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BROWNFIELD SITES IN CROATIA

July, 2019.

Why brownfield areas in Croatia ?

- Brownfield areas in Croatia occur largely due to:
  - changes in the state structure and war
    - abandoned military complexes
  - processes of transformation and privatization
  - global economic processes
  - economic crisis and the state of the recession
    - old industrial sites (traditional production industry), abandoned tourist facilities on the islands and the coastal area)

Industrial sites

Waste Management Strategy (OG 130/2005) recognized 9 „crne točke" – ***hot spots*** in Croatia (sites highly contaminated with waste)

1. Red mud pools and waste base at former aluminate factory Obrovac,
2. Salonit Vranjic
3. Slag landfill of Thermal power plant Plomin
4. Pit Sovjak near Rijeka,
5. „Oil slag" in Botovo – washing of railway vagons and locomotives
6. Phosphogypsum landfill from Petrokemija Kutina,
7. Former factory of carchoal „Koksara" Bakar,
8. Hazardous waste landfill Lemić Brdo by Karlovac,
9. Former factory of ferroalloys at Dugi Rat

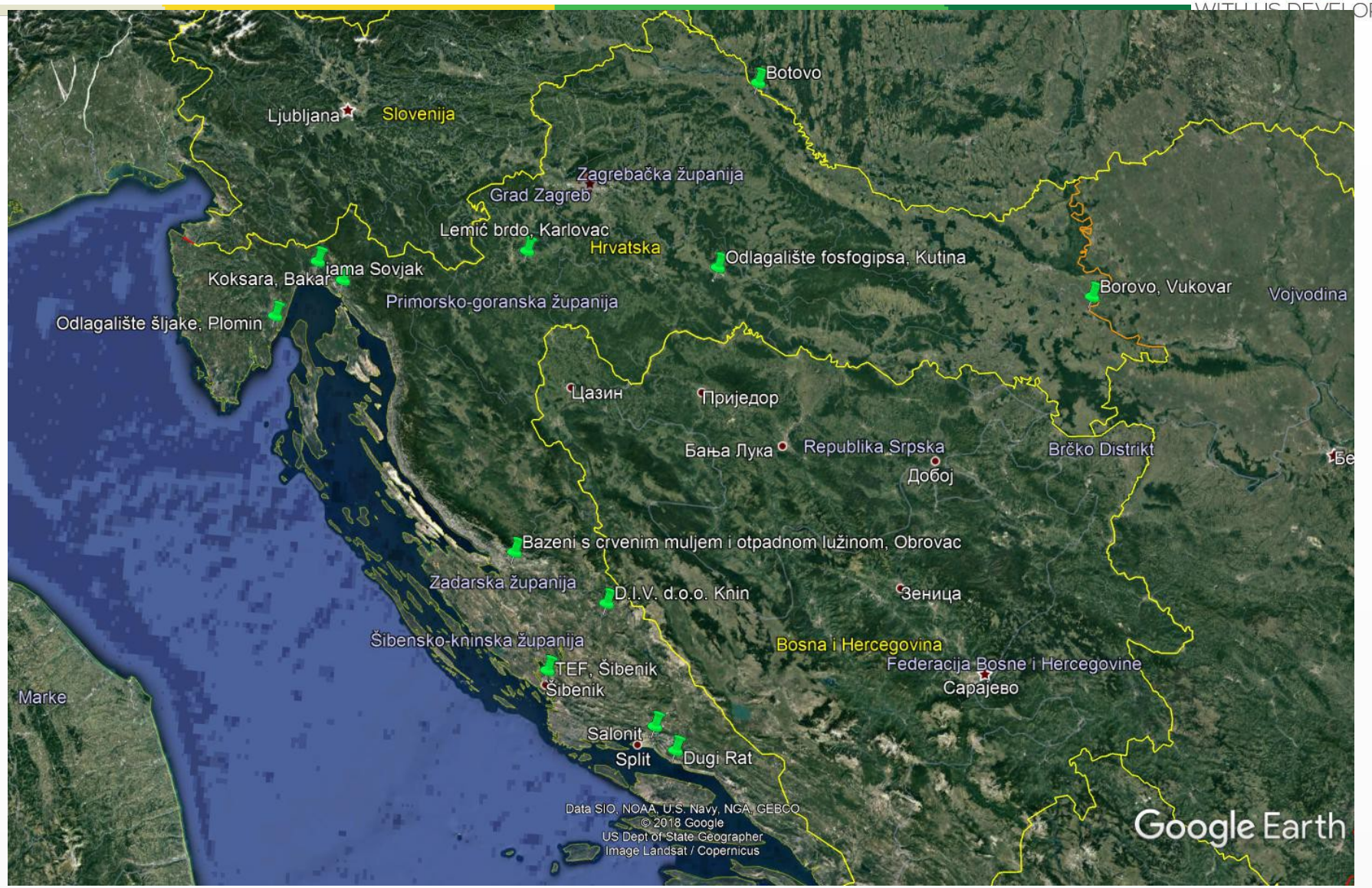
Obligation of the development of the Remediation Program for contaminated sites

