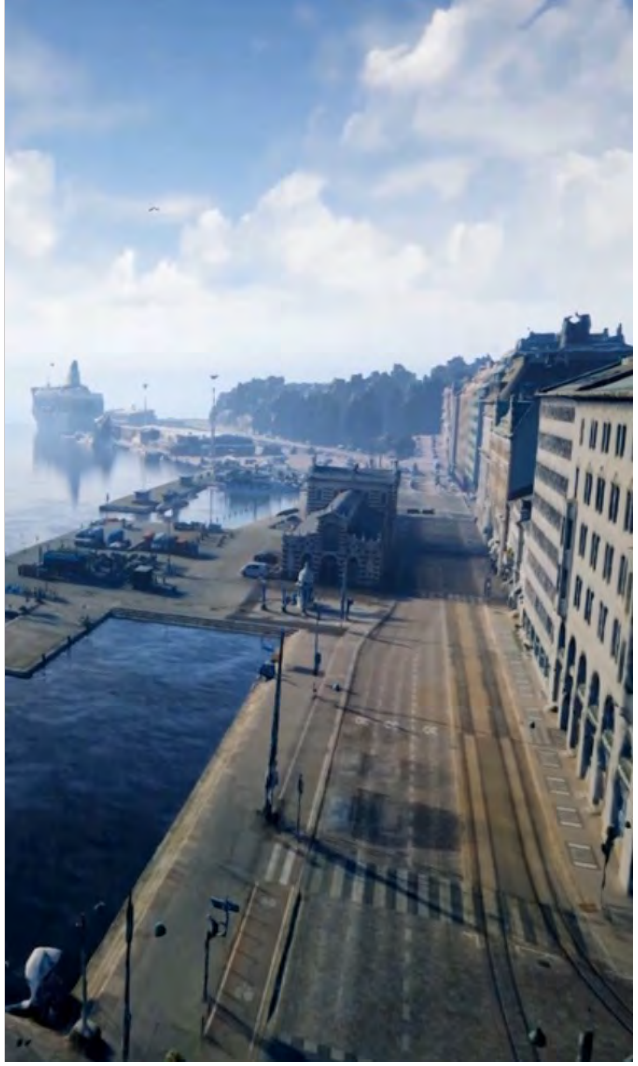
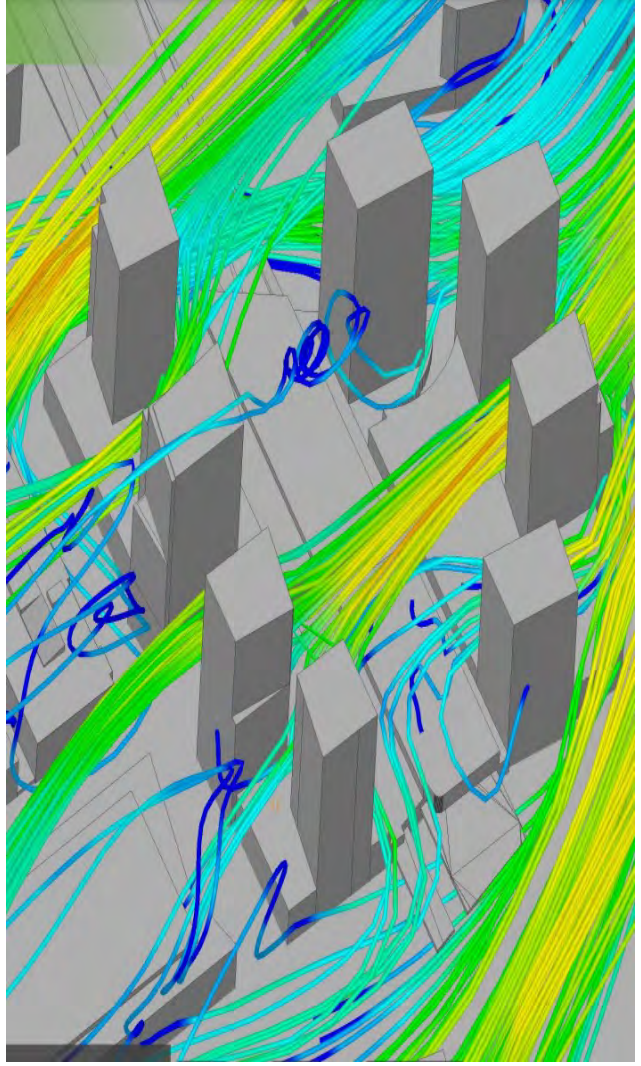





Helsinki 3D+ use cases and open services

Jarmo Suomisto 9/2022

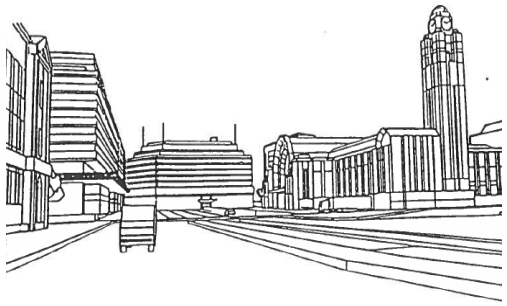
Helsinki

team

Helsinki 3D+ Mayors office / Strategies / Data and Analytics Team

Helsinki

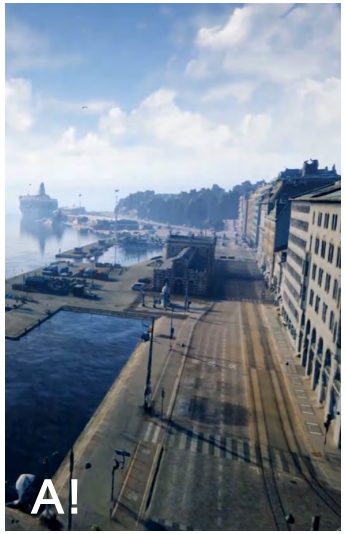
36 years of 3D Helsinki



OGC®
Making location count.

