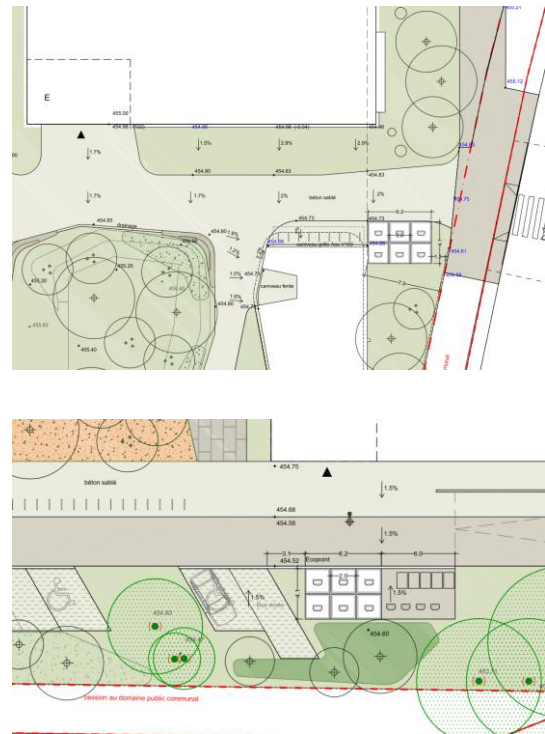
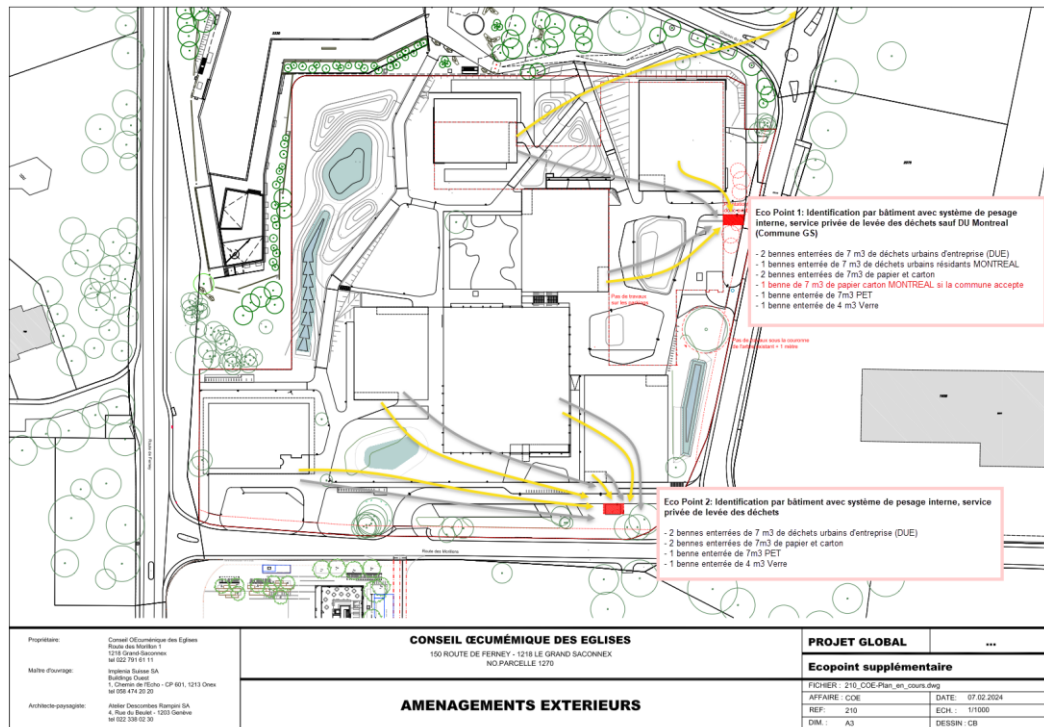
LEGENDE :

