



First Sustainable Energy and Climate Action Plan in Croatia by the City of Zagreb

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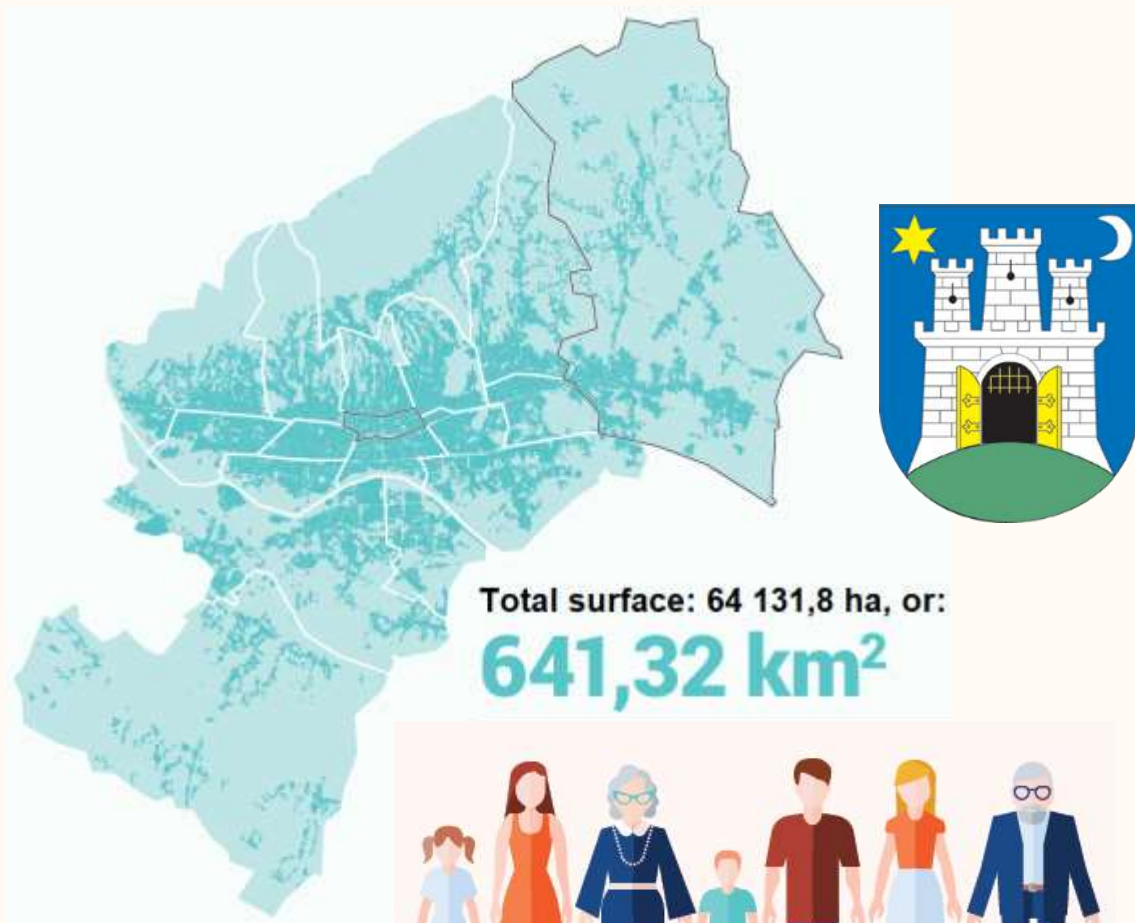
Head of Office