Industrial sites

Waste Management Plan for the period 2007 - 2014 recognized additional hot spots

- Former Electrodes and ferroalloys factory - TEF, Šibenik
- Former factory Borovo, Vukovar
- Oil lagoons in DIV factory of screws (former TVIK) in Knin
- City of Komiža – island Biševo remediation of tar at Salbunara beach.

Hot spots


Botovo
Ljubljana
Slovenija
Zagrebačka županija
Grad Zagreb
Lemić brdo, Karlovac
Hrvatska
Odlagalište fosfogipsa, Kutina
Koksara, Bakar
jama Sovjak
Primorsko-goranska županija
Odlagalište šljake, Plomin
Borovo, Vukovar
Vojvodina
Цазин
Приједор
Бања Лука
Republika Srpska
Brčko Distrikt
Добој
Bazeni s crvenim muljem i otpadnom lužinom, Obrovac
Zadarska županija
D.I.V. d.o.o. Knin
Зеница
Šibensko-kninska županija
Bosna i Hercegovina
TEF, Šibenik
Federacija Bosne i Hercegovine
Šibenik
Сарајево
Marke
Salonit
Split
Dugi Rat
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
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US Dept of State Geographer
Image Landsat / Copernicus
Google Earth

Hot spots – status of remediation

Waste Management plan of the Republic of Croatia (OG 3/2017)

Hot spot	Status	Financed
Red mud and waste base of the former alumina factory near Obrovac	Remediation program approved in 2015. Remediation begun in 2006 – still in progress	FZOEU
Slag landfill at Kaštela bay	Annex of Remediation Program in 2014. (City of Kaštela should develop Detailed Plan in order to proceeds with project documentation development	Owner, Local, FZOEU
Salonit Vranjic (abestos)	Asbestos waste landfill „Mravinačka kava" finished in period 2007 - 2012	FZOEU
Slag landfill of Thermal power plant Plomin		Owner
Pit Sovjak near Rijeka	Location permit. TOR for remediation work - in preparation	FZOEU, EU
„Oil slag" in Botovo – washing of railway vagons and locomotives	Remediation Program should be annexed. It is necessary to determine the legal adherent of the polluter.	Owner
Phosphogypsum landfill from Petrokemija Kutina	Remediation Program for closure developed in 2012.	Owner
Former charcoal factory „Koksara" Bakar	Remediation finished at 2010	FZOEU
Hazardous waste landfill Lemić Brdo by Karlovac	Remediation finished in 2016	FZOEU
Former factory of ferroalloys at Dugi Rat	Remediation program developed and approved by MZOE in 2014	

FZOEU – Environmental and Energy Efficiency Fund

Hot spots – status of remediation

Waste Management plan of the Republic of Croatia (OG 3/2017)

