서울특별시

동행·매력 특별시 서울

서울, 탄소중립 친환경도시로 나아가다.

2022 서울에너지드림센터 10주년 기념 국제세미나

The 10th Anniversary International Seminar of Seoul Energy Dream Center

2022. 12. 12.(월) 14:00 - 18:00

서울에너지드림센터 & 서울시 유튜브 생중계

개막식	서울에너지드림센터 10주년 기념식
Session 1	사람과 자연이 어우러지는 친환경 도시
Session 2	탄소중립 친환경건물 사례
기념전시	미래 친환경건축기술 전시회 'Beyond ZEB 10'

www.10thseouledc.or.kr

목 차

Session 1

사람과 자연이 어우러지는 친환경 도시

좌장 : 박연희,이클레이 한국사무소 소장

Session 2

탄소중립 친환경건물 사례

좌장 : 고배원 건축가(㈜인테그라디앤씨 대표)

전체 프로그램

시간	프로그램			비고
13:30 – 14:00	10주년 특별전시 투어			귀빈
14:00 – 14:01	기념식	개회 및 내빈소개		사회자
14:01 – 14:04		환영사		유연식, 기후환경본부장
14:04 – 14:07		축사		봉양순, 서울시의회 환경수자원위원회 위원장
14:07 – 14:10		축사		최영수, 서울에너지드림센터 운영위원회위원장
14:10 – 14:13		서울에너지드림센터 성과 영상		
14:13 – 14:15	BREAK	주요 내빈 기념촬영		
14:15 – 14:20		무대 정리		
14:20 – 14:25	**세션 1 사람과 자연이 어우러지는 친환경 도시**	**세션 1 주제 및 발표자 소개**		**좌장 : 박연희,이클레이 한국사무소 소장**
14:25 – 14:40		발표 1	서울, 친환경 도시로 나아가다	이인근, 서울시 기후환경본부 환경기획관
14:40 – 14:55		발표 2	우메오(스웨덴) – 자원순환	루카스 뢰힐링거, 우메오 전략개발담당관
14:55 – 15:10		발표 3	카스카이스(포르투갈) – 기후변화대비	조아오디니스, 카스카이스 도시전환국장
15:10 – 15:25		발표 4	쿄토(일본)	미기와타카하시, 교토 환경 활동 협회(KEAA)
15:25 – 15:50		패널 토론	패널토론 및 질의 응답	(패널) 이영성, 서울대학교 환경대학원 도시계획학 교수
15:50 – 16:10	BREAK	휴식시간 및 무대 정리		
16:10 – 16:15	**세션 2 탄소중립 친환경건물 사례**	**세션 2 주제 및 발표자 소개**		**좌장 : 고배원 건축가(㈜인테그라디앤씨 대표)**
16:15 – 16:30		발표 1	서울EDC 에너지 효율화 운영성과 사례	신동철 서울에너지드림센터 시설운영국장
16:30 – 16:45		발표 2	목조 건축물	존 헴스워스, 브리티시컬럼비아 대학교 건축학 교수, Hemsworth Architecture 대표
16:45 – 17:00		발표 3	친환경건축물 / 기후변화대비건축물	문섬웡, 싱가포르 국립대학교 건축학과 교수, WOHA 아키텍처 창립이사
17:00 – 17:15		발표 4	업사이클링건축물	니클라스놀소에, Business Development Director at Lendager
17:15 – 17:40		패널 토론	패널토론 및 질의 응답	(패널) 문수영, 한국건설기술연구원
17:40 – 17:50	폐회사	폐회사		사회자

인사말

반갑습니다.

「서울에너지드림센터 10주년 기념 국제세미나」에 참여해 주신 여러분, 진심으로 환영합니다.

서울에너지드림센터는 서울시 온실가스 배출량의 가장 큰 비중을 차지하는 건물 부분의 에너지를 절감하고 태양광, 지열 등 도시형 신재생 에너지원 보급 필요성을 시민들에게 보다 친근하고 가깝게 다가가게 하고자 건립된 국내 최초의 에너지자립 공공건축물입니다.

오는 2022년 12월 12일은 서울에너지드림센터가 개관 10주년을 맞이하는 날로서 그동안에 드림센터의 성과와 서울시의 비전 “사람·자연, 미래가 공존하는 지속가능한 도시”를 공유하고자 합니다.

UN 글로벌지속가능한보고서에 따르면 도시에서 배출되는 탄소가 전체 배출량의 75%를 차지하고 있다 합니다. 탄소 배출을 줄이기 위한 도시의 역할과 책임이 더욱 강조되는 점입니다.

이 자리에 참석하시는 여러 해외도시 정책 담당자, 국내외 건축가, 환경 관련 전문가 그리고 시민들과 함께 “탄소중립 친환경 도시 및 건축” 이라는 주제를 가지고 이를 위한 노력 등을 공유하고 사람과 자연이 조화로울 수 있는 지속가능한 도시로의 발전도 함께 모색하는 자리가 되었으면 합니다.

더불어 오는 12월 7일부터 3개월간 미래 친환경 건물에너지 기술 전시회 ‘Beyond ZEB 10’이 서울에너지드림센터 1층에 전시되어 있으니 오셔서 많은 정보 얻어 가시길 바랍니다.

2022. 12. 01. **기후환경본부장 유연식**

서울,
탄소중립
친환경도시로
나아가다.

Session 1

사람과 자연이 어우러지는 친환경 도시

▌서울, 친환경 도시로 나아가다

이인근 서울특별시 기후환경본부 환경기획관 국장

▌Climate mitigation in Umea

루카스 뢰힐링거(Lucas Röhlinger), 우메오 전략개발담당관

▌Climate Action in Cascais

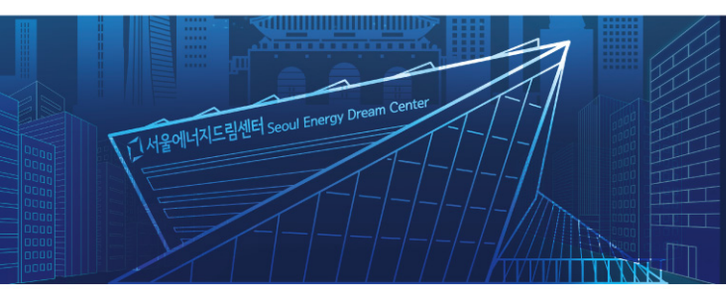
조아오 디니스(Joao Dinis,), 포르투갈 카스카이스시 도시전환국장

▌Co-creation for the sustainable development of "MIYAKO"

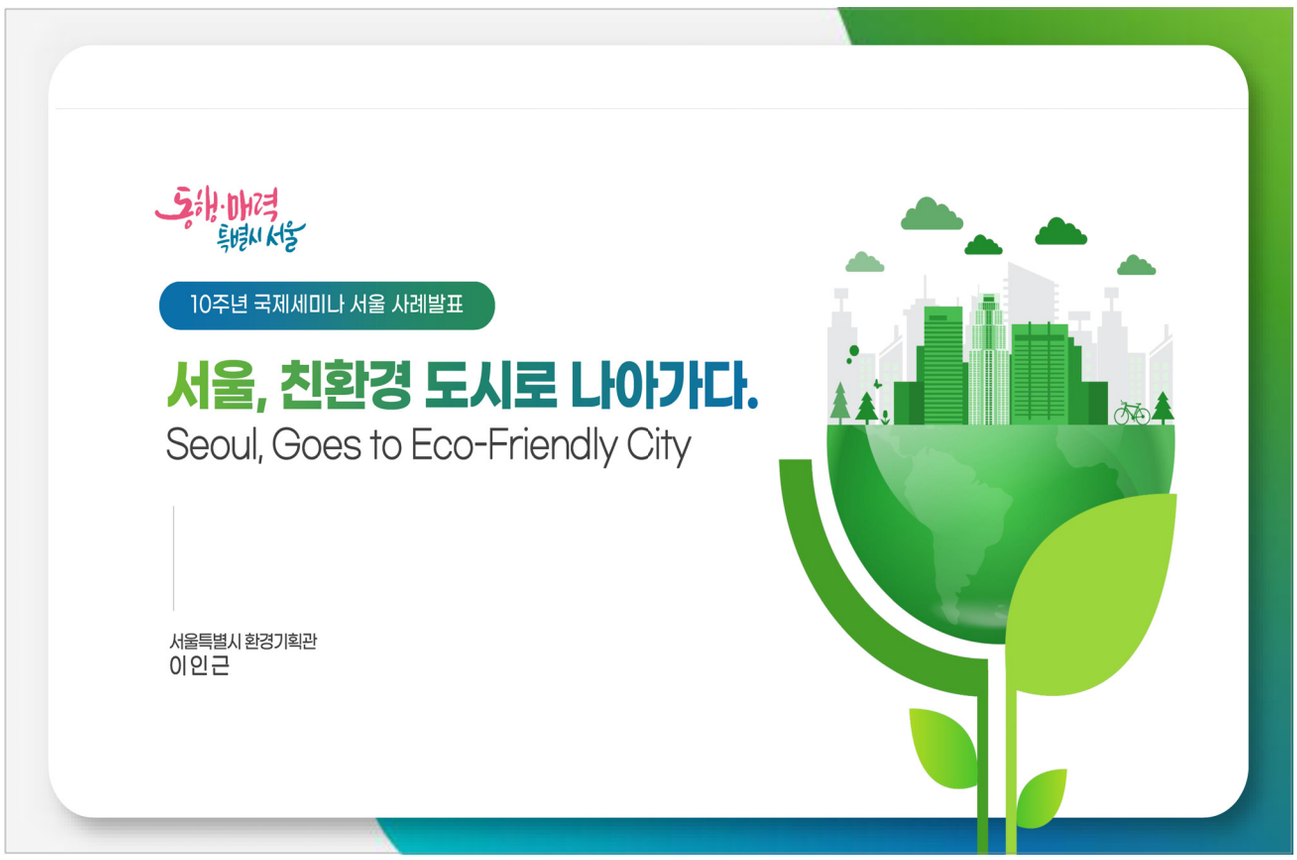
미기와 타카하시(Migiwa Takahashi) 교토 환경 활동 협회(KEAA) 환경교육담당

Session 1

서울, 친환경 도시로 나아가다



이인근 서울특별시 기후환경본부 환경기획관 국장


동행·매력
특별시 서울
10주년 국제세미나 서울 사례발표
서울, 친환경 도시로 나아가다.
Seoul, Goes to Eco-Friendly City
서울특별시 환경기획관
이인근


2022 서울, 친환경 도시로 나아가다.
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02-1. 더 맑은 서울
02-2. 숲으로 가득한 공원도시
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03 결언
동행·매력
특별시 서울

동행·매력 특별시 서울

01

환경친화 도시로 서울이 걸어온 길

서울의 현재 | 서울의 기후 위기

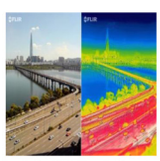
01-2 서울의 환경

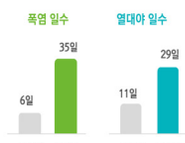
서울의 기후위기

서울 또한
심각한 기후위기

최근 100년간
2.3℃ ▲
서울의 평균 기온 상승

극한 기후 일수
증가추이
폭염, 열대야





2018년 서울 기상관측 이래 최초로 최고기온 39.6℃ 기록

기후변화로 인해 향후 폭염, 풍수해, 가뭄 등 자연재해 증가할 것으로 전망

2012년 집중호우로 인한 우면산 산사태

2018년 폭염으로 인한 온열질환자 증가

전 지구적으로
기후위기 피해가 매우 심각 수준

2021년 세계 10대 기후재난 피해액 약 202조원
(미국 허리케인 아이다 77조원, 유럽 홍수 51조원, 미국 텍사스 겨울 폭풍 27조원)

'20년 6월
북극 최고기온 38℃ 기록, 해빙 가속화

'21년 7월
유럽(독일, 프랑스 등) 대홍수 발생, 240명 사망

2022 서울, 친환경 도시로 나아가다.

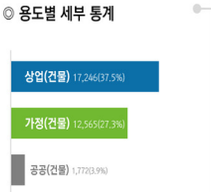
10주년 국제세미나 서울 사례발표

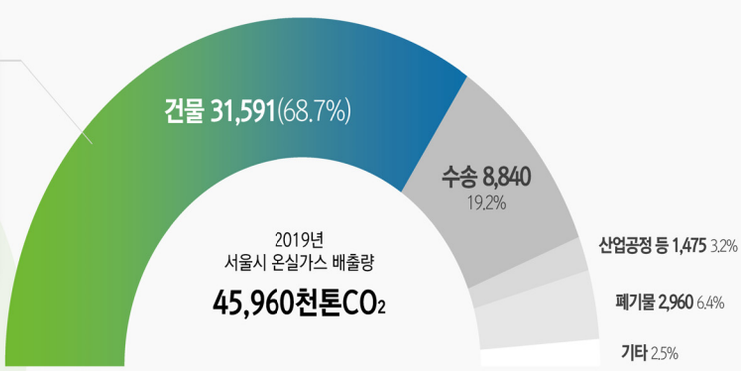
01-2 서울의 환경

서울의 온실가스 배출 현황

부문별로 건물 68.7%, 수송 19.2%, 폐기물 6.4% 등(건물 부문은 상업 〉 가정 〉 공공 순)

◎ 용도별 세부 통계





2022 | Seoul, Goes to Eco-Friendly City

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2022 서울, 친환경 도시로 나아가다.

10주년 국제세미나 서울 사례발표

02 그간의 노력 및 성과

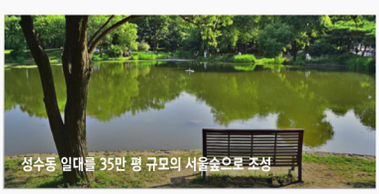
ECO-SEOUL

서울, 친환경 도시로 나아가다.

2000년대 청계천 복원, 서울숲 조성 등으로 친환경 서울로 변모하기 시작 → **2010년대** 난지 생태공원 복원과 서울에너지드림센터 건립 → **2020년대** 2050 온실가스 감축 추진계획 발표


1976~2003년 간 사라졌던 청계천을 복원


쓰레기 매립지 난지도를 21세기 들어 생태공원으로 복원


성수동 일대를 35만 평 규모의 서울숲으로 조성

생태공원 부지 위에 서울에너지드림센터 건립

「 2050 온실가스 감축 추진 계획 」
('21년 1월)

건물부문	건물 에너지효율개선사업 추진
교통부문	공공부문 전기·수소차 의무도입 내연기관차 등록·운행 금지 추진
숲 조성	생활밀착형 도시숲 조성
에너지생산	신재생에너지로 전환 가속화
자원순환	폐기물 원천 감량 및 직매립 제로화

2022 | Seoul, Goes to Eco-Friendly City

2022 서울, 친환경 도시로 나아가다.

10주년 국제세미나 서울 사례발표

02 그간의 노력 및 성과

Global-SEOUL

서울, 국제사회 협력을 위한 노력

국제 환경 협력 현황

2015년 파리협정 채택 이후

- 기후변화 대응은 단일 국가, 도시의 노력만으로 해결할 수 없다는 인식 확산
- 서울시, UN, WHO 등 국제기구와 C40, ICLEI 등 협의체와 다양한 국제협력 추진 중

C40 CITIES — 09년 제3차 서울회의 개최 이후 09-20년간 부의장 도시로 활동

ICLEI — 15년 이클레이 세계도시 기후환경총회 서울 개최

서울시 주관 기후환경분야 국제 컨퍼런스 개최

기후변화대응 세계도시 시장 포럼 | 2016년 부터 총 4회 개최

대기질 개선 서울 국제포럼 | 2010년부터 총 10회 개최

동행·매력 특별시 서울

02

사람·자연, 미래가 공존하는 지속가능한 도시 서울

더 맑은 서울 | 숲으로 가득한 공원도시 | 물이 순환하는 물의 도시 | 건물 100만호 에너지효율화 추진 | 폭우/폭설 등 기후위기 대비 안전도시 조성

02-1 더 맑은 서울

전기차 등 친환경 차량 확대

생활 밀접 화물 · 이륜차 '26년까지 전기차 전환

- 경유 택배 화물차 6,100대, '26년까지 전기 화물차로 교체
- 전업 배달 이륜차 33,400대, '25년까지 전기 이륜차로 교체

경유 청소차 저공해차 전환

- 경유 도로청소차 255대, '26년까지 CNG · 전기차로 교체
- 경유 수집운반차 2,118대, '30년까지 CNG · 전기차로 교체

경유 마을버스 전기버스 전환

- 경유 마을버스 457대, '26년까지 전기 마을버스로 전환
- '25년까지 민간주차장 · 공영차고지 내 전기차 공용충전소 구축 확대

서울진입 타 시 · 도 경유버스 저공해차 전환

- 서울 · 경기 · 인천 3차 협의체 활용, 저공해버스 우선 도입(~26년)
- 서울진입 신규노선 협의 시 친환경버스 운행조건 부여

2022 | Seoul, Goes to Eco-Friendly City

02-1 더 맑은 서울

공해차량 운행제한 확대

노후 공해차 운행제한 단계적 확대

- 녹색교통지역(한양도성)
  '25년부터 4등급 이하, '35년부터 모든 내연기관차 운행제한
- 서울전역
  '25년부터 5등급, '30년부터 4등급 이하,
  '50년부터 모든 내연기관차 운행제한

노후 경유차 조기폐차 지원

- '23년부터 4등급 경유차 조기폐차 지원 시행
  (5등급에서 4등급 차량으로 확대)
  ※ '30년까지 매년 1만대씩 지원

생활주변 배출원 관리 강화

대기오염 방지시설 확충

- 2025년까지
  사업용 일반버너 4천대를 저녹스버너로 전면교체
  소규모 사업장 IoT 상시감시시스템 854개소 구축
- 2030년까지
  가정용 친환경보일러 300만대 보급

서울형 친환경공사장 확대

- 2026년까지
  환경공사장 500개소로 확대(現 101개소 운영중)

※ 친환경공사장 기준
공사차량 실명제, 클린도로 책임제,
노후 건설장비 사용제한 등

첨단장비 활용 상시감시체계 운영

- 대형 공사장(연면적 1만㎡ 이상)
  IoT 비산먼지 상시 감시시스템 구축(70개소)
- 2023년 원격탐사시스템 시범도입

저공해 건설기계 사용 의무화

- 연면적 10만㎡ 이상('21년)
- 1만㎡ 이상('25년)
- 1천㎡ 이상 건설공사장('30년)

2022 서울, 친환경 도시로 나아가다.
10주년 국제세미나 서울 사례발표

02-2 숲으로 가득한 공원도시

생활권 공원 95만㎡ 조성 및 정비

매년 15만㎡ 규모 이상으로 추진

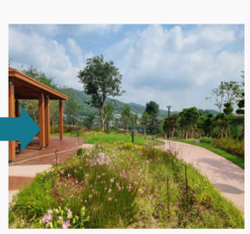
장기미집행 공원에 대한 연차별 생활권 공원조성 사업을 통해 시민체감도 높은 공원 서비스 제공 도모

무허가주택, 무단경작 등으로 훼손된 지역을 사람, 자연, 여가가 함께하는 생활밀착형 공원으로 조성(~ '26년)

관악산공원 경작지 및 산림쓰레기

경관 및 생태복원 준공 '21.10.

북악산공원 매공가, 훼손지



경관복원, 쉼터 등 준공 '21.7.

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2022 서울, 친환경 도시로 나아가다.

10주년 국제세미나 서울 사례발표

02-2 숲으로 가득한 공원도시

2022 | Seoul, Goes to Eco-Friendly City

도심 속 녹지 공간 확충

건물 옥상
녹화 조성

785개소 (2021년) → 1,000개소 (2030년)


옥상녹화(유네스코회관)

- 옥상공간을 활용한 녹지 조성으로 주민들에게 일상 속 녹색쉼터 조성
- 폭염 피해 완화, 미세먼지 저감 등 기후변화에 선제적으로 대응

학교, 어린이집 등
친환경 녹지공간 조성

403개소 (2021년) → 누적 500개소 (2030년)

- 학교, 어린이집 유휴공간에 학생들을 위한 다양한 녹지 조성 및 친환경 교육환경 제공
- 기후변화 대응 필요성 교육 및 생태탐구, 자연체험 등의 공간으로 조성

2022 서울, 친환경 도시로 나아가다.

10주년 국제세미나 서울 사례발표

02-2 숲으로 가득한 공원도시

2022 | Seoul, Goes to Eco-Friendly City

도심 속 녹지 공간 확충

교통섬, 교차로 유휴지 등
가로 띠녹지 조성

10만㎡
2026년 까지


띠녹지(성동구 행당로8길)

- 매년 가로수 500주 식재, 띠녹지 2만㎡ 조성, 편의시설 확충 추진

하천
생태숲 조성

18만㎡
2026년 까지


하천생태숲(중랑천)

- 42개 지천 제방 · 사면 등 하천생태 복원 및 녹화 추진
- 매년 2만㎡ 식재기반 조성 및 수목 · 초화류 식재

2022 | Seoul, Goes to Eco-Friendly City

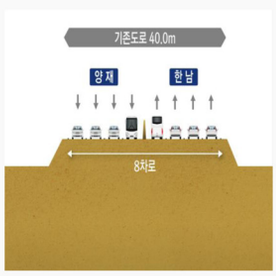
2022 서울, 친환경 도시로 나아가다.

10주년 국제세미나 서울 사례발표

경부간선도로 지하화 추진

경부간선도로는 극심한 지 · 정체와 도시 단절문제가 발생하는 도로
도로 지하화를 통해 만성 교통난 해소 및 단절된 동 · 서측 생활권 통합
지상부는 시민 여가공간 및 지역 필요시설 조성

경부간선도로 지하화 시뮬레이션

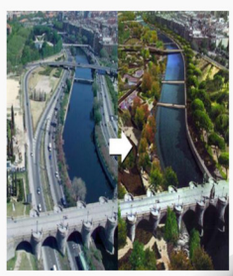


| 개선전

| 개선후

해외 사례

| 미국 보스턴 big dig 프로젝트



| 마드리드 만사나레스강변

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2022 서울, 친환경 도시로 나아가다.

10주년 국제세미나 서울 사례발표

02-3 물이 순환하는 물의 도시

기후변화 대비 서울형 도시물순환체계 구축

첨단기술 결합 스마트 물순환도시 조성 '26년까지 10개소

- 다양한 도시 물자원(빗물, 유출지하수, 중수, 재처리수) 통합 활용시스템 구축
- IT 기술을 활용하여 사업효과 모니터링 및 시민 홍보(폭염저감 효과 등)

물재이용시설 확충 '21년 1,637개소→'26년 2,157개소

- 빗물이용시설, 중수도 시설, 재처리수 공급대상 확대(매년 104개)
- 상수도 사용량 절감 및 하수처리부하 저감 효과

도심 하천의 자연성 회복 및 수변공간 확대

하천 및 주변 생태 복원 추진

- 복개하천 복원, 생태하천 조성, 유지용수 공급, 시민이용 복합공간 설치 등
- 2026년까지 6개 하천 우선 추진 [녹번천, 도림천, 중랑천, 성내천, 정릉천, 홍제천]

충분한 유량 확보, 바람길 형성 등을 통해 도심 열섬현상 완화

2022 | Seoul, Goes to Eco-Friendly City

2022 서울, 친환경 도시로 나아가다.

