HOLONI

AI4CITIES

"It has never been more urgent to confront the global climate crisis and accelerate the transition to reliable, accessible, and affordable carbonfree energy. This means that large electricity systems – including cities - must transition from centralised, fossil-fuel reliant power grids to more flexible, decentralised systems that are entirely powered by carbon-free energy assets".

What if…

…the city could produce a significant share of its energy consumption from solar rooftops?
…citizens could invest in shared solar PV and batteries on better terms?
…prosumers could sell their solar surplus within the city at a premium price?
…local companies and institutions could turn energy bills into a competitive advantage?

Problem

How can cities assess the potential and massively scale solar in the city - while ensuring all citizens are included?

Solar Surplus Predictor (SSP)

Solar Surplus Predictor (SSP) is an AI-powered Cloud-based platform helping municipalities, energy companies and energy consumers to assess the potential for solar production and surplus throughout the city, and simulate alternative deployment scenarios and their impact on CO2 emissions.
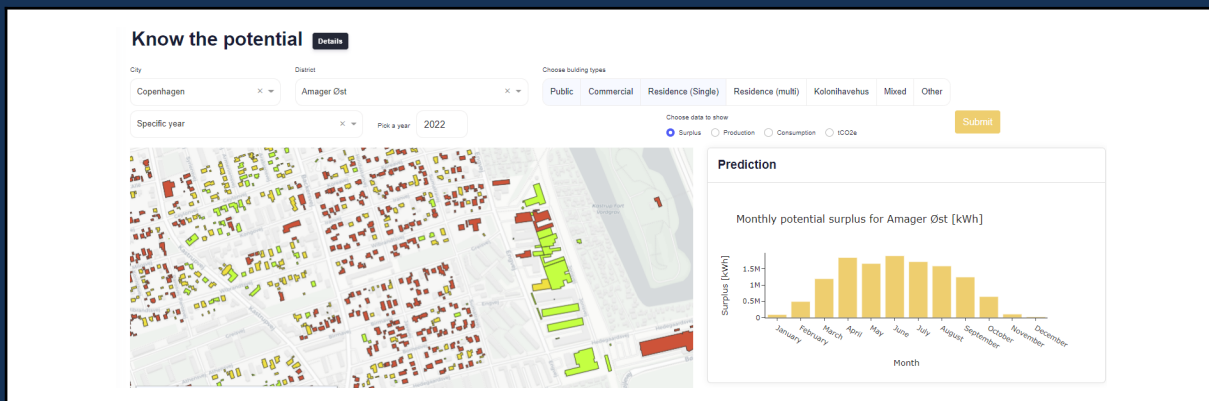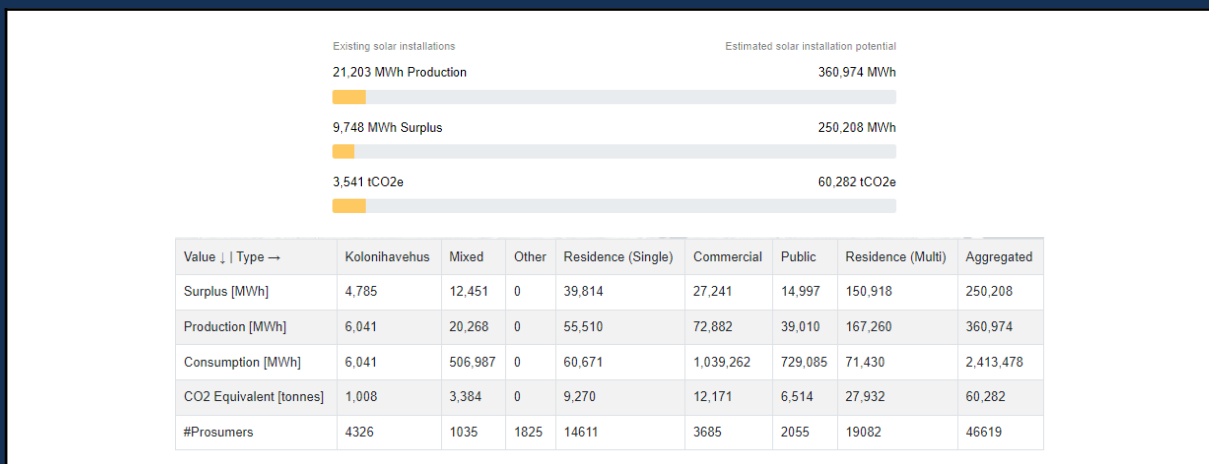