Hot spot	Status	Financed
Former Electrodes and ferroalloys factory - TEF, Šibenik	Remediation finished in 2015. (still persist point contamination with PAH-s). New Batižele development project (new business – residential area with touristic, cultural and educational content…)	FZOEU Local
Borovo, Vukovar	Remediation finished at 2009	Owner
DIV d.o.o. from Samobor - repairs of mazut within the former TVIK scaffold factory in Knin	As part of the PHARE 2006 project, a proposal for a rehabilitation plan was drafted. Company DIV d.o.o. is obliged to create a pollution remediation plan for the area of that company.	Owner
island Biševo remediation of tar at Salbunara beach	Finished 2008	National

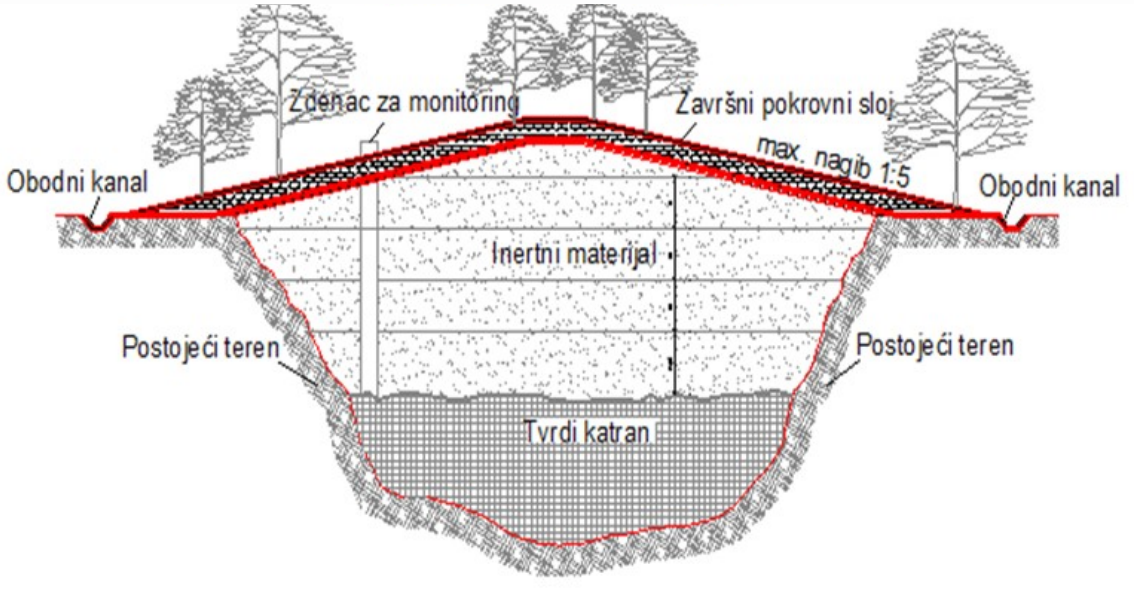
FZOEU – Environmental and Energy Efficiency Fund