10주년 국제세미나 서울 사례발표

02-4 건물 100만호 에너지효율화 추진 | 노후건물 : 저탄소건물 전환

공공건물 저탄소건물 전환 3,000개소

경로당, 어린이집, 공공건물 대상


- 제로에너지건물(ZEB) 전환, 그린리모델링, 에너지효율화 등


〈남산창작센터 ZEB 전환(예시)〉

- 사업내용 : 제로에너지건물 인증등에너지성능 75% 이상 개선
- 총사업비 : 39억원

민간주택 · 건물 저탄소건물 전환 80만호

주택 · 건물, 저층 노후주거지, 가정 대상

- 민간 건물에너지 효율화 사례(서초구 마더스병원)

저소득층 저탄소건물 전환 20만호

노후 공공주택, 저소득층 대상

- 친환경보일러 교체 지원, 고효율LED 교체 사업 등
- 한국에너지재단 등 저소득층 에너지효율개선사업 적극 협업

2022 | Seoul, Goes to Eco-Friendly City

2022 서울, 친환경 도시로 나아가다.

10주년 국제세미나 서울 사례발표

02-4 건물 100만호 에너지효율화 추진 | 신축건물 : 제로에너지건물(ZEB)로 조성

공공건물 ZEB 의무화 선도적 도입

- 연면적 1천㎡ 이상('20년~), 5백㎡ 이상('21년) ZEB 단계적 의무화
- 2024년부터 모든 공공건물로 제로에너지건물 확대

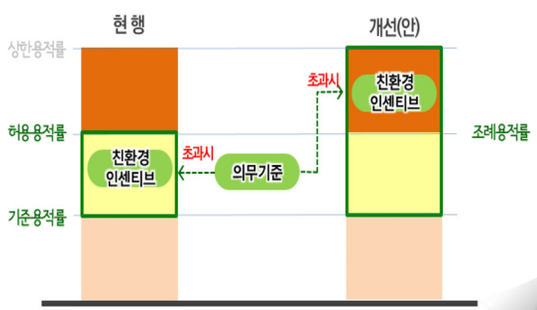
민간건물 ZEB 전환 가속화

- 연면적 10만㎡ 이상('23년~), 1만㎡ 이상('24년~), 1천㎡ 이상('25년~)

제로에너지건축(ZEB) 도입 시 용적률 인센티브 확대

적용대상	기반시설 기부채납 등에 한함 의무기준을 초과하는 친환경건축물까지 포함
인센티브 상한	시행령상 최대용적률의 120%

→ 친환경 건축물일 경우 법적 상한의 1.2배까지 용적률 완화 허용
→ 용적률 완화를 통한 친환경 건축 유도



02-4 건물 100만호 에너지효율화 추진

신재생에너지 확대

연료전지 보급 확산 2021년 147MW 2030년 600MW

- 도시기반시설(물재생센터, 차량기지 등) 활용 민자유치 추진
  '22년 추진실적 : 차량기지에 40MW 연료전지 유치
- 주유소 활용 'Total Energy Station(TES)' 확대 추진('21년~)
  '22년 추진실적 : 2개소 완료(금천구 박미주유소, 양천구 개나리주유소)


전기차 충전기 설치


연료전지 설치

수열 · 지열 · 소수력 등 신재생에너지 이용 확대

수열 도시개발사업에 열에너지 활용('21년 11MW → '30년 305MW)
'22년 추진실적 : 삼성서울병원 39.4MW 설계완료 및 착공

지열 건물 냉 · 난방 에너지로 활용('21년 232MW → '30년 600MW)
'22년 추진실적 : 평창동 미술문화복합공간 등 24개소 18MW 보급

소수력 수자원 낙차 활용 전력 생산('21년 0.5MW → '30년 5MW)


태양광 신기술 실증단지 현황 ①


태양광 신기술 실증단지 현황 ②

도심 특성에 맞는 태양광 보급 2021년 346MW → 2030년 800MW

- 도시 경관 · 미관을 고려한 태양광 보급 활성화 '22년 추진실적 : 태양광 15개 신기술 실증단지 운영
- 도심에 적합한 신기술 위주의 고효율 태양광 보급 추진 '22년 추진실적 : 건물일체형 태양광(BIPV) 민간보급 사업(3건, 12억)

02-5 폭우·폭설 등 기후재해 대비 안전도시 조성

가뭄·홍수 대비 상하수시설 집중관리

노후 정수센터 단계적 정비 4개 센터 180만톤/일('22~'33년)

장기사용 상수도관 정비 '21년 42km/년 → '26년 123km/년


비굴착 교체

굴착 교체

IoT 통신 활용
스마트 원격검침 구축

'21년 7,571개 → '26년 163,000개

① 공급량과 검침데이터 비교 분석
수돗물 생산 공급비용 절감 누수량 최소화
② 옥내 누수 조기발견
시민부담 및 민원발생 최소화
③ 각 가정에서 실시간 사용량 조회
이사정산 등 요금민원 해소
④ 방문검침에 따른 사생활 침해 요인 해소

[스마트 검침 체계도]

불량 노후 하수관로
종합정비사업 추진

'21년 203km/년 → '26년 312km/년


작업구 내부 구조검토


삼천역 사거리 작업구

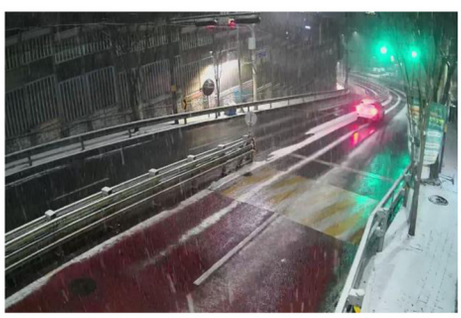
02-5 폭우·폭설 등 기후재해 대비 안전도시 조성

폭우·폭설 대비 도시기반시설 확충 및 안전관리

대심도 빗물배수터널 설치 27년 3개소, '32년 3개소 설치
| '27년: 강남역, 광화문, 도림천 / '32년: 사당동, 강동구, 용산구 설치

대심도 빗물배수터널(사진출처 : KBS)

폭설 대비 도로열선 확충 '24년까지 제설취약구간 완전해소 목표



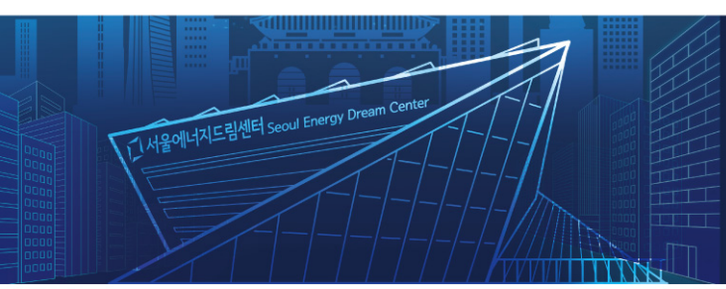
폭설 시 도로 열선 설치 효과

2022 서울, 친환경 도시로 나아가다.

10주년 국제세미나 서울 사례발표

Session 1

Climate mitigation in Umea



루카스 뢰힐링거(Lucas Röhlinger)

우메오 전략개발담당관


UMEÅ
KOMMUN
Presentation by
Lucas Röhlinger
Strategic development officer
Umeå, Sweden
Climate mitigation in Umeå.
How to drive sustainable development.
11 December 2022
Greeting from
Hans Lindberg
Mayor of Umeå, Sweden
International Seminar
– Celebrating 10th Anniversary of Seoul Energy Dream Center


Umeå
• Population – 130 000
• Average age – 38
• Universities – 2
• Students – Close to 40 000
• Nationalities represented – 130

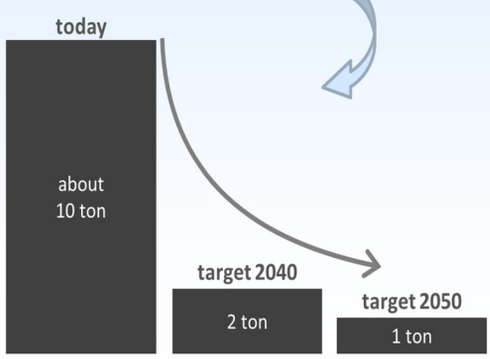

Social sustainability
Environmental sustainability
Economic sustainability
Cultural sustainability
Vision for Umeå
200,000 residents in 2050


Municipality Council objectives 2021-2024
Long-term goals
• Sustainable growth (200 000 inhabitants in 2050)
• Everyone can feel safe and secure
• Equality in terms of gender, background, chances etc.
• Climate neutral by 2040
UMEÅ KOMMUN

Umeås climate goals in stages

Comprehensive climate neutrality:

- Adopted by city February 2020
- Production perspective
- Consumption perspective



2025
- **Umeå Municipality** as climate neutral organisation

2030
- Climate neutral **City of Umeå**
- Agenda 2030

2040
- Climate neutral **Municipality of Umeå**
- Yearly consumption goal: 2 ton p.p.

2045
- Climate neutral **Sweden**

2050
- Consumption goal **Umeå**: 1 ton p.p.
- Climate neutral **EU**

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Climate city contract 2030

- Umeå is one of nine Swedish cities that have signed the first climate city contracts with the Swedish government.
- Umeå woks actively with consumption-based climate targets and behavioral change as well as sustainable lifestyle.
- Umeå was chosen to be 1 of 100 cities in the EU's mission on climate-neutral and smart cities

How will climate change affect Umeå and northern Sweden?

Increased temperatures

- ca 3 degrees (RCP4.5) or ca 6 degrees (RCP 8.5) by the end of the century.
- Largest temperature increases to occur in the winter, with up to 7 degree warmer temperatures aaccording to scenario RCP 8.5

Increased average rainfall

- ca 20-40 % increase depending on RCP scenario
- Largest increases in the spring. According to RCP8.5, up to a 50% increase in yearly rainfall in certain areas

Increased risk for droughts

- Amount of days with low ground humidity increase from 5-15 to 20-40 (RCP 4.5) or 25.50 (RCP 4.5) by end of century.

Source:
https://www.smhi.se/polopoly_fs/1.95723!/Menu/general/extGroup/attachmentColHold/mainCol1/file/Framtidsklimat_i_V%C3%A4sterbottens_l%C3%A4n_Klimatologi_nr_33.pdf

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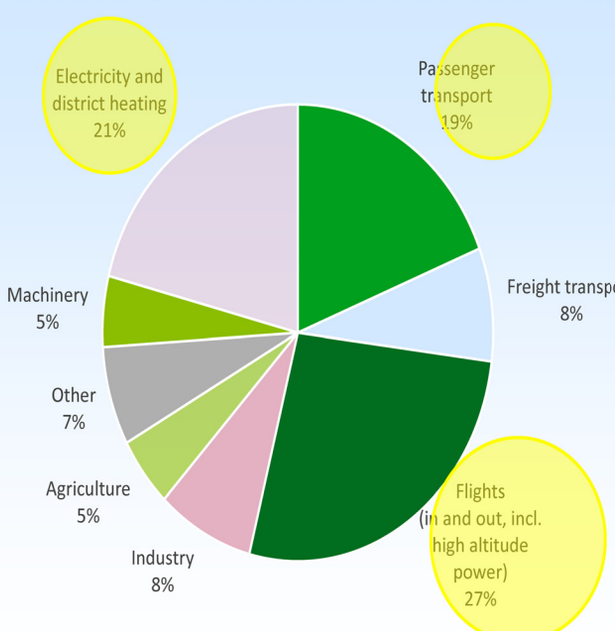
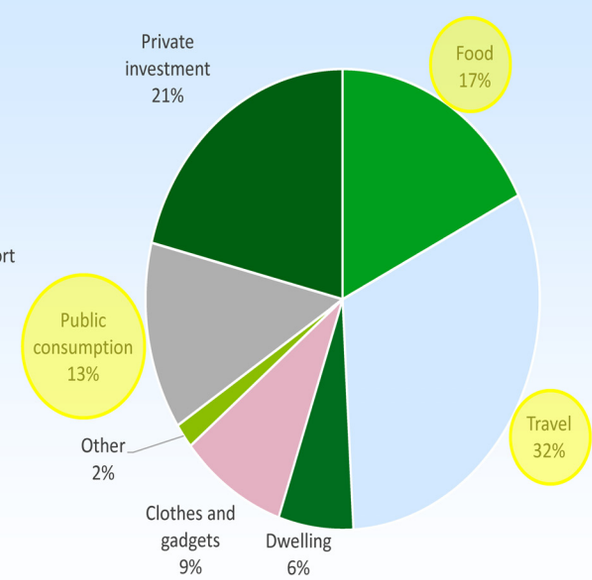
Climate emissions in Umeå – two perspectives



Territorial (393 000 tons)



Consumption based

(11,5 tons per person/year)

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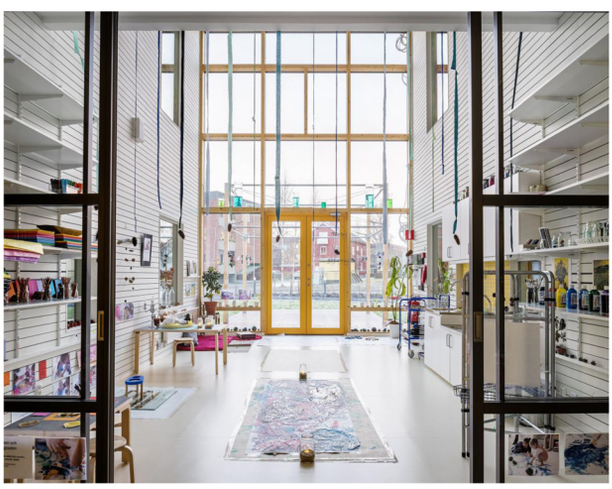
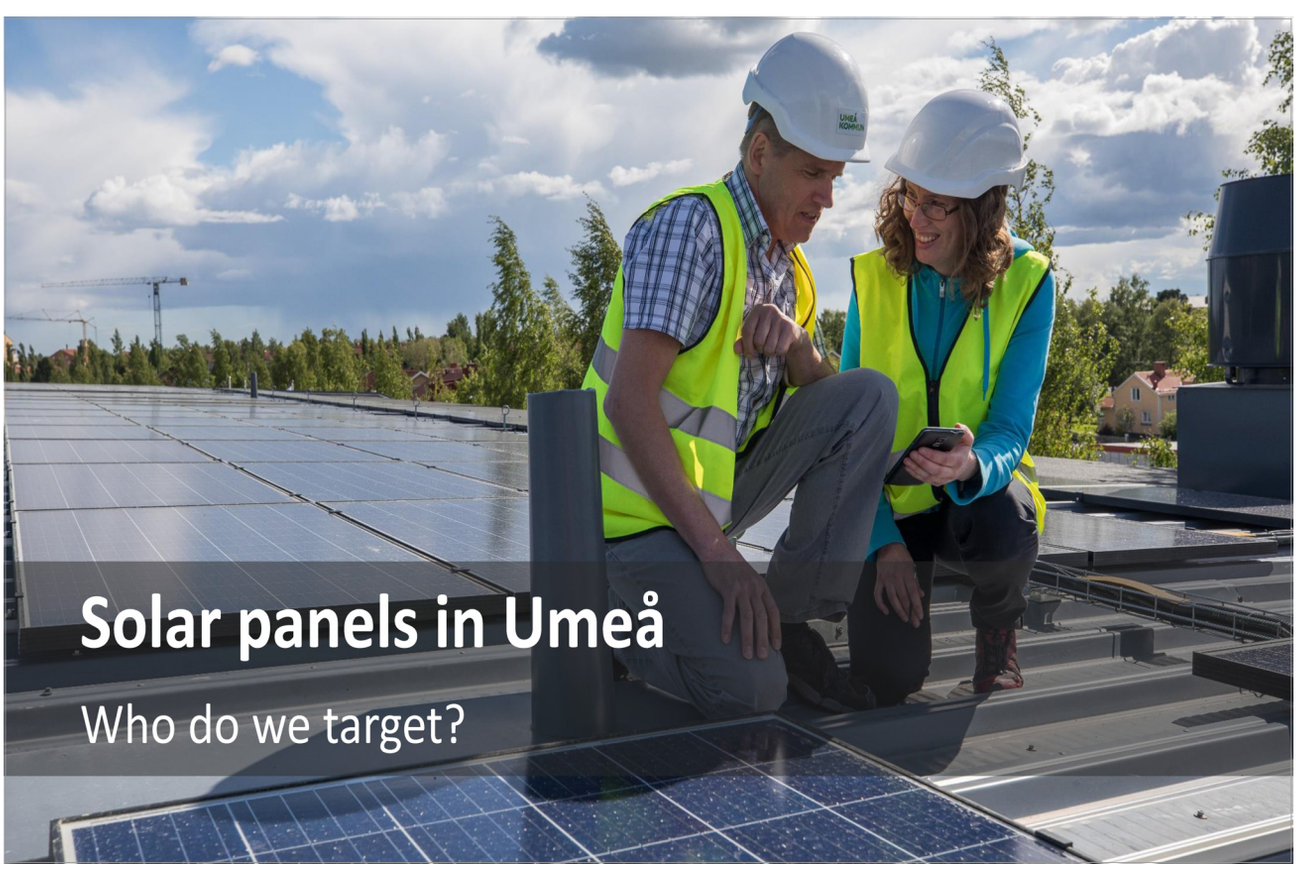
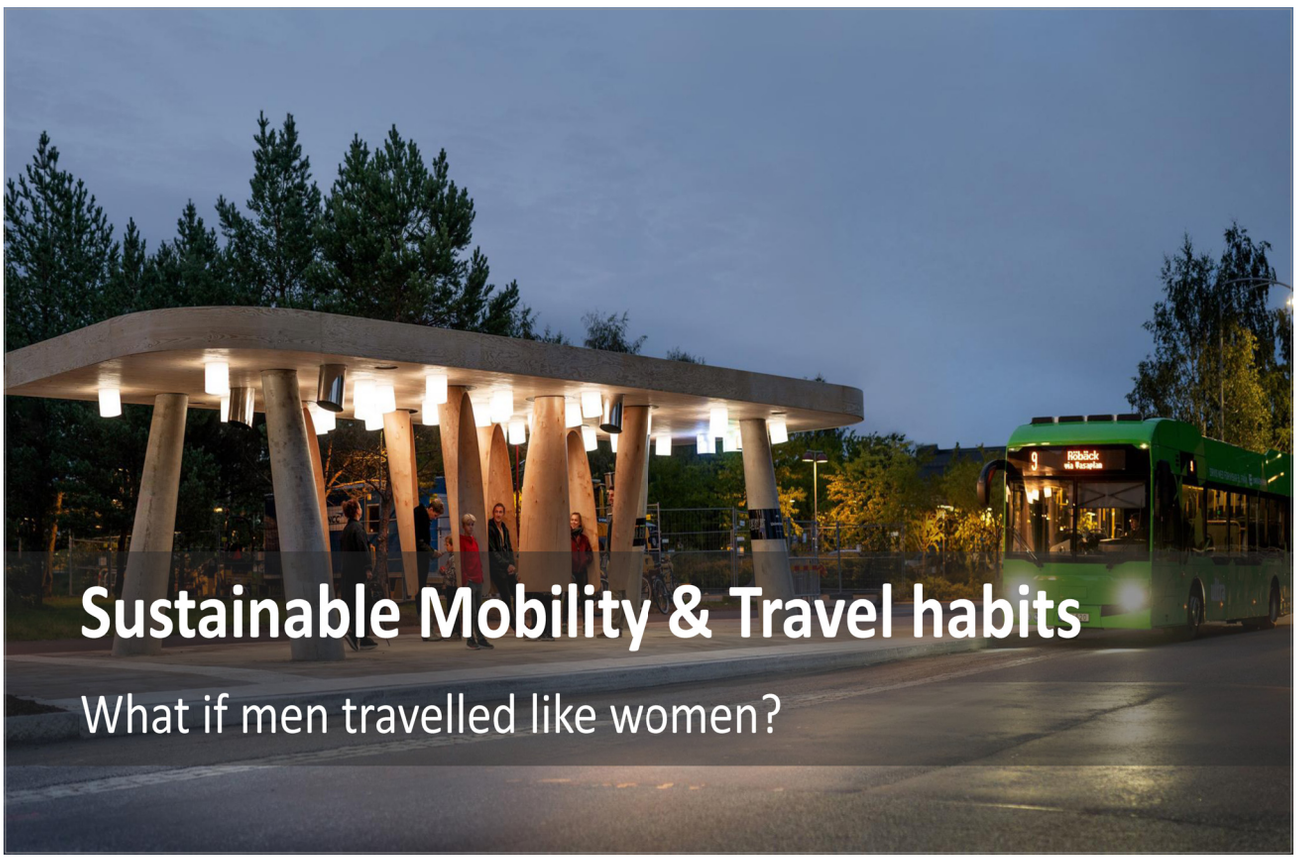
Energy efficiency
Preschool Hedlunda

The world's northernmost passive house.
Designated best practice reference






Sustainable Mobility & Travel habits
What if men travelled like women?


