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# DanuP-2-Gas

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## Delavnica za usposabljanje uporabnikov orodja za optimizacijo P2G vozlišč

 12. 10. 2022 | Velenje |

 DanuP-2-Gas projekt

 DanuP-2-Gas | KSSENA, Matevž Šilc, Hana Kolenc



# O PROJEKTU DANUP-2-GAS

**PROGRAM:** TRANSNACIONALNI PROGRAM PODONAVJE (INTERREG DANUBE)

**POLNO IME PROJEKTA:** Innovative model to drive energy security and diversity  
in the Danube Region via combination of bioenergy  
with surplus renewable energy

**ZAČETEK PROJEKTA:** 1. 7. 2020

**TRAJANJE:** 30 MESECEV

**BUDGET:** 2,553,726.85 €

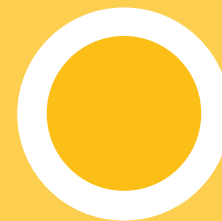


LP	Technology Centre Energy - University of Applied Sciences Landshut	LP - TZE	DE, DEUTSCHLAND
PP	Energy Agency of Savinjska, Šaleška and Koroška Region	ERDF PP1 - KSENA	SI, SLOVENIJA
PP	Tolna County Development Agency Nonprofit Public Ltd.	ERDF PP2 - TCDA	HU, MAGYARORSZÁG
PP	Energy Institute at the Johannes Kepler University Linz	ERDF PP3 - EI-JKU	AT, ÖSTERREICH
PP	Black Sea Energy Research Centre	ERDF PP4 - BSERC	BG, БЪЛГАРИЯ (BULGARIA)
PP	URBASOFIA SRL	ERDF PP5 - URBASOFIA	RO, ROMÂNIA
PP	Deggendorf Institute of Technology	ERDF PP6 - THD	DE, DEUTSCHLAND
PP	National Recycling Agency of Slovakia	ERDF PP7 - NARA-SK	SK, SLOVENSKO
PP	Institute of Technology and Business in České Budějovice	ERDF PP8 - VSTE	CZ, ČESKÁ REPUBLIKA
PP	MAHART-Freeport Co. Ltd	ERDF PP9 - MAHART	HU, MAGYARORSZÁG
PP	International Centre for Sustainable Development of Energy, Water and Environment Systems	ERDF PP10 - SDEWES CENTRE	HR, HRVATSKA
PP	Energy Institute Hrvoje Požar	ERDF PP11 - EIHP	HR, HRVATSKA
PP	University of Zagreb Faculty of Electrical Engineering and Computing	ERDF PP12 - UNIZGFER	HR, HRVATSKA
PP	Regional Agency for Socio – Economic Development – Banat Ltd	IPA PP1 - RDA Banat	RS, SERBIA






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## PROJEKTNIH PARTNERJEV





# ENERGETSKA PLATFORMA PODONAVJA – ZADNJA FAZA IMPLEMENTACIJE



ABOUT ▾ KNOWLEDGE HUB ▾ ATLAS TOOL

PROJECT

PARTNERS

ATLAS TOOL

ATLAS MANUAL

SUBSIDIES

BIOMASS REPORT

INFRA-STRUCTURE REPORTS

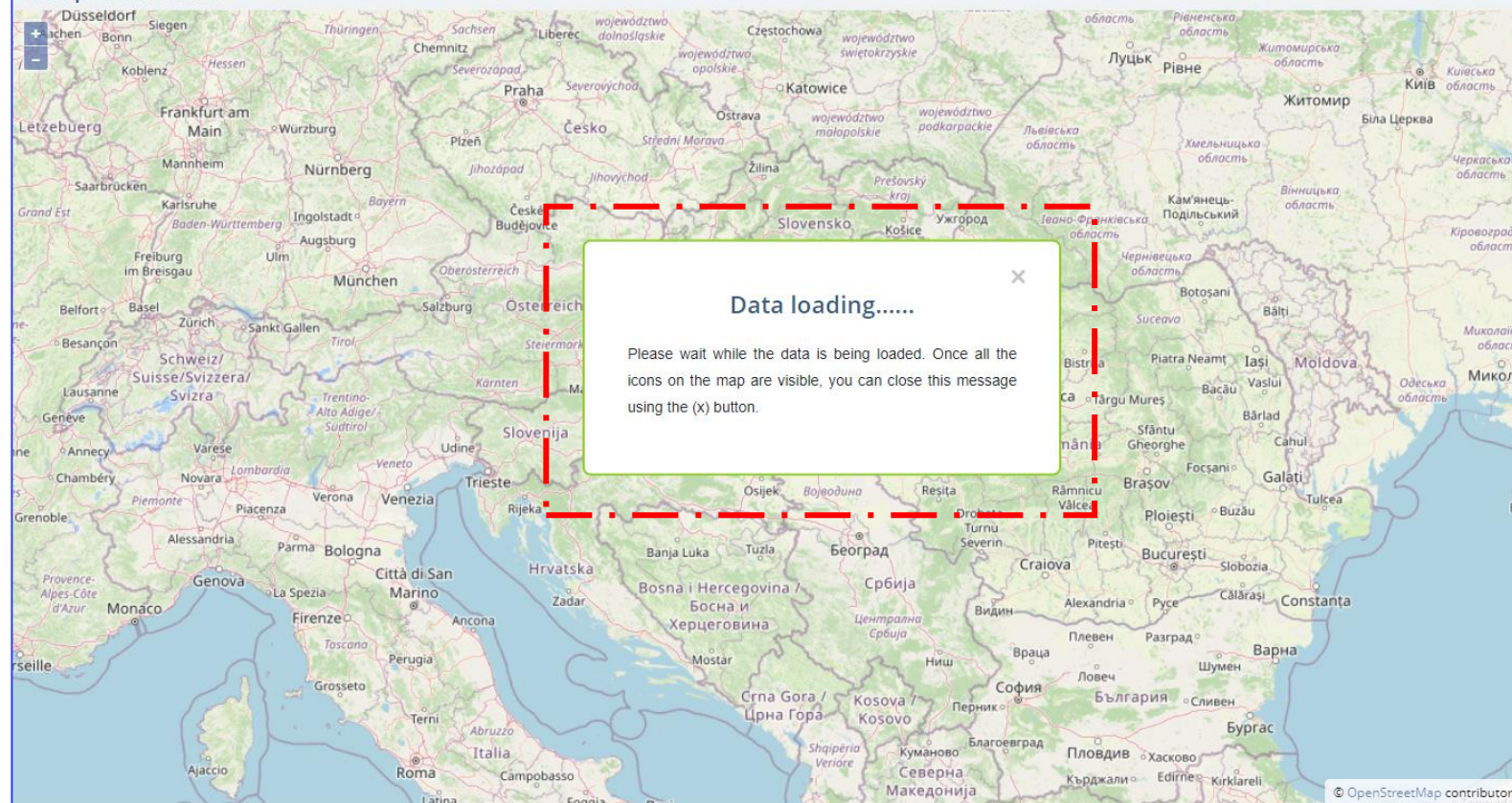
OPTIMIZATION TOOL

TRANS-NATIONAL STRATEGY








PRE-FEASABILITY STUDY



## Danup-2-Gas Atlas



### TRANSNATIONAL BIOMASS & INFRASTRUCTURE

- ☒  Biomass
- ☒  Connection Point
- ☒  Industrial Plant
- ☒  Renewable Energy Plant
- ☒  Biochar
- ☒  Transport Hub
- ☒  Transnational Link