CityGML

Reality Mesh



City Model try-outs

Urban Development Models

Entire City 3D CAD

Urban simulators

New Models

Co-innovation

1980

1990

2000

2010

2020

3D workstations

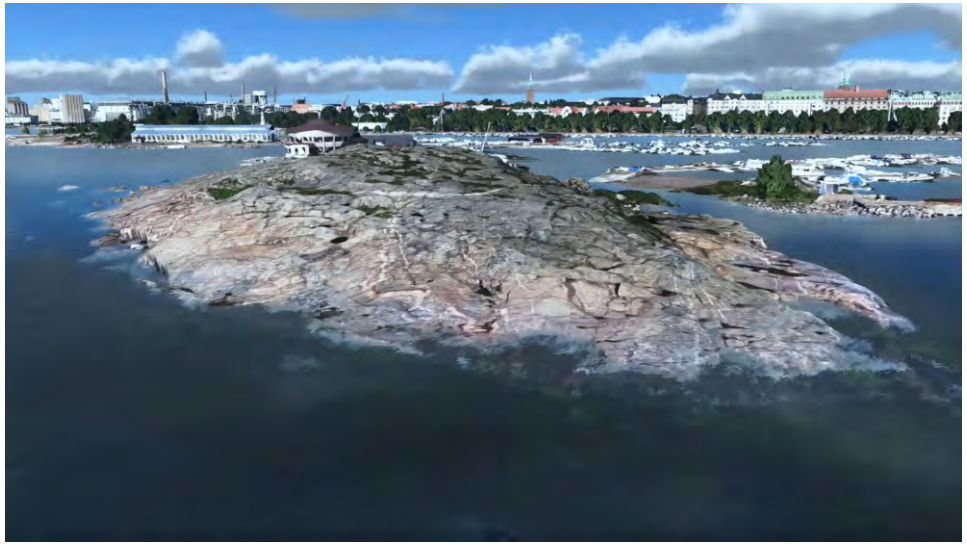
Architectural competitions

Real Time simulator

Helsinki 3D+

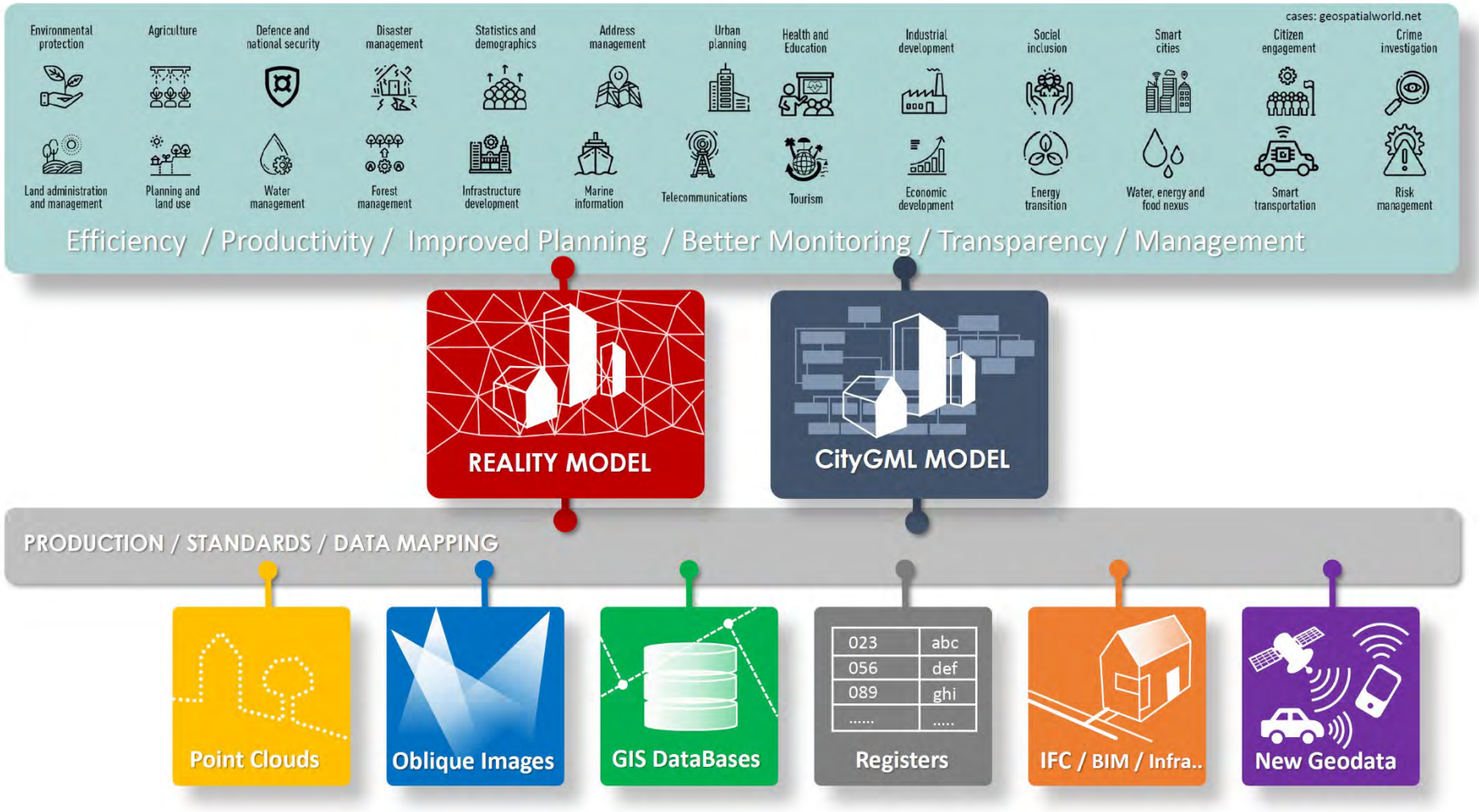
Energy Atlas

Digital Twin



Helsinki

BIG picture



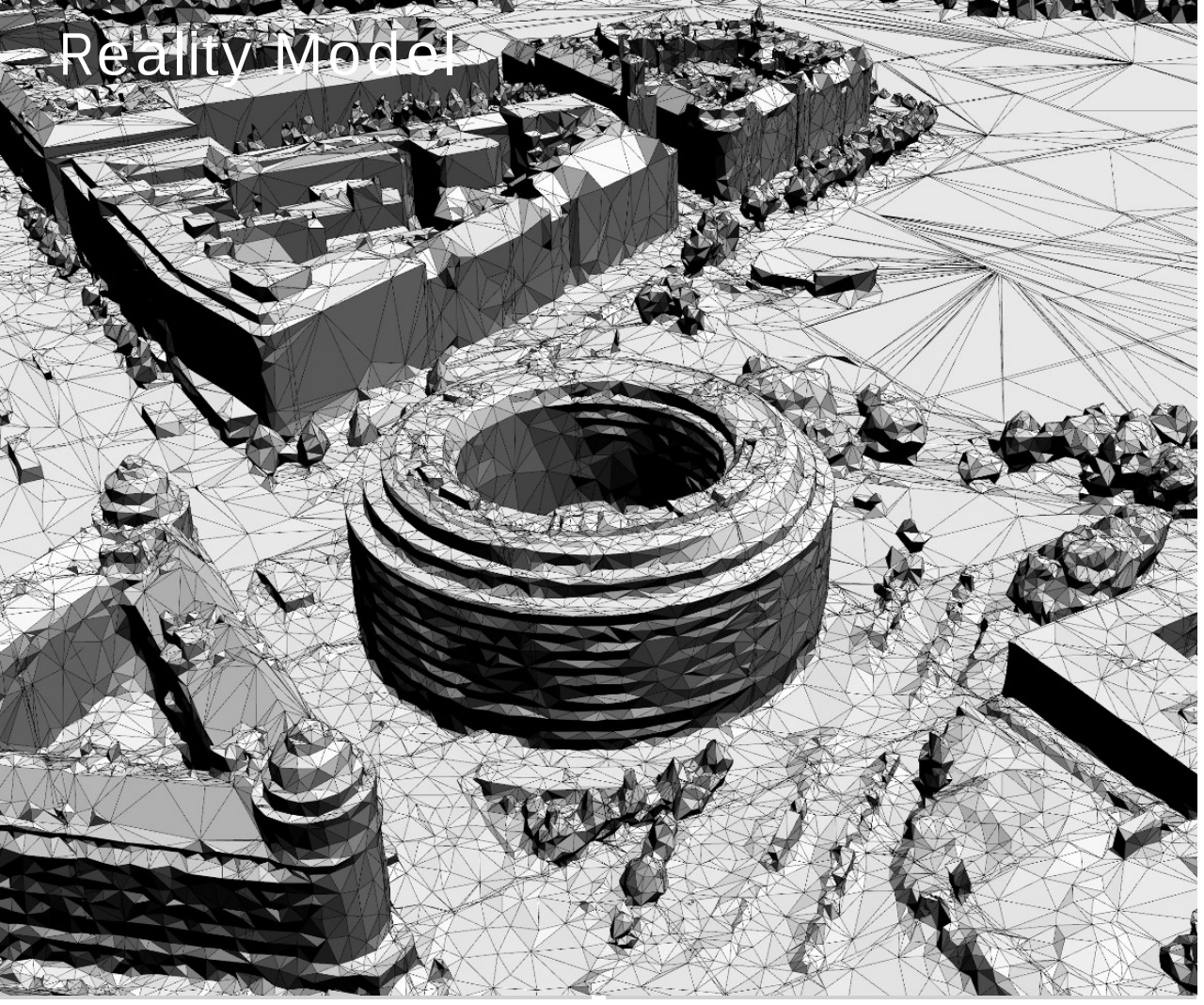
Two separate production lines

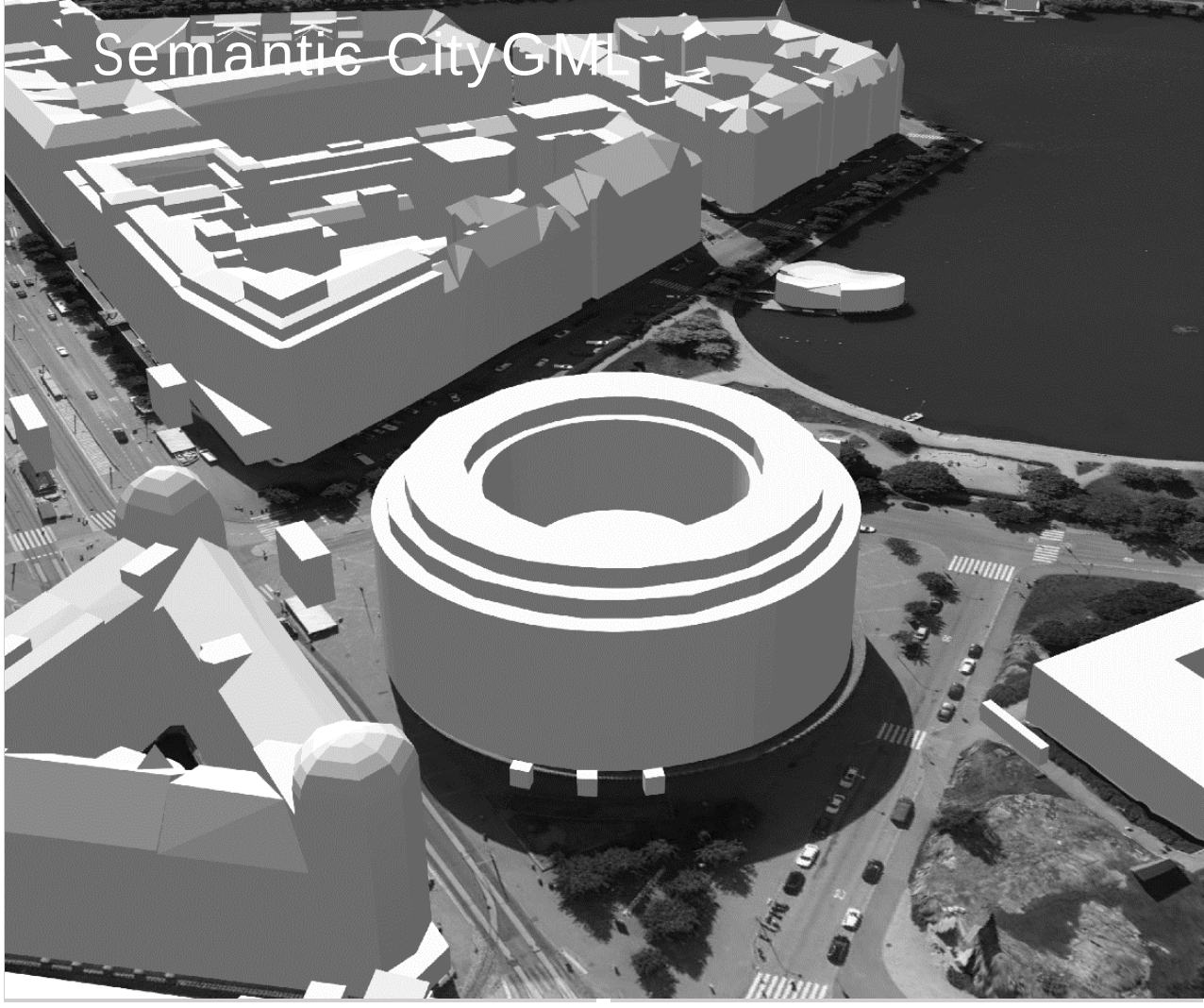