Challenging Consumer habits
collecting data, campaigns and support

Network for sustainable Restaurants in Umeå

Results

- Increased proportion of fossil free vehicles
- Strategies for sustainability communication with guests
- Increased number of plant-based menu items
- Reduced restaurant energy usage
- Increased recycling and food composting rates
- Phasing out of single use plastic products
- New partnerships and business with local producers

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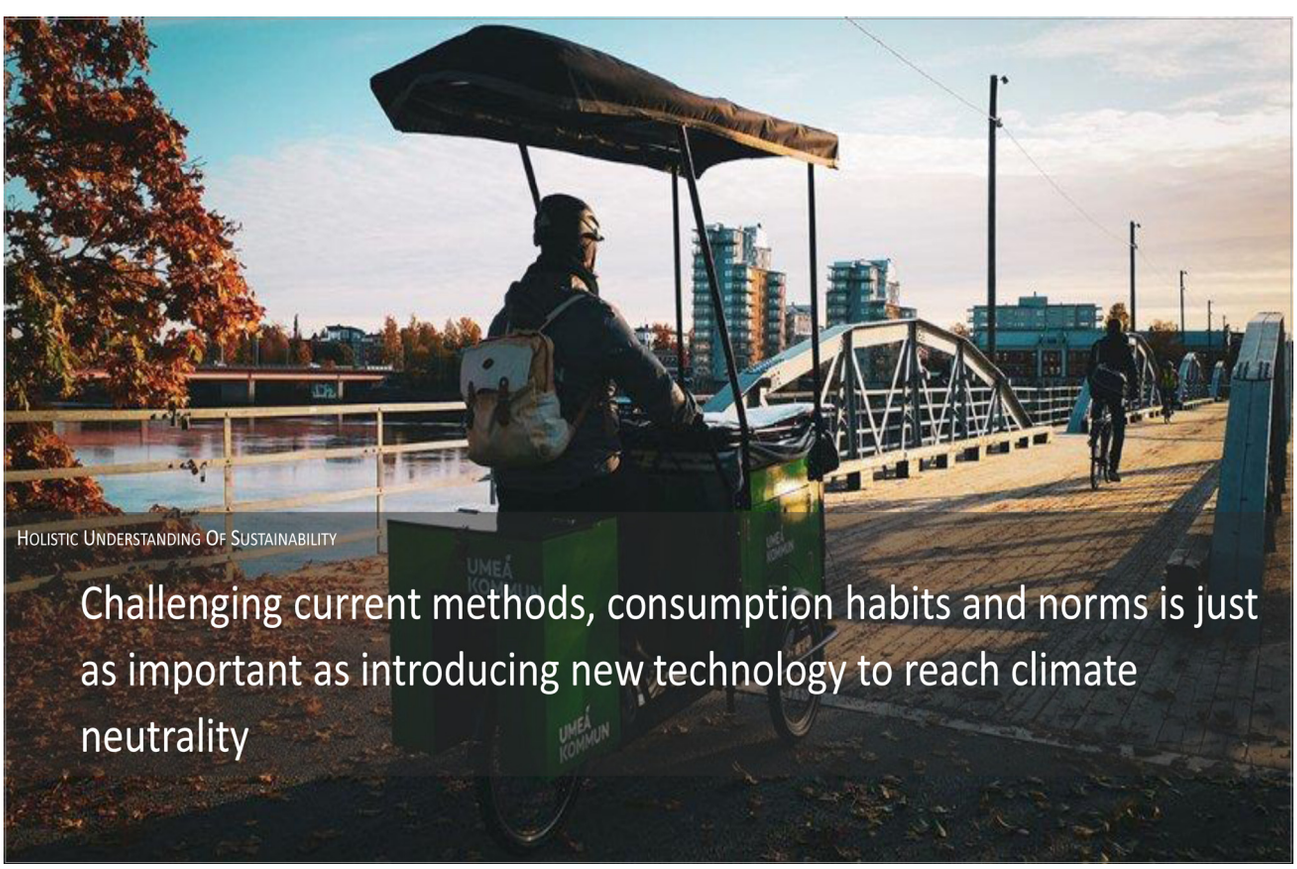
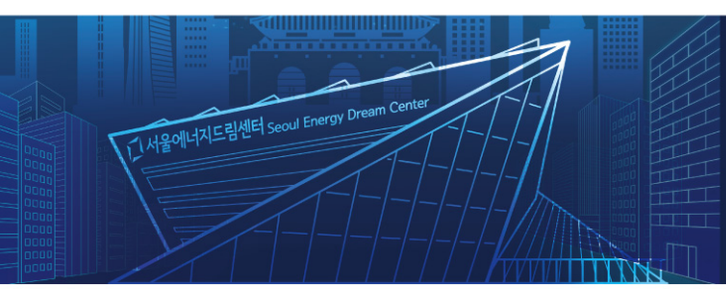



UMEÅ
KOMMUN
Thank you!
Lucas Röhlinger
MUNICIPALITY OF UMEÅ

Session 1

Climate Action in Cascais



조아오 디니스(Joao Dinis)

포르투갈 카스카이스시 도시전환국장

Cascais

.....

+ 97 km2

+ 30 km coastal line

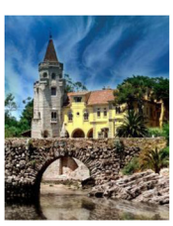
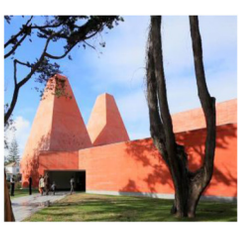
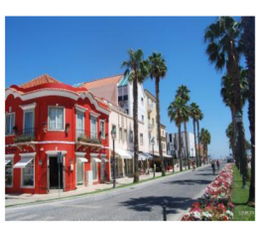
+ 1/3 of protected landscape

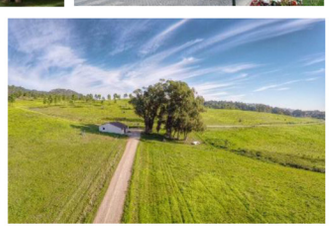
+ Metropolitan Area of Lisbon

+ Renowned tourist destination

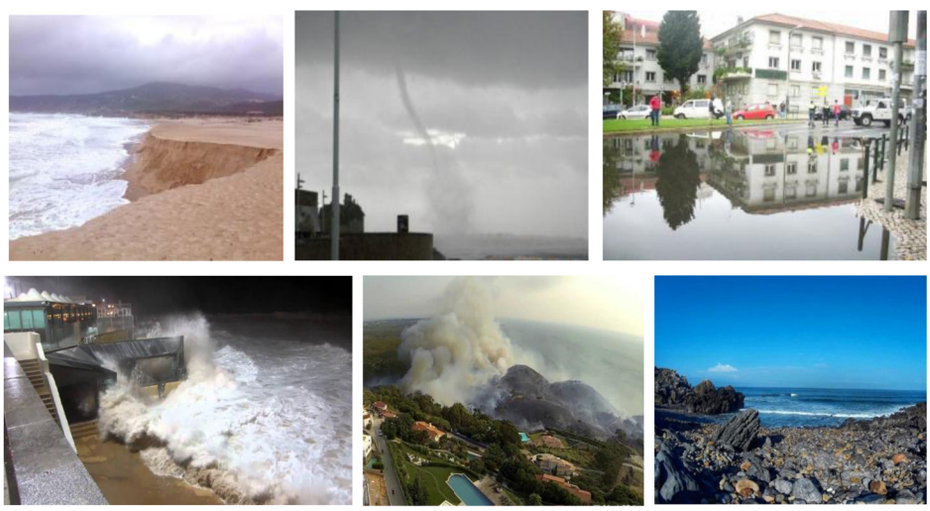
+ 206 000 inhabitants

+ Unrivaled heritage



Cascais



Strategy and Policy

Cascais is a frontrunning city on climate and sustainable policies. It has produced unrivaled policy support policies. This drives our action with a knowledge-based strategy.

+ **Strategic Plan for Climate Change in Cascais** (2009) is the first local climate change risk assessment with policy guidance.

+ **The Cascais Climate Change Adaptation Action Plan** (2017) defines a work frame of 80 actions to be implemented until 2030.

+ **Cascais SDG 2030** (2017) the first Portuguese localization process for the UN's sustainable development strategy.

+ **Carbon Neutrality Route 2050** (2020) the first municipal commitment towards carbon neutrality following the country's commitment to climate change.

Cascais' Action Plan for Climate Change Adaptation

	Adaptation Measures
1	Stakeholder awareness
2	Residual and pluvial water separation network
3	Sustainable school
4	Local alternatives to water supply
5	Green corridors and riverbeds requalification
6	Eliminate pollution in water beds
7	Reforestation in the natural park with native species and control of invasive ones
8	Full implementation on the fire prevention plan
9	Coastal erosion prevention actions
10	Contingency plan for heat waves
11	Vigilance and control of vector diseases
12	New urban green parks and natural infiltration areas
13	Legislation for bioclimatic architecture in urban areas

+ 13 Measures

+ 82 actions

+ €11 500 000 investment

+ Mostly "non-structural" or "green solutions".

+ "gray solutions" for water supply infrastructure

+ Transversal reply to the Sustainable Development Goals 2030

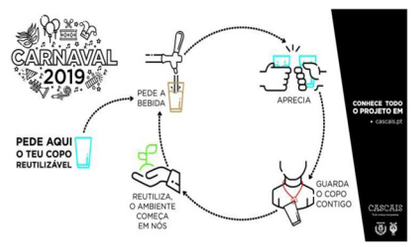
Adaptation: Awareness and Education

+ 30 000 citizens reached

+ 200 professionals trained

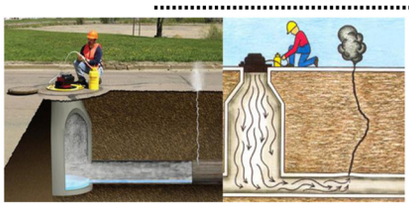
+ 20 communication actions

Adaptation: Awareness and Education



Adaptation: Awareness and Education

Adaptation: Water resources





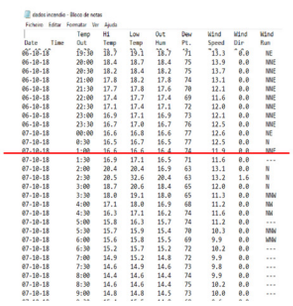

+ complete secondary water supply system (higher areas)

+ elevation stations maintenance and self-supply concluded

Adaptation: Water resources



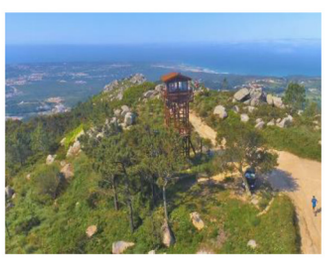

Adaptation: Civil protection and health



+ all year monitoring

+ all riverbed areas cleaned and monitored

+ information shared between health stakeholders



Adaptation: Civil protection and health

Adaptation: Ecological infrastructure and resilient urban green spaces

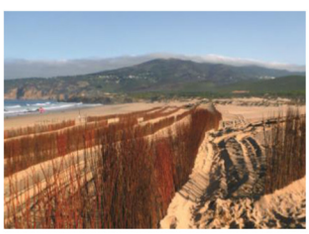
+ 17 autochthones species

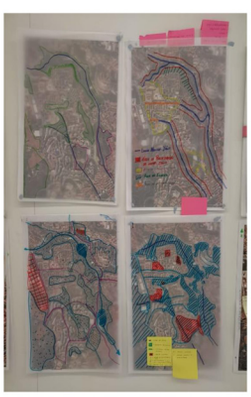
+ 5000 volunteers

+ best practice manual for urban green spaces design and maintenance

+ dune system maintained

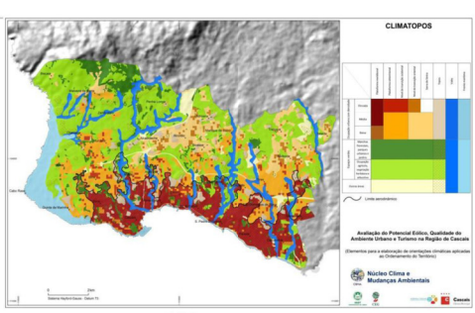
Adaptation: Ecological infrastructure and resilient urban green spaces





Adaptation: Ecological infrastructure and resilient urban green spaces

Adaptation: Spatial Planning



+ integrated team for urban process benefits under sustainable development principles

+ climate chart for urban processes

+ special ruling for large infrastructures

+ ecosystem services

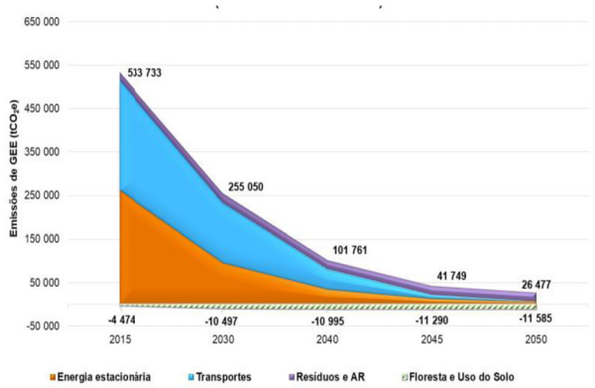
+ regulation for adaptation

Route to Carbon Neutrality 2050

+ The Cascais' Carbon Neutrality Route defines the transition goals and resources needs to change emission paradigm to comply with the Paris Agreement

+ An innovative assessement in Portugal intended to reduce **the 533 tk CO2e yearly emission rate to 15 kt CO2e**

+ A long term commitmnent aiming at societal change



Route to Carbon Neutrality 2050

+ Duly connected with the National Carbon Neutrality Route 2050, the Cascais strategy aims to ensure a structural and transversal change in the production chain to foment the use of new technologies and more efficiency circularity processes.

+ With some dependency with the national strategy (energy matrix), we propose a set of actions with local stakeholder responsability, meaning the town hall has a direct influence on the policies' outcomes.

Stationary Energy	- Renewable endogenous resources - Energy efficiency - electrification
Transports	- Electrification and alternative fuels - Promote smooth, shared and active mobility
Waste and water	- Reduce per capita waste and promote biowaste separation - Reduce organic mater in water by changing Food habits - End any landfill waste deposits
Forest and soil use	- Promote forest and green cover - Reduce forest fires - Promote forest productivity

Carbon Neutrality

+ Bridging the gap between stakeholders and citizens, increasing early adopters

+ Using positive feedback to generate change: gamification and incentives

+ Technology must benefit communities with tangible results (financial and environmental)

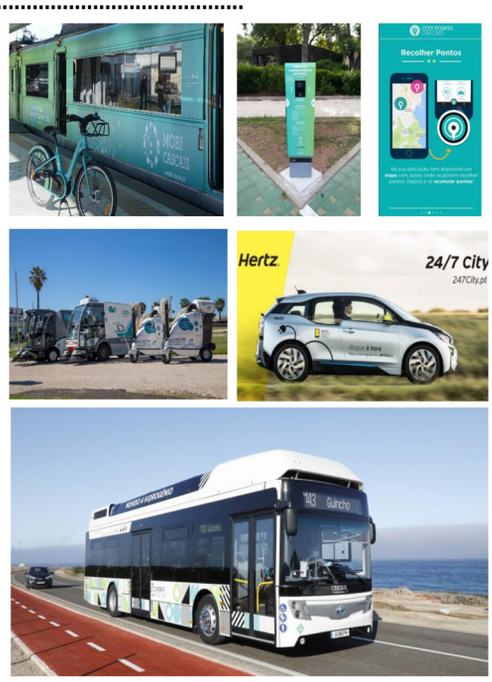
+ participatory processes reduce adoption risks

Mobility

+ Free public transport integrated with charging and bike sharing solutions and gamification wins. Partially financed by parking fees.

+ Promoting car sharing solutions and no polution zones

+ test bed for innovative urban transport solutions, including tax solutions

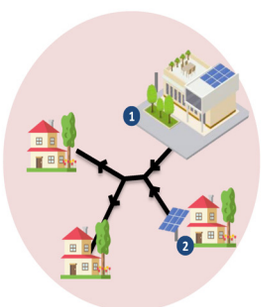


Energy Communities: Driving Forward

+ Aiming to develop community-based renewable production by installing 184 MW of solar energy through Local Energy Communities and respective feasibility studies

+ Implementing the first carbon neutral community pilot project in Portugal: "Cascais Smart Pole"

+ Connecting private investment and energy stakeholders to accelerate the deployment of energy communities



1 **Municipal Building, PU owned by EC**
Production is shared between EC members

2 **Private housing with PU owned by the EC**
Production is also shared between EC members

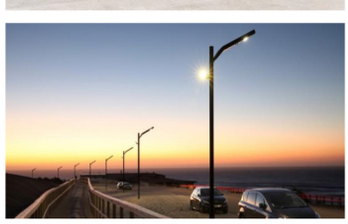
Public Engagement to "Lead by Example"

+ Public procurement process to implement over 33 photovoltaic solar energy production units in schools

+ Advancing with "inclusive communities" to foment energy efficiency in social housing programs through private capital investment

+ An Energy fund directed to families to support households efficiency investments (€3 Million)

+ contractual efficiency in public lighting systems (savings of €1,5M/year)



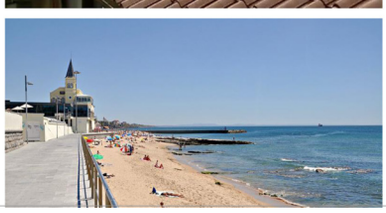
EU Innovation

+ Heavily investing resources on grant applications to foster consortiums of knowledge for energy transition and climate action

+ 10 Horizon Europe and LIFE grants achieved on decarbonization, energy, adaptation and awareness

+ 4 EEA Grants for innovative pilot projects

+ Supporting the Portuguese Government for the green economy efforts with the economic restoration project collaboration



Waste innovation

Carbon sink and biodiversity

In short

+ **Pilot projects** can lead the way to surpass challenges related to regulation and procurement.

+ Climate action planning is **now law bidding,** and all cities must comply. An opportunity to further green economy and innovative energy/planning approaches.

+ **Cost-Benefit analysis** is crucial to further resilience policies.

+ Carbon neutrality (together with adaptation) **is the next big challenge for private investors,** companies, cities and families altogether. The main driver of change for the decades to come.

+ **Team coordination** and knowledge leveling were unexpected challenges

+ Non-structural actions, such as training and awareness should be considered **a priority for action momentum where** we can easily change our methods of collaboration.

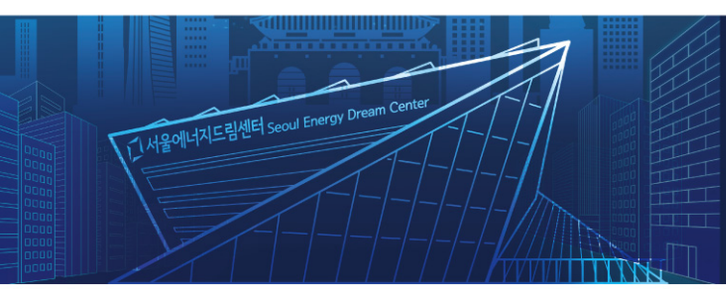
+ Most actions which tackle vulnerabilities are **nature-based solutions.**

+ Cities must ensure the inclusion of adaptation actions in **planning instruments and construction regulation.**


CASCAIS
Tudo começa nas pessoas
João Dinis joao.dinis@cascaisambiente.pt

Session 1

Co-creation for the sustainable development of "MIYAKO"



미기와 타카하시(Migiwa Takahashi)

교토 환경 활동 협회(KEAA) 환경교육담당

Co-creation for the sustainable development of "MIYAKO":

Working toward Initiatives to expand environmental activities to achieve carbon neutrality.

Migiwa Takahashi
Environmental Education Office,
Kyoto Environmental Activities Association

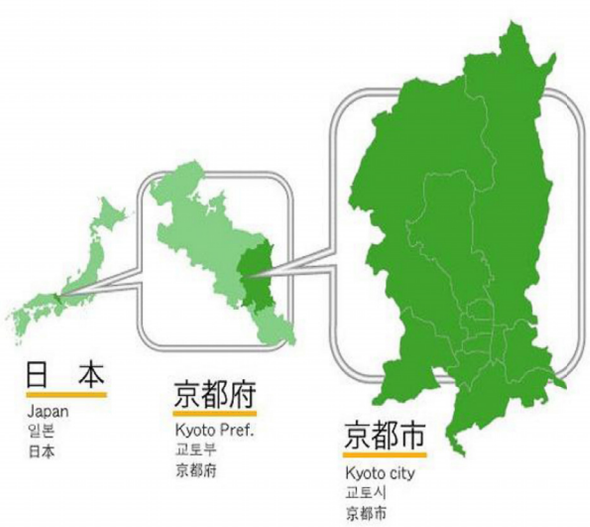
Contents

Profile

- NAME: Migiwa Takahashi (she)
- Graduated from Ritsumeikan Asia Pacific University in 2022(B)
- Started working at Kyoto Environmental Activities Association (KEAA) in April 2022
  In charge of International Program and Project, Environmental Education Office such as JICA Partnership Program in Malaysia, JICA Knowledge Co-creation program

PROFILE PAGE 03

Urban characteristics of Kyoto City



Birthplace of the Kyoto Protocol
Environmental model city

Capital of Japan in the 8th–19th century

Coexistence and harmony with varied natural settings

Inland large city
in which 1.46 million people live

Civil and regional power
backed by the tradition of self-government

A city home to universities
in which 39 universities and junior colleges are concentrated and 150,000 students study

Manufacturing city where advanced technology flourishes on the basis of excellent traditional industry

17 World Cultural Heritage sites*
* Kyoto City and adjacent areas

Outline of Kyoto City Program of Global Warming Countermeasure <2021–2030>

<Position of the Plan>

The plan was formulated as an implementation plan for "**10 years of action," which is very important to realize a decarbonized society achieving "net zero carbon dioxide emissions in 2050,"** a long-term target stipulated in the ordinance.

<The Target Image of the Society of Kyoto City in 2050>

"Prosperous Kyoto where future generations can have a dream," where decarbonization, along with the improvement of quality of life and sustainable economic development, are achieved through integration of culture and wisdom fostered in symbiosis with nature, and new technologies

<Basic Concept of the Actions>

- Fostering momentum by sharing a sense of crisis and a vision of ideal society with all actors, and promoting actions in entire Kyoto City.
- Developing global warming countermeasures to enrich Kyoto's future by simultaneously solving social and economic problems
- Constantly evolving measures by collecting the latest knowledge and introducing new technologies and systems
- Collaborating with the national and local governments in Japan and abroad to strengthen international communication and sharing of actions and information so that Kyoto will take a lead in decarbonization

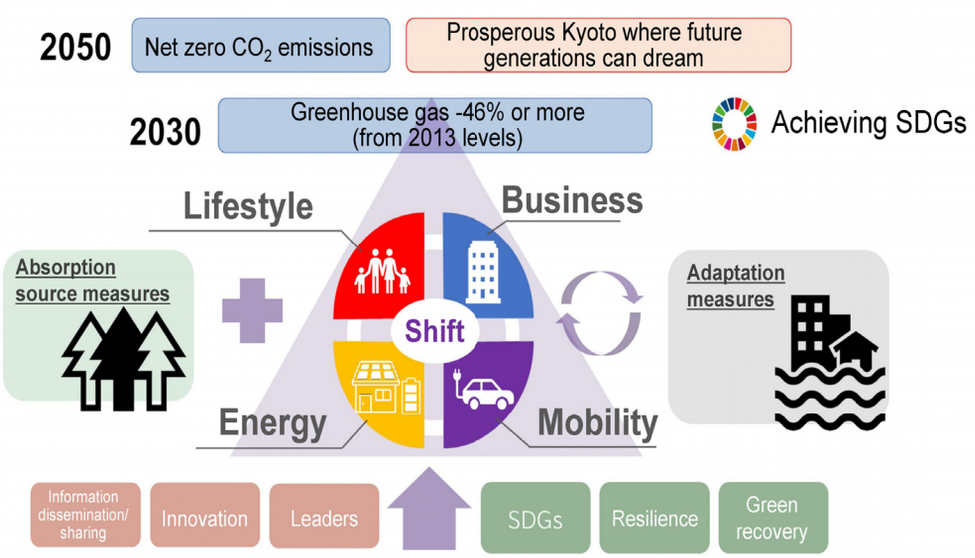
<Reduction Target>

Reduce greenhouse gas emissions from the Kyoto area by "at least 40% from FY2013 levels by 2030"

*In September 2021, in response to national trends, the City announced that it would aim for **a 46% reduction by FY2030.**

Overview of How to Proceed with Actions

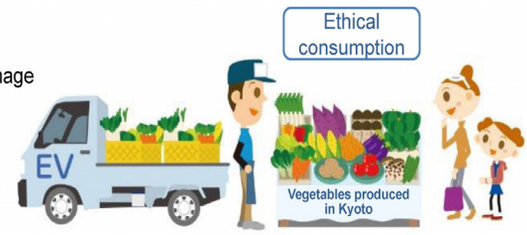
- Shift in four areas: lifestyle, business, energy and mobility
- Aiming to accelerate energy conservation and expand renewable energy while reflecting the concepts of offering and sharing information that leads to actions, encouraging innovation, promoting SDGs, and realizing green recovery
- Taking absorption source measures of forests, etc., which are essential for achieving "net zero emissions"
- Proceeding with these mitigation measures and adaptation measures to mitigate the effects of climate change in a comprehensive manner