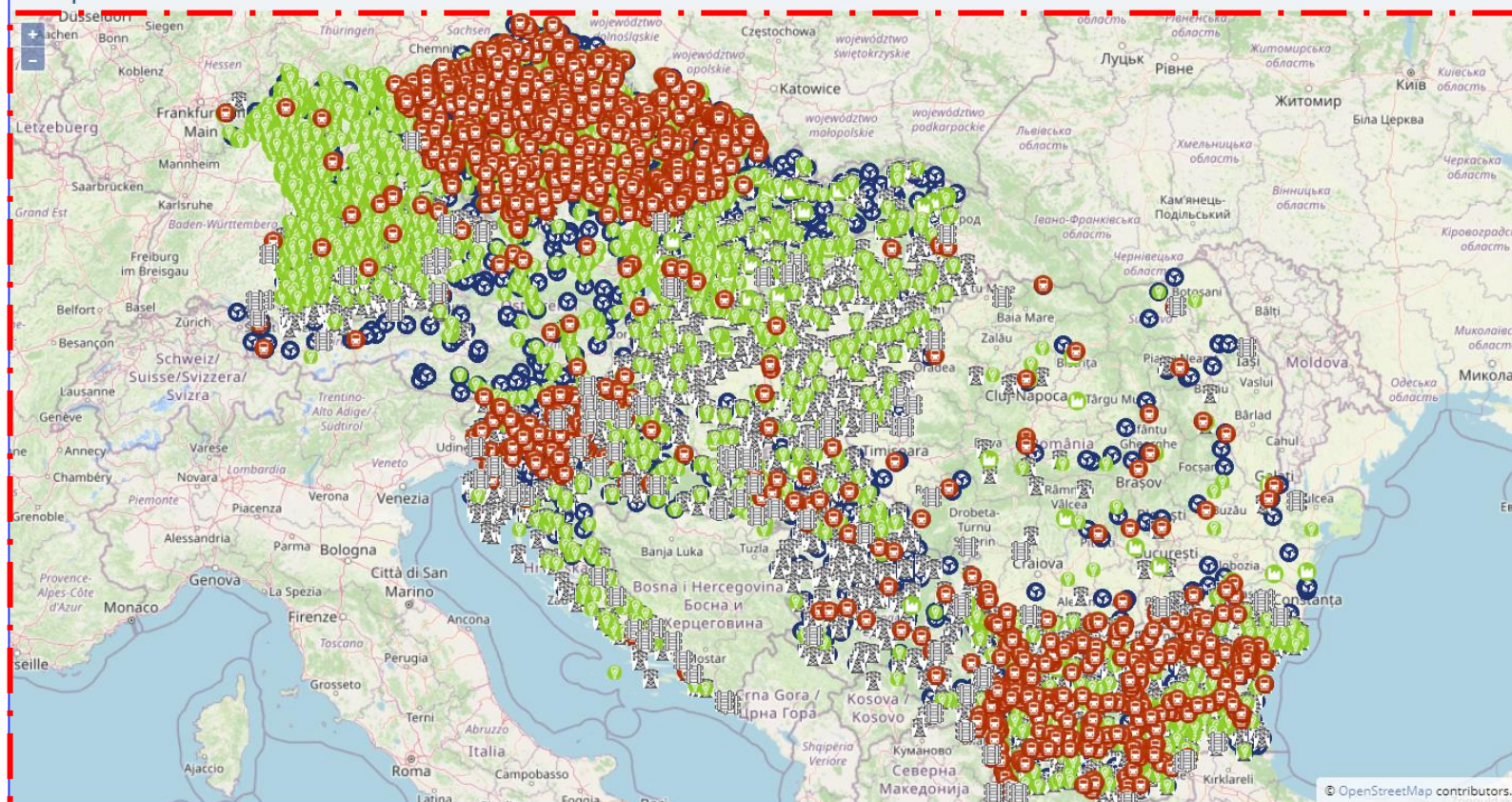
1. Select Biomass Sources

Nalaganje  
podatkov traja  
nekaj sekund.

<https://www.danup2gas.eu/atlas-test>



## DanuP-2-Gas Atlas



### TRANSNATIONAL BIOMASS & INFRASTRUCTURE

- ☒ Biomass
- ☒ Connection Point
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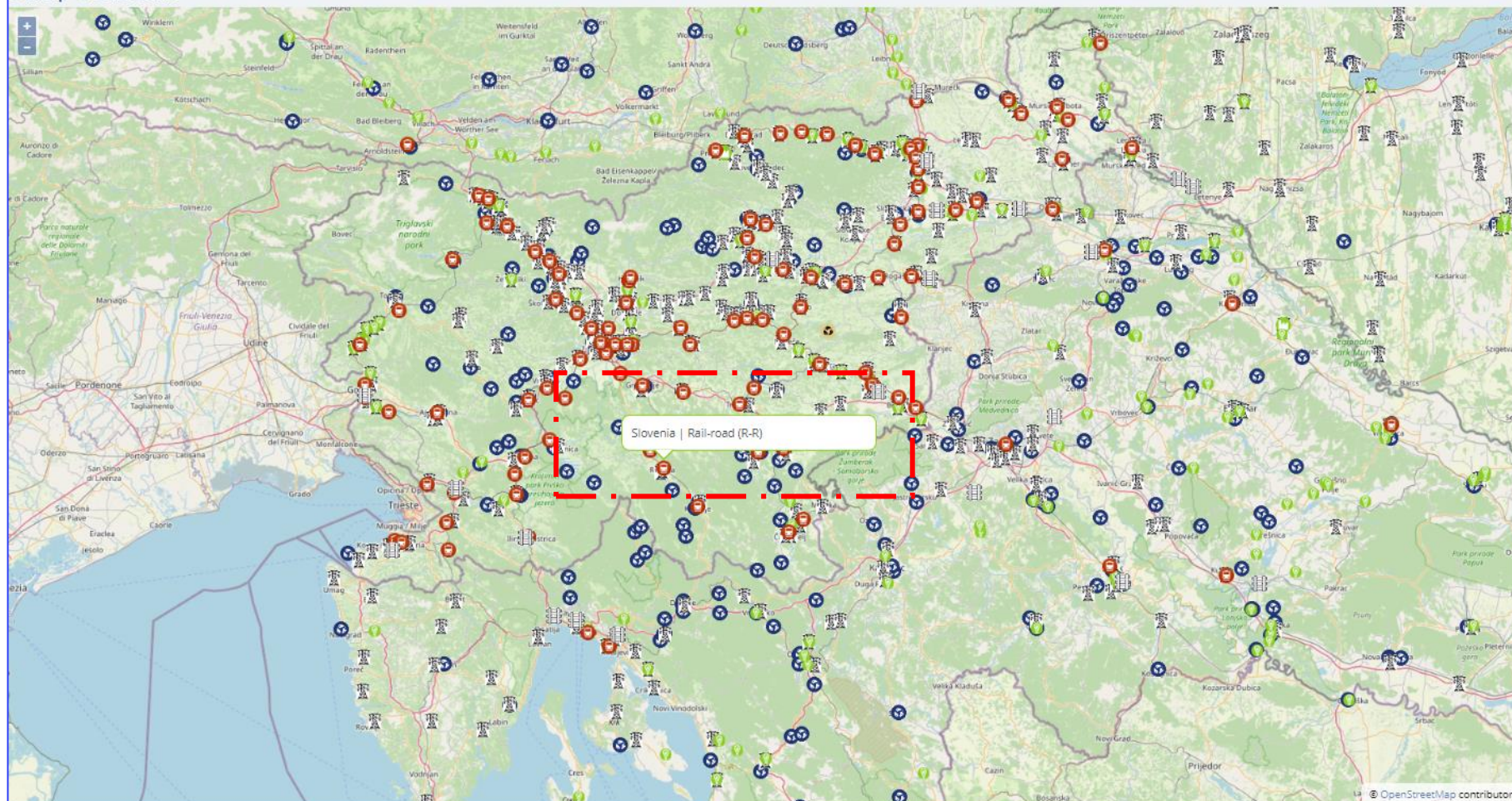
1. Select Biomass Sources

Ko se v ozadju prikažejo ikone, je Atlas pripravljen za uporabo. Ko so podatki vidni na zemljevidu, morate pojavno okno zapreti ročno.





