zelena Rijeka

green Rijeka

Grad Rijeka

organizator i autor izložbe: Grad Rijeka – dizajn izložbe: Vesna Rožman – fotografije: arhiva Grada Rijeke – Rijeka, lipanj 2021.

Solarna energija u gradu Rijeci | **Solar Energy** in the City

PPO Srdoči/ Kindergarten Srdoči

OŠ Fran Franković/ Primary school Fran Franković

Fotonaponske elektrane – preko solarnih ćelija pretvorba solarne energije direktno u električnu energiju

- postavljene na 7 zgrada javne namjene ukupne instalirane snage 110 kW

  OŠ Zamet, OŠ Kantrida, OŠ Pećine, OŠ Fran Franković, PPO Potok, PPO Srdoči i PPO Mavrica
- od 2013. godine ukupno proizvedeno 635.452 kWh električne energije iz energije sunca
- postavljeno 435 fotonaponska panela ukupne površine 769 m^2

Photovoltaic power plants - solar energy is directly converted into energy through solar cells

- installed on 7 public buildings with a total installed capacity of 110 kW

  Primary school Zamet, Primary school Kantrida, Primary school Pećine, Primary school Fran Franković, Kindergarten Potok, Kindergarten Srdoči, Kindergarten Mavrica
- since 2013, a total of 635,452 kWh of electricity has been produced from solar energy
- 435 photovoltaic panels with a total area of 769 m^2 were installed

Zanimljivosti

- još u godinama provedenim u Vatikanu, Leonardo da Vinci (1452. – 1519.) koristio konkavna ogledala koja bi usmjeravala solarno zračenje i grijala vodu. U modernim vremenima ovaj princip se zove koncentriranje solarne energije i glavni je princip rada današnjih solarnih elektrana. Da Vinci je korištenje solarne energije planirao jer je bio zabrinut zbog uništenja šuma koje su u tadašnje vrijeme bile glavno gorivo
- prema nekim izračunima Zemlja u 71 minutu primi dovoljno solarne energije da zadovolji energetske potrebe čovječanstva za cijelu godinu

http://www.cee.hr/cinjenice-solarnoj-energiji/

Interesting facts

- In the years spent in the Vatican, Leonardo da Vinci (1452 - 1519) used concave mirrors that would direct solar radiation and heat water. Nowadays, this principle is called the concentration of solar energy and it is the main principle of operation of the today's solar power plants. Da Vinci planned to use solar energy because he was concerned about the destruction of forests, which were the main fuel at the time.
- According to some calculations, the Earth receives enough solar energy in 71 minutes to meet the energy needs of humanity for the whole year.

Solarni paneli – Izravna pretvorba solarne energije u toplinu za pripremu potrošne tople vode postavljeni u vrtićima koji troše više energije zbog centralnih kuhinja ili praonica

PPO Potok, PPO Mavrica, PPO Morčić, PPO Đurđice

- postavljeno 32 solarna panela ukupne površine 90 m^2
- ukupna površina instaliranih panela na objektima Grada Rijeke pomoću kojih se koristi energija sunca iznosi 859 m^2 što je približno veličine 5 odbojkaških terena

Solar panels - direct conversion of solar energy into heat for the production of hot water installed in kindergartens that consume more energy due to central kitchens or laundries

Kindergarten Potok, Kindergarten Mavrica, Kindergarten Morčić, Kindergarten Đurđice

- 32 solar panels with a total area of 90 m^2 were installed
- The total area of installed panels on the facilities belonging to the City of Rijeka which use solar energy is 859 m^2, approximately the size of 5 volleyball courts.

Grad Rijeka

SUSTAINABLE ENERGY WEEK

SUSTAINABLE ENERGY DAY ORGANISER #EUSEW2021

Ricikleta gradska električna bicikla | System of public electric-bicycles

Početak upotrebe ožujak 2020. godine

- 28 električnih bicikala, mogućnost korištenja 0-24, 7 dana u tjednu
- 4 terminala
  Jadranski trg
  Sušački most
  na platou kompleksa Bazeni Kantrida
  ispred Dvorane mladosti na Trsatu
- u godinu dana korišteni su 4.417 puta
- najviše se koristi subotom
- plan – nastavak i proširenje projekta

Start of use March 2020

- 28 electric bicycles – possibility of using 0-24, 7 days a week
- 4 terminals
  Jadranski trg
  Sušački most
  Bazeni Kantrida complex
  in front of Dvorane mladosti on Trsat
- used 4,417 times in a year
- mostly used on Suterday
- plan – continuation and expansion of the project

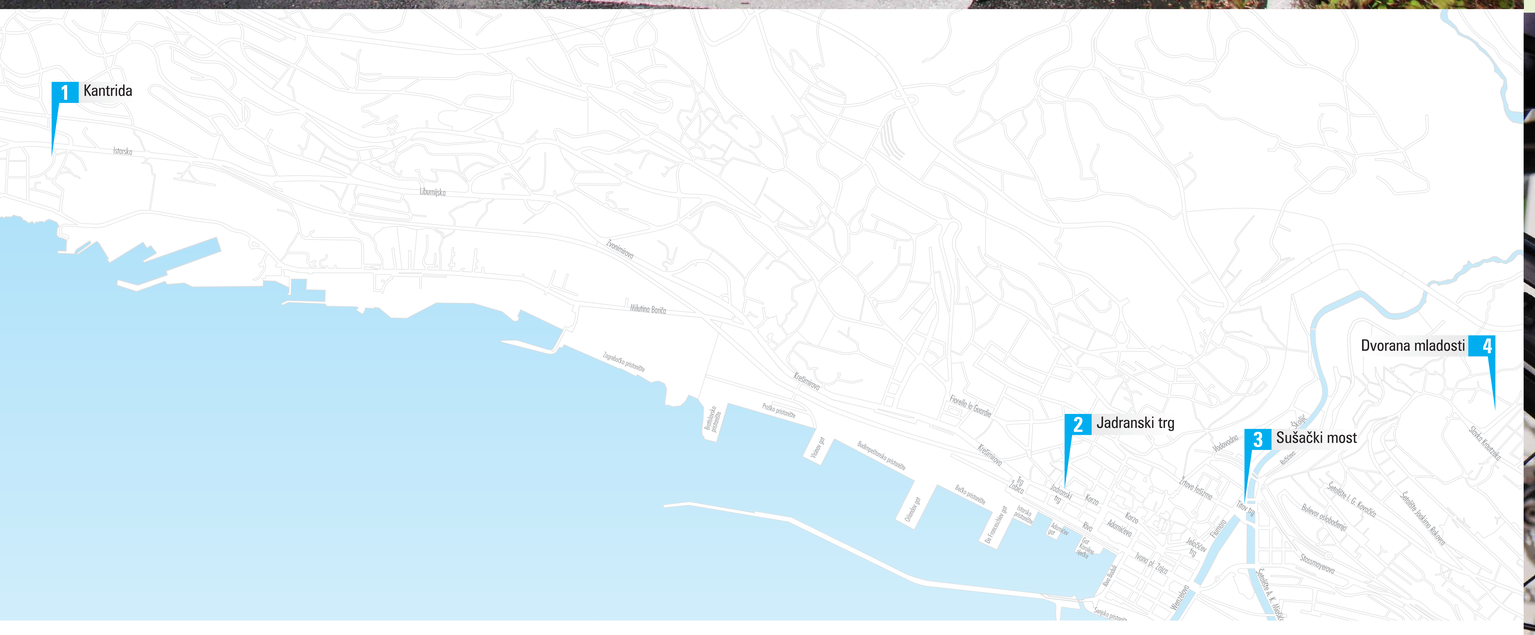
Zanimljivosti

- Prvi električni bicikli počeli su se javljati u 1890-ima među američkim patentima. Krajem 1895. Ogden Bolton Jr. dobio je patent za bicikl na baterijski pogon – motorom montiranim na stražnji kotač.
- Razvojem tehnologije i rastom cijena goriva, električni bicikli su vrlo brzo stekli popularnost. Danas se diljem svijeta koristi preko 200.000.000 električnih bicikala, a taj broj brzo raste.

https://www.xplorerlife.hr/blog/elektricni-bicikli-kroz-povijest/

Interesting facts

- The first electric bicycles were patented in the 1890s in the U.S. In 1895, Ogden Bolton Jr. obtained a patent for a battery-powered bicycle – it was an engine mounted on the rear wheel.
- With the development of technology and rising fuel prices, electric bicycles quickly gained popularity. Today, over 200,000,000 electric bicycles are used worldwide, and that number is growing rapidly.