Shift of Lifestyle

1 Dissemination and establishment of "a decarbonized lifestyle in Kyoto's version"

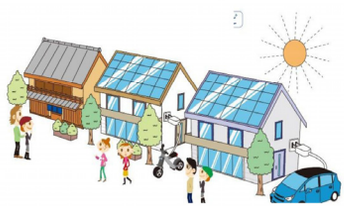
- Formulation of a lifestyle image and creation of a system to share the image
- Practice in cooperation with local communities
- Promotion of actions initiated by all actors



2 Promotion of ethical consumption

- Shift in consumption behavior (waste reduction)
- Promotion of local production for local consumption and food culture in Kyoto
- Dissemination of new consumption styles

Energy conservation houses, ZEH, etc., that are unique to Kyoto by making use of the features of traditional townhouse



3 Improvement in the quality of life by introducing energy-saving home appliances and renewable energy at home

- Popularization of new houses with high environmental performance such as ZEH
- Promotion of energy conservation measures in existing houses, condominiums, etc.
- Promotion of energy-saving home appliances and residential facilities

4 Fostering of leaders to support the shift to a decarbonized lifestyle

- **Enhancement of environmental learning according to life stage**
- **Development of human resources for environmental activities in local communities**

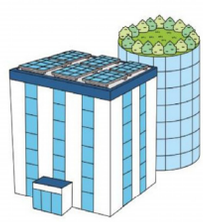
5 Innovation toward 2050 – Lifestyle –

- Research on new mechanisms for changing awareness and behavior

Shift of Business

6 Promotion of further measures in business activities

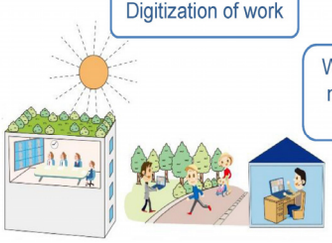
- Further promotion of actions by mass emission enterprises
- Promotion of voluntary reduction actions by small and medium-sized enterprises and enhancement of support
- Promotion to control CFC emissions



Buildings, etc. with net zero CO_2 emissions

Digitization of work

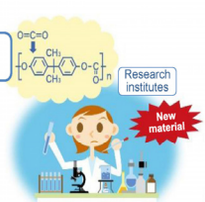
Working style that is not bound by place and time



7 Creation of a system to create a virtuous cycle between the environment and the economy

- Promotion of a shift to environmentally friendly business and working styles
- Promotion of green finance
- Promotion of sustainable tourism

Innovation



8 Innovation toward 2050 – Business –

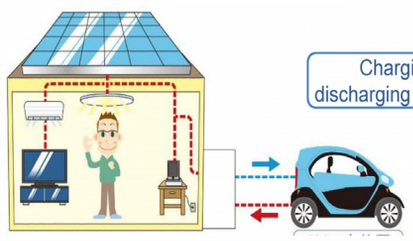
- Research and development of new technologies and creation of new business through industry–academia–government collaboration

20

Shift of Energy

9 Maximum use of renewable energy in the City

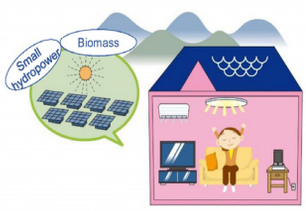
- Promotion of the installation of solar panels, etc.
- Utilization of local resources such as biomass and small hydropower
- Promotion of the installation of renewable energy equipment based on the ordinance



Necessary energy is supplied by installing solar panels

10 Promotion of the use of renewable electricity

- Creation of a system to encourage the demand side to select
- Establishment of a supply system in cooperation with other regions



Selecting 100% renewable energy plan

11 Promotion of renewable energy supply by energy suppliers

- Requests and proposals to electricity companies and the national government
- Support for renewable energy supply business

12 Innovation toward 2050 – Energy –

- Survey and research toward the establishment of a distributed energy system

Kyoto City's unique initiatives (introduction of measures)

City-to-City Renewable Energy Partnership

- Signed "Renewable Energy Partnership Agreement" with Aizu Wakamatsu City (Fukushima Prefecture) to meet our city's demand for renewable energy
- Create local vitality through cooperation

Signing ceremony with the mayors of both cities

EE-Den

System that allows easy group purchase of renewable electricity at a low cost

Shift of Mobility

A town that does not depend on fossil fuel automobiles

13 Promotion of urban development that prioritizes public transportation

- Improvement in the convenience of public transportation and promotion of its use
- **Development of a town where people enjoy walking and promotion of walking in daily life**
- Use of bicycles in various situations

14 Popularization of next-generation vehicles such as EVs

- Promotion of the popularization by disseminating multifaceted functions
- Improvement in the environment for the use
- Research toward decarbonization of urban transport

15 Shift of the awareness of using automobiles

- Promotion and practice of eco-driving
- Promotion of carsharing
- Promotion of efficient logistics

16 Innovation toward 2050 – Mobility –

- Promotion of research toward realization of mobile services based on new technologies and concepts

Kyoto City's unique initiatives (introduction of measures):
Promotion walking in Kyoto

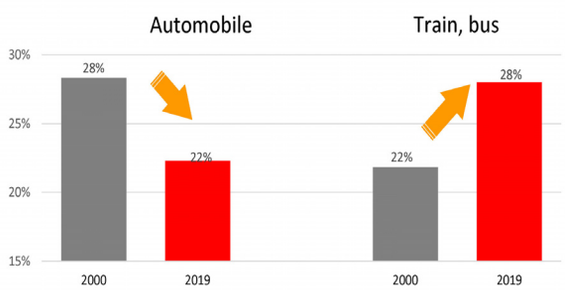
- Widening sidewalks on the main street (Shijo-dori)

- Number of lanes: 4 lanes ⇒ 2 lanes
- Sidewalk width: Approx. doubled
- Amount of traffic: Approx. 40% reduction

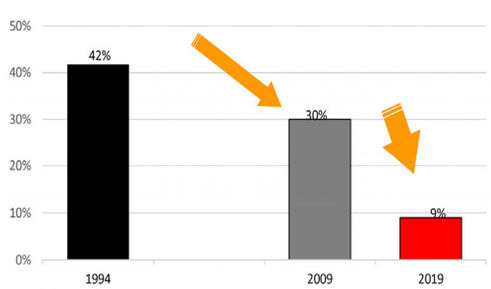
- Park-and-Ride

To promote an eco-friendlier way of traveling, parking lots near railroad stations in the city's periphery are introduced on the city's website throughout the year as "Park and Ride Parking Lots".
(7,816 spaces in 167 parking lots (as of 2021))

Allocation of means of transportation



Ratio of visitors to Kyoto by car



Among these, Kyoto Environmental Activities Association(KEAA)

is particularly focused on

Efforts to change the behavior of citizens

Support for environmental activities in the community and

Human resource development

Shift of Lifestyle

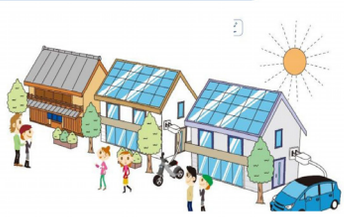
1 Dissemination and establishment of "a decarbonized lifestyle in Kyoto's version"

- Formulation of a lifestyle image and creation of a system to share the image
- Practice in cooperation with local communities
- Promotion of actions initiated by all actors

2 Promotion of ethical consumption

- Shift in consumption behavior (waste reduction)
- Promotion of local production for local consumption and food culture in Kyoto
- Dissemination of new consumption styles

Energy conservation houses, ZEH, etc., that are unique to Kyoto by making use of the features of traditional townhouse



3 Improvement in the quality of life by introducing energy-saving home appliances and renewable energy at home

- Popularization of new houses with high environmental performance such as ZEH
- Promotion of energy conservation measures in existing houses, condominiums, etc.
- Promotion of energy-saving home appliances and residential facilities

4 Fostering of leaders to support the shift to a decarbonized lifestyle

- Enhancement of environmental learning according to life stage
- Development of human resources for environmental activities in local communities

5 Innovation toward 2050 – Lifestyle –

- Research on new mechanisms for changing awareness and behavior

About us

"Kyoto Environmental Activities Association(KEAA)" was established **to promote the public interest for environmental activities** especially through the works in Kyoto Municipal Center for Promotion of Environmental Protection (Miyako Ecology Center, established in 2002).

ABOUT US

Our Mission

- **Co-creation for the sustainable development of "MIYAKO"**

*Sustainable
⇒ SDGs / Decarbonized society, recycle-oriented society, and society in harmony with nature / Post covid-19 resilience

*MIYAKO
⇒ **Kyoto,** cities, urban areas, and local communities
⇒ **Base, hub, and platform** where people, goods, money, and information gather
⇒ **History, culture, economy, and society lasting for 1,000 years** / Tradition (conservation) and innovation (experiment) / Education and human resources development.

OUR MISSION

Our Work

- Administration of “Kyoto Municipal Center for Promotion of Environmental Protection (Miyako Ecology Center)”
- Eco-School districts support center（Supporting environmental activities in communities）
- International programs & projects
- Consulting for environmental activities / human resource development etc.

OUR WORK

Administration of “Kyoto Municipal Center for Promotion of Environmental Protection (Miyako Ecology Center)”

京エコロジーセンター

Founder : Kyoto City
Designated Administrator : KEAA
Established in 2002, as COP3 Memorial Hall

HUB facility for …
- Environmental Learning (awareness raising)
- Supporting Environmental activities
- Providing information for eco-friendly lifestyle

Administration of “Kyoto Municipal Center for Promotion of Environmental Protection (Miyako Ecology Center)”

Hands-on Displays

Administration of “Kyoto Municipal Center for Promotion of Environmental Protection (Miyako Ecology Center)”

【ECO SORA KIDS】

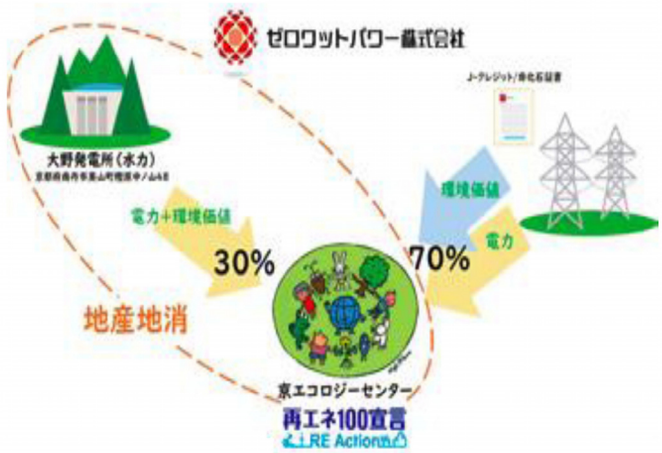
Target: 1~4graders and their families
（Year-round program）

Using the fields and biotope on the roof of Miyako ecology centre as a field, participants will engage in activities such as planting rice, sowing seeds, and observing living things. Grown crops are used for dyeing or cooked and eaten.

Through activities,
promote the families who practice eco-life at home by learning about food, culture, the connection between normal life and nature, and circulation.

Administration of “Kyoto Municipal Center for Promotion of Environmental Protection (Miyako Ecology Center)”

【Achieved 100% renewable energy】



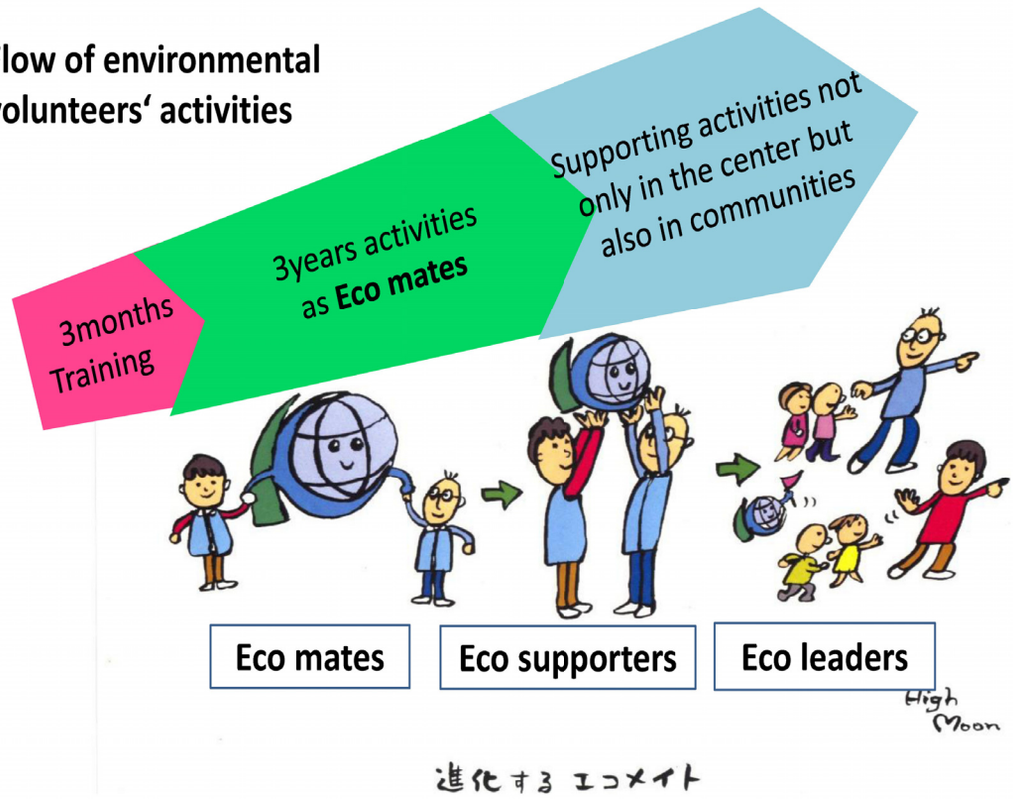
Administration of “Kyoto Municipal Center for Promotion of Environmental Protection (Miyako Ecology Center)”

【 Training & Managing Environmental Volunteers as human resources to spread environmental activities 】

•Eco mates **69**
•Eco supporters **182**
→Total number of volunteers : **251**
Graduated from Eco mate…more than 300!

【 As of Dec 2022 】

Flow of environmental volunteers' activities



Kyoto City's unique initiatives (introduction of measures)

Eco-School District Project worked on in each school district

- The Eco-School District Project, which aims at changing the current lifestyle to an environmentally friendly one and reducing CO_2 emissions in the household sector by encouraging 222 local communities to promote eco-activities is carried out as a project undertaken from Kyoto City on contract.
- This initiative is supported **by the Eco-School District Support Center established within the Miyako Ecology Center.**

Event that enables participants to learn about food loss and enjoy cooking under the guidance of professionals
[Hoen school district]

Learning that vegetable waste from restaurants becomes compost in fields and experiencing the planting of sweet potatoes [Fushimi Ward]

Experience in learning about the local community and climate change by creating fishways for *ayu* in the Kamo River

【EE Leader training】

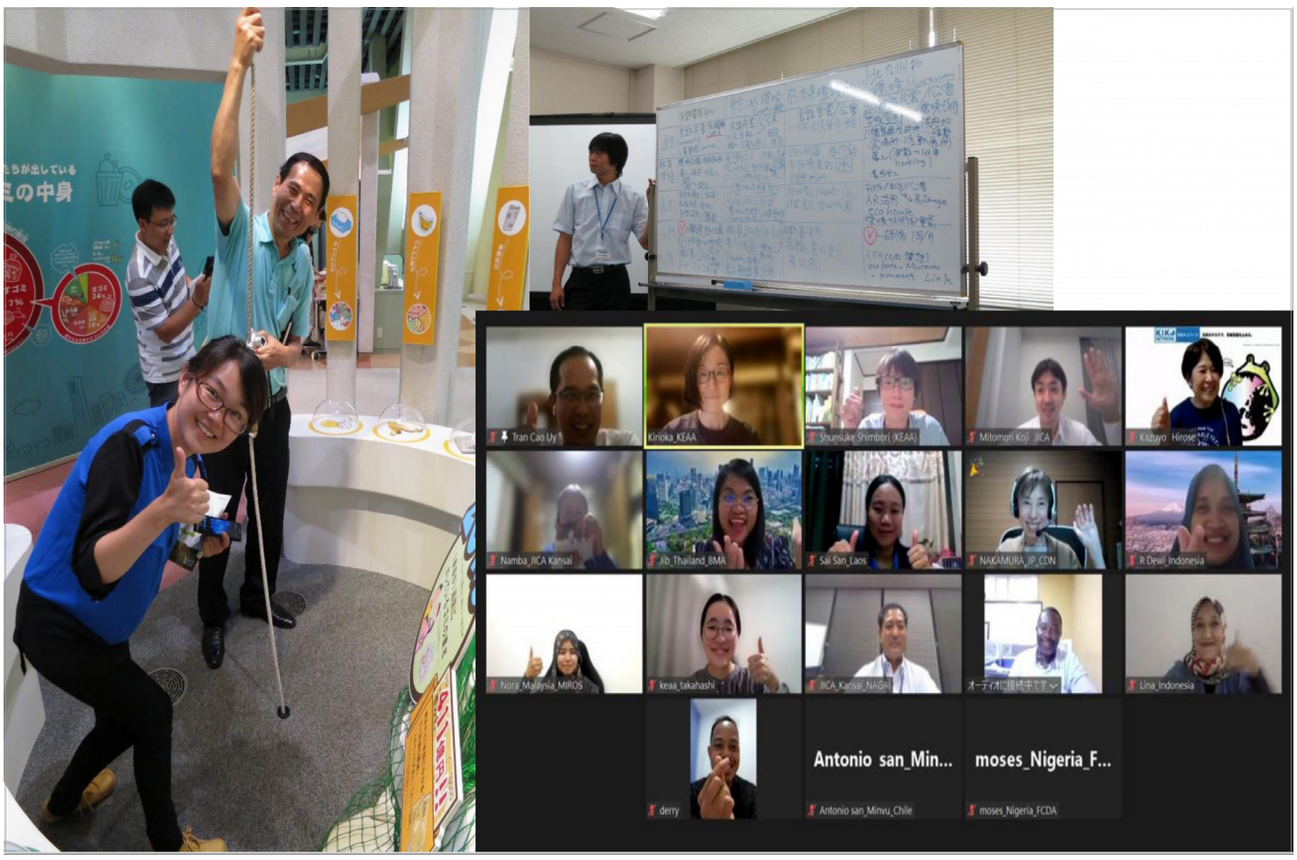
- More than 300 citizens have been participated.
- They are also spreading environmental education & activities in their own field.

【International programs & projects】

- “Project for Environment Friendly Society Building” in China (Training program for “Environmental Education and management of environmental education facilities / dispatch of experts from KEAA)
- JICA’s Knowledge Co-creation program “Enhancement of Solid Waste Management Capacity (Advance, Planning and Policy)”
- JICA’s Knowledge Co-creation program “Capacity development of local governments for sustainable and carbon-neutral urban development”

- JICA’s Partnership Program “Capacity building and Community development for Low-Carbon Society” Project in Malaysia
- The Nikkei Training Program

Number of JICA courses : 17
Accepted 108 persons
from 30 countries.
(As of Dec 2022)


Tran Cao Uy
Kinioka_KEAA
Shunsuke Shimbori (KEAA)
Mitomori Koji_JICA
Kazuyo Hirose
Namba_JICA Kansai
Jib_Thailand_BMA
Sai San_Laos
NAKAMURA_JP_CDN
R Dewi_Indonesia
Nora_Malaysia_MIROS
keaa_takahashi
JICA_Kansai_NAGAI
Lina_Indonesia
derry
Antonio san_Min...
Antonio san_Minvu_Chile
moses_Nigeria_F...
moses_Nigeria_FCDA

Our relation with Korea

- MoU with Ecobuddy Institute, a Korean incorporated association, on April 15, 2019 for mutual cooperation in promoting environmental education and ESD.

Director Mr. Oh Chang-gil and KEAA's former chairman Mr.Takatsuki

Climate Change Education workshop with Korean organization (March 2018)

Thank you!

Migiwa Takahashi
Environmental Education Office,
Kyoto Environmental Activities Association
takahashi@miyako-eco.jp
www.keaa.or.jp

THANK YOU!

서울,
탄소중립
친환경도시로
나아가다.