Danup-2-Gas Atlas



## Povečanje/pomanjšanje:

Z vrtenjem kolesčka miške navzgor se zemljevid poveča, z vrtenjem kolesčka miške navzdol pa se zemljevid zmanjša.

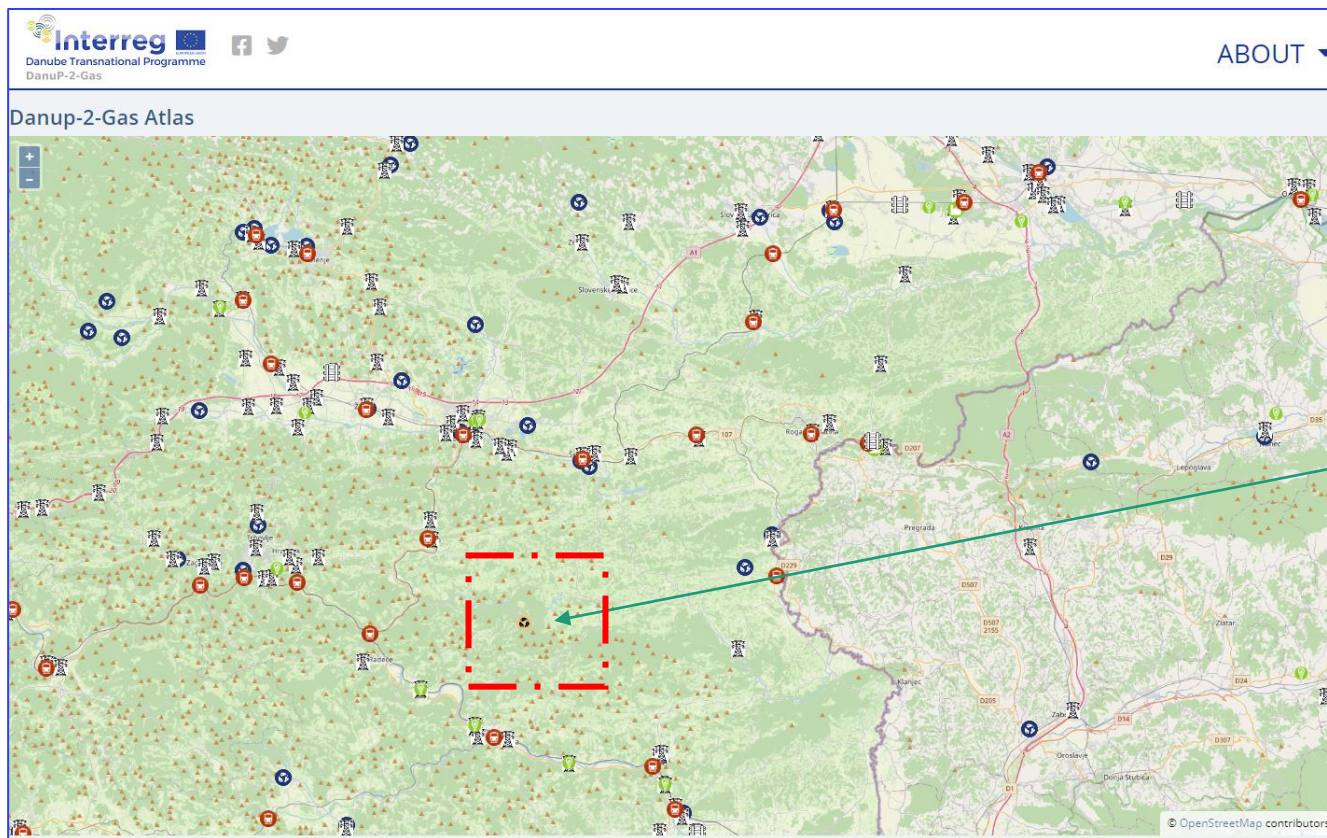
## Premikanje:

Z levim klikom miške omogočite pomikanje zemljevida v željeno smer.

Če se z miško pomaknete na ikone, se prikažeta država in vrsta podatkov.



# TRANSNATIONAL RENEWABLE ENERGY ATLAS



## TRANSNATIONAL BIOMASS & INFRASTRUCTURE

- ☒ Biomass
- ☒ Connection Point
- ☒ Industrial Plant
- ☒ Renewable Energy Plant
- ☒ Biochar
- ☒ Transport Hub
- ☒ Transnational Link