Grad Rijeka

SUSTAINABLE ENERGY WEEK

SUSTAINABLE ENERGY DAY ORGANISER #EUSEW2021

Javna rasvjeta | Public Lighting

- do 2020. godine - 91% energetski učinkovita rasvjetna tijela
- Grad Rijeka vlasnik je 15 790 rasvjetnih tijela
- trenutno instalirana snaga javne rasvjete u gradu Rijeci iznosi 2,33 MW
- kontinuirana modernizacija sustava javne rasvjete - smanjenje potrošnja energije za javnu rasvjetu, smanjenje emisija stakleničkih plinova, svjetlosnog zagađenja te unaprjeđenje kvaliteta osvijetljenosti prometnih i javnih površina
- dugoročni planovi – sva rasvjeta sa led izvorima svjetlosti

Primjer: Krešimirova ulica – zamjena postojećih izvora svjetlosti s novim led svjetiljkama – godišnja ušteda 3.915 tCO_2/god

Zanimljivosti

Rijeka - grad najbogatije industrijske tradicije u Hrvatskoj, zauzima i posebno mjesto u nacionalnoj povijesti električne energije. Prva macchina elettrica pojavila se u Rijeci 1838. godine a 1870. električna energija proizvedena u sličnom stroju služi za osvjetljavanje pozornice starog Admićevog kazališta. Krajem kolovoza 1881. zasjala je prva električna svjetlost u luci, a 1885. proradio prvi autonomni sustav u novoizgrađenom Općinskom kazalištu. Godine 1890. za potrebe luke i željeznice izgrađena je električna centrala, prva u Hrvatskoj, a dvije godine kasnije još jedna, ujedno prva monofazna izmjenična elektrana u Austro-Ugarskoj Monarhiji. Godine 1897. izgrađena je treća elektrana, a 1908. četvrta. Rijeka je 1896. dobila električni tramvaj a 1905. spalionicu smeća u kojoj se paljenjem kućnog i industrijskog otpada dobivala električna energija. Sušak je elektrificiran 1922. godine, sušačko - riječko područje povezano u jedinstven sustav 1940., a 1947. osnovano je Elektroprimorje.

- 91% energy efficient lighting fixtures were installed by 2020
- the City of Rijeka owns 15,790 lighting fixtures
- 2.33 MW is the currently installed public lighting power in the Rijeka
- continuous modernization of the public lighting system, which reduces energy consumption for public lighting, greenhouse gas emissions, light pollution and improves the quality of lighting in traffic and public areas
- long-term plans are in place to equip all lighting with LED light sources

Example: Krešimirova Street - replacement of existing light sources with new LED lamps - annual savings amount to 3,915 tCO_2

Interesting facts

Rijeka - the city with the richest industrial tradition in Croatia deserves a special place in the national history of electricity. The first *macchina elettrica* was set up in Rijeka in 1838, and in 1870 electricity produced by a similar machine was used to illuminate the stage of the old Adamić Theatre. In August 1881, the first electric light in the port, and in 1885 the first autonomous system in the newly built Municipal Theatre were put into operation. In 1890, a power plant, the first one in Croatia, was built for the needs of the port and the railway. Two years later, yet another one was erected, as the first monophasic alternating power plant in the Austro-Hungarian Monarchy. In 1897, Rijeka received its third power plant, and in 1908 the fourth. In 1896, Rijeka introduced an electric tram, and in 1905, a waste incinerator where electricity was obtained by burning household and industrial waste. Electric power was introduced in Sušak in 1922 and in 1940 the Sušak-Rijeka area was merged into a single city. Elektroprimorje, the electric power supply company was founded in 1947.

Nana Palinić: *125 godina električne energije u Rijeci*, 2006.

942	led svjetiljke / led lamps		397	fluokompaktne svjetiljke / fluorescent lamps
13,402	natrijeve svjetiljke / sodium lamps		264	živine svjetiljke / mercury lamps
785	metal-halogene svjetiljke / metal-halide lamps			

Održiva gradnja niskoenergetski objekti | **Sustainable Construction** low-energy buildings

2011. – Dječji vrtić **Srdoči**

- neto površina - 1.316 m^2
- broj upisane djece u pedagoškoj 2020./2021. godini - 142
- energetski certifikat A+ razreda
- ventilirana fasada
- niskotemperaturno grijanje
- fotonaponska elektrana na površini nadstrešnice parkirališta snage 10 kW

2011. - Kindergarten **Srdoči**

- floor area - 1,316 m^2
- number of enrolled children in the pedagogical 2020/2021. year - 142
- A + class energy certificate
- ventilated facade
- low temperature heating
- PV power plant on the surface parking lot canopies of 10 kW

2014. – Dječji vrtić **Mavrica**

- neto površina – 1.252 m^2
- broj upisane djece u pedagoškoj 2020./2021. godini - 91
- ventilirana fasada
- niskotemperaturno grijanje
- fotonaponska elektrana snage 30 kW čija se proizvedena električna energija koristi u objektu
- solarni paneli za pripremu potrošne tople vode
- korištenje oborinske vode za održavanje okoliša

2014. - Kindergarten **Mavrica**

- floor area - 1,252 m^2
- number of enrolled children in the pedagogical 2020/2021. year - 91
- ventilated facade
- low temperature heating
- PV power plant with a power of 30 kW - produced electricity is used in the building
- solar panels for domestic hot water preparation
- use of rainwater to maintain the environment

Grad Rijeka

SUSTAINABLE ENERGY WEEK

SUSTAINABLE ENERGY DAY ORGANISER #EUSEW2021

Održiva gradnja niskoenergetski objekti | **Sustainable Construction** low-energy buildings

2017. – Dječji vrtić **Morčić**

- neto površina – 2.075 m^2
- broj upisane djece u pedagoškoj 2020./2021. godini - 171
- modularna gradnja s toplinskom izolacijom 23 – 28 cm mineralne vune
- solarni paneli za pripremu potrošne tople vode – centralna praonica za više objekata
- ventilacija – rekuperacija otpadne topline
- hlađenje – dizalice topline

2017. - Kindergarten **Morčić**

- floor area - 1,316 m^2
- number of enrolled children in the pedagogical 2020/2021. year – 171
- modular construction with thermal insulation of 23 - 28 cm of mineral wool
- solar panels for domestic hot water preparation - central laundry for several buildings
- ventilation - waste heat recovery
- cooling - heat pumps

2018. – Dječji vrtić **Đurđice**

- neto površina – 2.009 m^2
- broj upisane djece u pedagoškoj 2020./2021. godini – 193
- modularna gradnja s toplinskom izolacijom 23 – 28 cm mineralne vune
- solarni paneli za pripremu potrošne tople vode – centralna kuhinja za više objekata
- ventilacija – rekuperacija otpadne topline
- hlađenje – dizalice topline

2018. - Kindergarten **Đurđice**

- floor area - 1,316 m^2
- number of enrolled children in the pedagogical 2020/2021. year – 193
- modular construction with thermal insulation of 23 - 28 cm of mineral wool
- solar panels for domestic hot water preparation - central kitchen for several buildings
- ventilation - waste heat recovery
- cooling - heat pumps

Energetske obnove, 2016. – EU projekti | **Energy Recovery**, 2016 - EU Projects

OŠ Nikola Tesla/Primary school Nikola Tesla

PPO Krijesnica/Kindergarten Krijesnica

Pilot projekti

Izrada projektne dokumentacije za energetsku obnovu zgrada

- 15 objekata osnovnih škola i vrtića
- 100% sufinanciranje – 85% Europski fonda za regionalni razvoj + 15% Fond za zaštitu okoliša i energetsku učinkovitost
- ukupna vrijednost – 1.233.300 kn

Energetska obnova zgrada i korištenje obnovljivih izvora energije u javnim ustanovama odgoja i obrazovanja

- 4 objekta – OŠ Nikola Tesla, OŠ Fran Franković, PPO Krijesnica i PPO Turnić
- 70% sufinanciranje – 30% Europski fonda za regionalni razvoj + 40% Fond za zaštitu okoliša i energetsku učinkovitost
- minimalne uštede 30% toplinske energije za grijanje
- ukupna vrijednost – 11.384.327 kn
- bespovratno – 6.459.103 kn

Osnovna škola Nikola Tesla

godina izgradnje – 1934.
bruto površina – 5.388 m^2
projektirane uštede – 47% energije za grijanje

Osnovna škola Fran Franković

godina izgradnje – 1987.
bruto površina – 3.080 m^2
projektirane uštede – 35% energije za grijanje

Podcentar predškolskog odgoja Krijesnica

godina izgradnje – 1972.
bruto površina – 865 m^2
projektirane uštede – 71% energije za grijanje

Podcentar predškolskog odgoja Turnić

godina izgradnje – 1972.
bruto površina – 822 m^2
projektirane uštede – 70% energije za grijanje

Pilot project

Preparation of project documentation for energy recovery of buildings

- 15 objects primary schools and kindergartens
- 100% Grants – 85% European Regional Development Fund + 15% Environmental Protection and Energy Efficiency Fund
- Total value – EUR 164,440

Energy recovery of buildings and use of renewable energy sources in public institutions for upbringing and education

- 4 facilities – Primary schools Nikola Tesla and Fran Franković, Kindergartens Krijesnica and Turnić
- 70% Grants – 30% European Regional Development Fund + 40% Environmental Protection and Energy Efficiency Fund
- At least 30% savings of annual energy for heating
- Total value – EUR 1,517,910
- Grants – EUR 861,214

Primary school Nikola Tesla

Year of construction – 1934.
Building floor area – 5.388 m^2
Projected savings – 47 % heating energy

Primary school Fran Franković

Year of construction – 1987.
Building floor area – 3.080 m^2
Projected savings – 35 % heating energy

Kindergarten Krijesnica

Year of construction – 1972.
Building floor area – 865 m^2
Projected savings – 71 % heating energy

Kindergarten Turnić

Year of construction – 1972.
Building floor area – 822 m^2
Projected savings – 70 % heating energy

Zanimljivosti

- 2016. godine OŠ Nikola Tesla bila je najznačajniji projekt programa energetske obnove kako zbog veličine projekta, iznosa sufinanciranja tako i zbog činjenice da je dio zaštićene kulturne jezgre grada

izvor: Grad Rijeka

Interesting facts

- In 2016, the Nikola Tesla Elementary School was the most important project in energy recovery programme in terms of project size, amount of co-financing and the fact that the school is part of the protected cultural city centre.