Session 2

탄소중립 친환경건물 사례

▌탄소중립도시 실현을 위한 서울시 최초 제로에너지 공공건물 10년 운영사례

신동철, 서울에너지드림센터 시설운영국장

▌헴스워스 건축사 대형 목조건축의 사례

존 헴스워스(John Hemsworth), 브리티시컬럼비아 대학교 건축학 교수,
Hemsworth Architecture 대표

▌Woha의 친환경건축물 사례

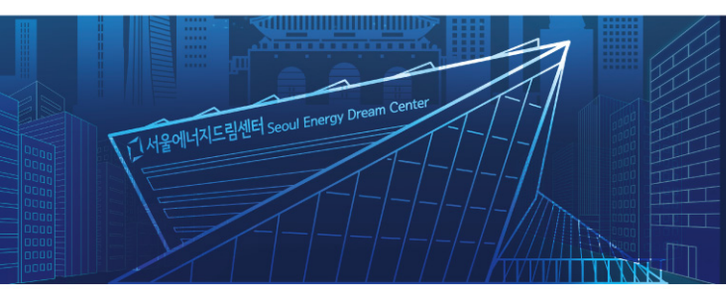
웡만썸(Mun Summ Wong), 싱가포르 국립대학교 건축학과 교수,
WOHA Architecture 창립이사(CV)

▌Building a Circular Future

니클라스 놀소에(Niklas Nolsoe), Business Development Director at Lendager(CV)

Session 2

탄소중립도시 실현을 위한 서울시 최초 제로에너지 공공건물 10년 운영사례



신동철, 서울에너지드림센터 시설운영국장


ZERO ENERGY BUILDING
탄소중립도시 실현을 위한
서울시 최초제로에너지공공건물
서울에너지드림센터
10년 운영사례
CARBON NEUTRAL CITY
ZEB
서울특별시
서울에너지드림센터
Seoul Energy Dream Center


서울에너지드림센터(SEDC) 소개
• 건축개요
• 연혁
• 건물에너지 운영현황 및 성과
ZEB 건축모델제시: 2012 START ZEB
• SITE
• 디자인 컨셉
• 적용기술
서울에너지드림센터 건물운영 사례
• ZEB 운영의 구체적 기준 설정
• ZEB 운영의 체계화
• 건물에너지성능 유지·개선
• 건물에너지 모니터링
• ZEB 최적화 운영
탄소중립도시 실현을 위한 ZEB운영 과제:
2022 Beyond ZEB
서울특별시
서울에너지드림센터
Seoul Energy Dream Center
탄소중립도시 실현을 위한
서울시 최초제로에너지공공건물
서울에너지드림센터
10년 운영사례
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ZERO ENERGY BUILDING
CARBON NEUTRAL CITY

서울에너지드림센터(SEDC) 소개

건축개요

목표

- 기후변화와 제로에너지건축 전문 전시교육관

비전

- '탄소중립도시,서울'을 견인하는 시민참여 에너지전환 플랫폼


항공뷰


외부 전경


태양광


로비


드림갤러리


전시관 내부

대지위치	서울시 마포구 증산로 14	연면적	3,762.32m²
지역지구	자연녹지지역	건폐율	15.84% < 20%
주요용도	전시홍보관	용적율	25.83% < 50%
대지면적	13,039.00m²	규모	지하1층, 지상3층
건축면적	2,065.91m²	구조	철골, 철근콘크리트 구조
ZEB 인증	3등급 에너지자립율(60.37%)		
계약전력	300kW		
에너지원	전기만 사용 (도시가스, 지역난방, 석유 등 사용안함)		

서울에너지드림센터(SEDC) 소개

연혁

서울특별시 서울에너지드림센터 Seoul Energy Dream Center

- 2007 서울시 에너지제로하우스 건립계획 수립
- 2008 설계
- 2009 착공
- 2012 준공
- 2012 건물에너지효율등급 인증 (1등급)
- 2012 녹색건축 인증
- 2012. 12. 12 **서울에너지드림센터 개관**
- 2016 아시아어워드 선정
- 2018 제로에너지건축물 인증 (3등급)
- 2021 환경교육부분 환경부 장관상 수상
- 2022 녹색건축대전 운영부분 국토부 장관상 수상

서울에너지드림센터 건물운영 사례

ZEB 운영의 구체적 기준 설정

서울특별시 서울에너지드림센터 Seoul Energy Dream Center

에너지자립률보다 구체적 기준이 필요

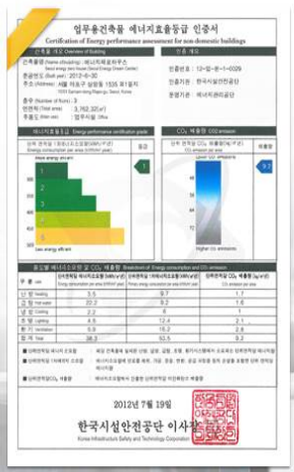
- 기후변화와 제로에너지건축 전문 전시교육관

ZEB 인증서류 부족

- ECO2 시뮬레이션 결과는 실제 에너지소비량과 다르다
- 건물들의 에너지성능 등급 기준

도입된 건물에너지시뮬레이션 사례

- 실제 에너지소비량 예측 (일반건물의 80% 감축)
- 적정 태양광발전설비용량 산정
- 연간 에너지생산량과 설비별 에너지소비량을 설계기준과 비교 가능



서울에너지드림센터 건물운영 사례

ZEB 운영의 구체적 기준 설정

서울특별시 서울에너지드림센터 Seoul Energy Dream Center

ZEB 목표

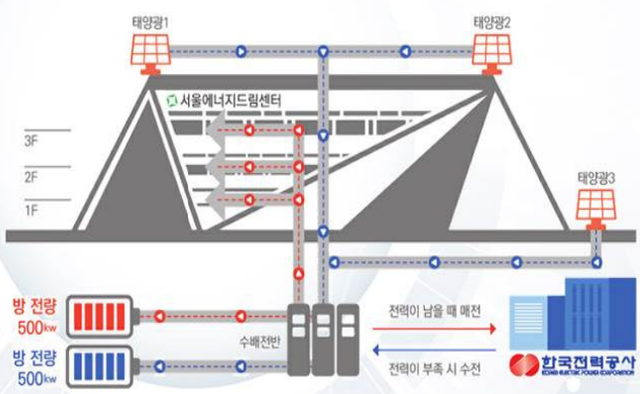
- 건물 외부로부터 에너지공급을 최소화

ZEB 특성

- 전기화 건물 (전기만 사용)
- 한국전력공사 (중앙공급형에너지 공급망)
- 2012 건물에너지효율등급 인증
- 동적 에너지시뮬레이션 진행

운영기준

- 피크전력 최소화
- 태양광발전 활용도를 높임
- 설계 시 건물에너지성능 (요구량, 소비량, 생산량)



서울에너지드림센터(SEDC) 소개

건물에너지운영현황 및 성과

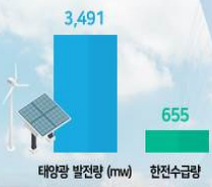
서울특별시 서울에너지드림센터 Seoul Energy Dream Center

운영현황

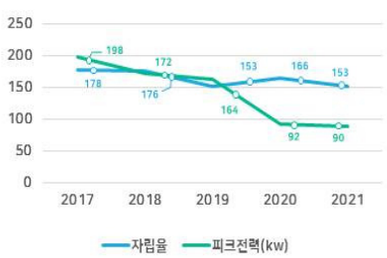
- 10년간 에너지자립 100%를 실현
- 2000년부터 피크전력 100KW이하
- 전력판매금 198백만원

운영성과

- **ZEB 건축모델을 제시** | 2012년 완공된 최초의 ZEB 공공건물이며, 2018년 ZEB 본인증으로 최초로 3등급 (당시 최고등급) 인증건물
- **건축분야 탄소중립 실현가능성 증명** | 10년 운영기간 에너지자립 100%를 실현
- **제로에너지건축물 확산의 중추적 역할을 수행** | 60만명 이상의 방문객과 ZEB 선문교육과 컨설팅



최근 5년 에너지자립률 및 피크전력 현황



구분		'13.	'14.	'15.	'16.	'17.	'18.	'19.	'20.	'21.	'22.10월	합 계
태양광 발전량 (MW)		347	364	363	361	344	368	359	343	337	305	3,491
총 전력 소비량 (MW)	소계	152	170	182	187	201	214	240	206	227	214	1,993
	자체발전 소비량	102	124	126	132	133	144	158	133	149	137	1,338
	한전 수급량	50	46	56	55	67	70	82	74	78	77	655
전력판매량 (MW)		174	181	180	179	205	224	200	210	188	167	1,908
전력판매금 (백만원)		26	25	17	14	16	21	18	14	16	31	198

2014~2020년 전기차 충전 사용량 포함

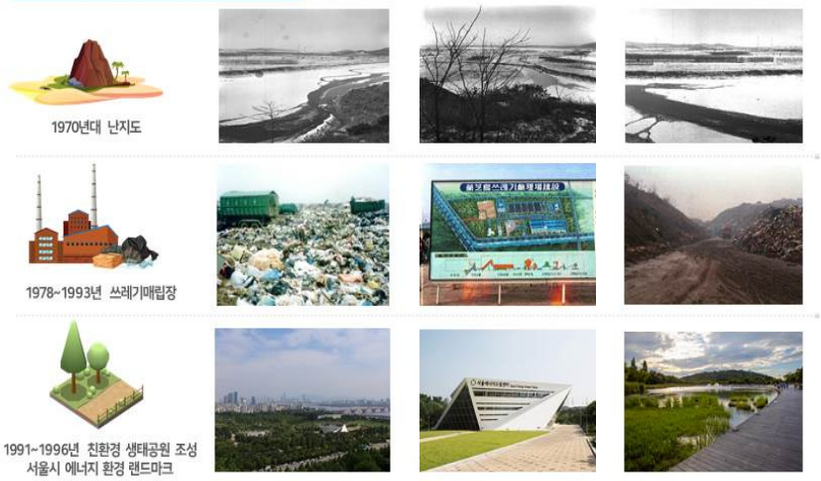
2021 START ZEB

SITE

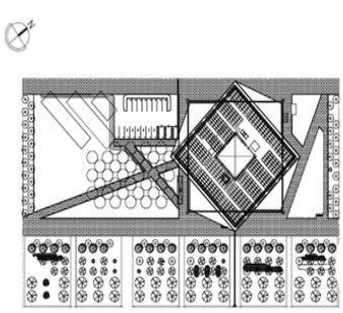
서울특별시 서울에너지드림센터 Seoul Energy Dream Center

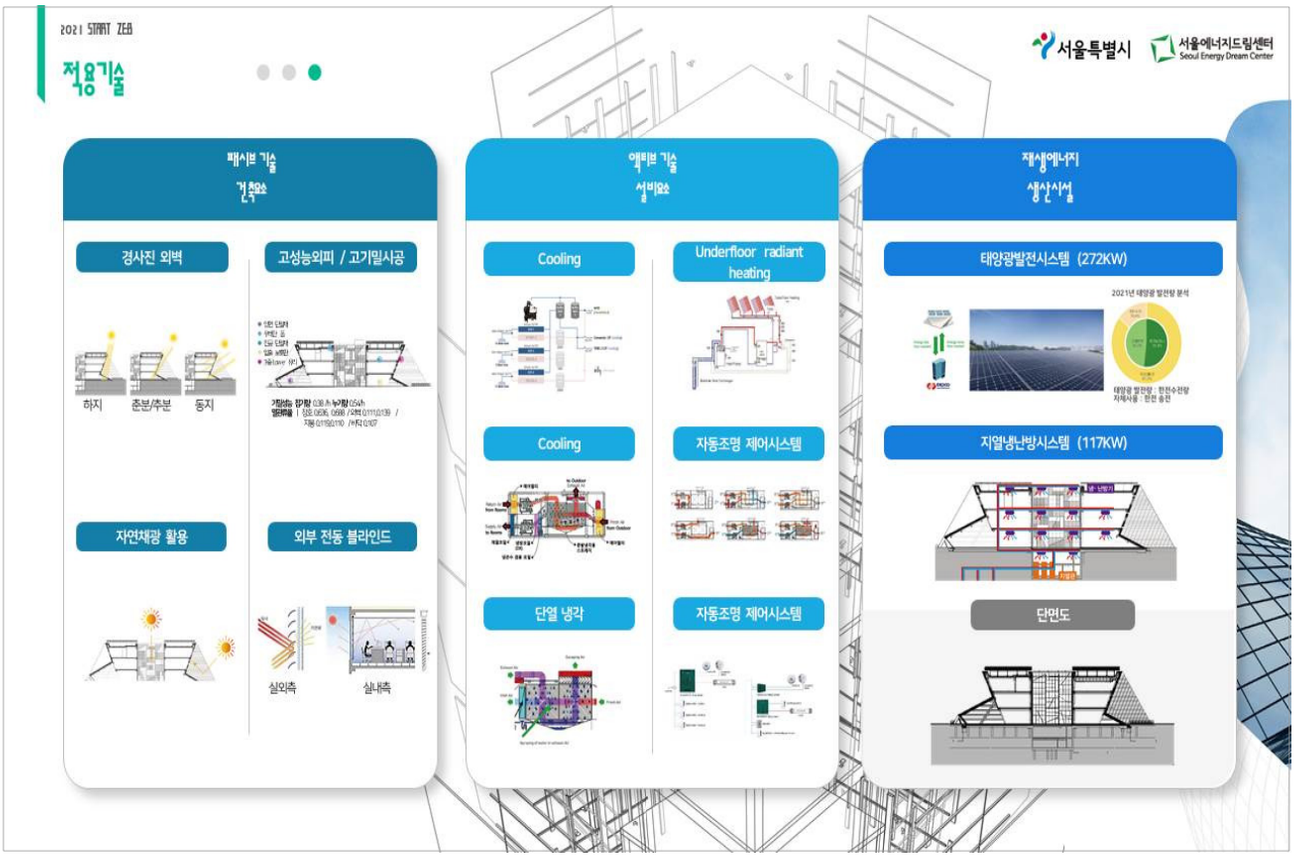
- SEDC가 위치한 곳은 쓰레기매립장을 복원하여 만든 평화의 공원 내에 위치
- 평화의 공원, 월드컵경기장, 서울에너지드림센터는 서울시의 에너지와 친환경 랜드마크

상암동 월드컵 평화의 공원 내



배치도




2021 SMART ZEB
적용기술
서울특별시
서울에너지드림센터
Seoul Energy Dream Center
패시브 기술
건축요소
경사진 외벽
고성능외피 / 고기밀시공
하지
춘분/추분
동지
자연채광 활용
외부 전동 블라인드
실외측
실내측
액티브 기술
설비요소
Cooling
Underfloor radiant heating
Cooling
자동조명 제어시스템
단열 냉각
자동조명 제어시스템
재생에너지
생산시설
태양광발전시스템 (272KW)
지열냉난방시스템 (117KW)
단면도


서울에너지드림센터 건물영 사례
ZEB 운영의 체계화
서울특별시
서울에너지드림센터
Seoul Energy Dream Center
건물에너지 모니터링
• 최적화 운영의 데이터베이스구축
• 피크전력관리
• 건물에너지효율화 효과 확인
건물에너지성능 유지 개선
• 준공 후 건물에너지성능 감소
• 유지기간 경과 후 성능 개선 필요
• 건물에너지효율화 사업
ZEB 최적화 운영
• 외부에너지 공급량을 최소화하기 위해서는 운영의 체계화가 필요
• 건물에너지성능 유지 개선, ZEB 최적화 운영, 건물에너지모니터링
ZEB 운영의 체계화
• 피크전력 최소화
• 태양광발전 활용도를 높임
• 자동제어시스템의 고도화

서울에너지드림센터 건물운영 사례

건물에너지 유지 · 개선

서울특별시 서울에너지드림센터 Seoul Energy Dream Center

전문기관 인증

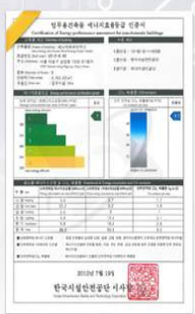
- 2012 건물에너지효율등급인증 1등급
- 2018 ZEB 인증 3등급

시설물 성능 모니터링

- 준공 후 건물에너지성능 감소
- 유지기간 경과 후 성능개선 필요
- 2020 주요설비성능진단 컨설팅
- 2021 건물에너지성능진단 컨설팅

건물에너지효율화 사업

- 2018~2019 LED 조명 교체
- 2018 EES 설치
- 2022 히트펌프 국산 교체



건물에너지성능 유지 개선 기준

- 설계 시 건물 에너지 시뮬레이션

서울에너지드림센터 건물운영 사례

건물에너지 최적화

서울특별시 서울에너지드림센터 Seoul Energy Dream Center

기술세미나

- 2019 한국제로에너지건축물 잘 운영되고 있는가? 세미나
- 2022년 제로에너지건축물 통합운영기술과 성과측정 및 검증

태양광발전 최대활용 사례

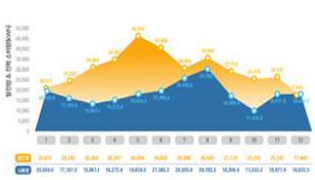
- 태양광발전 시간 설비활용
- 2018 ESS 구축
- ex) 전기차 충전

건물에너지 최적화 운영보고서

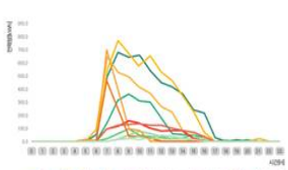
- 2018~ 2021 데이터분석
- 2019년 2021년 운영보고서 발간

제어시스템 고도화

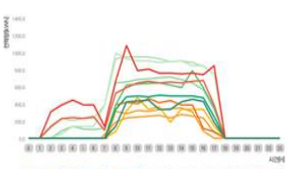
- 2013 설비제어시스템 구축
- 2013 자동조명제어시스템 구축
- 2018 외부블라인드제어시스템
- 2021 피크전력 알람기능
- 2022 BEMS 연계



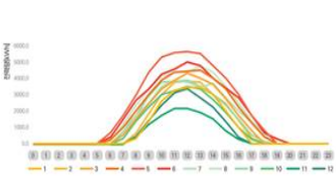
월별-시간별 태양광발전용량 (2019)



월별-시간별 지열사용량 (2019)



월별-시간별 공조기 사용량 (2019)



월별-시간별 태양광발전용량 (2019)

서울에너지드림센터 건물운영 사례

건물에너지 모니터링

서울특별시 서울에너지드림센터 Seoul Energy Dream Center

모니터링 대상

- 실시간 에너지생산소비모니터링
- 설비성능 모니터링
- 실내외 기상 데이타
- 시설물 유지관리 이력

기타 모니터링

- 2015 시설물 유지관리 이력 통합데이트베이스
- 2018 클리마체크(냉동기, 히트펌프)
- 2021 실내환경센서 설치

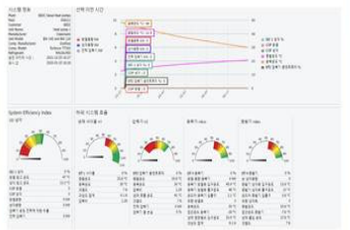
건물에너지 모니터링 목적

- 최적화 운영의 기본 데이터베이스
- 피크전력관리
- 건물에너지효율화 효과확인
- 건물에너지최적화 운영보고서

건물에너지관리시스템(BEMS) 구축 및 고도화

- 2013 데이터베이스 구축
- 2018 BEMS 구축
- 2021 BEMS고도화 계획수립
- 2022 신규 BEMS 구축

SCADA 건물에너지제어 및 모니터링



클리마체크 냉동기, 히트펌프 운전 모니터링

실내공기질 모니터링 (온도, 습도,CO2,미세먼지,라돈)

탄소중립도시 실현을 위한 ZEB운영 과제

2022 Beyound ZEB

서울특별시 서울에너지드림센터 Seoul Energy Dream Center

ZEB 운영방안 체계화

- **최적화 운영의 데이터베이스구축**
- 피크 전력 관리
- 건물 에너지 효율화 효과 확인

ZEB 전문교육 확대

- 대학교 학생, 현장 실무자 교육 (인증, 운영, 설비, BEMS 분야)
- **ZEB 공공시설물 운영 실무자 교육**
- 정책, 기획 담당 공무원 교육
- 교육청, 학교와 연계한 교육

탄소중립을 위한 ZEB 운영방안 마련

- ZEB건물과 건물분야탄소중립은다름
- **ZEB 건물 운영이 일반건물의 건물 에너지효율화와다르듯이 탄소중립 건물은 ZE**
- 운영 부분 온실가스 감축 성과 측정 및 검증 미흡
- 전기화, 지역화 확대 필요

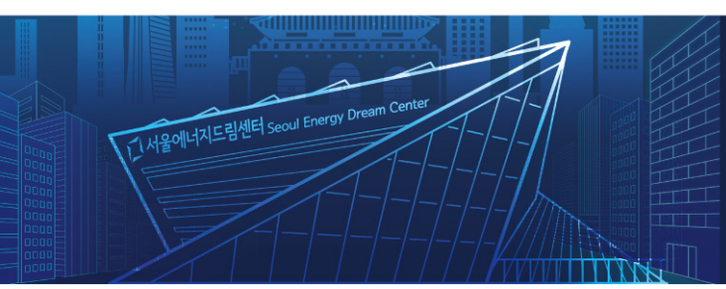
정책 제도적 과제

- **ZEB 의무화에 따른 양적 확대**
- 건축 후 사후관리 제도 부재로 운영 분야 관심 저조
- 건물 에너지 효율화 등급 인증, ZEB 인증 갱신 기준 마련
- ZEB 등급별 건축기준단가 산정


ZERO ENERGY BUILDING
SEOUL
탄소중립도시 실현을 위한
서울시 최초제로에너지공공건물
서울에너지드림센터
10년 운영사례
감사합니다
CARBON NEUTRAL CITY
ZEB
서울특별시
서울에너지드림센터
Seoul Energy Dream Center

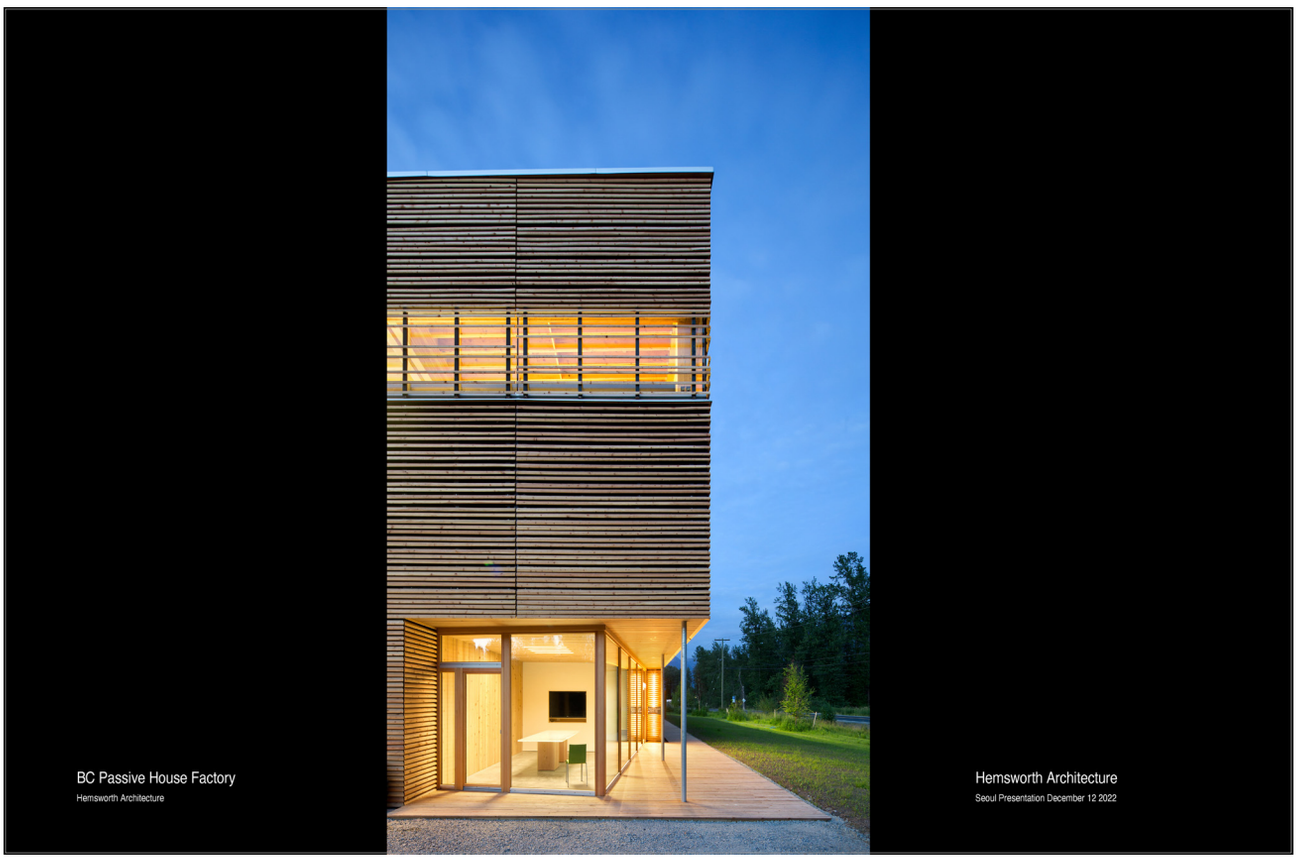
Session 2

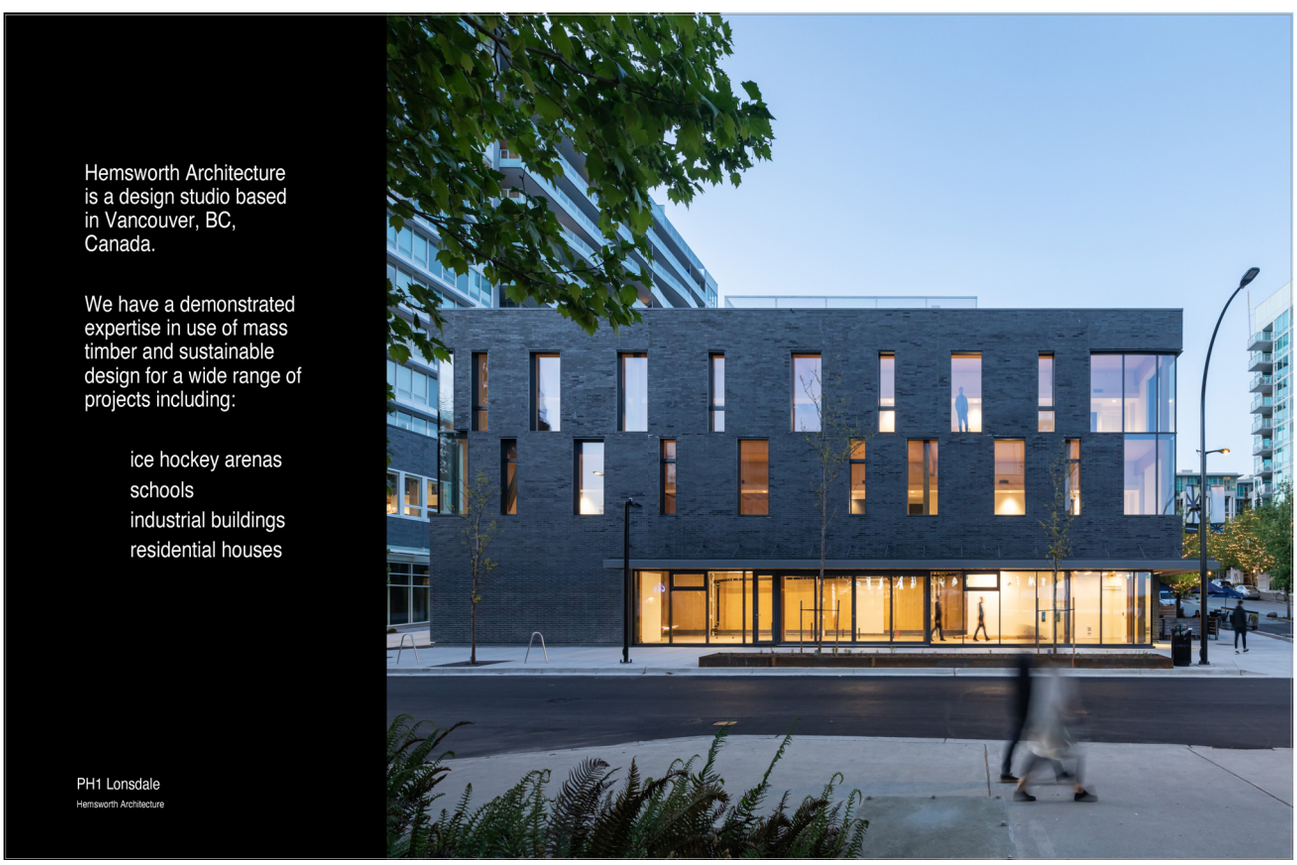
헴스워스 건축사 대형 목조건축의 사례



존 헴스워스(John Hemsworth)

브리티시컬럼비아 대학교 건축학 교수
Hemsworth Architecture 대표


BC Passive House Factory
Hemsworth Architecture
Hemsworth Architecture
Seoul Presentation December 12 2022


Hemsworth Architecture is a design studio based in Vancouver, BC, Canada.
We have a demonstrated expertise in use of mass timber and sustainable design for a wide range of projects including:
ice hockey arenas
schools
industrial buildings
residential houses
PH1 Lonsdale
Hemsworth Architecture

Our work has been recognized both provincially and nationally for our commitment to

design excellence,

sustainable practice,

and innovative construction practices.