1. Select Biomass Sources [Filter Icons](#)

### TIMBLES D.O.O.

#### Biomass Source

**Company Type:** Wood and woody biomass

**Country:** Slovenia

**Owner Address:** Lahov Graben 5, 3273 Jurklošte

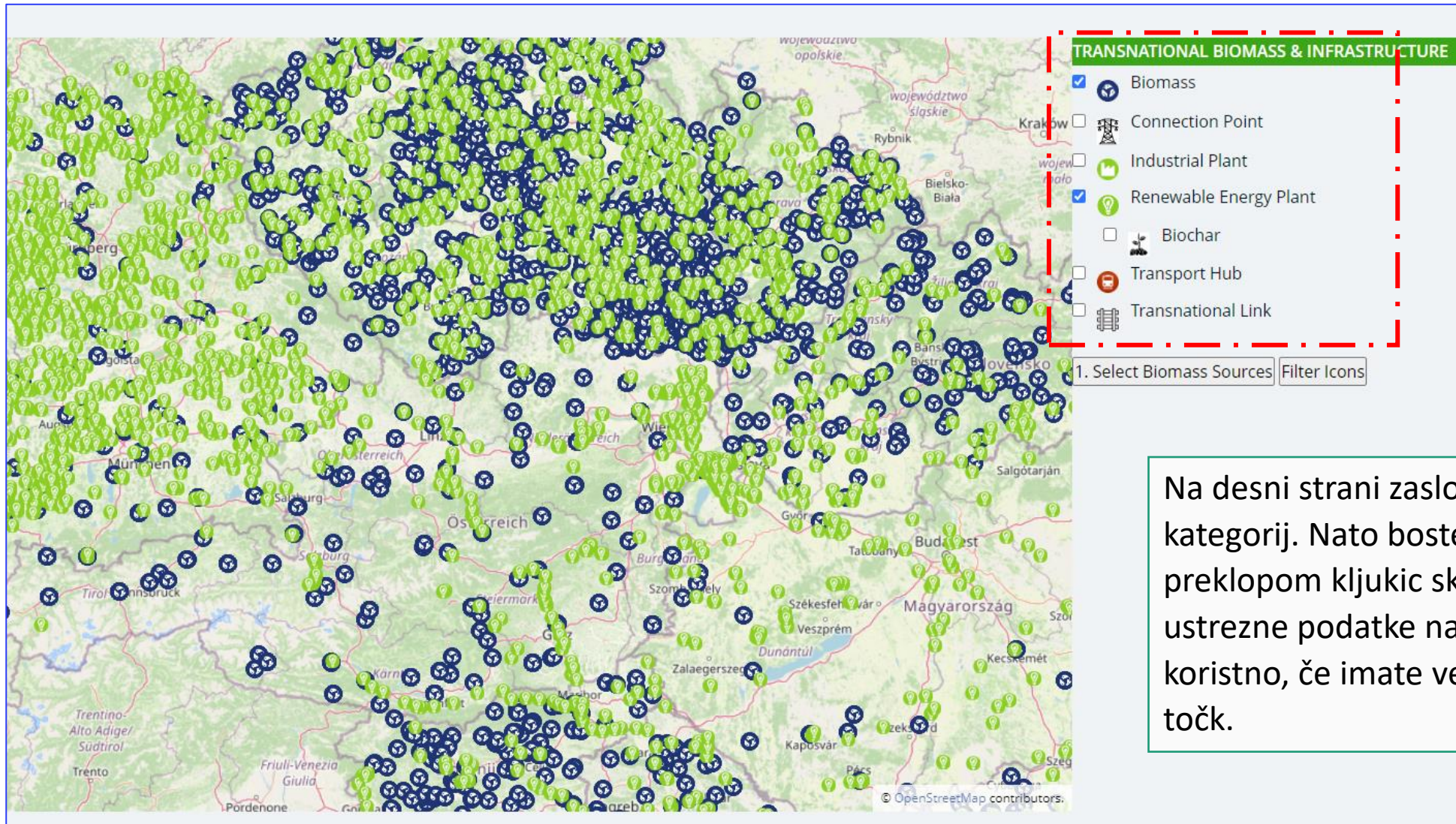
**Location:** 15.33307834, 46.09299592

#### Other Infos:

- Subtype: Stems, branches, foliage, bark (logging residues)
- Amount [tons/year]: 365
- Status: Idle
- LHV [MJ/ton]: 19500
- Bulk Density [tons/m<sup>3</sup>]: 0.32
- Moisture [%]: 45
- Hemicellulose [% dry]: 0.25
- Lignin [% dry]: 28.5
- Cellulose [% dry]: 42.5
- Ash Content [% dry]: 10
- Contaminants [% dry]: 1
- Carbon [%]: 50
- Price [€]:
- Transport Price [€]: 0.15

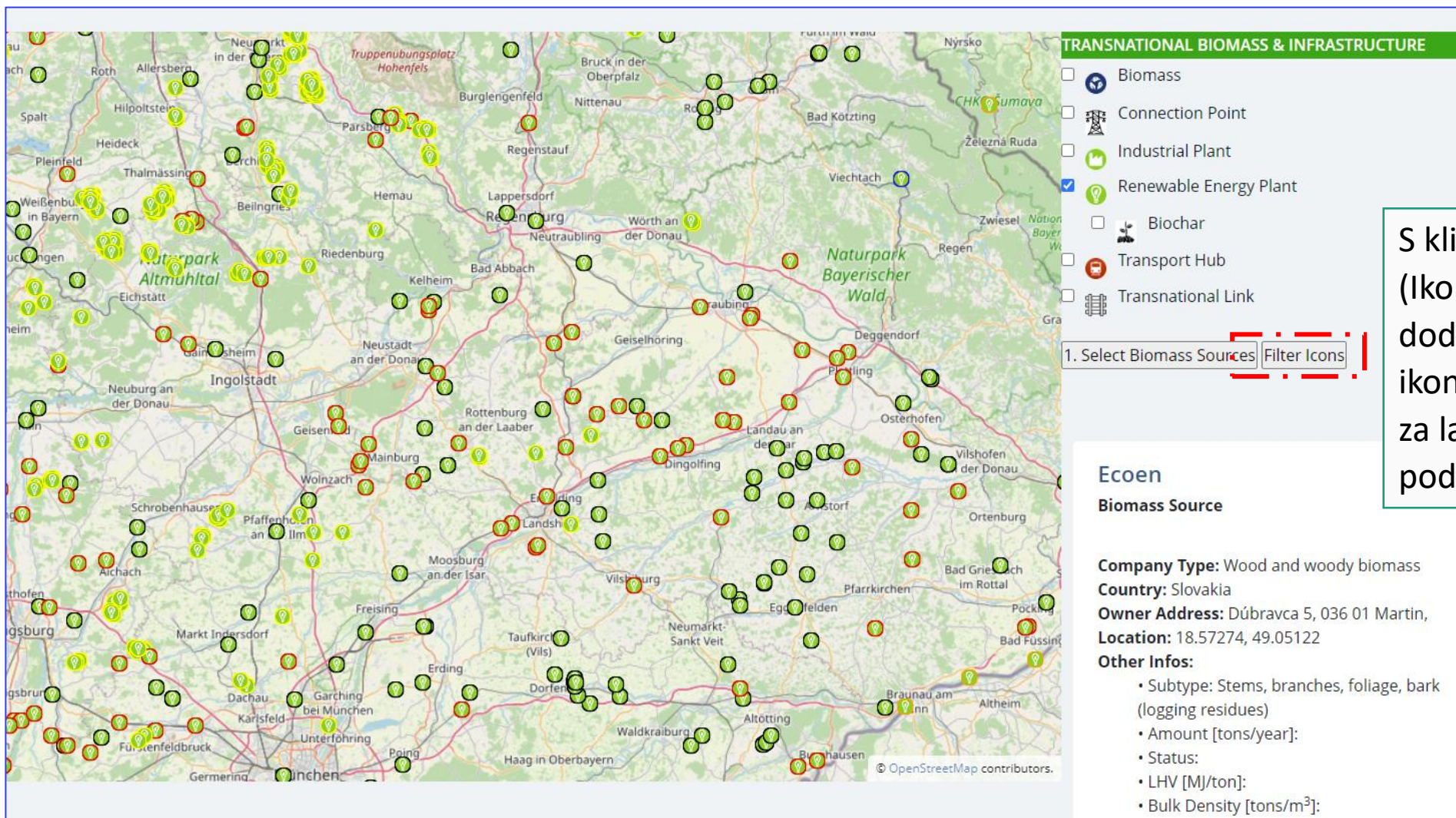
S klikom na katero koli ikono na zemljevidu se v spodnjem desnem delu zaslona prikažejo podrobne informacije o tej točki. Vključevali bodo vse informacije, kot so ime, vrsta, lokacija itd.





Na desni strani zaslona je navedenih 6 kategorij. Nato boste lahko s preklopom kljukic skrili ali prikazali ustrezne podatke na zemljevidu. To je koristno, če imate veliko podatkovnih točk.





S klikom na "Filter Icons" (Ikone za filtriranje) boste dodali dodatne robove ikon za "IP", "REP" in "CP" za lažje ločevanje njihovih podtipov.