EUROPSKI STRUKTURNI I INVESTICIJSKI FONDOVI
Europska unija
Zajedno do fondova EU
Grad Rijeka
SUSTAINABLE ENERGY WEEK
SUSTAINABLE ENERGY DAY ORGANISER #EUSEW2021

Energetske obnove, 2017. – 2018., EU projekti | **Energy Recovery**, 2017 - 2018 - EU Projects

OŠ Ivana Zajca/Primary school Ivana Zajca

PPO Veseljko/Kindergarten Veseljko

Javni poziv
Energetska obnova zgrada i korištenje obnovljivih izvora energije u javnim ustanovama odgoja i obrazovanja

- 11 objekta – 6 osnovnih škola + 5 dječja vrtića
- 35 % sufinanciranja – Europski fonda za regionalni razvoj
- 60 % vlastite komponente korisnika – Fond za regionalni razvoj
- minimalne uštede 50% toplinske energije za grijanje
- ukupna vrijednost – 57.961.729 kn
- bespovratno – 32.109.425 kn
- projekt obuhvaća radove na povećanje toplinske zaštite vanjske ovojnice, modernizaciju rasvjete i daljinsko očitanje potrošnje energenata, stručni i projektantski nadzor, promidžbu i upravljanje i administraciju projekta
- ukupna površina obnovljenih objekata je 28.299 m^2

OŠ Gelsi, OŠ Ivana Zajca, OŠ Kozala, OŠ Pećine, OŠ Podmurvice, OŠ Škurinje, PPO Krnjevo, PPO Kvarner, PPO Podmurvice, PPO Potok, PPO Veseljko

Public Call
Energy recovery of buildings and the use of renewable energy sources in public institutions for upbringing and education

- 11 facilities - 6 primary schools + 5 kindergartens
- 35% is co-financed by the European Regional Development Fund
- 60% is the beneficiary's own contribution - Regional Development Fund
- minimum savings of 50% of thermal energy for heating
- total value – EUR 7,728,230
- non-refundable – EUR 4,281,256
- the project includes works to increase the thermal protection of the outer shell, modernization of lighting and remote reading of the energy consumption, functional and design supervision, promotion and management and the administration of the project
- the total area of renovated buildings is 28,299 m^2

Primary school Gelsi, Primary school Ivana Zajca, Primary school Kozala, Primary school Pećine, Primary school Podmurvice, Primary school Škurinje, Kindergarten Krnjevo, Kindergarten Kvarner, Kindergarten Podmurvice, Kindergarten Potok, Kindergarten Veseljko

Zanimljivosti

Energetskim obnovama:

- smanjuje se potrošnja energije u zgradama javnog sektora
- stvara se povoljna mikroklima za rad
- produžuje se vijek trajanja zgrade
- smanjuju se troškovi za održavanje zgrade i financiranje potrošnje energenata
- smanjuju se emisije CO_2
- doprinosi se razvoju gospodarstva u iznosu navedenih ulaganja

izvor: Grad Rijeka

Interesting facts

Energy renewals:

- energy consumption in public sector buildings is reduced
- a favourable microclimate for work is created
- the lifespan of the buildings is extended
- maintenance costs for buildings and energy consumption are cut down
- CO_2 emissions are reduced
- contribution is made to the development of economy in the form of investments

EUROPSKI STRUKTURNI I INVESTICIJSKI FONDOVI
Europska unija
Zajedno do fondova EU
Grad Rijeka
SUSTAINABLE ENERGY WEEK
SUSTAINABLE ENERGY DAY ORGANISER #EUSEW2021

Energetske obnove, 2018. – 2020., EU projekti | **Energy Recovery**, 2018 - 2020 - EU Projects

Muzej grada Rijeke/City Museum of Rijeka

Javni poziv

Energetska obnova zgrada i korištenje obnovljivih izvora energije u zgradama javnog sektora

- 6 objekta: 3 osnovne škole + 2 dječja vrtića + Muzej grada Rijeke
- 35 % sufinanciranja – Europski fonda za regionalni razvoj
- 60 % vlastite komponente korisnika - Fond za regionalni razvoj – čeka se donošenje odluke
- minimalne uštede 50% toplinske energije za grijanje
- ukupna vrijednost – 27.872.822 kn
- bespovratno – 9.216.874 kn
- projekt obuhvaća radove na povećanje toplinske zaštite vanjske ovojnice, modernizaciju rasvjete i daljinsko očitanje potrošnje energenata, stručni i projektantski nadzor, promidžbu i upravljanje i administraciju projekta
- ukupna površina obnovljenih objekata je 13.785 m^2
- **OŠ Eugen Kumičić, OŠ Gornja Vežica, OŠ Pehlin, PPO Belveder, PPO Vidrice, Muzej grada Rijeke**

Public Call

Energy recovery of buildings and the use of renewable energy sources in public buildings

- 6 facilities: 3 primary schools + 2 kindergartens + City Museum of Rijeka
- 35% is co-financed by the European Regional Development Fund
- 60% is the beneficiary's own contribution - Regional Development Fund – a decision is awaited
- minimum savings of 50% of thermal energy for heating
- total value - EUR 3,716,376
- non-refundable - EUR 1,228,916
- the project includes works to increase the thermal protection of the outer shell, modernization of lighting and remote reading of the energy consumption, functional and design supervision, promotion and management and the administration of the project
- the total area of renovated buildings is 13,785 m^2
- **Primary school Eugen Kumičić, Primary school Gornja Vežica, Primary school Pehlin, Kindergarten Belveder, Kindergarten Vidrice, City Museum of Rijeka**

Zanimljivosti

- Grad Rijeka preko EU projekta energetskih obnova obnovio je zgrade ukupne površine 52.239 m^2, prosječne starosti objekta 62 godine. Prosječna projektirana ušteda energije za grijanje iznosi 62%.
- Ulica Drage Gervaisa – šampion energetske obnove
- Fond za zaštitu okoliša i energetsku učinkovitost objavio je podatak da je riječka ulica šampion energetske obnove. Stanovnici te ulice mogu se pohvaliti s 23 obnovljena objekta. Od 2014. godine sustavno se prijavljuju na javne pozive. Osim što je Rijeka pri samom vrhu po energetskim obnovama sada ima i ulicu kojoj je većina zgrada obnovljeno po ovom modelu.

izvor: Grad Rijeka

Interesting facts

- Through the European Energy Project for Recovery, the City of Rijeka has renovated buildings with a total area of 52,239 m^2; on average these the buildings were 62 years old. The average projected energy savings for heating is 62%.
- Drage Gervaisa Street – the Champion of Energy Recovery
- The Environmental Protection and Energy Efficiency Fund has made public that the Drage Gervaisa Street in Rijeka is the champion in energy recovery. Residents of this street possess 23 renovated buildings. Since 2014, they have been systematically applying to public calls. Apart from the fact that Rijeka is at the very top in terms of energy recovery, the city now has a street where most of the buildings have been renovated according to this model.

EUROPSKI STRUKTURNI I INVESTICIJSKI FONDOVI

Europska unija
Zajedno do fondova EU

Grad Rijeka

SUSTAINABLE ENERGY WEEK

SUSTAINABLE ENERGY DAY ORGANISER #EUSEW2021

Obnove

po principima energetske učinkovitosti

Renewals

According to the Principles of Energy Efficiency

OŠ Belvedere/Primary school Belvedere

OŠ Kantrida/Primary school Kantrida

Dvorana OŠ Brajda/Sports hall of Primary school Brajda

2013. – školska dvorana OŠ Vežica
godina izgradnje – 1970.
bruto površina – 408 m^2
ukupna investicija – 1.289.444 kn

2014.– školska dvorana OŠ Brajda
godina izgradnje – 1973.
bruto površina – 795 m2
ukupna investicija – 968.931 kn

2016./2017. – OŠ Kantrida
godina izgradnje – 1968.
bruto površina – 3.333 m^2
ukupna investicija – 2.522.457 kn

2018./2019. – OŠ Zamet
godina izgradnje – 1971., 1978.
bruto površina – 5.309 m^2
ukupna investicija – 4.495.934 kn

2014.– školska dvorana OŠ Srdoči
godina izgradnje – 1991.
bruto površina – 852 m2
ukupna investicija – 2.252.238 kn

2014.– OŠ Vladimir Gortan
godina izgradnje – 1967.
bruto površina – 3.465 m2
ukupna investicija – 1.964.821 kn
bespovratna sredstva Fonda za zaštitu okoliša i energetsku učinkovitost – 474.925 kn

2020. – OŠ Belvedere
godina izgradnje – 1911.
bruto površina – 2.393 m^2
ukupna investicija – 2.225.041 kn

2013. – Sports hall of Primary school Vežica
Year of construction – 1970.
Building floor area – 408 m2
Total investment – EUR 171,925

2014. – Sports hall of Primary school Brajda
Year of construction – 1973.
Building floor area – 795 m2
Total investment – EUR 129,190