- Both - and - solution

Helsinki

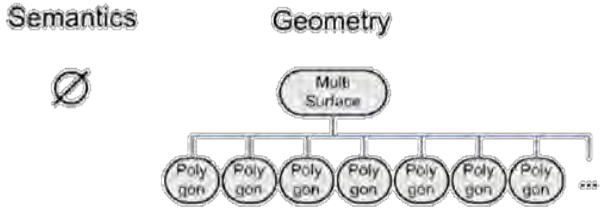
Differences in appearance

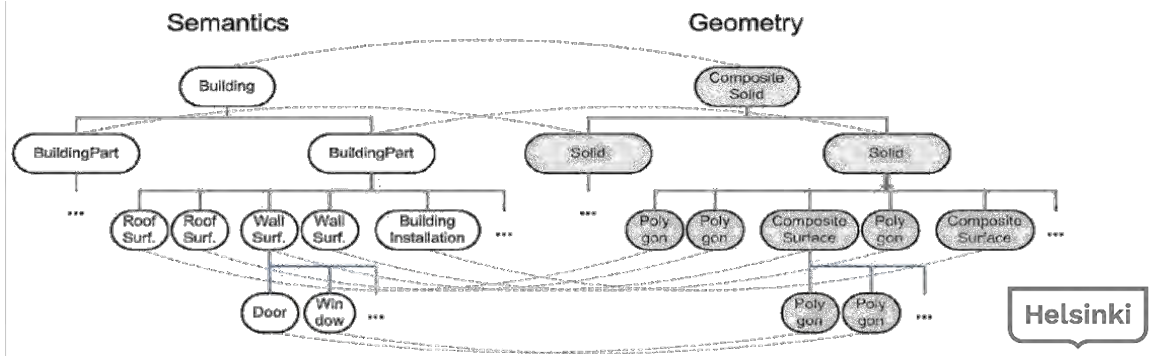
Helsinki





... under the bonnet





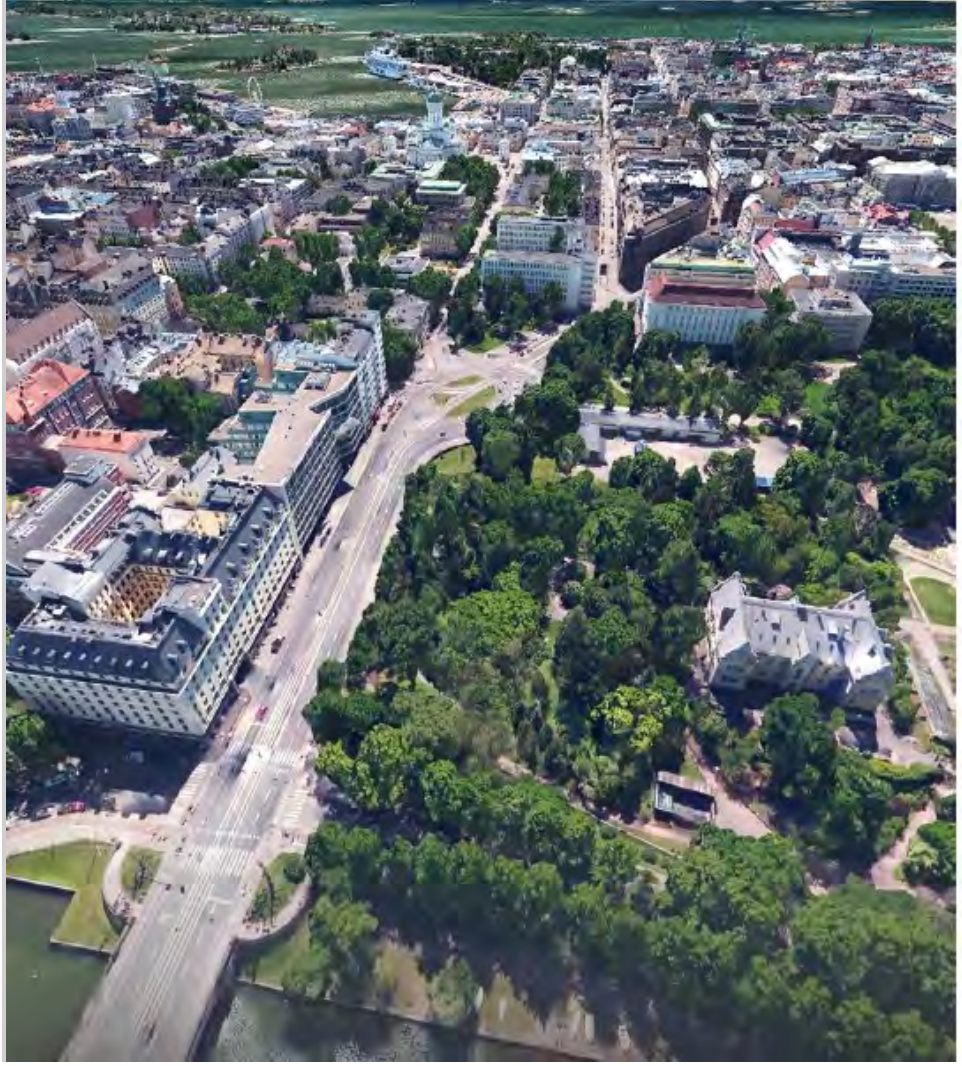
accuracy

CityGML + Reality Model

- good matching with base map
- allows combinations
- use as a design platform
-

open data

hel.fi/3D



Reality Mesh

- enter kartta.hel.fi/3d/mesh
- data hri.fi/dataset/helsingin-3d-kaupunkimalli

CityGML

- enter kartta.hel.fi/3d