Upper Skeena Recreation Centre
Hemsworth Architecture

Hemsworth Architecture is the recipient of the Governor General's Medal for Architecture for the design and construction of the BC Passive House Factory in Pemberton.

This award is the highest honour in Canadian Architecture.

BC Passive House Factory
Hemsworth Architecture

Our knowledge and practical experience in architectural wood design is based on a long, storied history of construction traditions of the Pacific Northwest.

City of Vancouver Archive

MASS TIMBER is STRONG

Mass timber construction products, such as glulam and cross laminated timber (CLT) are approximately 1/6 the weight of concrete.

This results in smaller foundations and less inertial seismic forces during an earthquake event.

These buildings perform better in high seismic zones due to their high strength to weight ratios.

Upper Skeena Recreation Centre
Hemsworth Architecture

MASS TIMBER is FIRE RESISTANT

In the event of a fire, mass timber wood will char on the outside just like a large tree in a forest fire. The unburned core maintains its strength.

Char acts in a predictable way and is accounted for in the structural design.

During fire testing, a mass timber panel (5ply CLT) maintained its structural capacity for over 3 hours when exposed to temperatures exceeding 980 degrees Celsius, which is in excess of the 2 hours required by Canadian Building Codes.

CLT fire testing
CREDIT: Naturally Wood BC

For more information about the Canadian Wood Council testing go to www.firetests.cwc.ca

MASS TIMBER is SUSTAINABLE

Renewable British Columbia wood products are certified to have been harvested from sustainably managed forests in Canada.

British Columbia producers have been supplying high-quality forest products including Glulam columns and beams, as well as CLT (cross laminated timber) to:

United States
China
Japan
South Korea
European Union

MASS TIMBER is COST EFFECTIVE

Mass timber buildings are constructed 25% faster than conventional concrete buildings and require 90% less construction traffic.

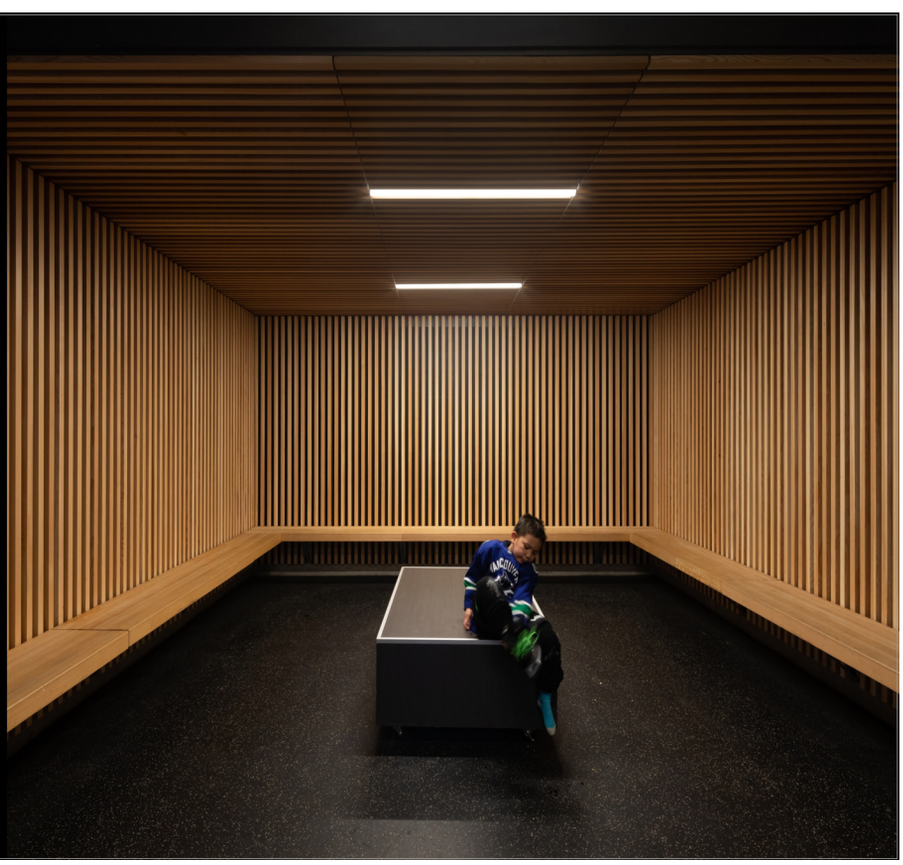
With the implementation of mass timber offsite prefabrication, and digital construction technologies, projects can have significantly accelerated project timelines.

The glulam/CLT and prefabricated exterior wall panels resulted in the super structure erection of this office building in North Vancouver, Canada in just 10 days!

We will present two projects:

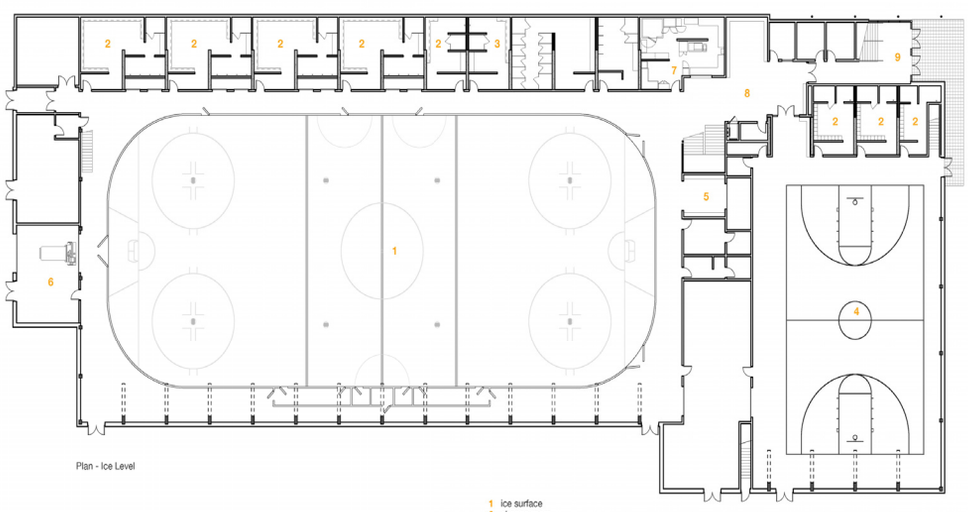
Upper Skeena Recreation Centre

1 Lonsdale

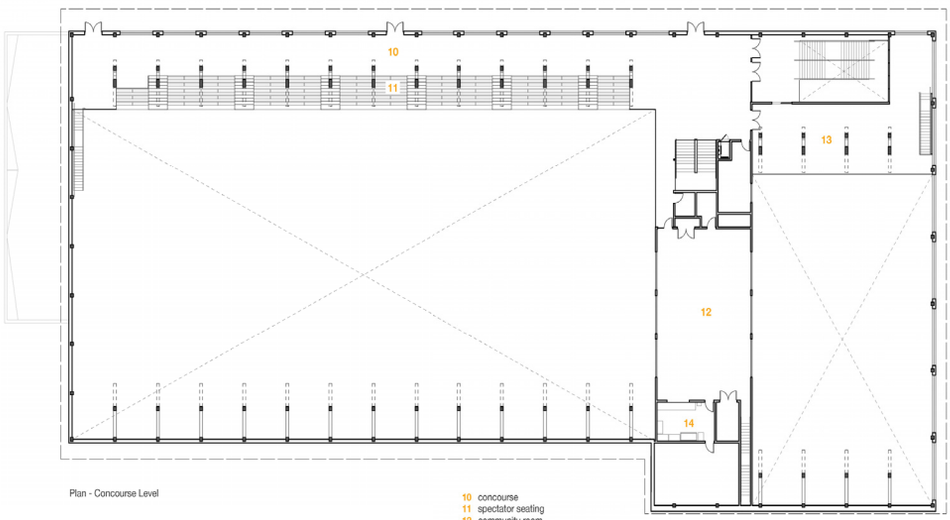


Upper Skeena Recreation Centre
Hemsworth Architecture

DRAWING: PLAN

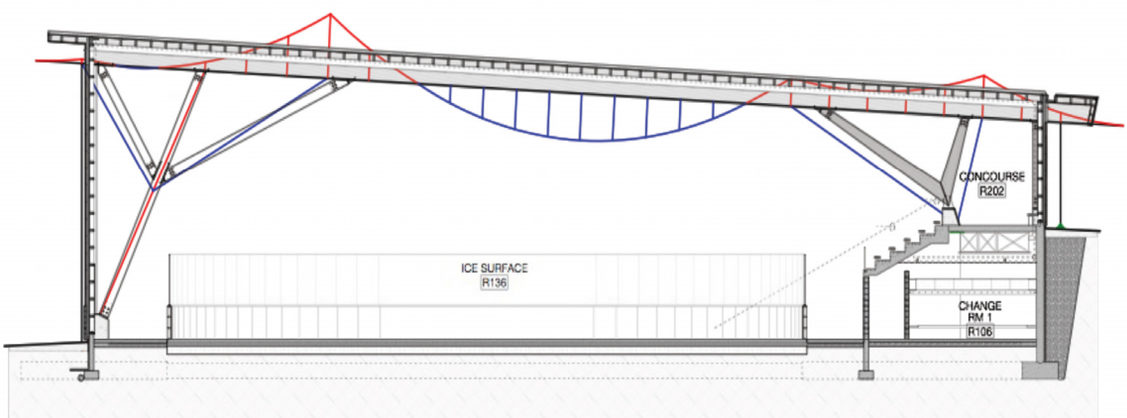


DRAWING: PLAN



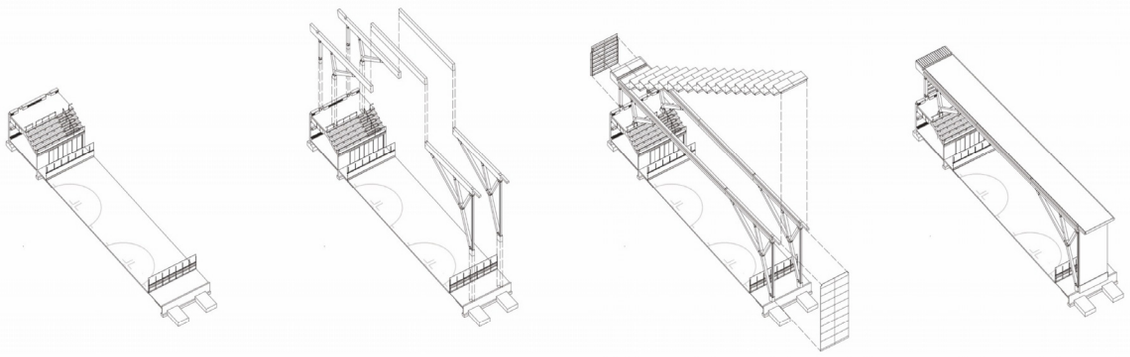
Plan - Concourse Level

10 concourse
11 spectator seating
12 community room
13 fitness area
14 kitchenette



2 **BUILDING CROSS-SECTION - ICE**
scale 1:150

PREFABRICATED STRUCTURE



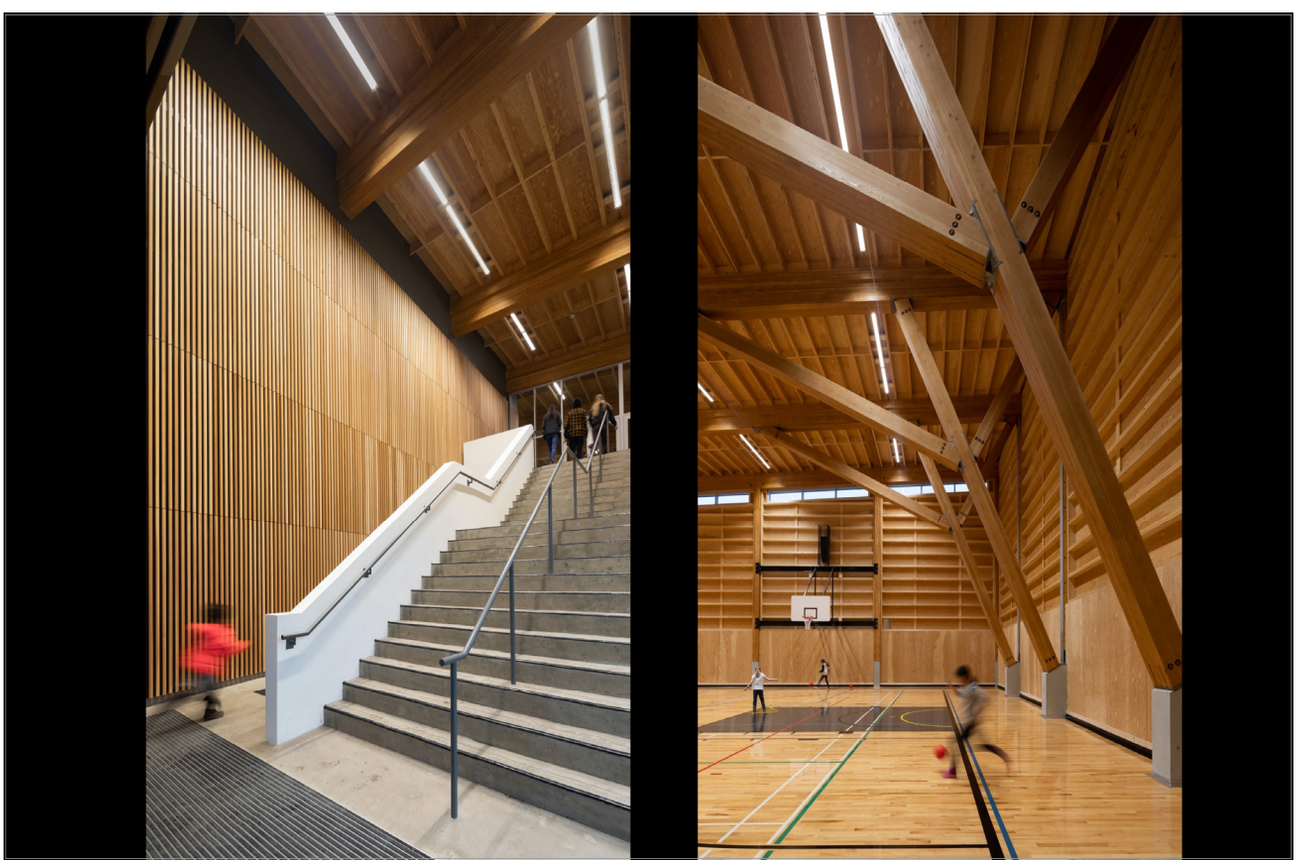
Step 1: Concrete Structure

Step 2: Installation of Glulam Structure

Step 3: Installation of Prefabricated Roof and Wall Panels

Step 4: Completed Building

In response to the building's remote location in northern British Columbia, the design team developed a prefabricated structural system to maximize the use of local labour in the construction of the building. This system allowed for the entire roof and all exterior walls to be panelized using 38x184 joists and plywood sheathing. Through digital modeling and careful coordination with the contractor, all panels were built on-site using local labour, expanding the local capacity, and supporting the local economy. The end result was over 26,000 hours of local labour on the project.



North Vancouver Outdoor School

McFarland Marceau Architects : Design Architect John Hemsworth

Our work is strongly influenced by the advancement in engineered mass timber construction materials.

Examples include CLT (cross laminated timber) panels for walls and floors, and

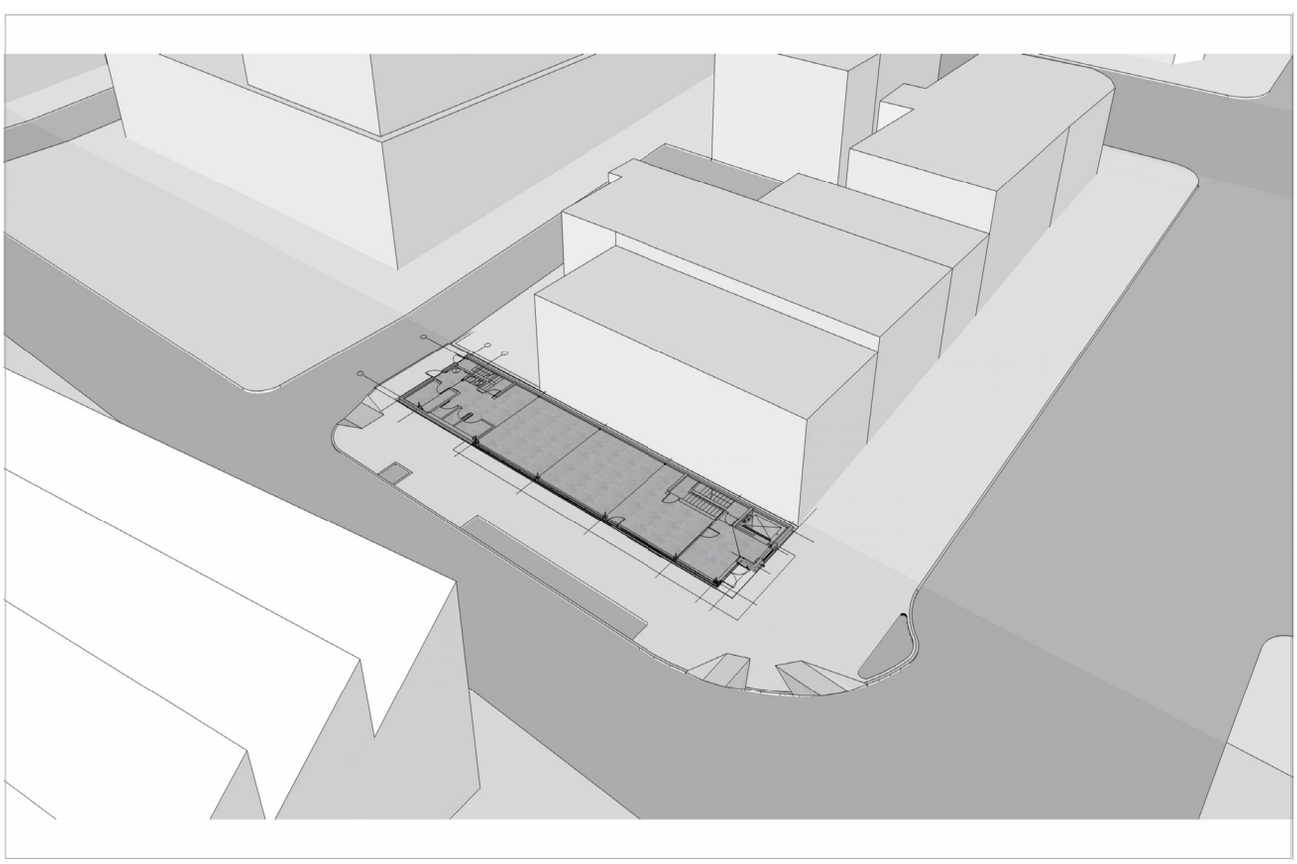
GLULAM post and beam structures.