2016./2017. – Primary school Kantrida
Year of construction – 1968.
Building floor area – 3.333 m2
Total investment – EUR 336,328

2018./2019. – Primary school Zamet
Year of construction – 1971., 1978.
Building floor area – 5.309 m2
Total investment – EUR 599,458

2014. – Sports hall of Primary school Srdoči
Year of construction – 1991.
Building floor area – 852 m2
Total investment – EUR 300,298

2014. – Primary school Vladimir Gortan
Year of construction – 1967.
Building floor area – 3.465 m2
Total investment – EUR 261,976
Grants of Environmental Protection and Energy Efficiency Fund – EUR 63,323

2020. – Primary school Belvedere
Year of construction – 1911.
Building floor area – 2.393 m2
Total investment – EUR 296,672

OŠ Vladimir Gortan/ Primary school Vladimir Gortan

Dvorana OŠ Srdoči/ Sports hall of Primary school Srdoči

OŠ Zamet/Primary school Zamet

Grad Rijeka

SUSTAINABLE ENERGY WEEK

SUSTAINABLE ENERGY DAY ORGANISER #EUSEW2021

Sustavno gospodarenje energijom

- 2008. – Grad Rijeka potpisivanjem Pisma namjere o suradnji Grad postao je dio projekta Sustavnog gospodarenja energijom u gradovima i županijama u Republici Hrvatskoj.
- 2009. – uveden Nacionalni informacijski sustav za gospodarenje energijom – ISGE – prati se redovitost unosa podataka o potrošnji energenata i vode za 165 objekta u vlasništvu Grada Rijeke što se odnosi na 771 mjerno mjesto
- 27 objekata javne namjene ima ugrađen sustav daljinskog očitanja potrošnje energenata koji je spojen sa ISGE

ISO 50001:2018

- 2020. – u sklopu projekta Compete4SECAP koji se financira iz Europskog programa za istraživanje i inovacije Obzor 2020. za dvije upravne zgrade Grada Rijeke na adresama Korzo 16 i Titov trg 3 uspostavljen je sustav upravljanja energijom koji je certificiran prema normi ISO 50001:2018. Navedeni standard predstavlja nadogradnju na postojeće obveze sustavnog gospodarenja energijom

Energetski tjedan

- Dio "Sustainable Energy Week" u organizaciji Europske unije
- Održava se od 2011. godine uz potporu raznih partnera – PGŽ, REA Kvarner, Tehnički fakultet u Rijeci
- Ukupno 186 događanja koja se uglavnom odnose na predavanja, predstavljanja projekta i energetski učinkovitih komunalnih vozila, studijskih posjeta realiziranim uspješnim projektima održivog razvoja
- 2019. – izložba na Korzu "Rijeka misli zeleno" kojom se Grad Rijeka predstavio kao grad koji uspješno provodi energetske obnove objekata javne namjene sufinancirane bespovratnim sredstvima EU

Bojanka za male čuvare planete Zemlje

- Energetska učinkovitost i obnovljivi izvori energije za najmlađe
- u 2013. godini izrađena u suradnji s učenicima Srednje škole za primijenjenu umjetnost
- do sada je 2356 djece predškolskog uzrasta dobilo bojanku na poklon

Zelena energija u mom domu

- poticanje primjene OIE u kućanstvima
- sufinanciranje od strane Grada Rijeke i Fonda za zaštitu okoliša i energetsku učinkovitost
- 38 kućanstava dobilo subvenciju za ugradnju solarnih kolektora za pripremu potrošne tople vode i uređaja za grijanje na biomasu

Energetska učinkovitost obiteljskih kuća u Gradu Rijeci

- sufinanciranje od strane Grada Rijeke i Fonda za zaštitu okoliša i energetsku učinkovitost
- tijekom 2014. s 19 korisnika potpisani ugovori o sufinanciranju
- mjere koje su sufinancirane - ugradnja nove vanjske stolarije, povećanje toplinske zaštite ovojnice obiteljske kuće, povećanje energetske učinkovitosti sustava grijanja ugradnjom plinskih kondenzacijskih kotlova, povećanje energetske učinkovitosti sustava prozračivanja ugradnjom uređaja za povrat topline, kao i energetski pregled i energetski certifikat.

Systematic Energy Management

- 2008 - by signing the Letter of Intent on Cooperation, Rijeka became part of the Systematic Energy Management Project in cities and counties in the Republic of Croatia
- 2009 - the National Information System for Energy Management (ISGE) was introduced with the purpose to monitor the regularity of data entry on energy and water consumption for 165 facilities owned by the City of Rijeka, encompassing a total of 771 metering points
- 27 public facilities have a built-in system for remote reading of energy consumption, which is connected to the ISGE

ISO 50001: 2018

- 2020 - within the Compete4SECAP Project funded by the European Union's Framework Programme for Research and Innovation *Horizon 2020* two administrative buildings of the City of Rijeka in Korzo 16 and Titov trg 3, introduced an energy management system which is certified according to ISO 50001: 2018. This standard is an upgrade to the existing obligations pursuing from the systematic energy management policy.

Energy Week

- part of the Sustainable Energy Week organized by the European Union
- held since 2011 with the support of various partners - PGC, REA Kvarner, the Technical Faculty in Rijeka
- a total of 186 events, such as lectures, project presentations, energy-efficient utility vehicles, study visits to successfully implemented sustainable development projects
- 2019 - the *Rijeka Thinks Green* exhibition was held on the Korzo, highlighting Rijeka as a city which successfully implements energy renovation of public facilities co-financed by EU grants

Colouring Book for the Little Guardians of the Planet Earth

- energy efficiency and renewable energy sources for the youngest
- developed in 2013 in collaboration with students of the High School of Applied Arts
- so far, 2356 preschool children received a colouring book as a gift

Green Energy in my Home

- initiative to encourage the use of RES in households
- co-financed by the City of Rijeka and the Environmental Protection and Energy Efficiency Fund
- 38 households received a subsidy for the installation of solar collectors for the production of hot water and biomass heating devices

Energy Efficiency of Family Houses in Rijeka

- co-financed by the City of Rijeka and the Environmental Protection and Energy Efficiency Fund
- co-financing agreements were signed with 19 beneficiaries in 2014
- co-financed measures: installation of new exterior window and door frames, upgrading of thermal insulation layer for family houses, upgrading of energy efficiency of the heating system through the installation of gas condensing boilers, upgrading of energy efficiency of the ventilation system through the installation of heat recovery devices, as well as energy inspection and energy certificate

Grad Rijeka

SUSTAINABLE ENERGY WEEK

SUSTAINABLE ENERGY DAY ORGANISER #EUSEW2021

Energetska učinkovitost u EU projektima | Energy Efficiency in EU Projects

iURBAN – Intelligent URBANn eNergy Tool

- Rezultati projekta: Poticanje energetske učinkovitosti u gradovima. Kroz ovaj projekt 26 objekata Grada Rijeke i Energa opremljeni su pametnim mjeračima, koji u realnom vremenu daju podatke o potrošnji energenata. Sustav je spojen na ISGE – informacijski sustav za gospodarenje energijom.
- Trajanje projekta: listopad 2013. – rujan 2016.
- Program financiranja: FP7 – program za istraživanje i razvoj

FIESTA – Families Intelligent Energy Saving Targeted Action / Promicanje inteligentnih energetskih ušteda u obiteljima

- Rezultati projekta: Usmjeriti obitelji na uštedu energije kod kuće, djelovati na njihove navike u potrošnji energije, kao i na odluke o kupovini energetski učinkovitijih kućanskih aparata.
- uspostava FIESTA energetskog info pulta u gradovima partnerima
- educiranje FIESTA savjetnika koji su savjetovati obitelji u primjeni mjera energetske učinkovitosti
- provedeno 150 energetskih audita i savjetovanja
- organizirane radionice za ciljne skupine i ključne dionike
- organizacija FIESTA energetske lutrije
- Trajanje projekta: listopad 2014. – rujan 2017.
- Program financiranja: IEE – Inteligentna energija Europe

Compete4SECAP

- Rezultati projekta: U sklopu projekta izrađen Akcijski plan energetski i klimatski održivog razvoja Grada Rijeke (SECAP). Za dvije upravne zgrade Grada Rijeke na adresama Korzo 16 i Titov trg 3 uspostavljen je sustav upravljanja energijom koji je certificiran prema normi ISO 50001:2018.
- Trajanje projekta: listopad 2014. – rujan 2017.
- Program financiranja: IEE – Inteligentna energija Europe

mySMARTLife

- Pametna tranzicija EU gradova prema novom konceptu pametnog života i ekonomije. Razvijanje inovativnih rješenja u području participacije građana, mobilnosti i energetike.
- Trajanje projekta: listopad 2014. – rujan 2017.
- Program financiranja: Obzor 2020

EIT – SumBOOST (Sustainable Urban Mobility Boost Smart Toolbox)