- data hri.fi/dataset/helsingin-3d-kaupunkimalli

Helsinki

Utility levels

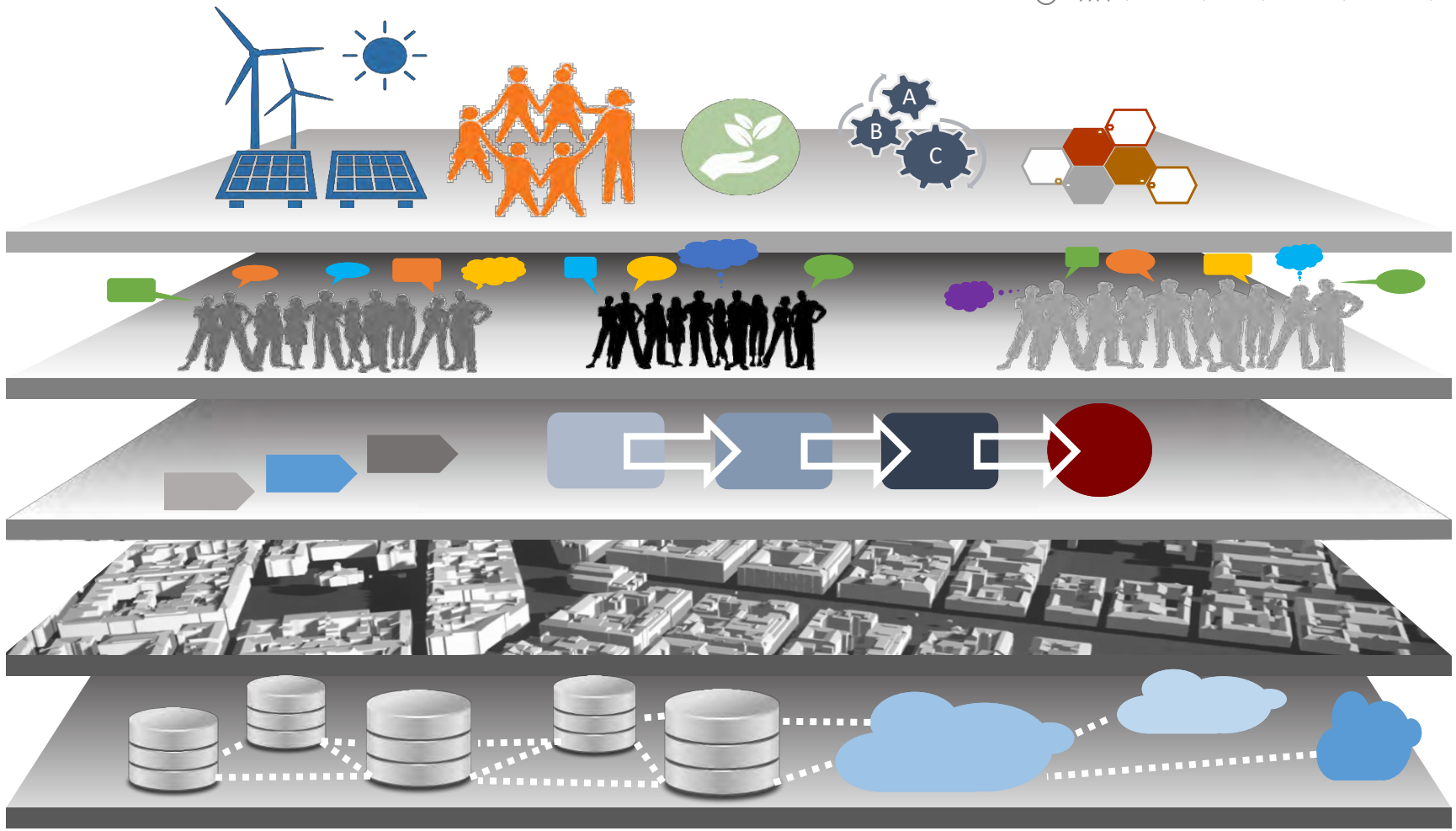
STRATEGIC GOALS

OPEN DATA

PROCESSES & SERVICES

3D MODELS

DATA



Helsinki Data Strategy Vision

Data produced by the city of Helsinki is the most usable and most used urban data by 2025

Helsinki

DIGITALLY FIRST !

Urban digital twin is a synthesis of interoperable datasets and systems

Plan, analyze, optimize, simulate and build the whole lifecycle digitally first