# TRANSNATIONAL RENEWABLE ENERGY ATLAS



## Danup-2-Gas Atlas



### TRANSNATIONAL BIOMASS & INFRASTRUCTURE

- ☒ Biomass
- ☒ Connection Point
- ☒ Industrial Plant
- ☒ Renewable Energy Plant
- ☒ Biochar
- ☒ Transport Hub
- ☒ Transnational Link

1. Select Biomass Sources Filter Icons

Če želite začeti postopek, kliknite gumb "1. Izberite vire biomase".

**Korenić - pilana i obrada elemenata**

**Biomass Source**

**Company Type:** Wood and woody biomass

**Country:** Croatia

**Owner Address:** Orišje 7, 47251, Bosiljevo

**Location:** 15.2894428, 45.4059775

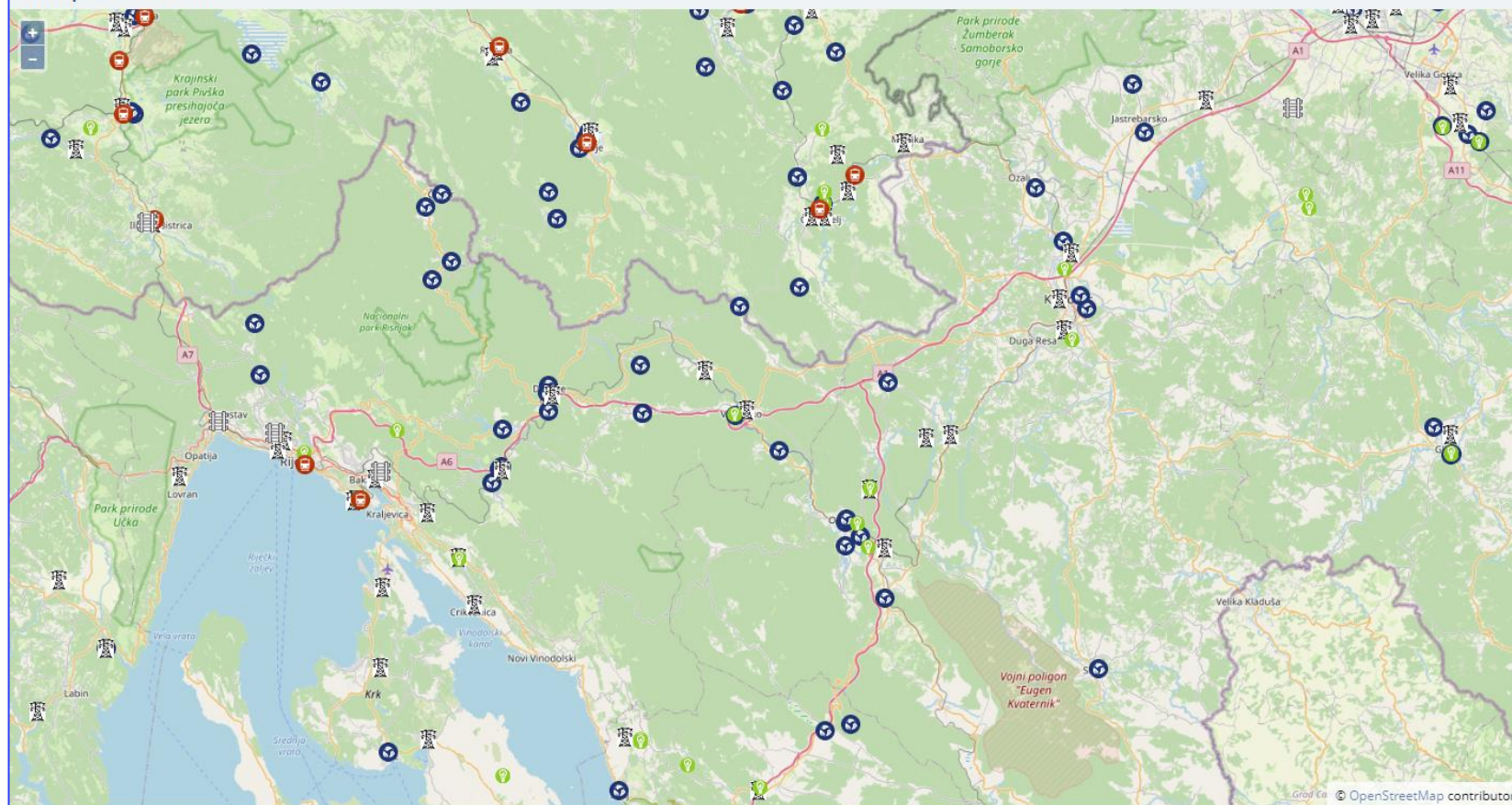
**Other Infos:**

- Subtype: Sawdust, sawmill (industrial)
- Amount [tons/year]: 1323.5005
- Status: in-use
- LHV [MJ/ton]: 12500





## Danup-2-Gas Atlas



### TRANSNATIONAL BIOMASS & INFRASTRUCTURE

- ☒ Biomass
- ☒ Connection Point
- ☒ Industrial Plant
- ☒ Renewable Energy Plant
- ☒ Biochar
- ☒ Transport Hub
- ☒ Transnational Link

1. Select Biomass Sources

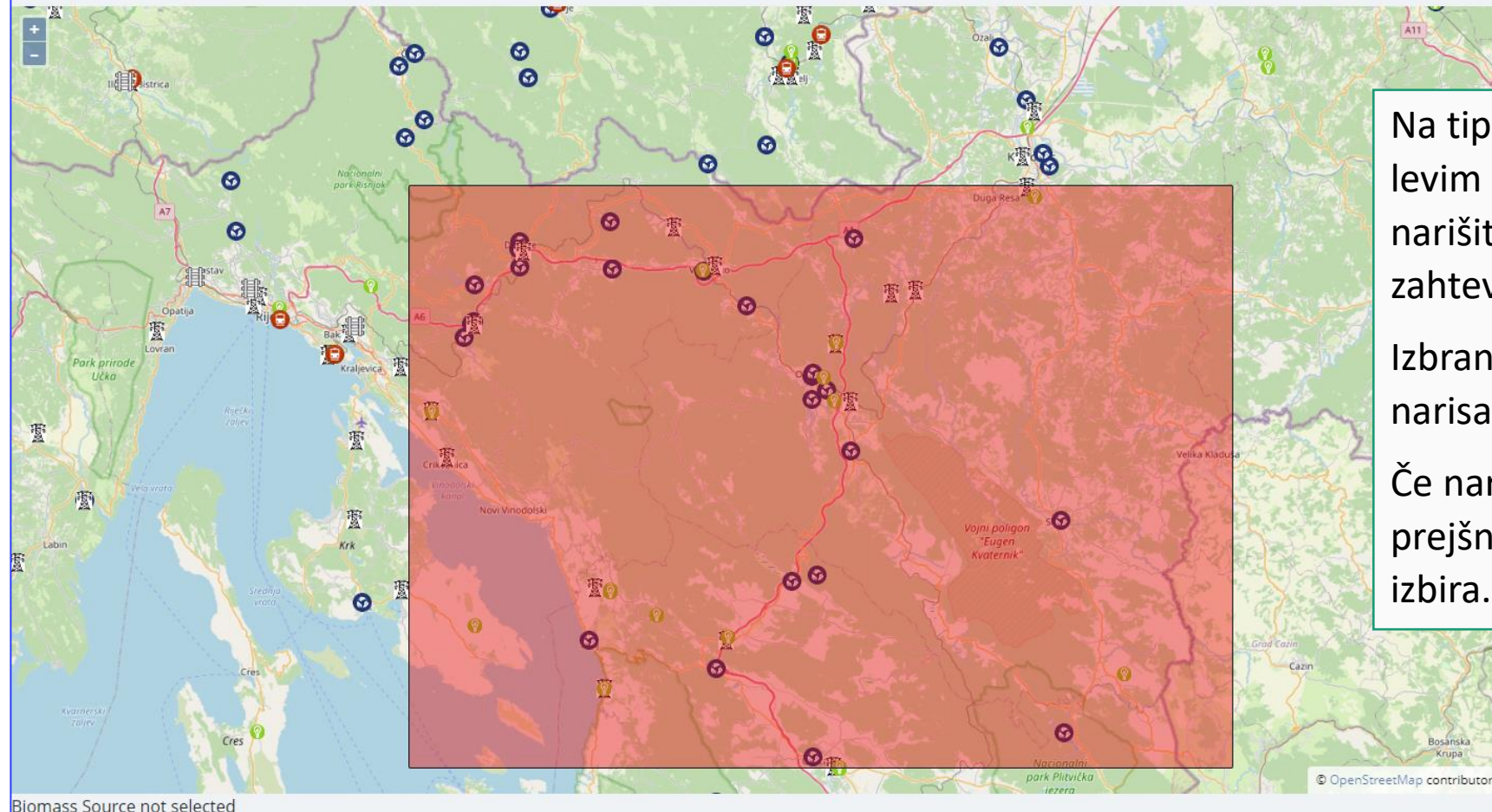
Please press the **'Ctrl'** key (Win / Linux) or **'⌘'** Key (Mac) to draw a box by clicking and dragging on the map.