Key features:

- Visualisation, charts and key numbers per building types
- Prediction of consumption, rooftop solar production and surplus potential, down to hourly granularity
- Comparison between currently installed solar PVs and predicted potential
- Anonymised AI model combining open data with energy metering data
- Powerful tools to identify, optimize, evaluate and rank pre-defined and custom solar surplus cases
- Estimation of CO2 emission reduction potential

Zoom in on the Copenhagen Case

Developed through the AI4cities EU program, our solutions were tested in summer 2022 together with Copenhagen. The municipality uses HOLONI to understand the potential of urban solar, and tests digital solutions to incentivize and buy verified green energy directly from its own citizens' solar rooftops.

Existing solar installations

21,203 MWh Production

9,748 MWh Surplus

3,541 tCO2e

Estimated solar installation potential

360,974 MWh

250,208 MWh

60,282 tCO2e

Value ↓	Type →	Kolonihavehus	Mixed	Other	Residence (Single)	Commercial	Public	Residence (Multi)	Aggregated
Surplus [MWh]	4,785	12,451	0	39,814	27,241	14,997	150,918	250,208
Production [MWh]	6,041	20,268	0	55,510	72,882	39,010	167,260	360,974
Consumption [MWh]	6,041	506,987	0	60,671	1,039,262	729,085	71,430	2,413,478
CO2 Equivalent [tonnes]	1,008	3,384	0	9,270	12,171	6,514	27,932	60,282
#Prosumers	4326	1035	1825	14611	3685	2055	19082	46619

Typical results from Solar Surplus Predictor in Copenhagen
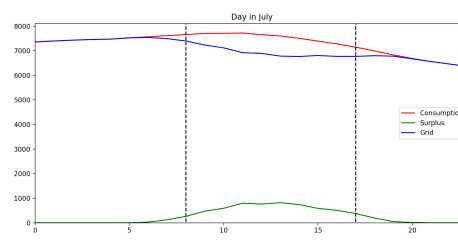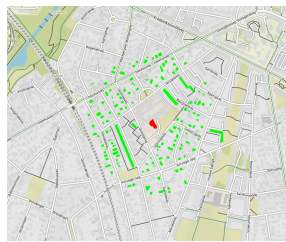
Advanced analytics of the Solar Surplus Predictor

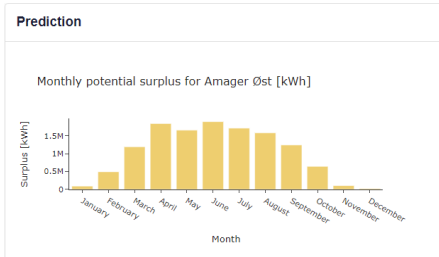### # 1: Ranking Districts and Buildings according to Surplus potential

Comparing the solar surplus potential of districts and buildings throughout the city

2: Local green sourcing scenarios

Matching the consumption of one building with nearby collective surplus potential

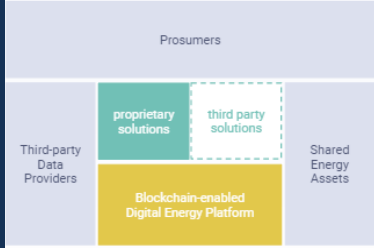### # 3: Solar surplus potential and buildings' economics

Estimating the value and cost savings of deploying solar at scale throughout a building portfolio

Part of a suite of HOLONI Solutions for Cities

Solar Surplus Predictor (SSP) is part of a broader suite of solutions for municipal entities depending on the role they play in the energy transition and city solar deployment.

CITY AS…			
… URBAN PLANNER	**… MARKET CATALYST**	**… ENERGY CONSUMER**	**… PROSUMER**
We provide the Solar Surplus Predictor to assess the potential for solar production and surplus throughout the city • *Visualisation, charts and key numbers per building types* • *Powerful analytics* • *Simulate alternative deployment scenarios* • *Instantly see impact on CO2 emissions*	*We provide a digital enabled public incentive scheme for city solar prosumers* • *Rewards solar surplus based on certified green surplus* • *Automated digital processing and transactions* • *Rewards: digital vouchers or stable digital currency* • *Trustworthy audit trail*	*We help procurement managers to source and certify local green energy from nearby prosumers* • *Assess how much solar surplus could come from nearby prosumers* • *Verifies the origin of the energy you consume hour by hour* • *Automate accounting, billing and payments* • *Trustworthy audit trail*	*We help public building managers design and invest in rooftop solar beyond self consumption* • *Predict solar surplus potential of your building* • *Team up with other prosumers to aggregate and sell collective surplus* • *Take part in innovative collective self consumption initiatives*