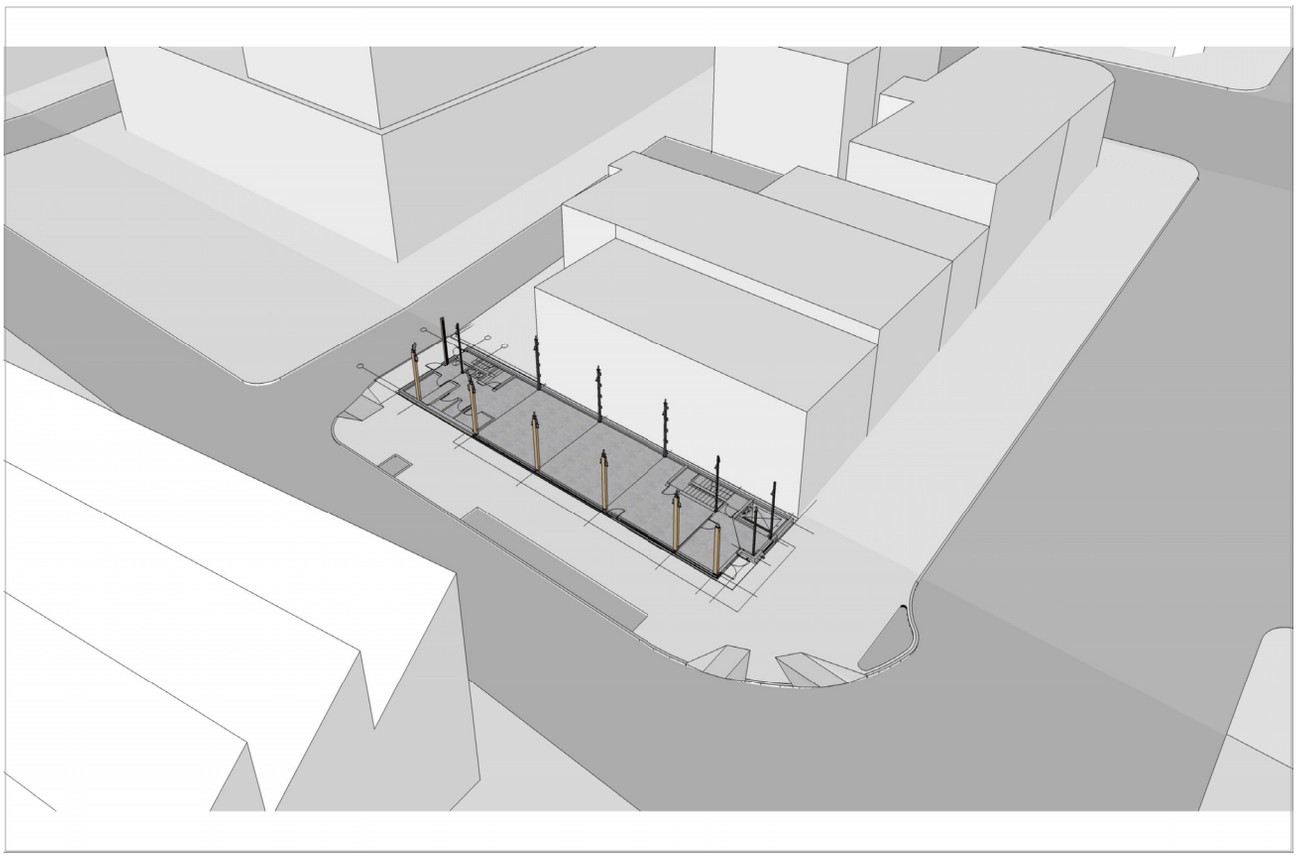
PH1 Lonsdale
Hemsworth Architecture

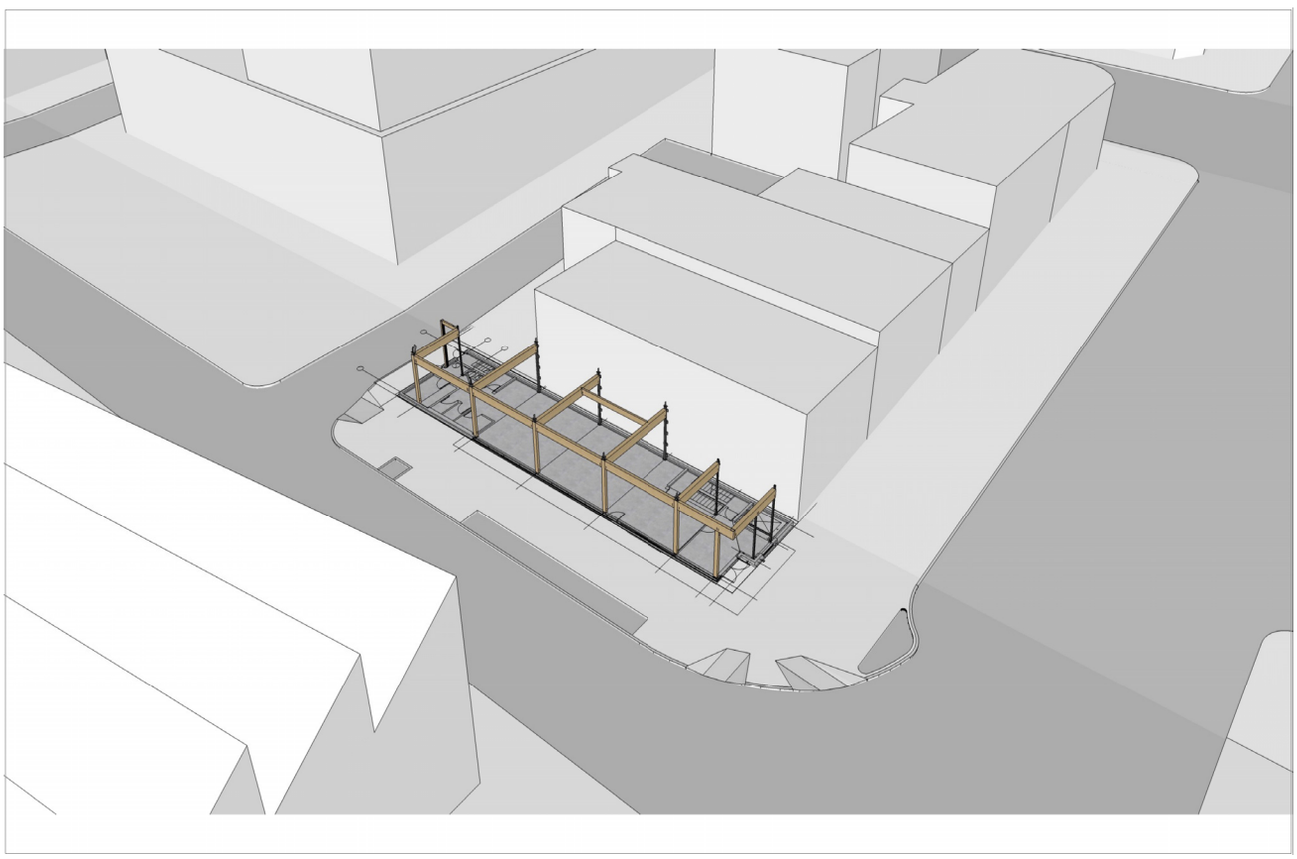
With the innovations in pre-fabrication and digital preconstruction, this Passive House Certified office building in North Vancouver, was erected in just 10 days.

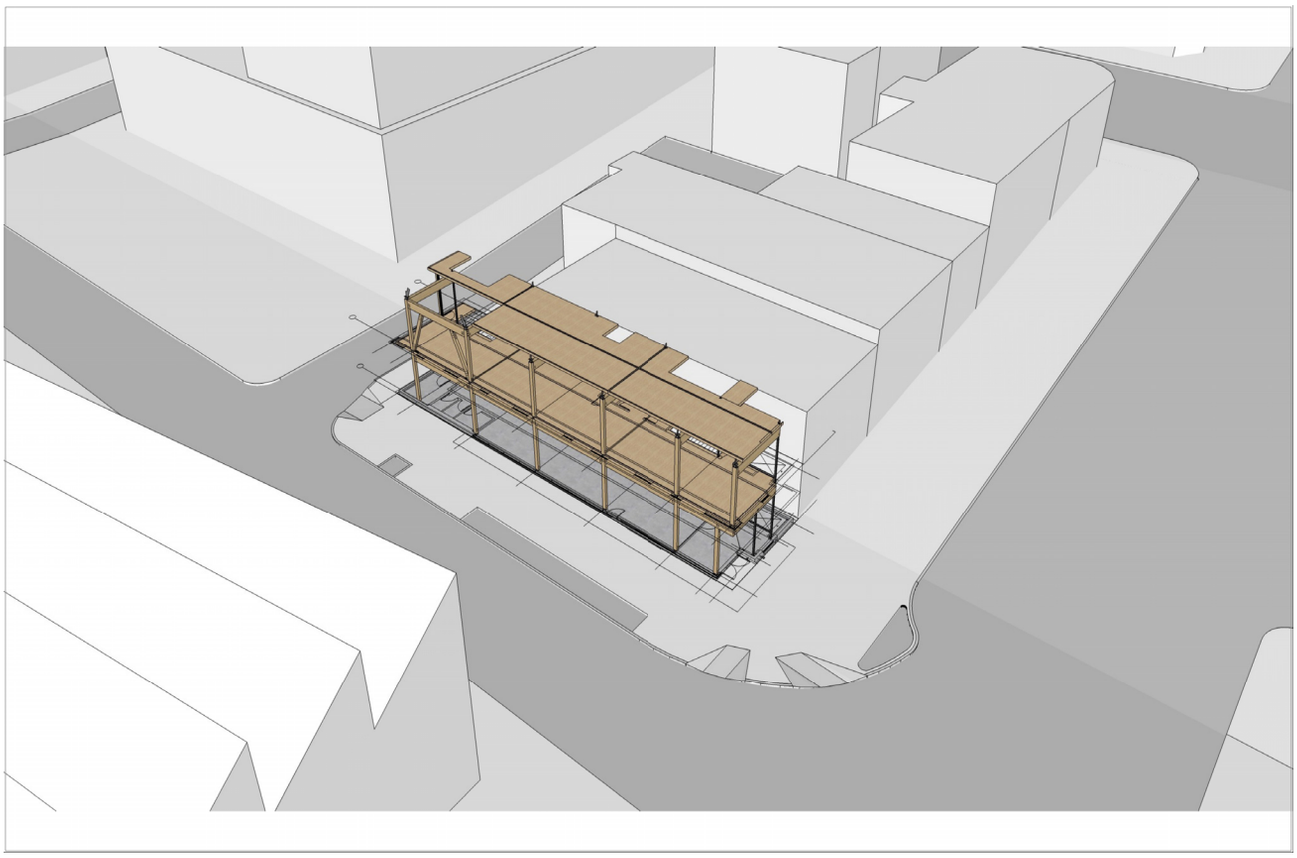
All mass timber construction materials and insulated, prefabricated panels were manufactured in British Columbia, Canada.