- Rezultati projekta: U okviru projekta izrađen je alat i nova strateška podloga za realizaciju mjera iz područja urbane mobilnosti koje bi trebale značajno unaprijediti prometni sustav grada i usmjeriti ga na korištenje održivih oblika mobilnosti.
- Rezultati analiza su dostupni na dograđenom Portalu otvorenih podataka Grada Rijeke, a akademski dionici imaju mogućnost korištenja nove metodologije u Laboratoriju za znanost o podacima u prometu i logistici koji su zajedno oformili Fakultet prometnih znanosti Sveučilišta u Zagrebu i Ericsson Nikola Tesla.
- Trajanje projekta: 1. srpnja – 31. prosinca 2020.
- Program financiranja: Obzor 2020

iURBAN - Intelligent URBANn eNergy Tool

- Project goal: promoting energy efficiency in cities. Through this project, 26 facilities owned by the City of Rijeka and the Energo Public Utility Company have been equipped with smart meters which provide real-time data on energy consumption. The system is connected to the ISGE – the Information System for Energy Management.
- Project duration: October 2013 - September 2016
- Financed under the program: FP7 - research and development program

FIESTA - Families Intelligent Energy Saving Targeted Action / Promoting intelligent energy savings in families

- Project goal: to motivate families to save energy at home, to influence the families' energy consumption habits, as well as purchasing more energy-efficient household appliances.
- FIESTA energy info desk in partner cities
- education for FIESTA advisors to advise families in the application of energy efficiency measures
- 150 energy audits and consultations were conducted
- workshops for target groups and key stakeholders
- FIESTA energy lottery
- Project duration: October 2014 - September 2017
- Financed under the program: IEE - Intelligent Energy Europe

Compete4SECAP

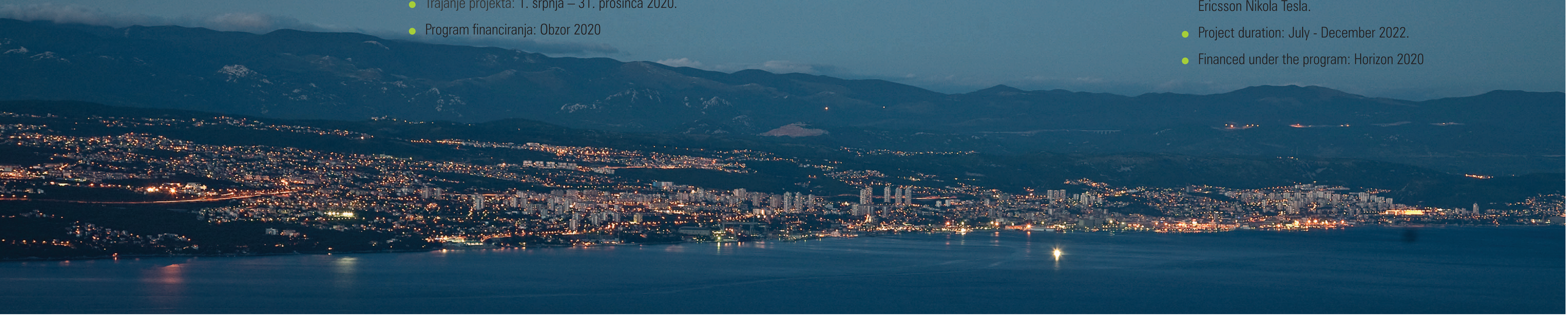
- Project results: Development of the Sustainable Energy and Climate Action Plan (SECAP) of the City of Rijeka. An energy management system was introduced in two administrative buildings of the City of Rijeka on Korzo 16 and Titov trg 3, certified according to the ISO 50001: 2018 standard.
- Project duration: October 2014 - September 2017
- Financed under the program: Horizon 2020

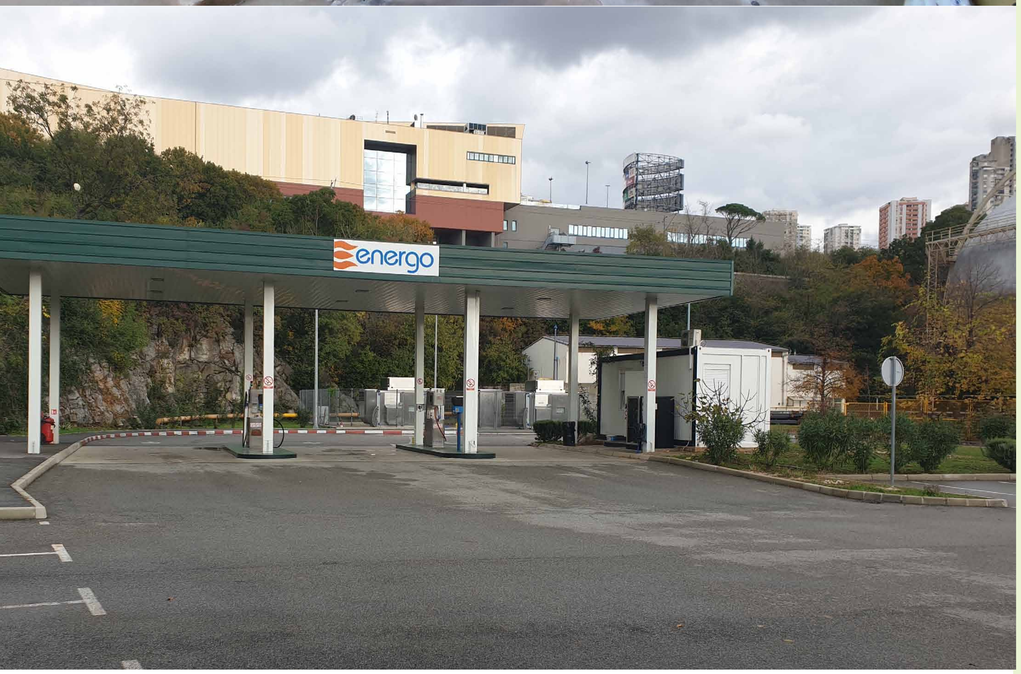
mySMARTLife

- Smart transition of EU cities towards a new concept of smart life and economy which includes developing innovative solutions in the field of citizen participation, mobility and energy.
- Project duration: December 2016. - September 2022.
- Financed under the program: Horizon 2020

EIT - SumBOOST (Sustainable Urban Mobility Boost Smart Toolbox)

- Project results: Development of a tool and new strategic basis for the implementation of measures in the field of urban mobility, which should significantly improve the city's transport system and direct it towards the use of sustainable mobility options.
- The results of the analyses are available on the upgraded *Open Data Portal of the City of Rijeka*, and academic stakeholders have the opportunity to use the new methodology in the Laboratory for Traffic Science and Logistics, which was jointly formed by the Faculty of Transport Sciences of the University of Zagreb and Ericsson Nikola Tesla.
- Project duration: July - December 2022.
- Financed under the program: Horizon 2020





Plinofikacija i automatizacija toplana i kotlovnica

- Od 2004. do 2011. plinoficirano je 10 toplana i kotlovnica dok Energana Bazen i toplana Krnjevo koriste plin od izgradnje
- Toplana Vojak plinoficirana je 2019. godine
- Ukupna investicije u plinofikaciju iznosila je 19.434.380,42 kn
- Ukupan udio prirodno plina u proizvodnji 2020. godine iznosio je 90% odnosno 69 MWh
- Ukupna snaga plinoficiranih toplana iznosi 89 MW odnosn 89%
- Prilikom plinifikacije ugradio se daljinski nadzor u 7 toplana koji je s vremenom unaprijeđen u daljinsko upravljanje.
- Plinofikacija i automatizacija omogućili su postepeno uvođenje 24-satnog rada toplana i podizanje razine usluge za građane

Energana Bazen

- izgrađen 2008. godine
- oprema energane:
  - 3 plinska kotla ukupne snage 3,06 MW,
  - 2 visoko učinkovita kogeneratora
    (2 x 0,23 MW električne snage, te 2 x 0,36 MW toplinske snage
- Godišnja proizvodnja toplinske energije ~ 5,0 MWh godišnje
- Godišnja proizvodnja električne energije ~ 1,7-1,9 MWh godišnje
- Poticana otkupna cijena električne energije
- Energana je u daljinskom nadzoru

Izgradnja toplovoda Kampus + EBRD projekt

- 2010. Izgradnja toplovoda kampus ukupne duljine 2,21 km
- 2015. Rekonstrukcija dijela toplovoda sustava Vojak duljine 1,49 kn
- 2018. – 2019. Rekonstrukcija dijela toplovoda na sustavima Škurinje, Kozala, Podmurvice, PO48 i Srdoči ukupne duljine 2,43 km
- Do sada je obnovljeno ukupno 6,13 km odnosno 39% ukupne toplinske mreže
- Prilikom izgradnje i obnove korištena je moderna tehnologija predizoliranih toplovoda sa ugrađenim nordijskim sustavom detekcije puknuća
- Ukupna investicija na izgradnji i obnovi toplovodne mreže u razdoblju 2010. – 2019. iznosila je 24.256.488,34 kn

Spp punionica

- izgrađena i puštena u rad 2013. godine
- prva tzv. *fast fill* punionica u RH – osobni automobil spremnik goriva napuni za 3-5 min, autobus i komunalna vozila za 20 min
- otvorenog tipa – za tvrtke i građane – u vrijeme turističke sezone do 5000 korisnika
- kapacitet jednog kompresora iznosi 1120 l
- od 2021.g. jedina punionica stlačenog prirodnog plina za javni gradski promet i privatne korisnike
- u EU više od 3.500 SPP punionica
- do danas u 9 godina rada isporučeno više od 6.500.000 kg SPP-a za promet vozila
- u odnosu na dizel uštađeno gotovo 6.000 tCO_2
- prikladna za buduće korištenje bio metana te vodika u javnom gradskom prometu i kod privatnih korisnika sukladno Zelenom planu EU