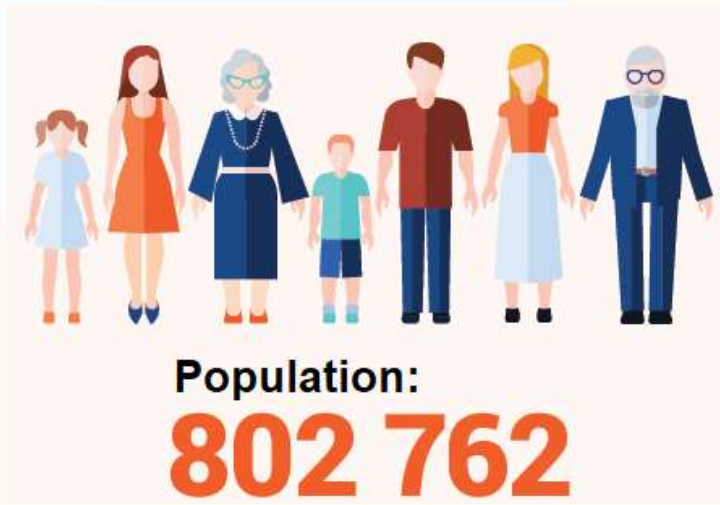
City of Zagreb

City Office for Economy, Energy and Environment Protection

16.10.2019.



Total surface: 64 131,8 ha, or:
641,32 km²



Population:
802 762

ECONOMY

Nominal gross domestic product, 2015.



Zagreb
141 379 kn
GDP per capita



Croatia
80 555 kn
GDP per capita

Tourism, 2017.



Quick overview of Zagreb's energy policy

- In effect since March 2008
- Legal mandate (*Law on Energy Efficiency, OJ 127/14 & 116/18*):
 - Energy efficiency plans – every year
 - Energy efficiency action plans – every 3 years
- **Covenant of Mayors framework** (2008 as baseline):
 - **Sustainable Energy Action Plan (SEAP): 2010. – 2020.**
 - 21% CO₂ reduction by 2020.
 - **Sustainable Energy and Climate Action Plan (SECAP): 2030.**
 - **40% CO₂ reduction by 2030.**
 - **Climate change adaptation part of the integrated plan**
 - SECAP unanimously adopted in June 2019 City Assembly session



Zagreb SECAP (1)