BETTER UNDERSTANDING - BETTER DECISIONS - BETTER CITY - GOOD LIFE




Helsinki

2030

~~2035~~

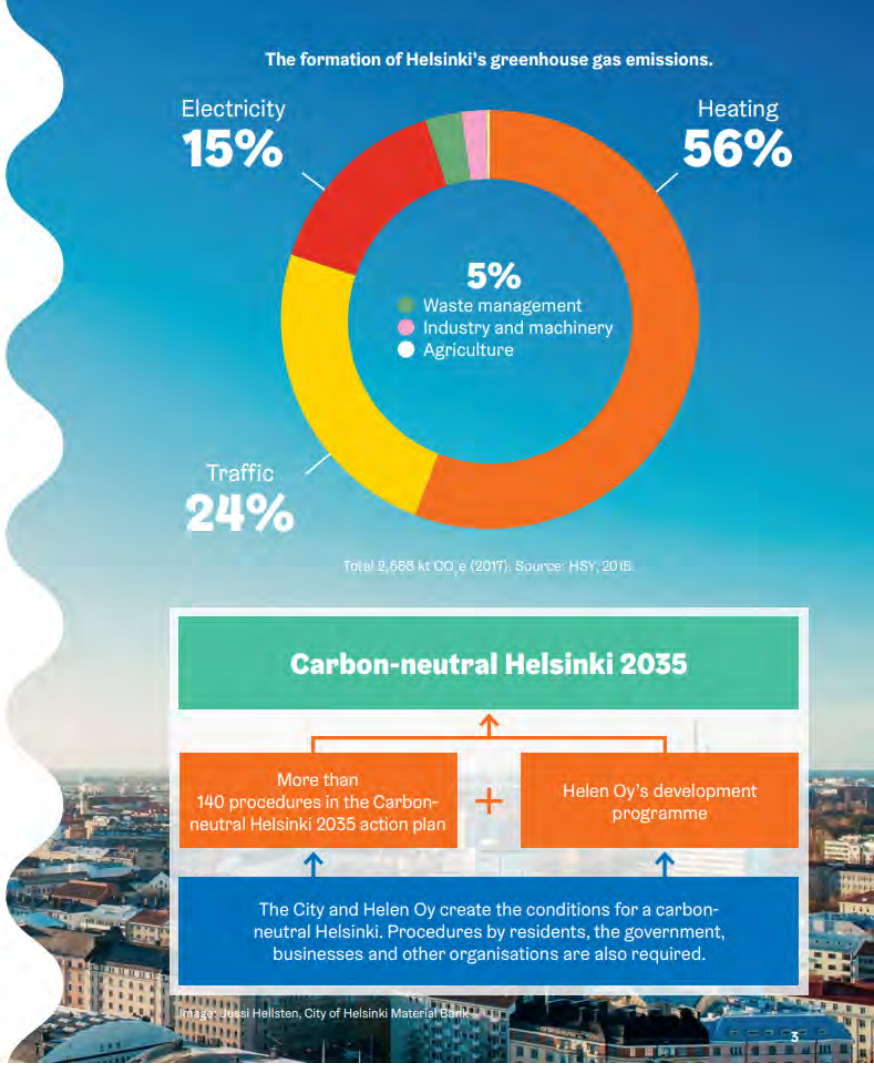
Making Helsinki carbon-neutral

The goal of Helsinki City Strategy 2017–2021 is to create a carbon-neutral Helsinki by 2035. When this goal is reached, operations taking place in Helsinki will no longer warm up the climate. The Carbon-neutral Helsinki 2035 action plan describes how Helsinki can get on the right track in terms of reducing emissions.