Pit Sovjak – site highly comtaminated with hazardous waste

Remediation already planned at 80s of 20th Century

Recent project includes

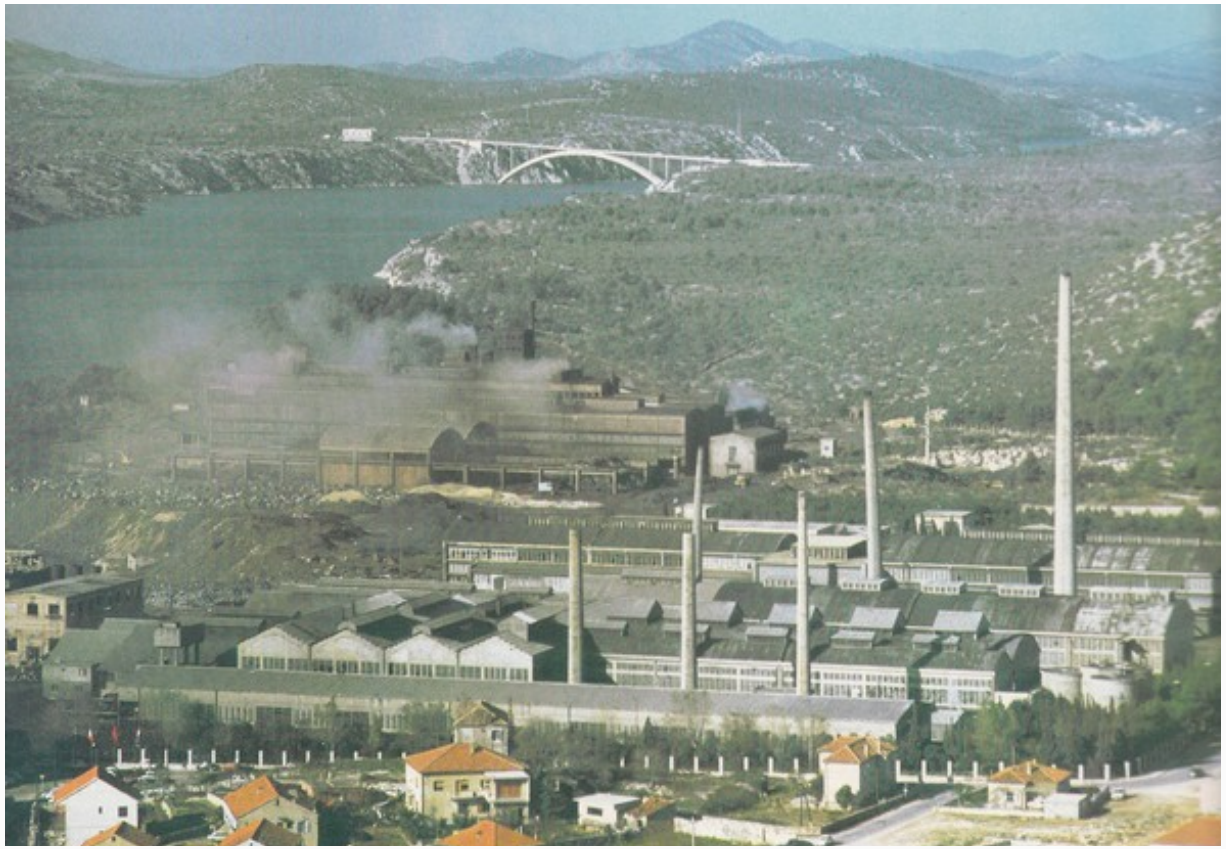
- removing of bulk waste and oils,
- digging of tar and mixing with lime
- export to incineration outside Croatia
- covering of the pit with inert material