Implementation of Gas Network Development and Automation of Heating Plants and Boiler Rooms

- from 2004 to 2011, gas lines were installed for 10 heating plants and boiler rooms, while the Bazen power station and the Krnjevo heating plant have been using gas since construction
- the Vojak Heating Plant switched to gas in 2019
- total investments in gas network development were in the amount of HRK 19,434,380.42
- the total share of natural gas in production in 2020 was 90% or 69 MWh
- the total capacity of gas-fired heating plants is 89 MW or 89%
- during the gas network development, remote monitoring was installed in 7 heating plants; over time, this was upgraded into remote control
- the gas network development and automation enabled gradual introduction of 24-hour operation of heating plants, whereby the level of service for citizens was raised

The Bazen Power Station

- built in 2008
- power plant equipment:
  - 3 gas boilers with a total capacity of 3.06 MW,
  - 2 highly efficient cogenerating plants (2 x 0.23 MW of electric power, and 2 x 0.36 MW of thermal power)
- annual heat production ~ 5.0 MWh per year
- annual electricity production ~ 1.7-1.9 MWh per year
- subsidized purchase price of electricity
- power station is under remote supervision

Construction of the Campus Heating Pipeline + EBRD Project

- construction of the campus heating pipeline with a total length of 2.21 km in 2010
- reconstruction of a part of the heating pipeline of the Vojak system, 1.49 km long in 2015
- reconstruction of part of the heating pipeline on the Škurinje, Kozala, Podmurvice, PO48 and Srdoči system in the length of 2,43 km in 2018-2019
- so far, a total of 6.13 km or 39% of the total district heating network has been repaired
- during the construction and rehabilitation, modern technology of pre-insulated heating pipes with a built-in Nordic crack detection system was used
- total investment in the construction and renovation of the district heating pipeline network in the period 2010-2019 amounted to HRK 24,256,488.34.

CNG Filling Station

- built and put into operation in 2013
- the first fast fill station in Croatia – the fuel tank of a passenger vehicle takes 3-5 minutes, bus and utility vehicles 20 minutes
- open type - for companies and private users - during the tourist season up to 5000 users
- the capacity of one compressor is 1120 l
- the only compressed natural gas filling station for public city transport and private users – installed in 2021
- there are more than 3,500 CNG filling stations in the EU
- in 9 years of operation more than 6,500,000 kg of CNG for vehicles have been supplied
- compared to diesel, this amounts to savings of almost 6,000 tCO_2
- suitable for future use of bio methane and hydrogen in public urban transport and for private users in accordance with the European Green Deal

EU projekt – Obnova toplinarstva grada Rijeke (kk.04.2.3.04)

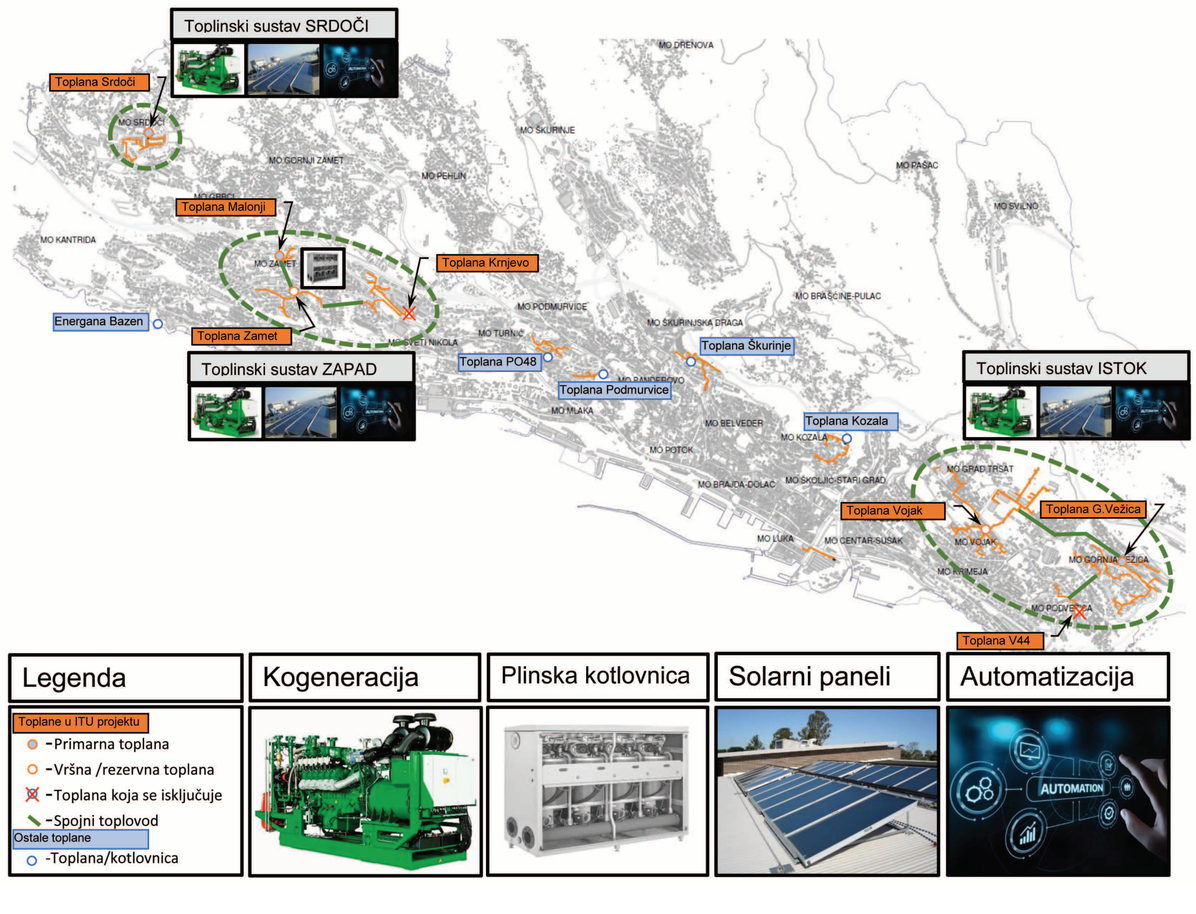
- Trajanje projekta 1. 3. 2021. – 31. 8. 2023.
- Program iz kojeg se financira → Operativni program "Konkurentnost i kohezija 2014. – 2020." – mehanizam Integriranih teritorijalnih ulaganja u sklopu Urbane aglomeracije Rijeka
- Ukupna vrijednost projekta: 112.270.986,39 kuna
- iznos EU sufinanciranja/bespovratnih sredstava: 83.893.707,80 kuna (78,46%)

Projekt uključuje:

- rekonstrukcija 7,9 km postojeće distribucijske toplovodne mreže čime se postiže 95% nove distributivne mreže
- Izgradnja nove spojne distributivne mreže od 2,5 km
- Objedinjavanje 3 toplinska sustava na istoku grada Rijeke u CTS ISTOK i 3 toplinska sustava na zapadu grada Rijeke u CTS ZAPAD uz rekonstrukciju i obnovu proizvodnje.
- Rekonstrukcija i obnova proizvodnje u toplinskom sustavu Srdoči

Ciljevi projekta:

- značajno smanjenje emisija CO_2 te uklanjanje SO_2 iz proizvodnje
- unaprjeđenje učinkovitosti radi optimizacije u proizvodnji i manjih gubitaka distribucije
- projekt će omogućiti proizvodnju više od 50% toplinske energije iz visokoučinkovite kogeneracije i solarnih panela
- potpuna automatizacija sustava u projektu
- 24 satni rad i opskrba toplinskom energijom
- ukupno 700.000 litara spremnika topline
- potpuna obnova sustava bez povećanja troškova za korisnike ili opterećenja proračuna Grada



EU Project - Renovation of the Rijeka Heating System (Kk.04.2.3.04)

- project duration: 1 March 2021 – 31 August 2023
- the programme is financed by → Operational Programme Competitiveness and Cohesion 2014-2020 - Integrated Territorial Investment Mechanism within the Urban Agglomeration of Rijeka
- total value of the project: HRK 112,270,986.39
- amount of EU co-financing / grants: HRK 83,893,707.80 (78.46%)

The project includes:

- reconstruction of 7.9 km of existing hot water distribution network. With this intervention 95% of Rijeka's distribution will be reconstructed
- construction of a new 2.5 km connecting distribution network
- consolidation of 3 heating systems in the east of Rijeka in CTS EAST and 3 heating systems in the west of Rijeka in CTS WEST along with the reconstruction and renewal of production
- Reconstruction and renewal of production in the Srdoči heating system

The objectives of the project:

- significant reduction of CO_2 emissions and removal of SO_2 from the production process
- improved efficiency to optimize production and reduce distribution losses
- the project will enable production of more than 50% of thermal energy from high-efficiency cogeneration and solar panels
- full automation of the system within the project
- 24-hour operation and heat supply
- a total of 700,000 litres of heat containers
- complete renovation of the system without increase of cost for users or additional burden on the City budget

EUROPSKI STRUKTURNI I INVESTICIJSKI FONDOVI

Europska unija
Zajedno do fondova EU

Grad Rijeka

SUSTAINABLE ENERGY WEEK

SUSTAINABLE ENERGY DAY ORGANISER #EUSEW2021

ČISTOĆA
RIJEKA

Viševac

Postrojenje za proizvodnju električne energije iz odlagališnog plina na zatvorenom i saniranom odlagalištu neopasnog otpada Viševac

- 2017. godine je na saniranom i zatvorenom odlagalištu neopasnog otpada Viševac pušteno u pogon postrojenje za proizvodnju električne energije iz odlagališnog plina (plinogenerator)
- nakon zagrebačkog Jakuševca, ovo je drugi ovakav pogon u Republici Hrvatskoj
- snaga postrojenja za energetsko iskorištavanje odlagališnog plina iznosi 1,2 MW
- do 30.4.2021. proizvedeno je 6.402 MWh električne energije

Prednosti izgradnje postrojenja za proizvodnju električne energije iz odlagališnog plina

Na odlagalištima komunalnog otpada se razgradnjom organske komponente stvara odlagališni plin čiji je glavni sastojak metan. Energetskim iskorištavanjem odlagališnog plina smanjuju se emisije štetnih plinova iz fosilnih goriva za ekvivalentnu količinu proizvedene električne energije.