- Places TIM Standard
- Places TIM Electrifiés

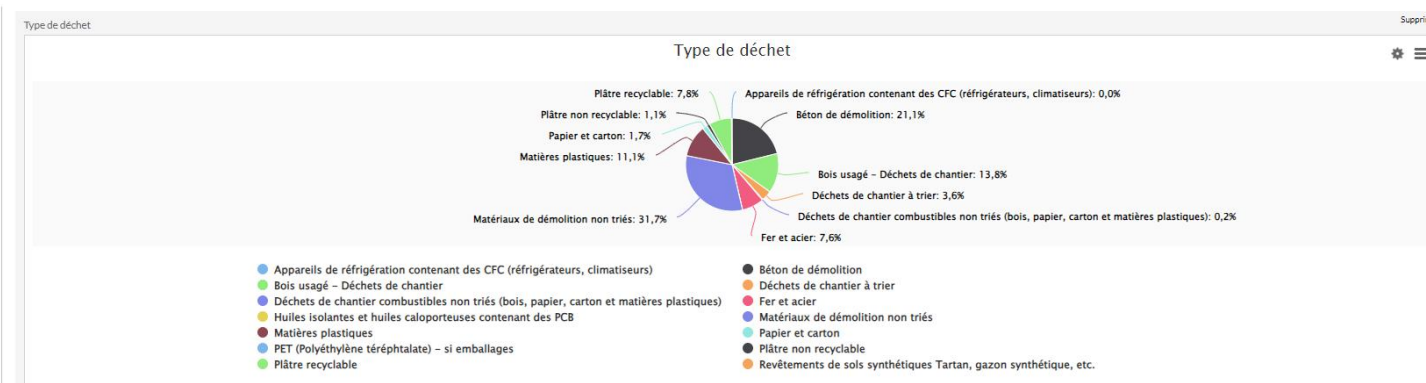
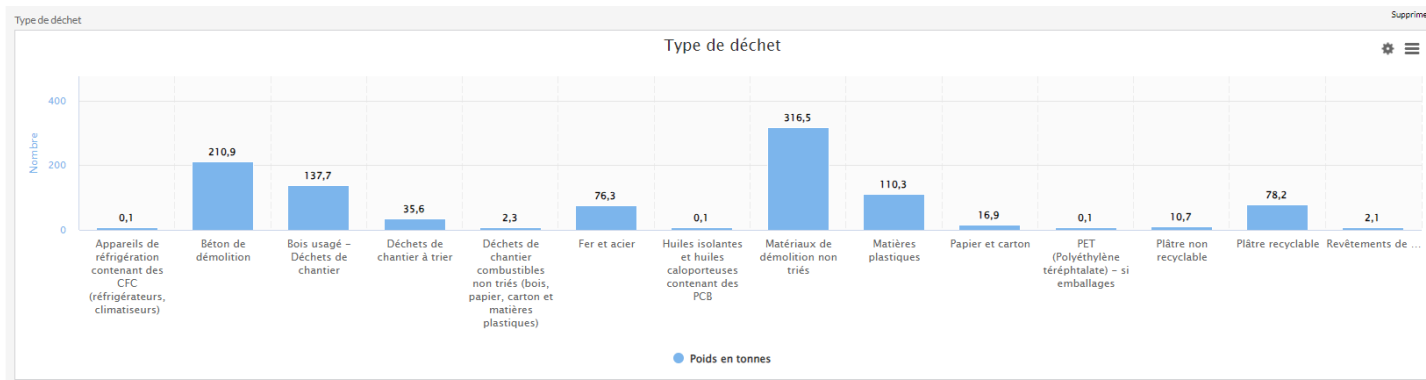


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WASTE MANAGEMENT IN OPERATION