V tem razdelku so prikazani naslednji koraki, ki jim morate slediti.





## Danup-2-Gas Atlas





## Danup-2-Gas Atlas



Selected Biomass Sources: [25] | Total Amount (tons/year): 116840

### TRANSNATIONAL BIOMASS & INFRASTRUCTURE

- ☒ Biomass
- ☒ Connection Point
- ☒ Industrial Plant
- ☒ Renewable Energy Plant
- ☒ Biochar
- ☒ Transport Hub
- ☒ Transnational Link

1. Select Biomass Sources
2. new P2G location or

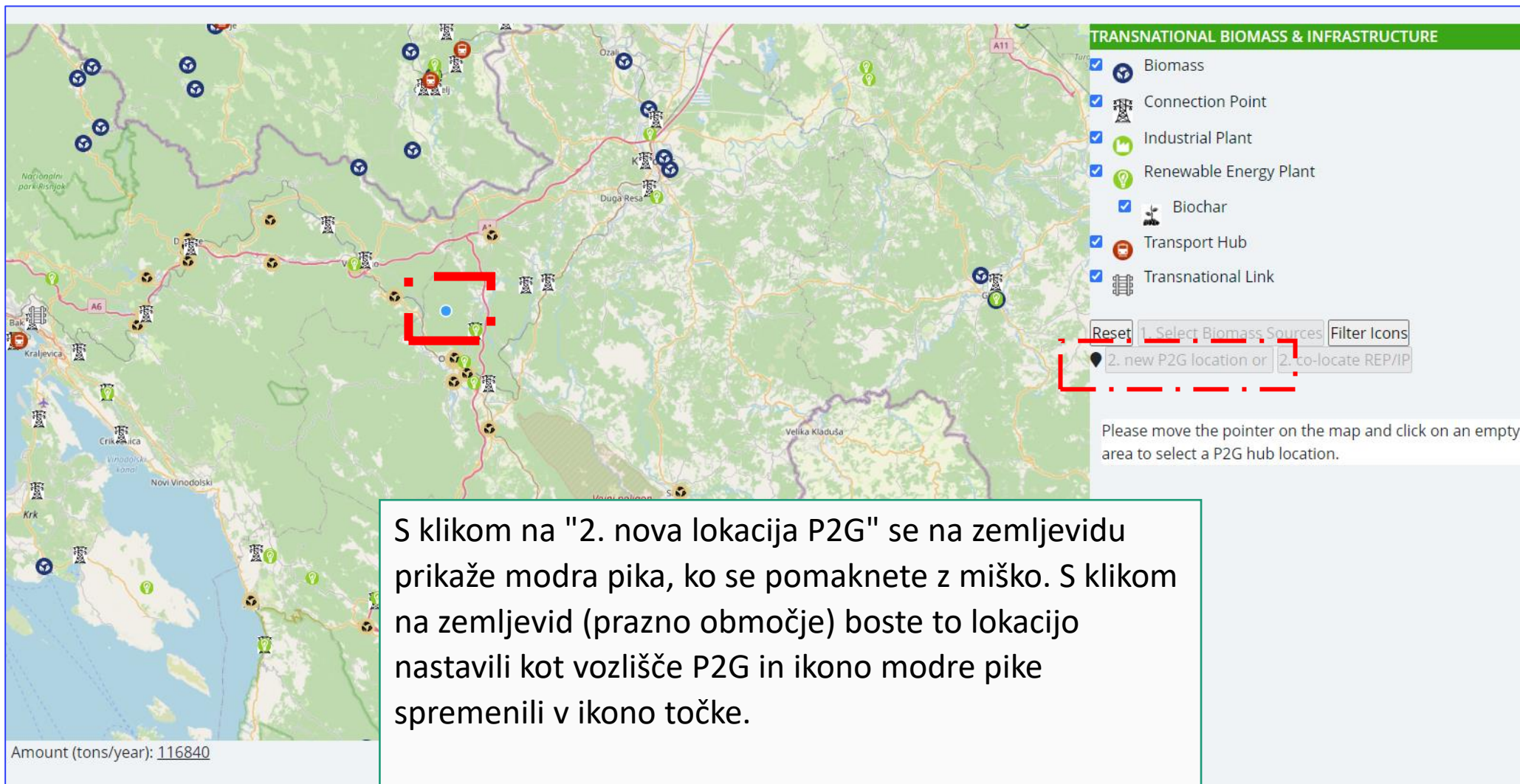
Please select **new P2G location** to select a point on the map for a P2G hub location.

Please select **co-locate REP/IP** to co-locate with existing Renewable Energy Plant or an Industrial Plant.

Število izbranih virov biomase bo prikazano pod zemljevidom skupaj s skupno količino v tonah na leto.

Naslednji korak je izbira lokacije na zemljevidu za lokacijo P2G ali izbira REP ali IP za skupno lokacijo vozlišča P2G.





**TRANSNATIONAL BIOMASS & INFRASTRUCTURE**

- ☒ Biomass
- ☒ Connection Point
- ☒ Industrial Plant
- ☒ Renewable Energy Plant
- ☒ Biochar
- ☒ Transport Hub
- ☒ Transnational Link

Reset 1. Select Biomass Sources Filter Icons  
2. new P2G location or 2. co-locate REP/IP

Please move the pointer on the map and click on an empty area to select a P2G hub location.