Former Ferroalloys and electrodes factory in Šibenik

Remediation finished in 2012

- demolition of old objects
- soil remediation
- slag recovery



Before

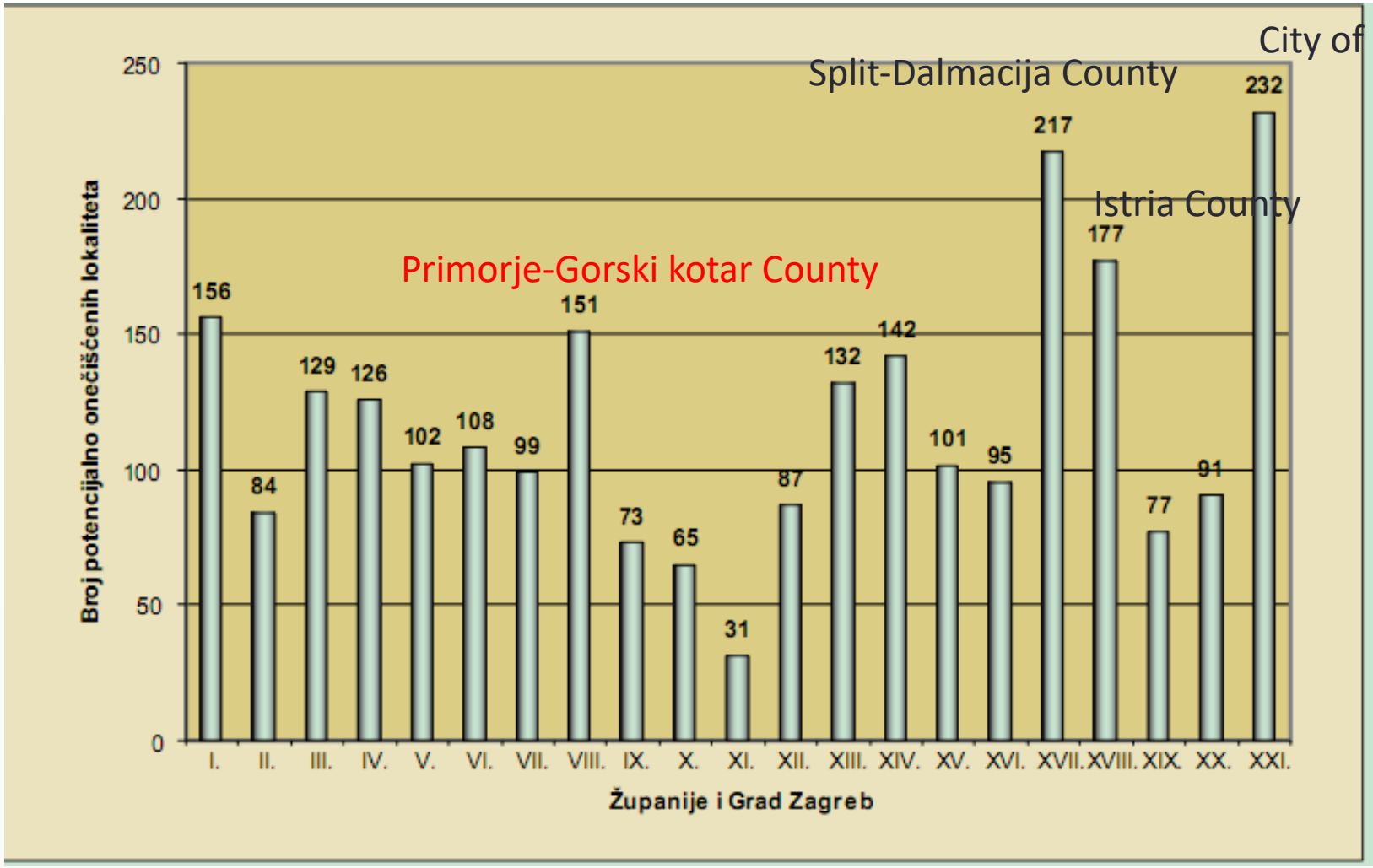
Now

Potential contaminated sites

In 2006 Agency for Environmental Protection developed **Georeferenced base on potential contaminated and contaminated sites (GEOL)**

- 2852 potentially contaminated sites on the territory of Republic of Croatia, owned by 1080 legal entities
- Current status - Base is not in function

Potential contaminated sites 2009 by counties



Source: Okoliš na dlanu, AZO, 2009

Soil screening values of pollutants in soil

EU legislation

- There is no Law on soil protection
- Most countries have their own soil screening values (SSV) of pollutants in the soil (*Carlon, C. (Ed.) (2007) Derivation methods of soil screening values in Europe. A review and evaluation of national procedures towards harmonization. European Commission, Joint Research Centre, Ispra, EUR)*

Croatian legislation

- There is no Law on soil protection
- *Guidelines for permanent soil monitoring in Croatia*, *Croatian Agency for Environmental protection, AZO 2009* – suggested German standard BBodSchV, 1999
- *Ewald Spitaler, Summary of thresholds for pollution and contamination of soils" (Task 1.1.), PHARE 2006 – Development of hazardous waste management system, including the identification and management of „Hot spot sites" in Croatia*
- *Kisić I., Sanacija onečišćenog tla, Agronomski fakultete Sveučilišta u Zagrebu, 2012* - Limit values of pollutants in soils depending on future use (agricultural, natural, residential, recreational, industrial)

National Strategy of Spatial Development

National Strategy of Spatial Development (OG 106/2017) adopted in 2017.