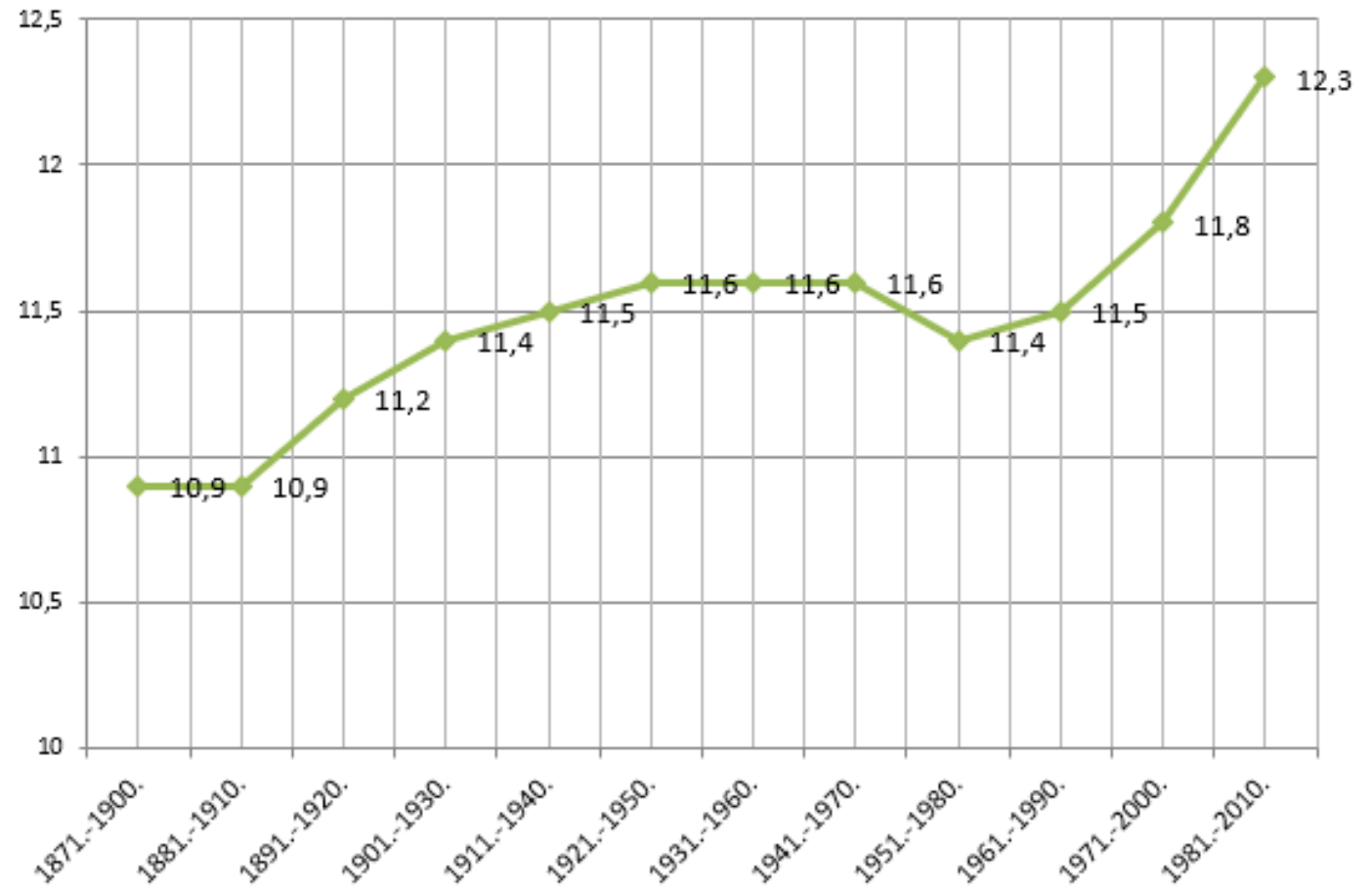
- Key energy document for the City of Zagreb.
- **Overall CO₂ reduction of 40% by 2030. compared to the 2008. baseline.**
 - We anticipate a more ambitious target of minimum 50 or 55% in the near future.
- A „living document” that will be regularly updated and enhanced.
- SECAP is focused on long-term local actions, taking into consideration energy efficiency and providing measurable objectives and results related to the reduction of energy consumption and CO₂ emissions.
- Climate Change Mitigation sectors:
 - **building sector; traffic sector; public lighting; district heating**
- Climate Change Adaptation sectors:
 - **10 sectors ranging from green infrastructure and water management to civil defense impact, ...**

Zagreb SECAP (2)

- Key challenges:
 - Traffic sector (diesel engines in particular)
 - Electricity generation
 - Natural gas consumption
 - Monitoring of the industry sector and more precise monitoring of the commercial and private sectors
- SECAP is our baseline for City of Zagreb negotiations regarding energy and climate projects in the next EU MFF 2021 – 2027 across all sources of funding (Cohesion Fund, ESI, InvestEU, ITI mechanism, ...).

Climate Change Adaptation – „feeling the heat” already

- Zagreb is already feeling the impacts of the drastic changes in the climate.
- For the observed 30-year time period an increase in the mean annual air temperature (°C) in the City of Zagreb is noticeable, with a noticeable upward trend in the last observed 30-year period (1981. – 2010.).



Mean recorded air temperatures (°C) for 30-year periods since 1871 for the City of Zagreb

Climate Change Adaptation – a new approach

- The 34 climate adaptation measures cover a broad range of sectors to ensure a robust transformation of the City of Zagreb into a climate-resilient capital of the future.
- Sectors covered include building sector, traffic infrastructure, energy sector, water management, spatial planning and land management, environment and biodiversity, agriculture and forestry, healthcare, civil protection and crisis situations, economy and tourism.
- Specific measures are grouped and linked, usually in the way that a preparatory/analytical part precedes the actual implementation measure.
- The city plans to prepare and nominate several large-scale projects, directly referenced in the SECAP adaptation measures, to be financed from the EU LIFE program as well as the upcoming Horizon Europe program in the next EU MFF 2021 – 2027.