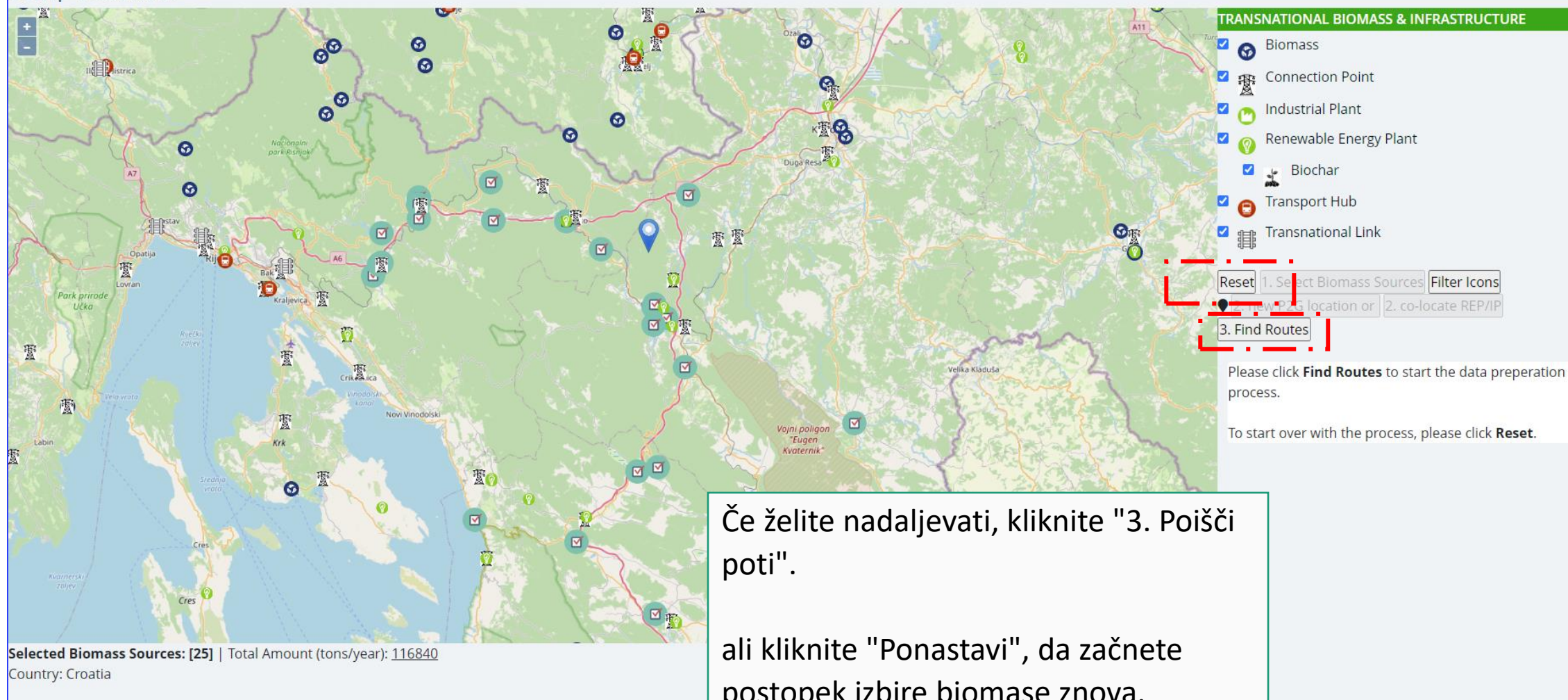
Amount (tons/year): 116840

S klikom na "2. nova lokacija P2G" se na zemljevidu prikaže modra pika, ko se pomaknete z miško. S klikom na zemljevid (prazno območje) boste to lokacijo nastavili kot vozlišče P2G in ikono modre pike spremenili v ikono točke.

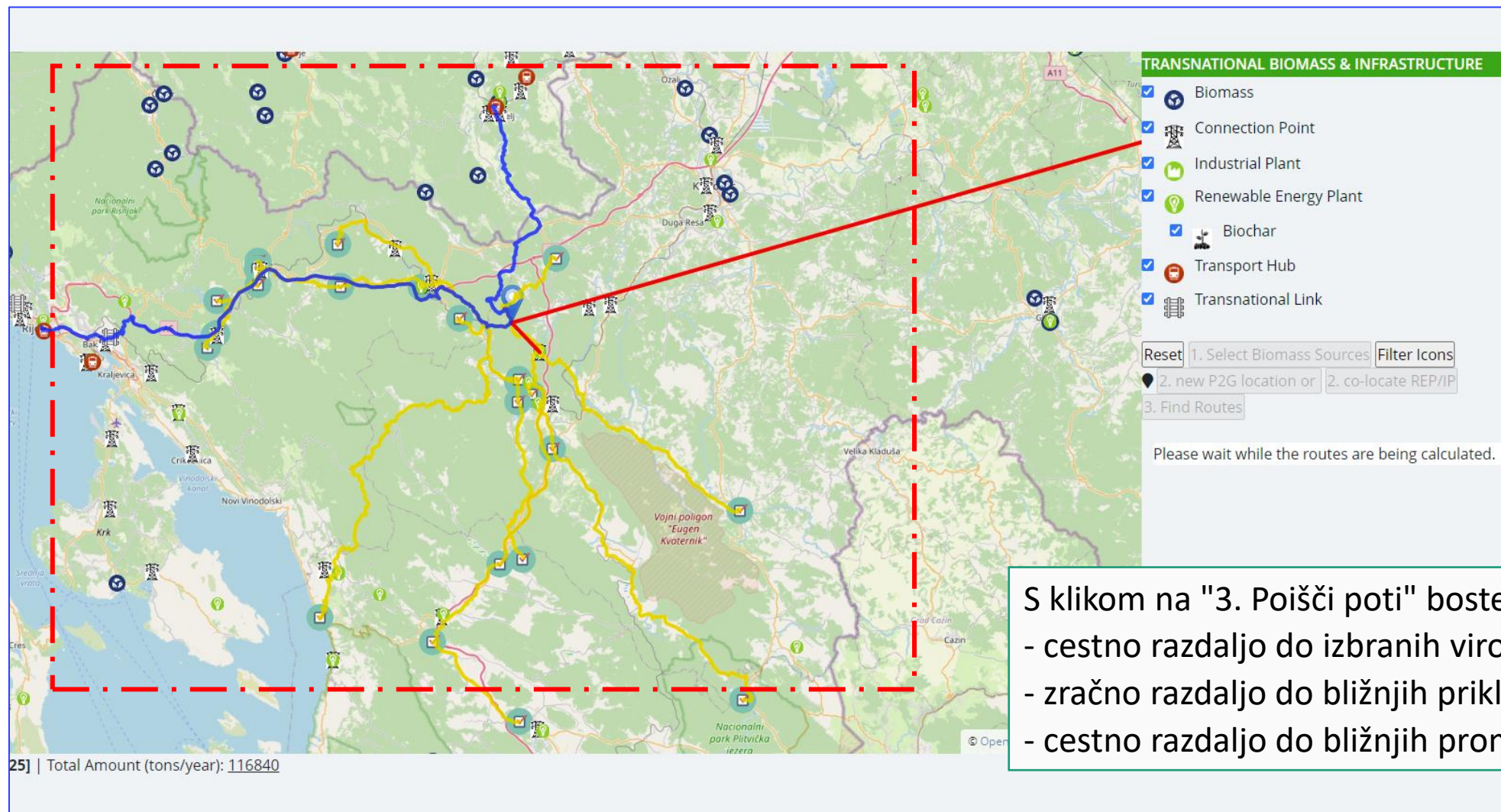
Ikona vseh predhodno izbranih biomas se bo spremenila v modro/belo potrditveno polje.