Becoming carbon-neutral requires that greenhouse gas emissions are reduced by at least **80%** from the levels of 1990. The remaining **20%** will be compensated for by Helsinki taking care of implementing emission reductions outside the city or, for example, increasing the number of carbon sinks. The City's emission calculations take emissions generated inside the city limits into account. The calculations do not include emissions generated outside Helsinki, such as those from air travel, food produced elsewhere or goods and services purchased outside the city.

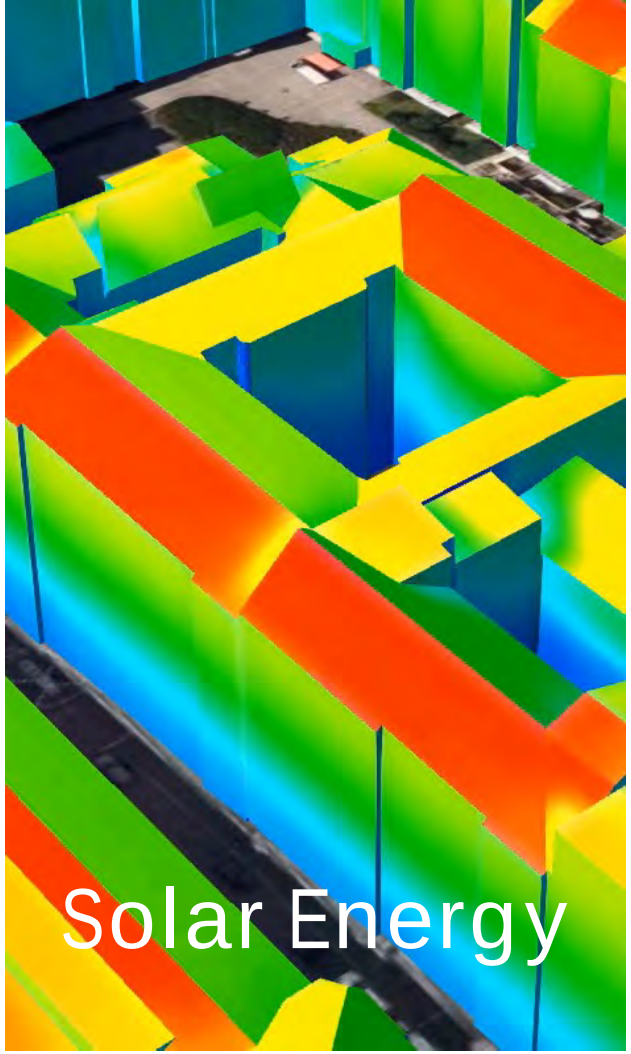
Significant progress has already been made with continuous climate work. In 2017, Helsinki's emissions were **24%** smaller than those in 1990, even though the number of residents had increased by 150,000. Per resident, the emissions were calculated to be approximately **42%** smaller. However, in order to make Helsinki carbon-neutral, the emissions have to be reduced even more and faster than before. A carbon-neutral Helsinki is being created in collaboration between the residents, the City, businesses and organisations.

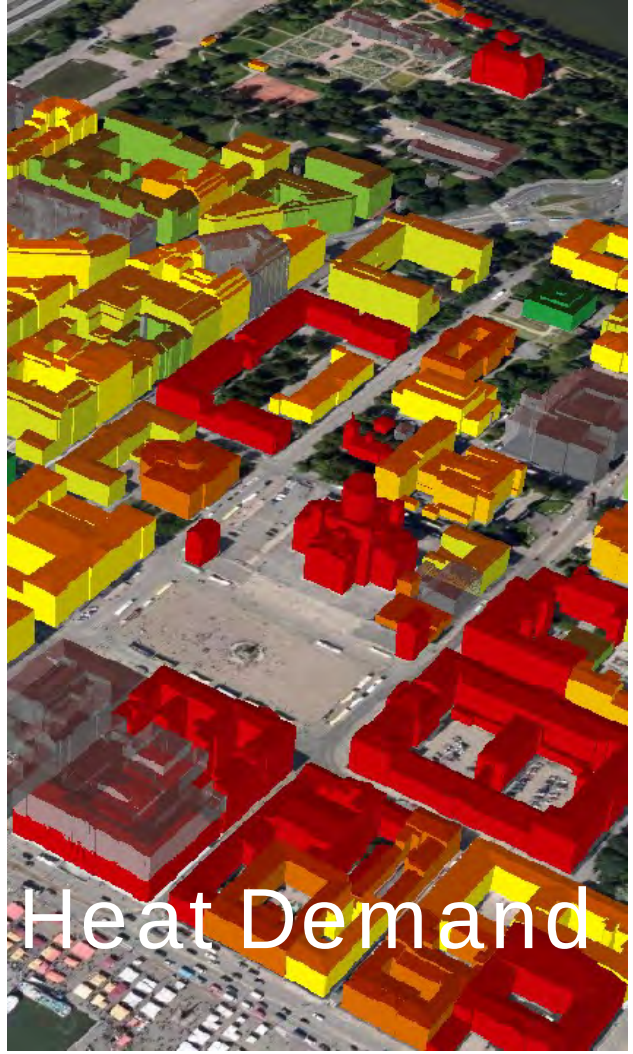
https://www.hel.fi/static/liitteet/kaupunkiymparisto/julkaisut/esitteet/HNH2035_en_summary_14022019.pdf