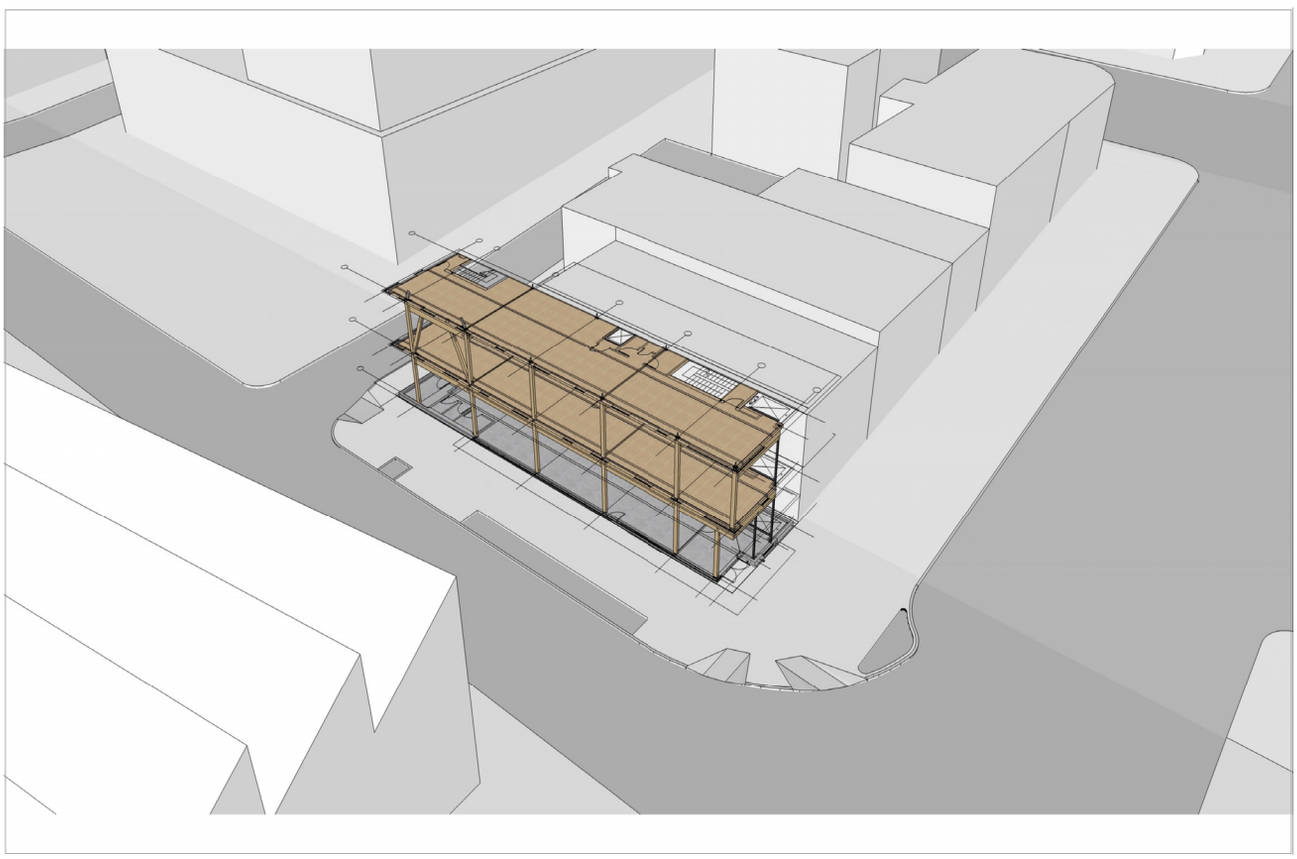
PH1 Lonsdale
Hemsworth Architecture

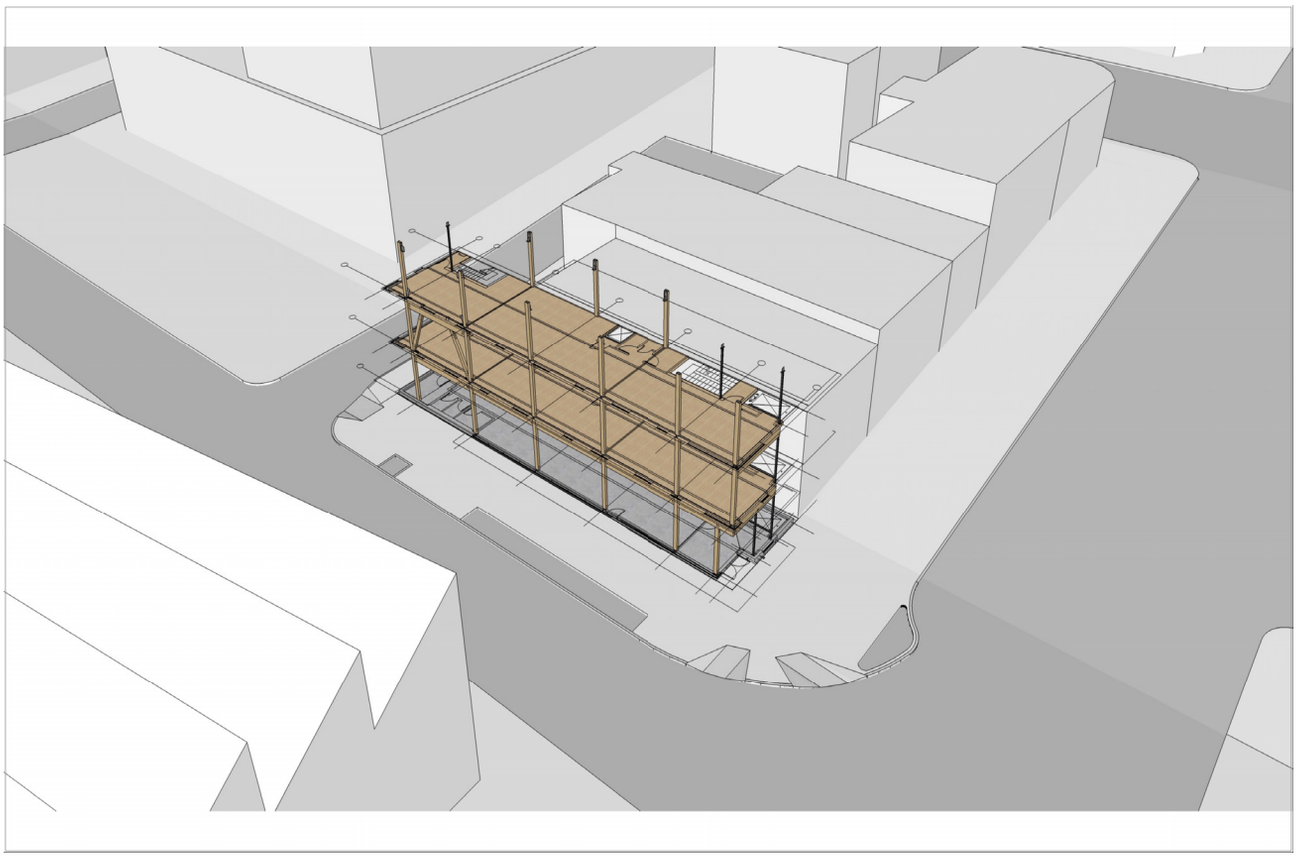


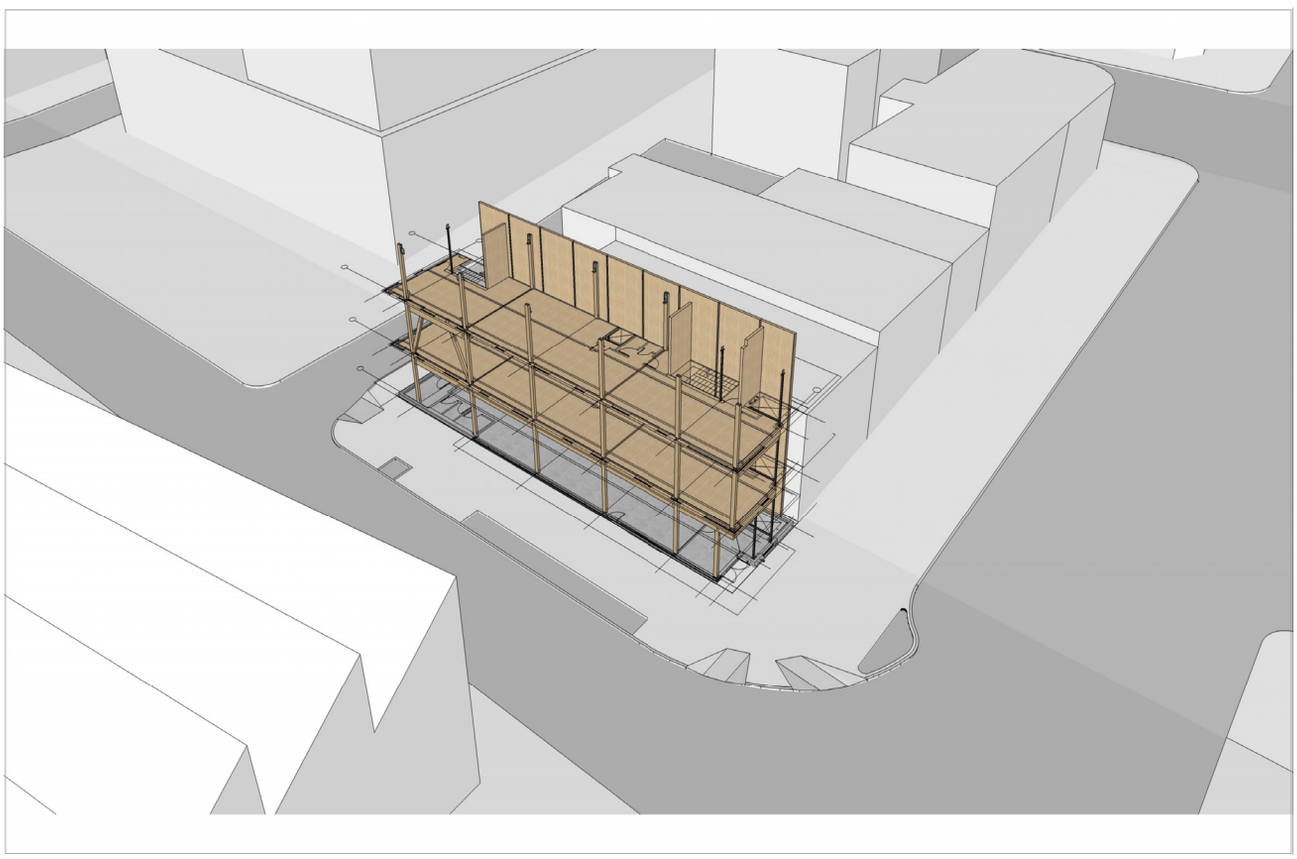


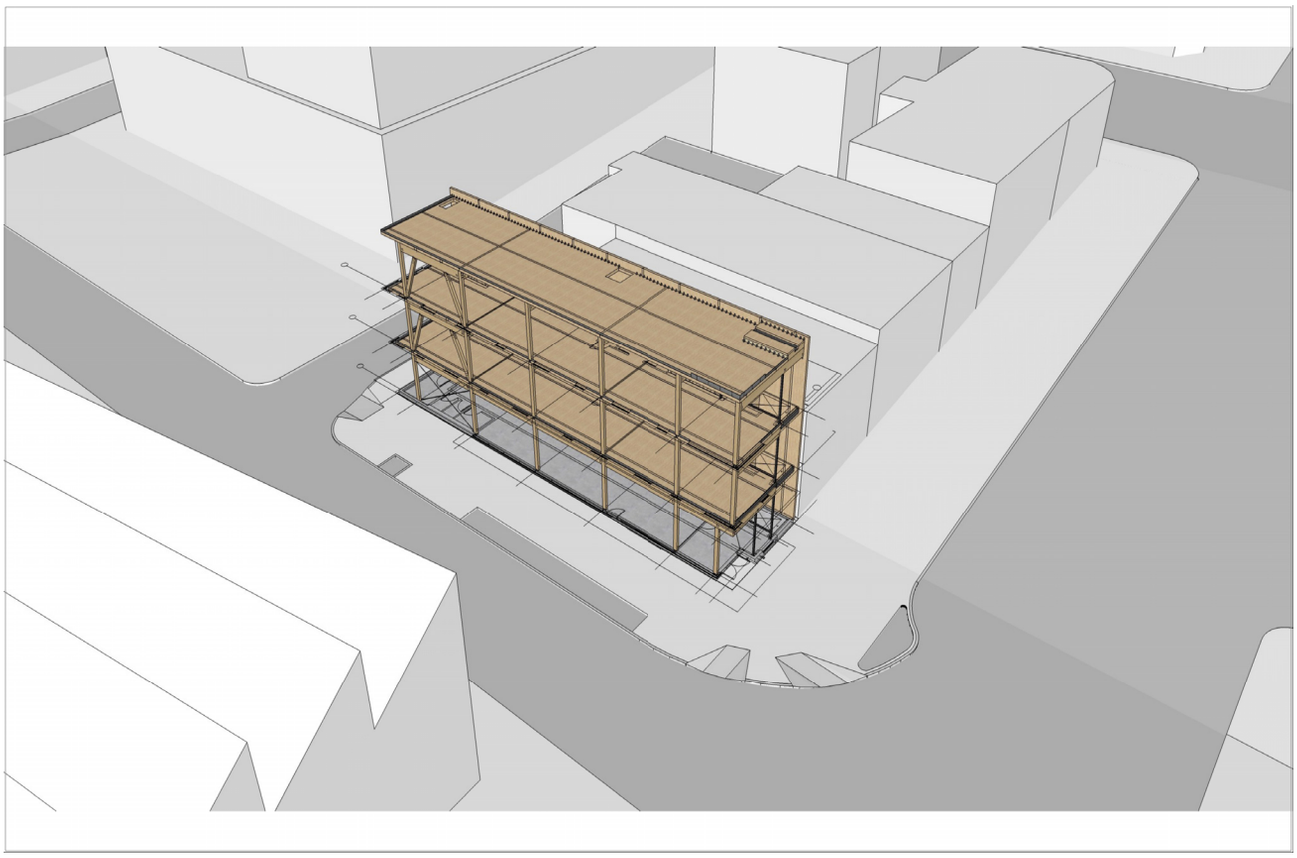


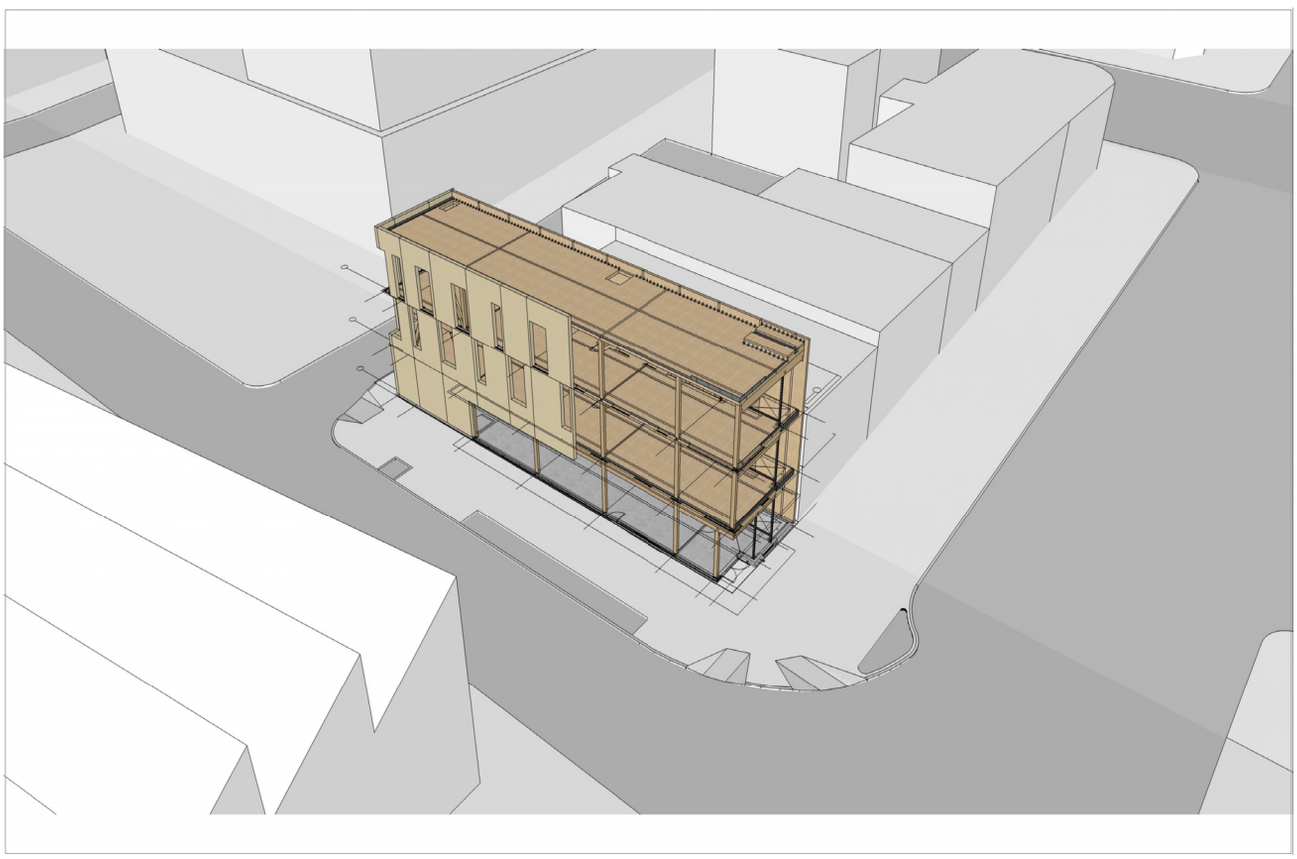


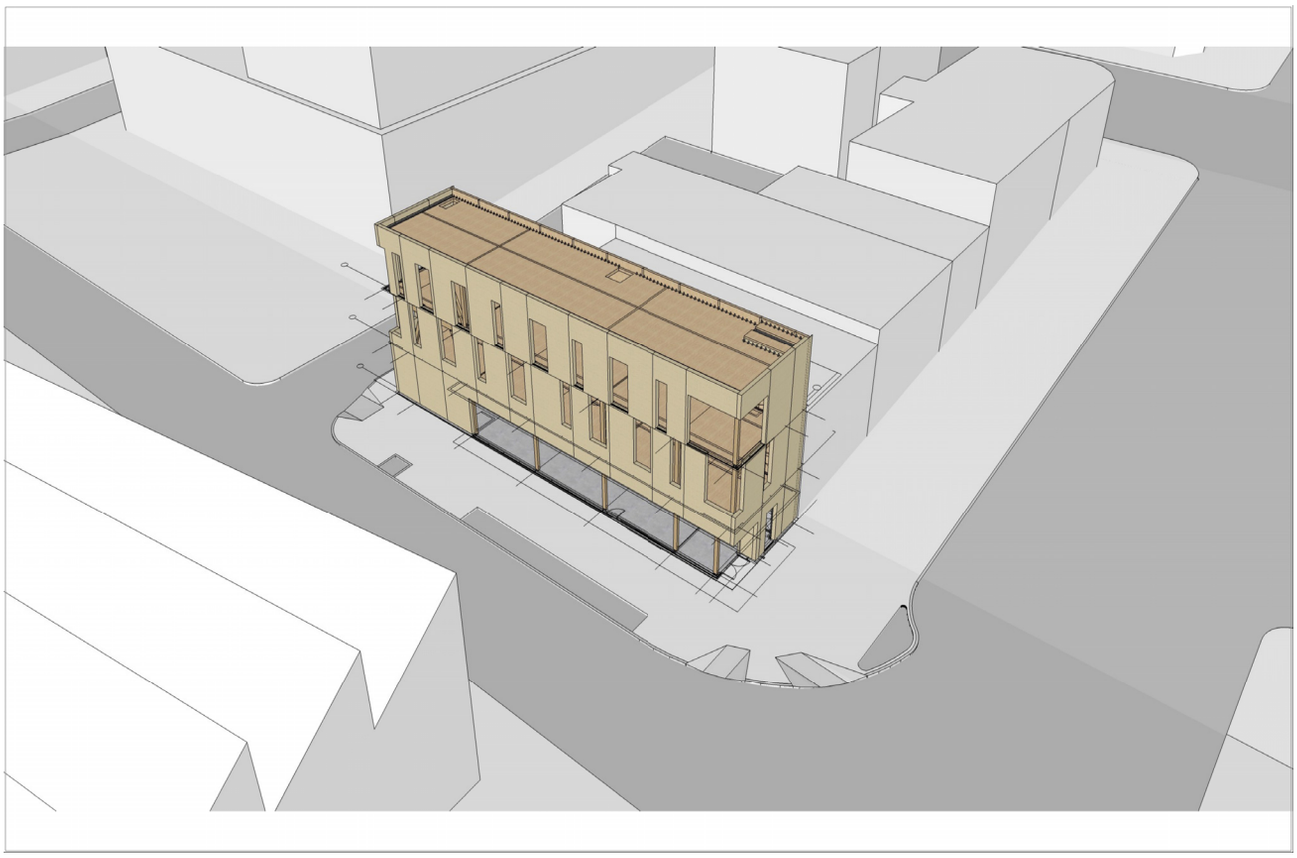


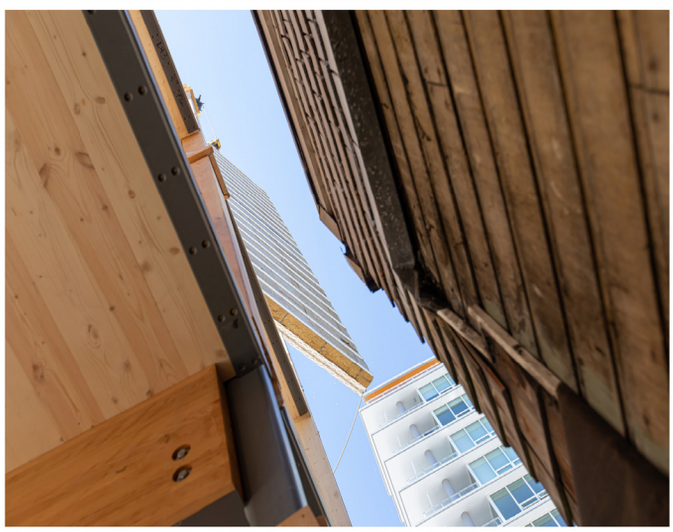








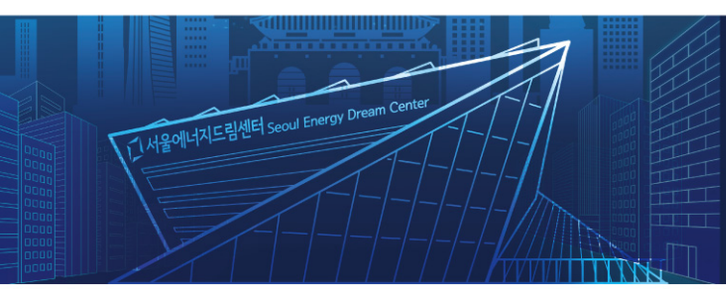





Tyvek

Session 2

Woha의 친환경건축물 사례



웡만썸(Mun Summ Wong)

싱가포르 국립대학교 건축학과 교수
WOHA Architecture 창립이사(CV)

웡만썸의 발표자료는 발표자의 사정으로 제공되지 않습니다.

Curriculum Vitae
Wong Mun Summ

Name
Wong Mun Summ

Gender
Male

Age
60

Citizenship
Singaporean

Designation
Founding Director

Qualifications
Bachelor of Arts (Architectural Studies), National University of Singapore (1986)
Bachelor of Architecture (Hons), National University of Singapore (1989)

Professional Qualifications
Registered with Board of Architects, Singapore (1999)

Professional Memberships
Member of Singapore Institute of Architects

Academic Appointments
- Seidler Chair in the Practice of Architecture, University of New South Wales, Australia (1 November 2022 – 31 October 2024)
- Professor (Practice), Department of Architecture, National University of Singapore (13 October 2015 – 30 June 2023)
- Member of CTBUH Masters of Tall Building and Vertical Urbanism Advisory Panel (1 October 2021 – 30 September 2025)
- Member of Head Search Committee for the Department of Architecture, School of Design and Environment, National University of Singapore (NUS) (1 October 2021 –)
- Member of NUS College of Design and Engineering Task Force (11 August 2020 –)
- External Examiner, Department of Architecture, School of Design and Environment, National University of Singapore (2003 – 2005)

Official Appointments
- Member of World Cities Summit Urban Resilience Knowledge Council (1 July 2022 – 30 June 2024)
- Member of DesignSingapore Advisory Board (1 January 2021 – 31 December 2022)
- Member of Nominating Committee, Lee Kuan Yew World City Prize (2018 - 2022)
- Board of Architect's Design Panel under Section (15)(2)(c) of the Architects Act (2010 – December 2024)
- Member of URA Design Advisory Committee (July 2017 – June 2021)
- Member of BuildSG Advisory Committee and Tripartite Committee (25 June 2018 - 24 June 2020)
- Board Member of National Environment Agency (1 April 2016 – 31 March 2020)
- Member of Architectural Design Review Panel (ADRP) for Cross-Island Line (CRL), Land Transport Authority (14 September 2017 – 8 April 2021)
- Member of National Heritage Board Preservation of Sites & Monuments Advisory Board (1 January 2016 – 18 June 2018)
- Member of Design Advisory Committee for the new Family Justice Courts Building (23 January 2015 - Present)
- Member of Design Advisory Panel for Bay Gardens Bridge (11 March 2014 - Present)

Curriculum Vitae (cont.)

- Board Member of Singapore Land Authority (1 August 2011 – 31 July 2015)
- Member of HDB Architectural Design Panel (29 September 2010 – 28 September 2012)
- Board Member of Urban Redevelopment Authority (URA) (1999 – 2005)
- Member of the International Design Consultancy for the Waterfront at the Downtown at Marina Bay, URA
- Member of the Concept Evaluation Committee for the tender of Beach Road sale site
- Member of the following Design Advisory Panels, URA
  - Singapore Sports Hub
  - Beach Road Sale Site
  - Specialists' Centre, Hotel Phoenix and Orchard Emerald
  - Business Financial Centre
  - Marina Barrage
  - New Clifford Pier
  - Orchard Turn, Somerset and Somerset Central
  - Orchard Mall Enhancement Consultancy
  - Integrated Resort at Marina Bay
  - Proposed Redevelopment of Overseas Union House and Change Alley Aerial Plaza at Collyer Quay and other future developments around Marina Bay
- REDAS Honorary Advisor (Architectural) (2007 – 2008)

Work Experiences

Completed Projects in the last 12 Years

- Aquatique Pattaya Mixed-Use Development Masterplan, Thailand (2020 – 2022)
- High End Condominium Development, Meyer Road, Singapore (2018 – 2022)
- Ascott Reit LYF Co-live Residences, One North, Singapore (2018 – 2022)
- Singapore Pavilion, World Expo 2020, Dubai (2019 – 2021)
- Sky Green Mixed-Use Development, Taichung, Taiwan (2014 – 2019)
- Design Orchard, Orchard Road, Singapore (2016 – 2018)
- E2C Campus Educational and Community Building, Redhill Road, Singapore (2015 – 2016)
- Vanke Yun City, Mixed-Use Development, Shenzhen, China (2014 – 2019)
- Enabling Village, Lengkok Bahru, Redhill, Singapore (2014 – 2016)
- Kampung Admiralty Integrated HDB Development, Woodlands Drive, Singapore (2013 – 2021)
- The Grove, Mixed-Use Development, Baiyun, Guang Zhou, China (2012 – 2015)
- Oasia Hotel Downtown, Mixed-Use Development, Peck Seah Street, Singapore (2011 – 2016)
- Huaku Sky Garden Residential Development, Tianmu, Taipei, Taiwan (2010 – 2017)
- Commercial Development, Carpenter Street, Singapore (2010 – 2015)
- Ogilvy & Mather Headquarters Office Fit Out, Robinson Road,

Curriculum Vitae (cont.)

Singapore (2010 – 2011)
- Commercial Development, 48 North Canal Road, Singapore (2009 – 2013)
- SPACE Asia Hub, Bencoolen Street, Singapore (2008 – 2012)
- PARKROYAL COLLECTION Pickering (f.k.a. PARKROYAL on Pickering), Mixed-Use Development, Upper Pickering Street, Singapore (2007 – 2014)
- Residence at Jalan Sejarah, Singapore (2007 – 2012)
- Goodwood Residence Condominium Development, Bukit Timah Road, Singapore (2006 – 2014)
- Genexis Theatre Interior Architecture for Auditorium, Fusionopolis, Singapore (2005 – 2008)
- Iluma Entertainment Development, Victoria Street, Singapore (2005 – 2010)
- The Hansar Hotel and Serviced Apartments, Bangkok, Thailand (2005 – 2011)
- School of the Arts (SOTA), Zubir Said Drive, Singapore (2005 – 2013)
- The Pano Condominium Development, Bangkok, Thailand (2005 – 2010)
- Newton Suites Residential Development, Newton Road, Singapore (2003 – 2008)
- Alila Villas Uluwatu, Bali, Indonesia (2003 – 2009)
- The Met Condominium Development, South Sathorn Road, Bangkok, Thailand (2003 – 2009)
- Bras Basah Underground MRT Station, Bras Basah Road, Singapore (2000 – 2010)

Completed Masterplans in the last 10 Years
- Prapanca Masterplan, Jakarta, Indonesia (2019)
- Holiday Villas Masterplan, Okinawa, Japan (2018 – 2019)
- Qingpu Mixed-Use Development Master Plan, Shanghai, China (2019)
- Singapore Institute of Technology Masterplan, Singapore (2014 – 2017)
- Punggol Creative Cluster & Learning Corridor Masterplan, Singapore (2016 – 2017)
- Ancol Masterplan, Jakarta, Indonesai (2014 – 2015)
- Jimbaran Bay Masterplan, Bali, Indonesia (2014 – 2015)

Competitions in the last 10 Years
- University Campus Feasibility Study, Singapore (2022)
- Lim Chu Kang Masterplan, Singapore (2022)
- New Office for Ministry of Sustainability and the Environment, Singapore (2022)
- Springleaf Precinct Masterplan, Singapore (2020)
- Kallang-Kolam Ayer Industrial Estate Masterplan, Singapore (2020)
- Racecourse Masterplan, Singapore (2019)
- Bukit Timah Integrated Development, Singapore (2019)
- HDB Punggol North C4, Singapore (2016)
- Integrated Transport Hub, Singapore (2015)
- Market Street Mixed Use Development, Singapore (2015)
- Mandai Eco-lodge, Singapore (2015)

- Woodlands Integrated Healthcare Campus Masterplan, Singapore (2014)
- Tengah Town Masterplan and Urban Design, Singapore (2013)
- Community Town Hub, Singapore (2013)

Projects under Construction
- BRAC University, Dhaka, Bangladesh (2012 – Present)
- Pan Pacific Orchard, Orchard Road, Singapore (2016 – Present)
- The Tre Ver Condominium Development, Potong Pasir, Singapore (2017 – Present)
- Punggol Digital District (Integrated Business Park Development), Punggol North, Singapore (2017 – Present)
- Singapore Institute of Technology Plot 1 Campus, Punggol North, Singapore (2017 – Present)
- Residential Development, Nassim Road, Singapore (2019 – Present)

Current Projects
- Shanghai Future City Masterplan, China (2021 – Present)
- Enabling Village Extension, Singapore (2020 – Present)
- NS Square Floating Platform, Singapore (2020 – Present)
- Elderly Community, Xi'an, China (2020 – Present)
- Community Building Development, Queenstown, Singapore (2021 – Present)
- Faber House, Orchard Road, Singapore (2021 – Present)
- Project Pewter, Mixed Use Development, Singapore (2021 – Present)
- Vanke Jiading Future City, Shanghai, China (2022 – Present)

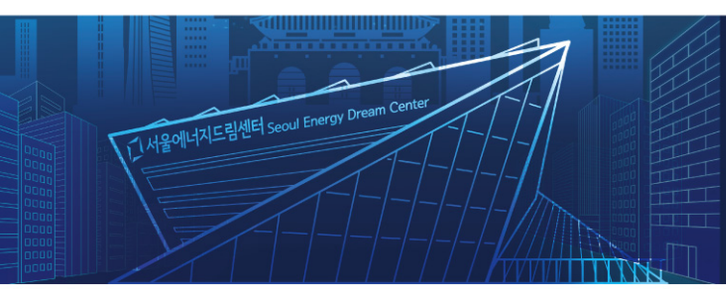
Awards
Personal Awards
- Designer of the Year Asia, awarded by Maison&Objet (2017)
- SIA-Getz Architecture Prize for Emergent Architecture, awarded by Singapore Institute of Architects and Getz Brothers (2010)
- President's Design Award - Designer of the Year, awarded by DesignSingapore Council and Urban Redevelopment Authority (2008)

Refer to WOHA Awards Listing for the following Project Awards
- Bras Basah MRT Station
- The Met
- Alila Villas Uluwatu
- Newton Suites
- The Pano
- SOTA
- The Hansar
- Iluma
- Genexia Theatre
- Goodwood Residence
- Residence at Jalan Sejarah
- PARKROYAL on Pickering
- Space Asia Hub

- 48 North Canal Road
- Ogilvy & Mather Office Fit-Out
- Huaku Sky Garden
- Oasia Hotel Downtown
- Kampung Admiralty
- Enabling Village
- Design Orchard
- Sky Green

Session 2

Building a Circular Future



니클라스 놀소에(Niklas Nolsoe)

Business Development Director at Lendager(CV)

니클라스 놀소에의 발표자료는 발표자의 사정으로 제공되지 않습니다.

Lendager

Niklas Nolsøe

Business Development Director at Lendager

Niklas Nolsøe is Business Development Director at the Danish architectural company Lendager. He is an architect from the Royal Danish Academy of Fine Arts in Copenhagen and a construction architect from the Copenhagen School of Technology. Niklas has been working at Lendager for almost 10 years and has been a key person in establishing the company as a front runner and one most influential architecture studios and strategic consultancies working within the realm of sustainability and circular economy.

As business develcpment director, Niklas is responsible for the company's growth and ensuring that the latest and most innovative knowledge on sustainability and circularity is implemented within a wide range of typologies, scales, and consultancy services. His goal is to push the boundaries and scale sustainable transition throughout the value chain. Niklas' double degree provides him with the ability to combine technical knowledge with creativity to leverage the level of circular innovation in the projects, from developing new materials and design concepts to facilitating new collaborations and processes across the built environment.

EDUCATION

2016	Architect, MAA, Royal Danish Academy of Fine Arts
2011	Constructing Architect, Copenhagen School of Technology

WORK EXPERIENCE

2014 -	Lendager
2012-2013	Holscher Nordberg Architects

AWARDS

2022	Nominated, Mies van der Rohe Award for The Resource Rows
2021	Winner, Danish Design Award, category 'Message Understood'
2019	Winner, Danish Arts Foundation, "Dristighedsprisen" ("The Audacity Award")
2019	Winner, Danish Design Award, category 'Save Resources'
2018	Winner, Danish Design Award, category "Building Markets"
2017	Winner, The Gazelle Award
2016	Winner, The Gazelle Award

SELECTED PROJECTS

TRÆ, Aarhus, Denmark (2018 - 2020)
Three-tower project consisting of massive-wood hybrid structures of up to 20 stories with a high level of innovation throughout, including reuse of windows and windmill wings and interior design with recycled materials.

Client PFA/Kilden & Kindby
Typology Timber high-rise
Area 28,000 m2
Service Architectural consultancy
Role Project manager

Karstad, Berlin, Germany (2022-)
International re-use competition for recycling the construction and materials from an existing car park behind the historic Karstadt department store in Berlin. The proposal reintegrates a catalogue of materials from the adjacent transformat on project and adds a light timber structure on top.

Client SIGNA
Typology Office and retail
Area 20,179 m2
Role Innovation lead

The Resource Rows, Copenhagen (2015 - 2019)
Residential project developed with a radical approach to cutting out elements of existing buildings, and implementing them into a new architectural context.

Client NREP & AG Gruppen
Typology Housing
Area 9,148 m2
Service Architectural consultancy
Role Project manager

Upcycle Studios, Copenhagen (2015 - 2018)
An example of tomorrow's sustainable and circular homes built of our waste materials of today through the development and implementation of a wide range of innovations within upcycling and recycling, including glass, concrete, wood and interior finishing.

Client NREP & AG Gruppen
Typology Housing
Area 3,909 m2
Service Architectural consultancy
Role Project manager