HOLONI's 3 Core Technological Innovations

ARTIFICIAL INTELLIGENCE	*We use Artificial Intelligence to predict energy <u>surplus</u> for individual buildings throughout the city and process advanced analytics to generate unique insights for urban planning, solar deployment strategies and local energy procurement.* *"Surplus" = "Production" minus "Consumption"* *We predict separately Solar Production and Building Consumption and combine and visualize outcomes through our cloud solution. Our AI and Big Data models are trained using both open and proprietary data from global and city-specific sources.*
BLOCKCHAIN ENABLED DIGITAL ENERGY PLATFORM	*We leverage a blockchain-enabled digital energy platform to develop faster and cheaper complementary solutions to HOLONI's Solar Surplus Predictor* ● *Access to off-the-shelf software applications & frameworks* ● *Automated, Low cost accounting, billing & transactions* ● *Interoperability through API gateways for third party data sources, share energy assets and Prosumer solutions* ● *Security & Privacy-preserving data sharing architecture and data governance and Self Sovereign Identity*
ENERGY TRACK&TRACE	*Our Solutions and Digital Energy Platform integrate with energytrackandtrace.com, a solution developed by Energinet and other European Transmission System Operators (TSO) to track and trace, on an hourly basis, the carbon-free origin of energy consumed.* *Through HOLONI, Energinet enables the tracking of green energy every hour to* ● *Contribute to climate neutral cities* ● *Enable local green energy procurement* ● *Empower solar prosumers*

Strategy Advisory & Innovation Services

#1 Strategic Advisory Services
The HOLONI team and associated partners deliver for municipalities and other stakeholders strategic projects and consulting engagement customised to the City context. For examples:

CITY SOLAR STRATEGY	MUNICIPAL SOLAR ASSETS	FINANCING NET ZERO ENERGY
What is the true value of solar for the city ecosystem? *How can policy, finance and market come together to reach your solar targets?* *What are the new roles and ecosystem play required from the municipality?*	*Should / How can Municipality owned buildings:* ● *deploy rooftop solar* ● *sell surplus to local energy consumers* ● *buy local green energy from the city prosumers*	*How can the municipality, its citizens and local businesses leverage sustainable finance, crowdfunding and fintech innovation to democratise and accelerate investments in shared energy assets and infrastructure?*

Together with partners, we combine our expertise in energy markets, smart cities, sustainability, business model and social innovation with Solar Surplus Predictor (SSP) to generate unique data driven insights and visualisation.

#2 Innovation Services

HOLONI helps municipalities, energy suppliers, enterprise energy consumers and solution providers design and develop prosumer-centric software solutions and frameworks - with ease, speed and lower cost without compromising on cybersecurity and e-privacy.

DESIGN	BUILD	PILOT
Use case co creation *Minimal Viable Ecosystem*	*Customised analytics* *Proof of Concept & MVPs*	*Living Lab demonstration* *Business Model Innovation*

Together with partners, we combine capabilities in co-creation, business model innovation with digital product development. HOLONI's Solutions and underlying blockchain enabled digital energy platform are leveraged as a service to ease the product development process and streamline implementation.

Impact & Benefits

REDUCE CO2 EMISSION	*We displace carbon emission from conventional centralised power generation with local solar energy and enable its scaling by incentivising city collective self consumption.*
SCALE ROOFTOP SOLAR	*We provide solar insights, enable portfolio development and portfolio-based financing, result-based incentive schemes and facilitate local solar energy sharing to bring more value to solar prosumers and unlock collective self consumption.*
EMPOWER PROSUMERS	*We accelerate the development of innovative solutions and collective actions bringing more value to prosumers such as Local green-certified energy sharing, Demand-side flexibility solutions or Shared Asset Crowdfunding*

We contribute to achieving UN Sustainable Development Goals

Onboarding, maintenance and support provided after deployment

- Case to case city onboarding to assess and acquire necessary data
- Direct access to cloud-based portal for registered users
- Support service for on-demand advanced analytics and the development of new solutions

Get in Touch

Please get in touch to explore partnerships or inquire about our products & services

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