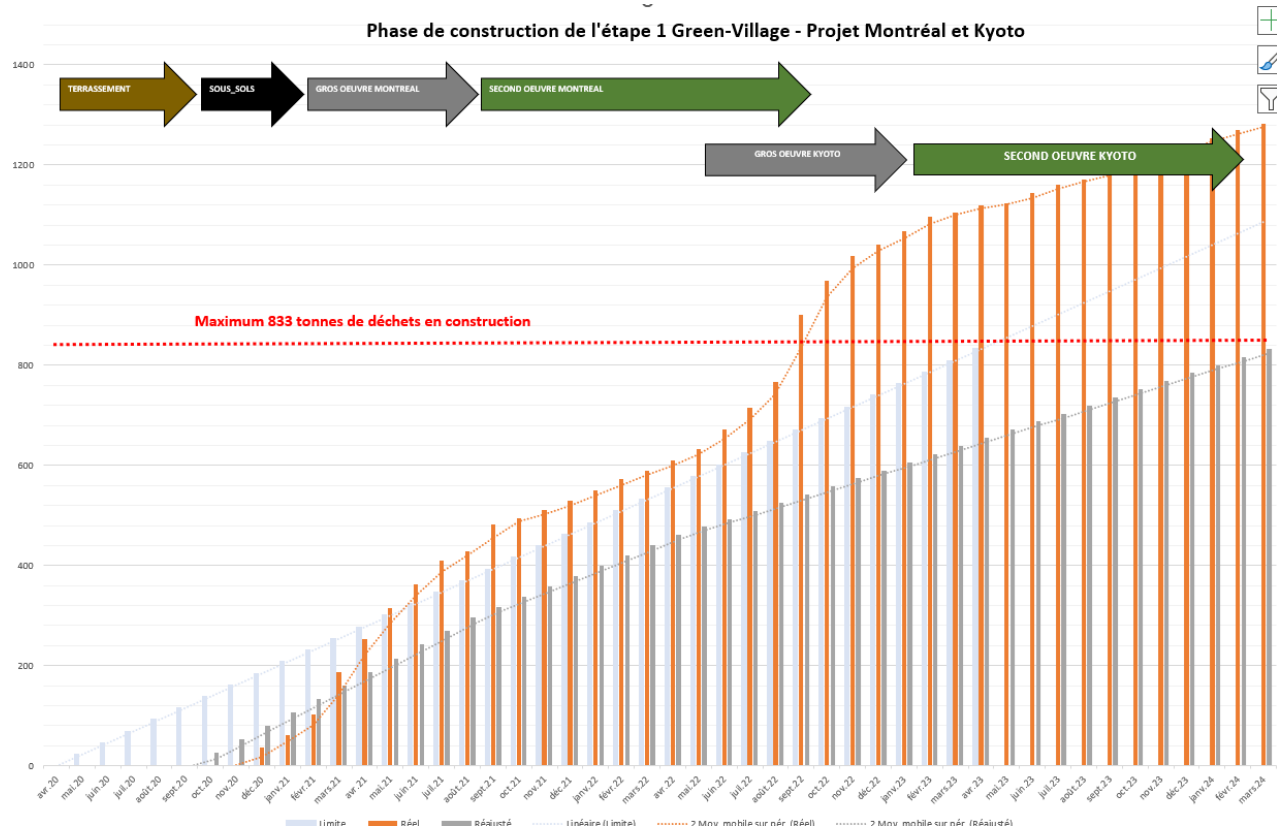


WASTE MANAGEMENT DURING CONSTRUCTION



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WASTE MANAGEMENT DURING CONSTRUCTION