Conclusion

- Extremely difficult work ahead for us – a „*make it or brake it*” decade
- Significant cross-sectoral contributions will be need to effectively prepare the growing city to accelerating climate change impacts.
- Zagreb, one of many capitals in the Global Covenant of Mayors aims to tackle this enormous challenge with coordinated efforts across all sectors.
- A particular challenge will be securing the necessary funding via effective combined use of grants and use of alternative financing models (PPP/EPC/ESCO) with the aim of mobilizing significant private investments for bankable climate projects.

Zagreb SECAP – some numbers for perspective

- The total amount of CO₂ emissions generated by the building sector equaled 1.802.000 t CO₂, which represents a 2% increase in comparison to the 2008 BEI. **However, from 2008 to 2015, the residential buildings (households) and the commercial spaces increased by 2.416.882 m², which represents a 29,04% expansion.**
- Comparison of emission-to-area (residential and commercial) ratios of the building sector for 2008 and 2015 show a **notable decrease:**
- **0,0610 t CO₂/m² (of heated area, 2008);**
- **0,0458 t CO₂/m² (of heated area, 2015).**
- Even though the city's population and heated space **grow constantly**, the **final energy consumption of the City of Zagreb decreases steadily** - from **51.658 TJ in 2010. to 45.962 TJ in 2017.**

Climate Change Mitigation – public buildings energy retrofit

- Works have been completed on over 45 public buildings (kindergartens, schools, public administration buildings, ...), with more under preparation.
- The total energy efficiency investments in public buildings have surpassed 30 million EUR.



"Ruđer Bošković" Technical School - before and after reconstruction

Climate Change Mitigation – RES integration

- Continuous energy efficiency measures in city-owned buildings are also done on a regular basis, such as the installation of thermal insulation of exterior walls, thermal insulation of the base of the walls, thermal insulation of the sloping and flat roof, replacement, worn out energy-inefficient joinery, installation of air recuperators, replacement of inefficient lighting, modernization of the boiler rooms and balancing of the heating system, installation of thermostatic radiator valves, etc. Photovoltaic and solar thermal collectors are also installed on a regular basis to support the development of renewable energy sources.



Photovoltaic & solar thermal collectors installed on public buildings

Climate Change Mitigation – public lighting

- The City is currently preparing a comprehensive reconstruction and modernization of its public lighting system through the “RePubLEEc” project, funded by the EIB ELENA financing mechanism.
- The overall objective of the project is reconstruction/modernization of public lighting in the City of Zagreb - implementation of energy efficiency measures, new energy-efficient light sources and power regulation systems as well as modernization of other existing public lighting parts like poles and cables.
- **The project aims to utilize innovative EPC/ESCO financing models.**

Climate Change Mitigation – district heating system

- The City of Zagreb has a 227.3km district heating network which will go through a major reconstruction project in the 2020 – 2023 period.
- Project is being prepared by the concessionaire HEP Toplinarstvo d.o.o. (part of HEP Group) in cooperation with the City of Zagreb.
- The project is being prepared as an EU major project) be co-financed through Zagreb's Integrated Territorial Investments EU initiative.
- Total project costs are estimated at around 77 million EUR with the expected co-financing rate of 56 million EUR



Zagreb's district heating network will undergo a major refurbishment and upgrade in the 2020 – 2023 period.

Climate Change Mitigation – EL-TO modernization

- Large scale project to replace outdated oil- and gas-fired turbines and boilers
- Installation of two low-NOx gas turbines, two heat recovery steam generators and one back pressure steam turbine producing heat and electricity at the EL TO combined heat and power (EL TO CHP).
- The capacity of the new combined cycle gas turbine units will be 150 MW of electrical energy and 114 MW of thermal energy, with lower greenhouse gas emissions.



43m €

&



EFSI guarantee

+



European Bank
for Reconstruction and Development

87m €

=

130m €



03.04.2019.

District Heating – The Road Ahead: A city's view on challenges and opportunities in deep decarbonization



Thank you.

Mirka Jozić, MSc

Head of Office



City of Zagreb

**City Office for Economy, Energy and
Environment Protection**

16.10.2019.