56% of greenhouse gas emissions from heating

Helsinki



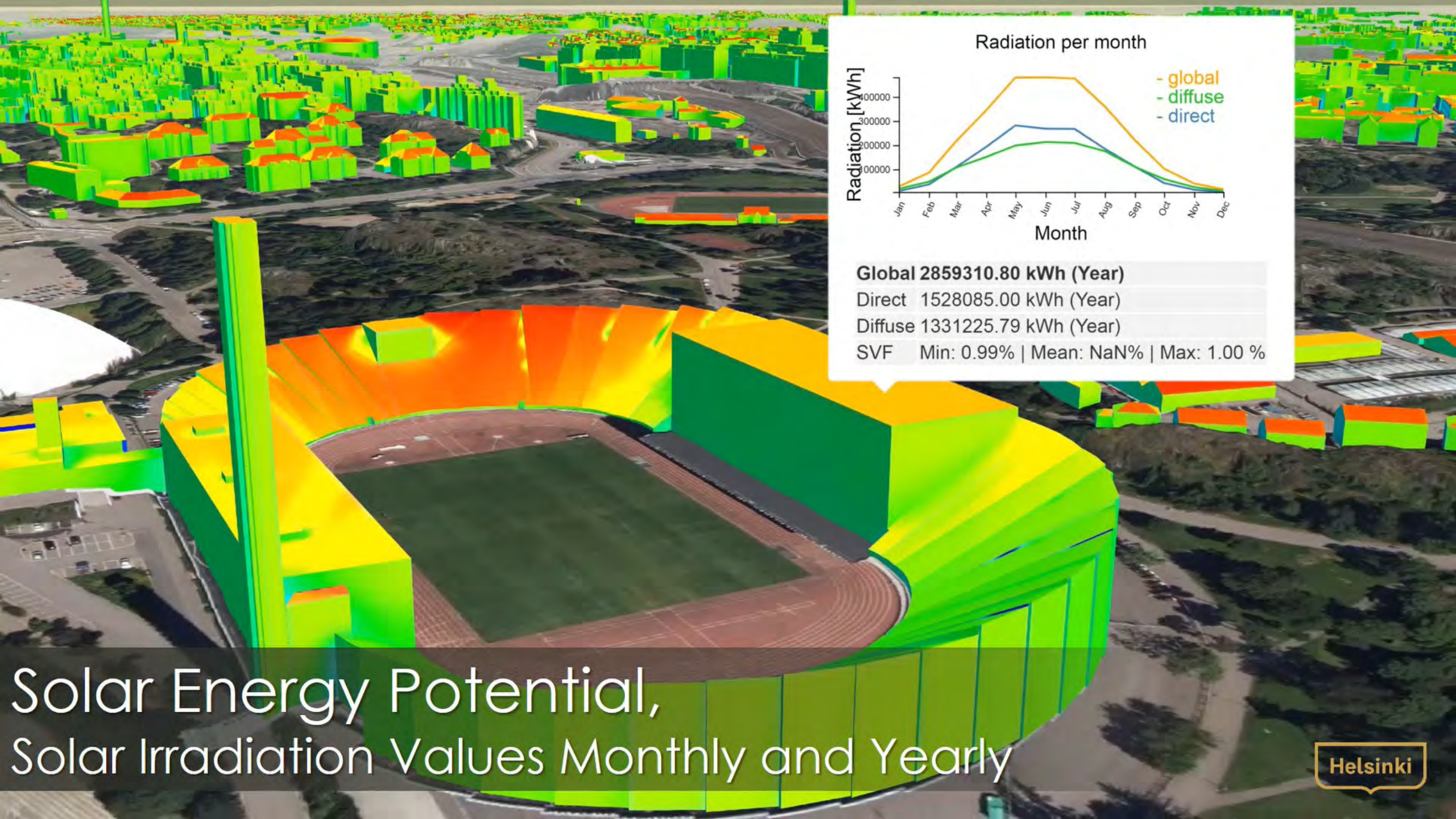


Helsinki Energy and Climate Atlas hel.fi/3D

- Understand the situation now
- Alternative energy sources
- Heat demand simulations and impact of renovations

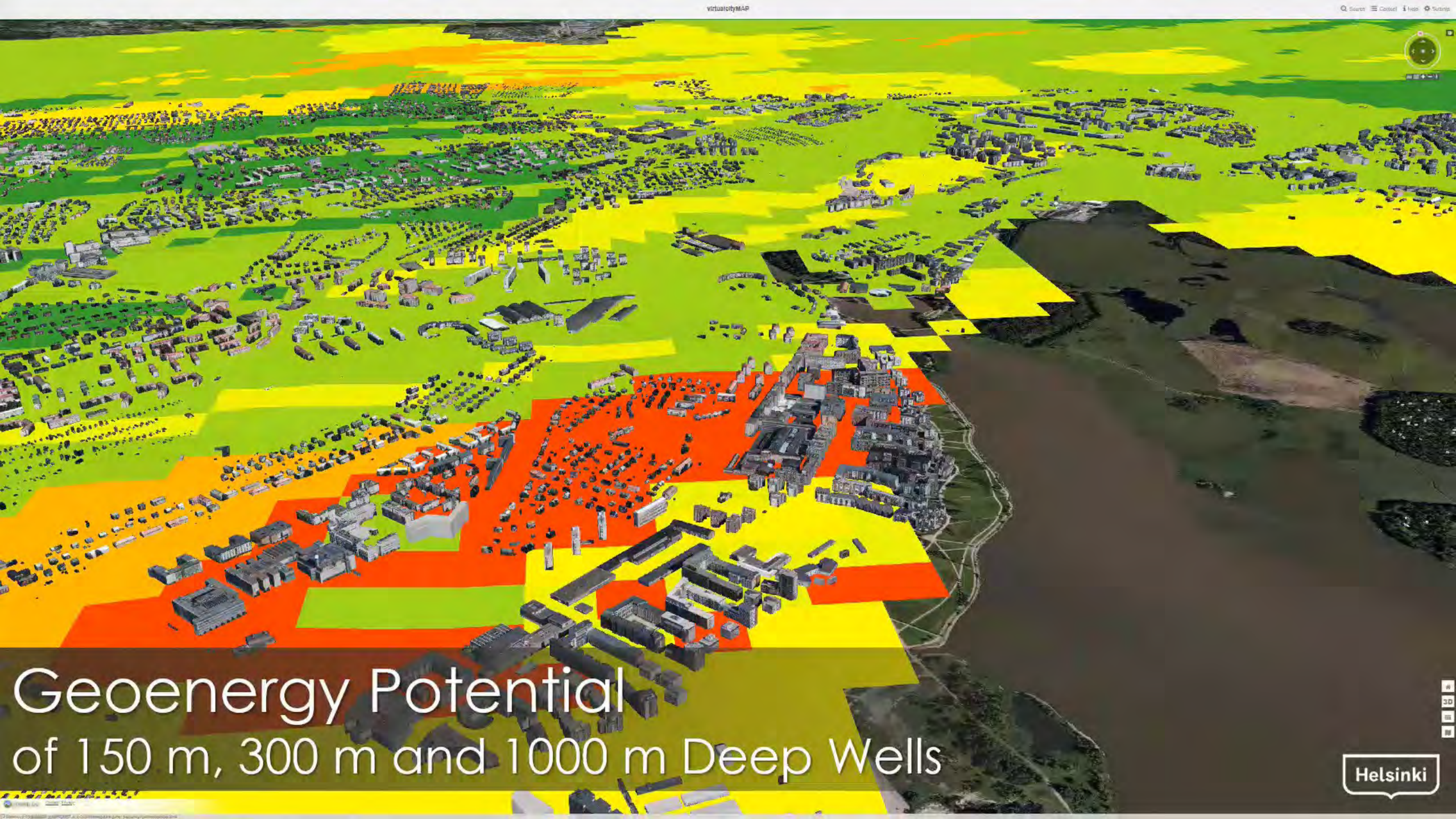
Helsinki

Energy Data,
Renovation History and Real Consumption Data


Radiation per month
Radiation [kWh]
400000
300000
200000
100000
- global
- diffuse
- direct
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Month
Global 2859310.80 kWh (Year)
Direct 1528085.00 kWh (Year)
Diffuse 1331225.79 kWh (Year)
SVF Min: 0.99% | Mean: NaN% | Max: 1.00 %
Solar Energy Potential,
Solar Irradiation Values Monthly and Yearly
Helsinki