recognized „napuštena i preskočena područja” - ***brownfield*** areas in Croatia

Development of **Register of brownfield areas in Croatia – in progress**

Brownfield sites

Spatial Development Strategy of Republic of Croatia

Chapter 4. Priorities and Strategic Directions for Spatial Development - subsection Effective use of used space:

- revitalization of abandoned areas and buildings and decontamination of the area where any form of pollution is recorded
- Strategic planning and identification of brownfield locations through development priorities
- Evaluating the potential of the existing structure
- Brownfield as a development resource, from national to local level: inventory and evaluation

Brownfield sites

Spatial Development Strategy of Republic of Croatia

Chapter 4. Priorities and Strategic Directions for Spatial Development - subsection Effective use of used space:

- making a Brownfield register within the ISPU (Information system of spatial planning) as a unique and publicly available data viewer planned for urban transformation

- creation of Urban plan for urban transformation - avoiding uniform and single-purpose solutions, high quality of public content and public open spaces

The City of Zagreb

The Urban Agglomeration Development Strategy

The main goals:

- inventory of the brownfield area; creating a unique database
- development of revitalization projects for selected brownfield areas
- introduction of measures for more successful resolutions for property and legal relations
- remediation of contaminated sites in order to prevent the spread of contamination
- revitalization of industrial zones, former military facilities, etc., which will enable the use of existing (physical) resources within urban areas without loading the additional space and environment

The City of Zagreb

- Regional multifunction center Jedinstvo Facility - reconstruction of the former factory building
- Project for construction of the URIHO complex in Kajzerica
- Renewal of the warehouse building of the Technical Museum Nikola Tesla in the triangle Tratinska - Jukićeva – Brozova for the purpose of introducing new content and revitalizing the area
- Revitalization of the abandoned area of the former military area in Jastrebarsko into economic-social and public purposes
- Reconstruction of the abandoned military infrastructure for the purpose of Aircraft Training Center Lučko
- Reconstruction and revitalization of the abandoned Paromlin complex for the purpose of Zagreb City library

The City of Zagreb

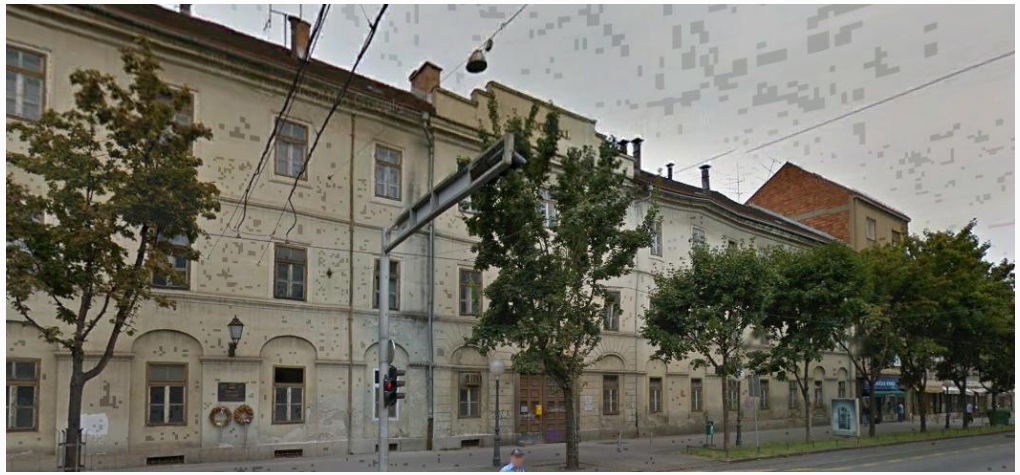
- Zagreb Creative Cluster Gredelj - Revitalization of abandoned industrial area Gredelj for the purpose of Center of Creative Industries
- Block Badel
- Project of the University Campus Borongaj
- Former military hospitals in Vlaška Street
- Zagreb oil factory in Branimirova
- Zagreb Fair - transformation into a multifunctional space

The City of Zagreb

Gorica

Paromlin

vojna bolnica



The City of Zagreb

Gorica

Paromlin

vojna bolnica

HVALA NA PAŽNJI!

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