Viševac

Electricity Plant Powered by Landfill Gas from the Closed and Rehabilitated Non-Hazardous Viševac Waste Landfill

- in 2017, electricity-producing plant from landfill gas (gas generator) was put into operation at the rehabilitated and closed non-hazardous Viševac waste landfill
- after the Jakuševac landfill in Zagreb, this is the second gas-production plant in Croatia
- the capacity of the landfill gas energy utilization plant is 1,2 MW
- 6,402 MWh of electricity was produced until 30 April 2021

Advantages of Building an Electricity-producing Plant from Landfill Gas

In municipal landfills, the decomposition of organic components creates landfill gas which mainly consists of methane. Energy utilization of landfill gas reduces emissions of harmful gases from fossil fuels in correlation to the amount of electricity produced.

Zatvoreno i sanirano odlagalište neopasnog otpada Viševac

ČISTOĆA RIJEKA

Vozila na SPP, EE i solarna energija

Aktivnosti KD Čistoća usmjerene na doprinos energetskoj učinkovitosti

Vozila s niskom ili nultom stopom emisije štetnih plinova

- Vodeći se ciljevima u postizanju učinkovitog gospodarenja energijom, postizanju ciljeva Programa smanjenja negativnog utjecaja prometa na okoliš kao i postizanju ciljeva 3 × 20 Deklaracije gradova, KD Čistoća d.o.o. Rijeka je od 2014. godine pokrenulo aktivnosti usmjerenih na nabavu električnih vozila i vozila na stlačeni prirodni plin.
- KD Čistoća raspolaže s jednom električnom čistilicom, tri električna vozila za prikupljanje reciklabilnih frakcija, četiri električna tricikla za prikupljanje otpada iz košarica i pametnih spremnika, dva električna i jedno hibridno službeno vozilo te tri vozila na stlačeni prirodni plin.

Vehicles Powered by CNG, EE and solar energy

Activities of Čistoća Public Utility Company Aimed at Contributing to Energy Efficiency

Vehicles with low or zero-rate of harmful gas emissions

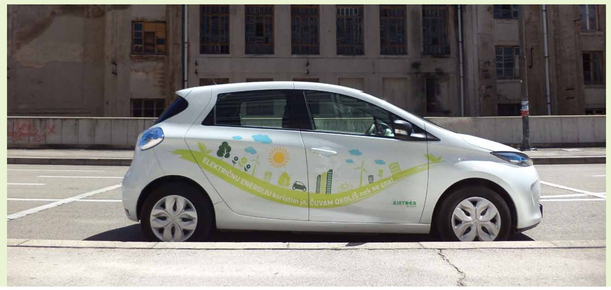
- Pursuing the goals of efficient energy management, within the scope of the Programme to Reduce the Environmental Impact of Transport Logistics, as well as the '3 × 20' Declaration of Cities, the Čistoća Public Utility Company Rijeka initiated in 2014 the procurement of electric and compressed natural gas vehicles.
- Čistoća Utility Company has one electric cleaner, three electric vehicles for collecting recyclable fractions, four electric tricycles for collecting waste from baskets and smart containers, two electric and one hybrid company cars and three vehicles running on compressed natural gas.

Električna čistilica – Dulevo D.zero² / Electric cleaner - Dulevo D.zero²

Električno vozilo za prikupljanje reciklabilnih frakcija - Goupil G6 / Electric vehicle for collecting recyclable fractions - Goupil G6

Električno vozilo – porter za prikupljanje reciklabilnih frakcija / Electric tricycles for collecting waste from baskets and smart containers

Električni tricikli za prikupljanje otpada iz košarica i pametnih spremnika / Electric tricycles for collecting waste from baskets and smart containers


Električno službeno vozilo / Electric company car

Vozila na stlačeni prirodni plin

Vehicles Powered by Compressed Natural Gas

manje teretne vozilom s nadogradnjom zapremine 7m³ pogodno za uske ulice / one small truck with an upgrade of 7m³ suitable for narrow streets

veće vozilo s nadogradnjom od dviju komora ukupne zapremine 30 m³ za prikupljanje različitih reciklabilnih frakcija otpada / one larger vehicle with a two-chamber superstructure with a total volume of 30 m³ for collecting different recyclable waste fractions

samoistovarivač za održavanje zelenih površina u gradu Rijeci / one self-unloading vehicle used for the maintenance of green areas in Rijeka

Pametni spremnici

Pametni spremnici su modularni spremnici za prikupljanje miješanog komunalnog i reciklabilnog otpada. Odlikuju se senzorom popunjenosti, snažnom prešom koja komprimira otpad te radom na energiju dobivenu putem solarnih panela. Na području užeg centra grada Rijeke postavljeno je ukupno 22 kompleta pametnih spremnika.

Smart containers

Smart containers are modular containers for the collection of mixed municipal and recyclable waste. They are equipped with a fullness sensor, a powerful press that compresses waste and they run on energy obtained through solar panels. A total of 22 sets of smart containers have been installed in the Rijeka city centre.

Mobilno reciklažno dvorište

Mobilno reciklažno dvorište je pokretna jedinica koja služi odvojenom prikupljanju i skladištenju manjih količina iskoristivih i problematičnih vrsta otpada iz kućanstva. Svu energiju potrebnu za rad dobiva putem solarnih panela.

Mobile recycling yard

A mobile recycling yard is a mobile unit which serves to separately collect and store small amounts of usable and problematic types of household waste. All the energy for its operation is obtained by solar panels.

RIJEKAPLUS

Modernizacija rasvjete na objektima u vlasništvu i najmu Rijeka plus d.o.o.

- 3 hale – Velika hala remonta, Hala za kontrolu ispravnosti vozila, Hala limarije
- rasvjeta vanjskog prostora garaže
- 2 garaže – Kantrida i Ciottina
- ukupna instalirana snaga prije modernizacije – 71,83 kW
- ukupna instalirana snaga nakon modernizacije – 39,49 kW
- ušteda od 45%
- prosječno povećanje svjetlosnog toka – 45%

Centralna tržnica Ribarnica

- radovi izvedeni u ožujku 2021. godine
- nova, jača rasvjeta koja sada iznosi 500 luxa, umjesto dosadašnjih 200 luxa – takva jačina rasvjete odgovara normama za svaki pult, odnosno za svako radno mjesto u paviljonu
- ušteda u instaliranoj snazi 106 %
- povećanje svjetlosnog toka 60 %
- postavljeno je ukupno 5 ringova na stropu ribarnice, te 64 bočna reflektora koji sada doprinose i sasvim novom vizualnom doživljaju paviljona.

Zanimljivosti

- Paviljon ribarnice u punoj je funkciji od 1916. godine i kao moderan objekt već je tada imao instaliranu električnu energiju. Arhitekt ribarnice je Riječanin Carlo Pergoli, a venecijanski kipar Urbano Bottasso izveo je kamene dekoracije s morskim motivima koji zgradi daju secesijski pečat. Uz ribarnicu, cjelokupna je lokacija gradske tržnice zajedno s dva paviljona činila napredne urbanističke i komunalne sadržaje.

izvor: Grad Rijeka

Modernization of Lighting on Buildings Owned and Leased by Rijeka plus d.o.o.

- 3 halls - large overhaul hall, vehicle control hall, bodywork hall
- External garage lighting
- 2 garages - Kantrida and Ciottina Street
- total installed power before modernization - 71.83 kW
- total installed power after modernization - 39.49 kW
- overall savings of 45%
- average increase in luminous flux - 45%

Central Fish Market

- works completed in March 2021
- new and stronger lighting, which now amounts to 500 lux, instead of the previous 200 lux - the lighting intensity corresponds to the norms for each counter in the pavilion
- savings in installed power of 106%
- increase in luminous flux of 60%
- a total of 5 rings were placed on the ceiling of the fish market, as well as 64 side spotlights, which now create a completely new visual experience of the pavilion

Some interesting facts

- The fish market pavilion has been in function since 1916 and as a modern facility it already had electricity installed at that time. The architect of the fish market is Carlo Pergoli from Rijeka, while the Venetian sculptor Urbano Bottasso made the stone decorations with marine motifs that gave the building a Secessionist stamp. In addition to the fish market, the entire city market complex with its two pavilions represented an advanced urban and communal facility of the period.