PROGRAMME AND DEVELOPMENT HISTORY



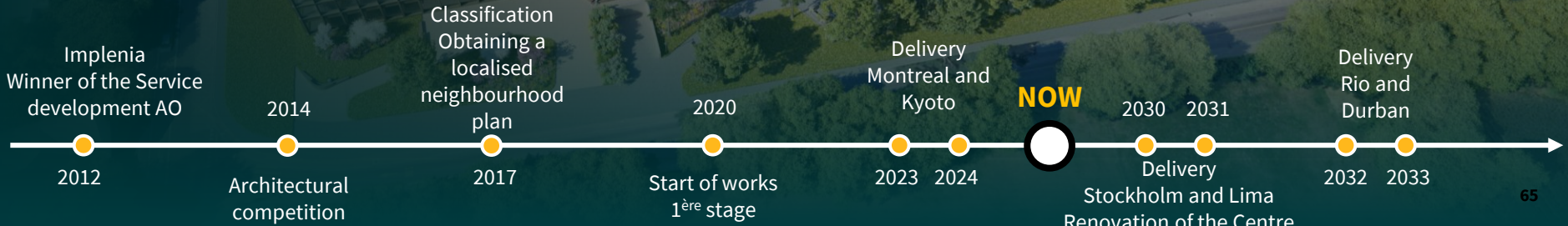
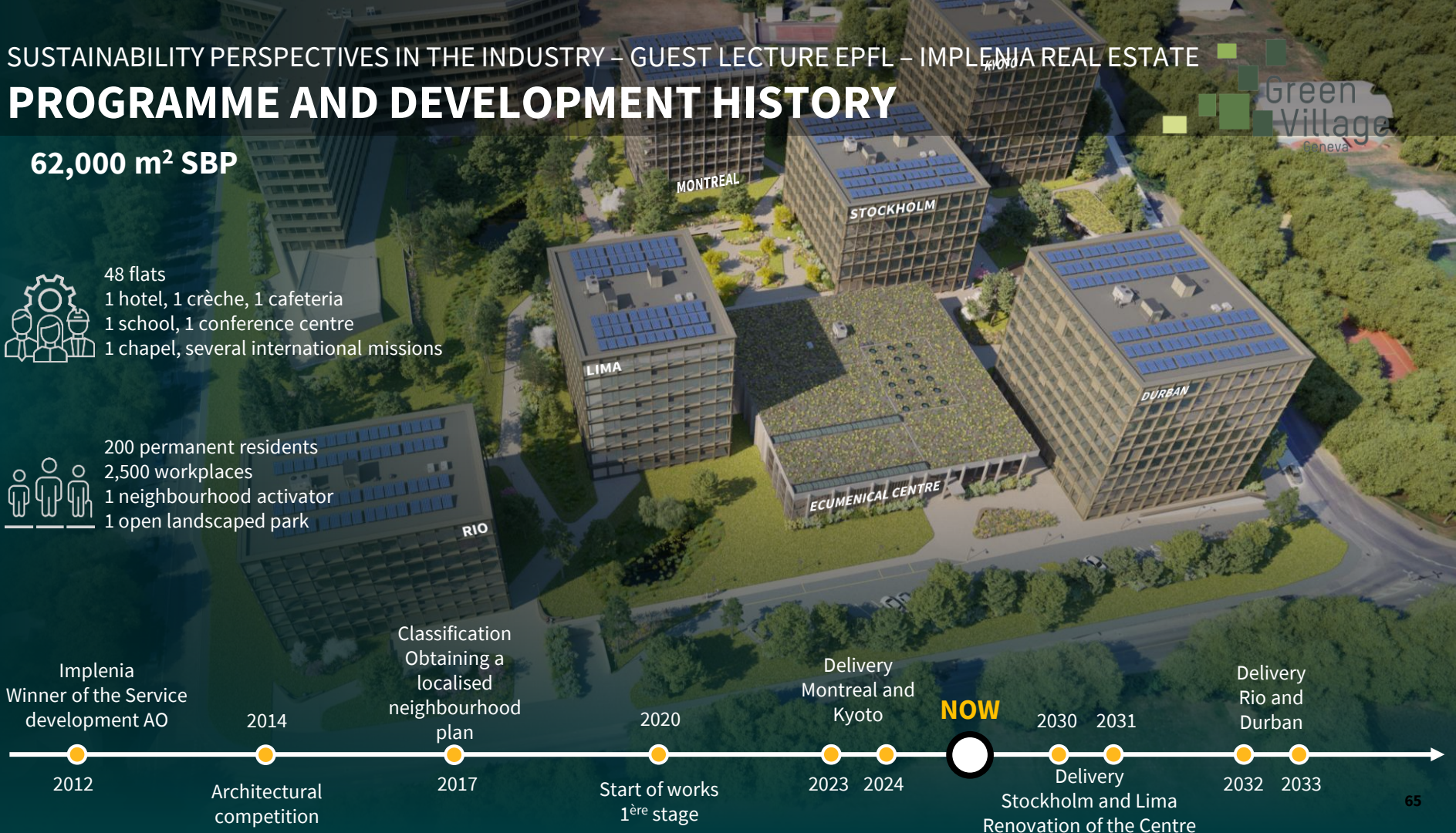
62,000 m² SBP