Heat Demand,

Heat Savings and also CO_2 Emissions


virtualcityMAP
Geoenergy Potential
of 150 m, 300 m and 1000 m Deep Wells
Helsinki

Project presentations

Spatial planning and communication with stakeholders

Helsinki

virtual history

From scale model to virtual model

Helsinki

virtual history

- Scale model 2m x 5m
- 4000 images
- Processing at office

Helsinki

UNREAL ENGINE

Helsinki 3D Reality Mesh and UNREAL-integration under construction

- End user viewer application
- Open source developer package in Unreal Asset Store
- METAVERSE on UNREAL 2023

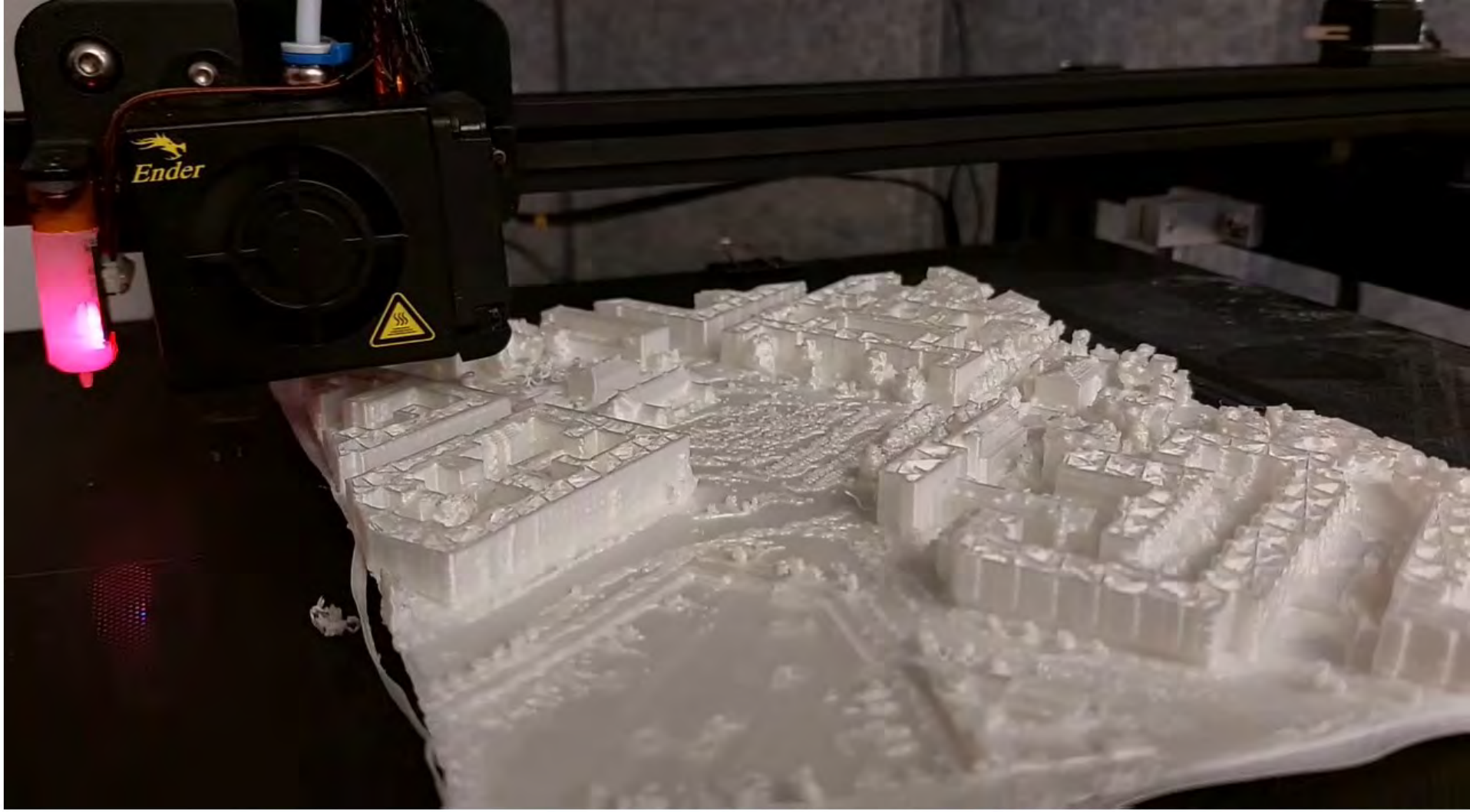
Helsinki

Minecraft Helsinki

- Entire city generated automatically
- Java and Bedrock versions 1m x 1m x 1m cubes
- Download

Helsinki

3D printing



- Every mans simple web service ”3D print your own neighborhood” – March 2022
- Select area – download file – 3D print in library
- https://hri.fi/data/fi/showcase/stadi3d-lataaja

Helsinki

project report

- Production
- Sharing
- Smart City development
- Simulations
- Process Integration

Helsinki

Links

- Helsinki 3D+ website www.hel.fi/3D
- Helsinki Energy and Climate Atlas https://kartta.hel.fi/3d/atlas
- Open Energy Atlas data in Helsinki Region Infoshare https://hri.fi/fi/dataset/helsingin-3d-kaupunkimalli
- Energy and Climateatlas videoclip (no audio) https://youtu.be/Cr-M1bla7K0
- Heat Demand Prediction of Buildings Using a 3D City Model
  Presentation by Enni Airaksinen https://youtu.be/J6r-cCL25O0
- 3D City Models as open data in Helsinki Region Infoshare
  https://hri.fi/data/en_GB/dataset/helsingin-3d-kaupunkimalli
- Helsinki 3D+ Youtube channel https://www.youtube.com/channel/UCC5zVtGUdLXRI354lghLLqg/videos

Helsinki

3D+

Helsinki

Thank You

jarmo.suomisto@hel.fi

www.hel.fi/3D

Youtube Helsinki3D+