Punionice za elektro automobile

Garaža Zagrad B – punionice elektro automobile:
u funkciji od 2015. godine

- jednostavno i sigurno istovremeno punjenje 5 električnih vozila
- za jednofazno ili trofazno punjenje s maksimalnom nazivnom strujom punjenja od 32 A (što daje snagu punjenja do 7,4 kW pri jednofaznom odnosno do 22 kW pri trofaznom punjenju)
- Stanica za punjenje fiksno je spojena na kućnu mrežu od 220 – 240 V ili 380 – 400 V.

Otvorena parkirališta

- 2 ELEN – HEP punionice postavljenje u suradnji s Gradom Rijeka na otvorenim parkiralištima Delta (2017.) i Gomila (2018.)
- instalirana je po jedna stanica za istovremeno punjenje 2 elektro automobila
- konektori tip 2AC – 2x22 kW AC

Charging Stations for Electric Cars

The Zagrad B Parking Garage - electric car chargers:

- in operation since 2015
- easy and safe simultaneous charging of 5 electric cars
- designed for single-phase or three-phase charging with a maximum rated charging current of 32 A (which gives a charging power of up to 7.4 kW for single-phase or up to 22 kW for three-phase charging)
- the charging station is connected to the household power grid of 220 - 240 V or 380 - 400 V

Open Parking Facilities

- 2 ELEN - HEP filling stations were installed in cooperation with the City of Rijeka in the open parking lots Delta (2017) and Gomila (2018)
- one station was installed for simultaneous charging of 2 electric cars
- connectors type 2AC - 2x22 kW AC

Grad Rijeka

SUSTAINABLE ENERGY WEEK

SUSTAINABLE ENERGY DAY ORGANISER #EUSEW2021

Komunalno društvo

Autotrolej d.o.o.

za prijevoz putnika Rijeka

Vozim na plin – Prema prirodi sam pristojan i fin!

Cilj - smanjenje emisija CO_2 u prometu, zaštita okoliša i poboljšanje kvalitete zraka u gradu kao i bolja usluga prijevoza građanima

U periodu od 2013 – 2018.

- nabavljeno i pušteno u promet – 40 autobusa s pogonom na stlačeni prirodni plin (SPP)
- 20 solo vozila
- 10 minibusa
- 8 zglobnih autobusa
- 2 midi busa

Niskopodni autobusi

- Investicija – 73,6 mil kn
- Sufinanciranje FZOEU – 8,1 mil kn

- 2014. - u promet je pušteno i 10 vozila koja kao pogonsko gorivo koriste smjesu dizela i UNP-a - Zahvaljujući ugradnji ovog uređaja očekuje se ušteda na trošku goriva i smanjenje vrijednosti elemenata ispušnih plinova do 35 % i emisija CO_2 za 51,57 t/godišnje.
- u promet su puštena i nova vozila - ukupno 5 opremljena motorima po posljednjim standardima i direktivama Europske unije – motorima Euro 5/EEV (enhanced environmentally friendly vehicles – poboljšana ekološki prihvatljiva vozila).

I drive on gas – I treat nature politely and nice!

OBJECTIVE - reduction of CO_2 emissions in transport, environmental protection and improvement of air quality in the city as well as better transport service to citizens

- 10 vehicles using a mixture of diesel and LPG as propellant entered circulation in 2014. Thanks to their operation, fuel costs were cut down and exhaust gas elements were reduced by up to 35%, as well as CO_2 emissions by 51.57 t per year.
- 5 other new vehicles were also introduced equipped with engines according to the latest standards and directives of the European Union - Euro 5 / EEV engines (enhanced environmentally friendly vehicles).

In the period from 2013 to 2018

- purchase and entry into operation of 40 buses powered by compressed natural gas (CNG)
- 20 solo vehicles
- 10 minibuses
- 8 articulated buses
- 2 midi buses

Low-floor buses

- total investment - HRK 73.6 million
- EPEEF co-financing - HRK 8.1 million

Grad Rijeka

SUSTAINABLE ENERGY WEEK

SUSTAINABLE ENERGY DAY ORGANISER #EUSEW2021

Komunalno društvo
Autotrolej d.o.o.
za prijevoz putnika Rijeka

EU projekti:
Nabavka novih autobusa za KD Autotrolej

2019. – EU projekt – 22 nova autobusa na dizel gorivo

- niske emisije CO_2 - EURO6
- sufinanciranje iz Operativnog programa konkurentnost i kohezija putem javnog poziva raspisanog od strane Ministarstva mora, prometa i veza
- investicija – 48,5 mil kn
- bespovratna sredstva 38 mil kn

Cilj projekta: osigurati održivu i kvalitetnu uslugu prijevoza građanima. Novi autobusi pružaju veću udobnost putnicima budući da imaju pretežno sjedeća mjesta te su konstrukcijski namijenjeni za duža putovanja. Projekt predstavlja moderniziranje postojećeg voznog parka, a sve u cilju osiguravanja većeg standarda kvalitete za putnike, unaprjeđenje kapaciteta kroz povećanje brzine putovanja i smanjenje operativnih troškova, unaprjeđenje pouzdanosti i sigurnosti prometa, smanjenje emisije štetnih plinova i zagađenja zraka, povećanje broja putnika u javnom prijevozu u odnosu na osobna vozila te prilagođavanje EU standardima.

Jačanje sustava javnog prijevoza

2020. – EU projekt – nabava 32 nova autobusa

- 22 na dizel gorivo norme EURO 6 i 10 na SPP
- EURO 6 – 7 zglobnih niskopodnih, 10 minibusa, 5 solo prigradskih autobusa
- SPP – 10 solo autobusa
- Sufinanciranje - iz Kohezijskog fonda putem Operativnog programa Konkurentnost i kohezija putem mehanizma Integriranih teritorijalnih ulaganja (ITU mehanizam) za Urbanu aglomeraciju Rijeka ITU mehanizam
- Investicija – 81 mil kn
- Bespovratna sredstva – 54,6 mil kn
- Sredstva su osigurana putem EU projekta "Jačanje sustava javnog prijevoza" koji obuhvaća modernizaciju postojećeg voznog parka s ukupno 32 nova autobusa, a uključuje i uvođenje informativnih displeja na autobusnim stajalištima, postava pametnih semafora na raskrižjima te izrada mobilne i web aplikacije kojom se najavljuju dolasci autobusa.

Ciljevi projekta su unaprjeđenje kapaciteta i povećanje brzine putovanja, smanjenje operativnih troškova, unaprjeđenje pouzdanosti i sigurnosti prometa, smanjenje emisije štetnih plinova i zagađenja zraka, povećanje broja putnika u javnom prijevozu u odnosu na osobna vozila te prilagođavanje EU standardima uvođenje modernih sustava obavješćivanja putnika.

EU Projects: Procurement of New Buses for the Autotrolej Public Transport Company

22 new diesel buses were procured in 2019 as part of EU projects

- low CO_2 emissions - EURO6
- co-financing from the Operational Programme Competitiveness and Cohesion through a public call issued by the Ministry of the Sea, Transport and Communications
- investment - HRK 48.5 million
- grants HRK 38 million

Project goal: to provide a sustainable and quality transport service to citizens. The new buses provide greater comfort to passengers as they have more seats than standing places and are designed for longer routes. The project exemplifies the effort to modernize the existing vehicle fleet, ensuring a higher quality standard for passengers, improving capacity by increasing travel speeds, reducing operating costs, improving reliability and safety, reducing emissions and air pollution, increasing the number of passengers using public transport compared to passenger cars and harmonizing with EU standards.

Strengthening of the Public Transport System

32 new buses were procured in 2020 as part of EU projects

- 22 use diesel EURO 6 and 10 use CNG
- 7 articulated low-floor buses, 10 minibuses, 5 solo suburban buses use EURO 6
- 10 solo buses run on CNG
- co-financing from the Cohesion Fund through the Operational Programme Competitiveness and Cohesion and the Integrated Territorial Investment Mechanism (ITU) for the Urban Agglomeration of Rijeka
- investment – HRK 81 million
- grants – HRK 54.6 million
- The funds were provided through the EU project "Strengthening the Public Transport System", which includes the modernization of the existing fleet with a total of 32 new buses, and includes the introduction of information displays at bus stops, installation of smart traffic lights at intersections and mobile and web application announcing bus arrivals.
- The objectives of the project were to improve capacity and increase travel speed, reduce operating costs, improve reliability and traffic safety, reduce emissions and air pollution, increase the number of passengers in public transport compared to passenger cars, adapt to EU standards and introduce modern passenger information systems.

EUROPSKI STRUKTURNI I INVESTICIJSKI FONDOVI
Europska unija
Zajedno do fondova EU
Grad Rijeka
SUSTAINABLE ENERGY WEEK
SUSTAINABLE ENERGY DAY ORGANISER #EUSEW2021

green Rijeka

zelena Rijeka

City of Rijeka

organizer and exhibition author: City of Rijeka – exhibition design: Vesna Rožman – photography: archive of City of Rijeka – Rijeka, June2021.