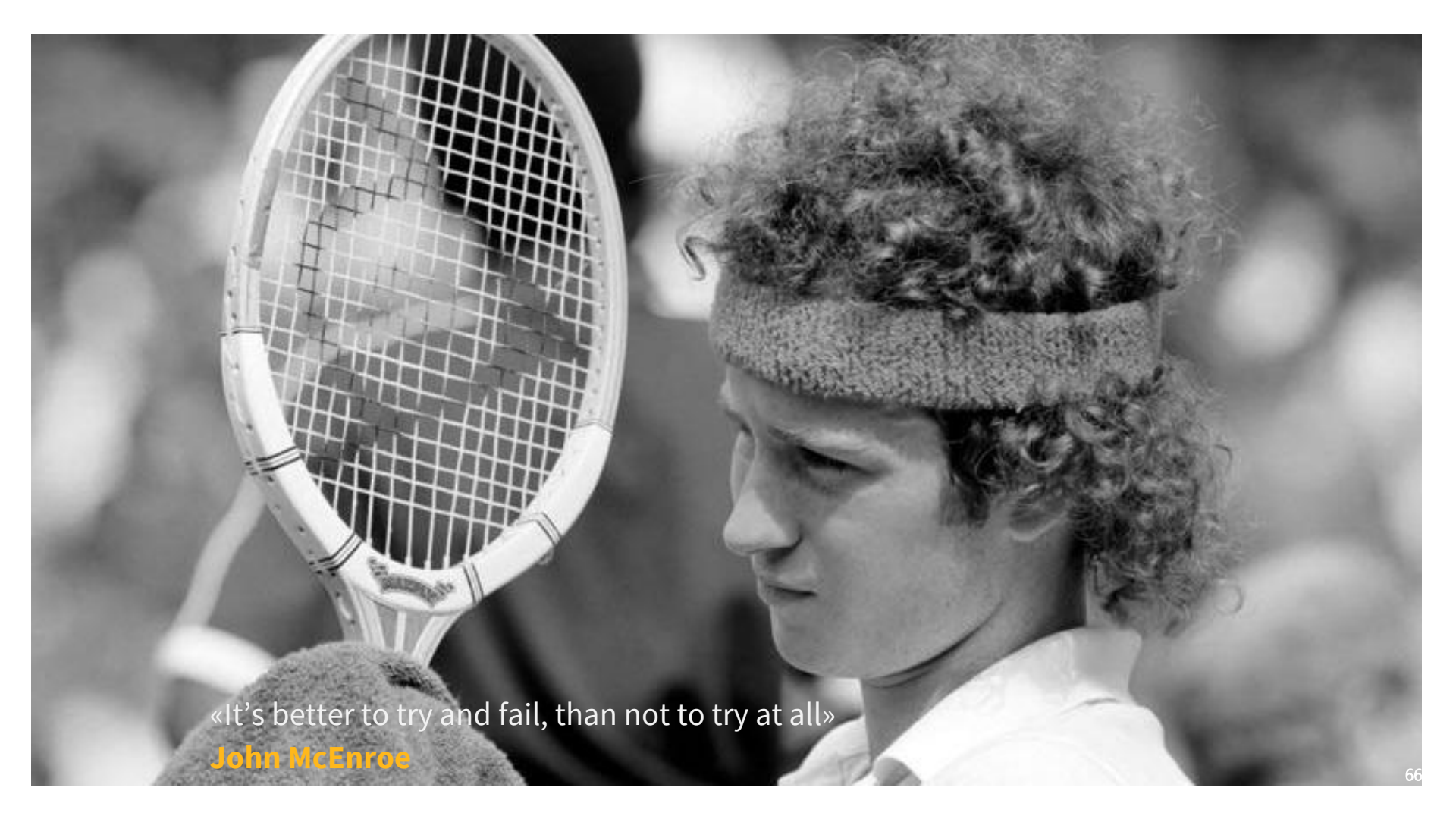


- 48 flats
- 1 hotel, 1 crèche, 1 cafeteria
- 1 school, 1 conference centre
- 1 chapel, several international missions



- 200 permanent residents
- 2,500 workplaces
- 1 neighbourhood activator
- 1 open landscaped park



A black and white photograph of tennis player John McEnroe. He is shown in profile, looking downwards with a serious expression. He has his characteristic wild, curly hair and is wearing a headband. In the foreground, a tennis racket is visible, its head partially obscuring the left side of the frame. The background is blurred, suggesting a tennis court setting.

«It's better to try and fail, than not to try at all»

John McEnroe

LET'S TRY ALL TOGETHER



Benoît KLEIN

Senior Sustainability Manager

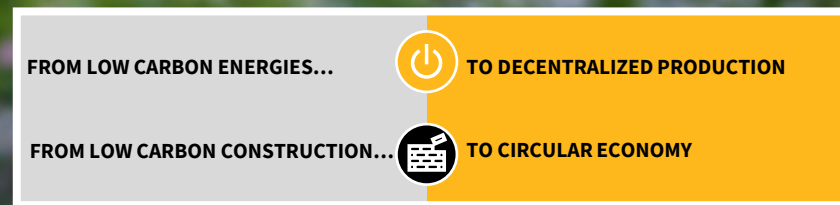
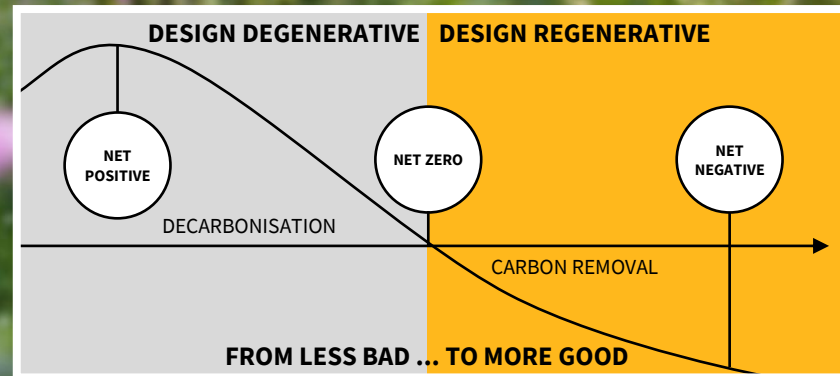
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