## Danup-2-Gas Atlas







S klikom na "3. Poišči poti" boste izračunali:

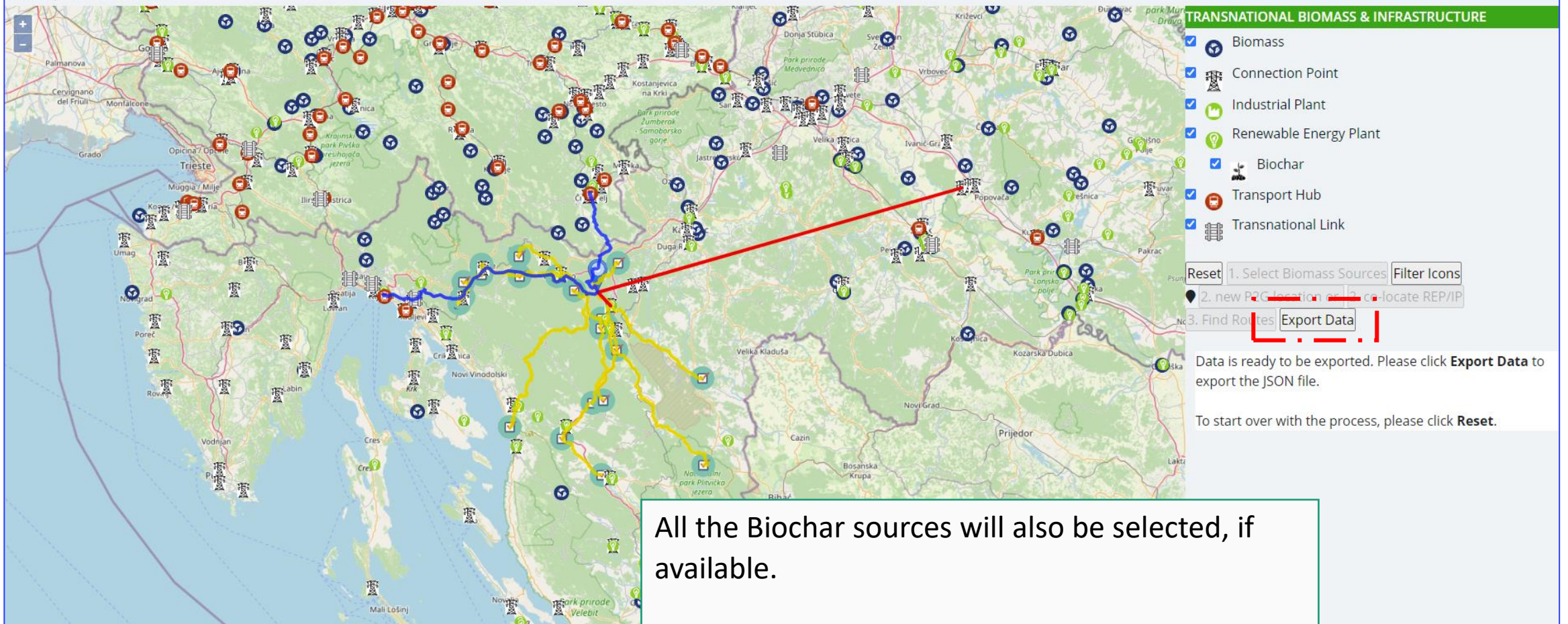
- cestno razdaljo do izbranih virov biomase
- zračno razdaljo do bližnjih priključnih točk
- cestno razdaljo do bližnjih prometnih vozlišč



# TRANSNATIONAL RENEWABLE ENERGY ATLAS



## Danup-2-Gas Atlas



Selected Biomass Sources: [25] | Total Amount (tons/year): 116840

Country: Croatia

All the Biochar sources will also be selected, if available.

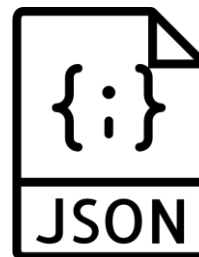
You will then be prompted to export the data as JSON file using the “Export Data” button.





data as JSON file

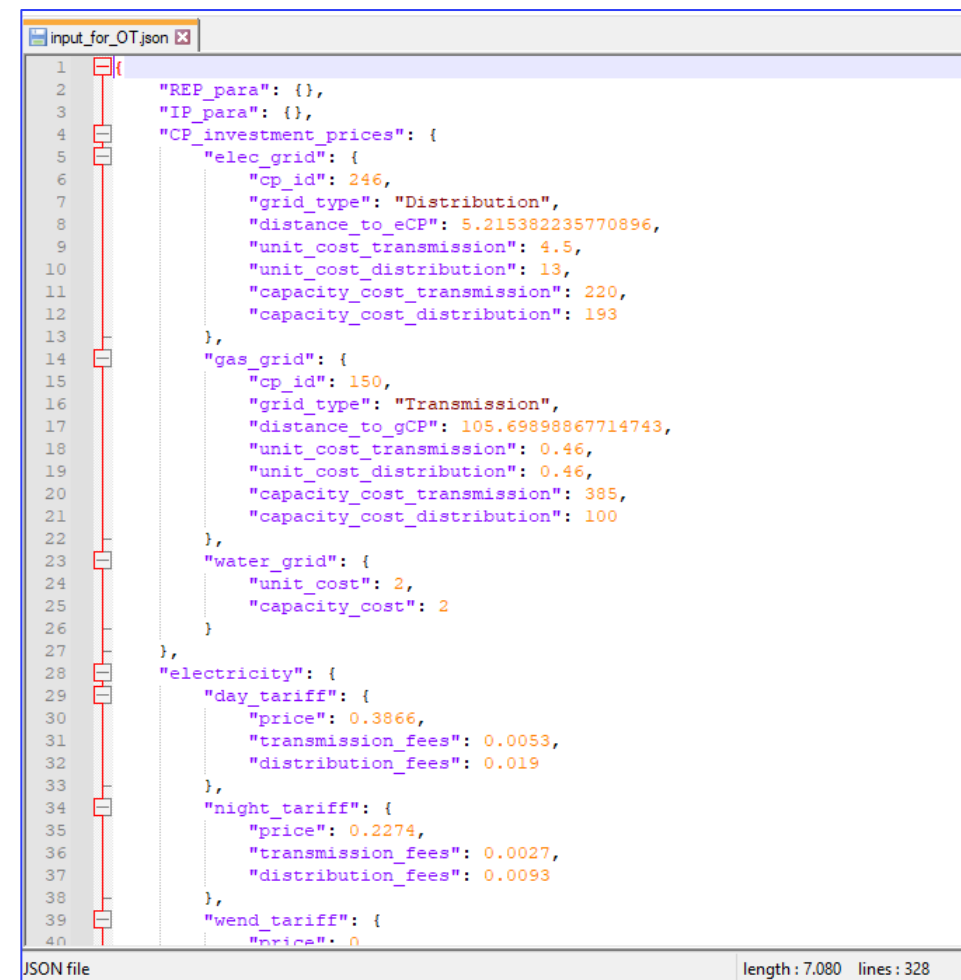
(input\_for\_OT.json)



Privzeto ime datoteke JSON je  
"input\_for\_OT.json".

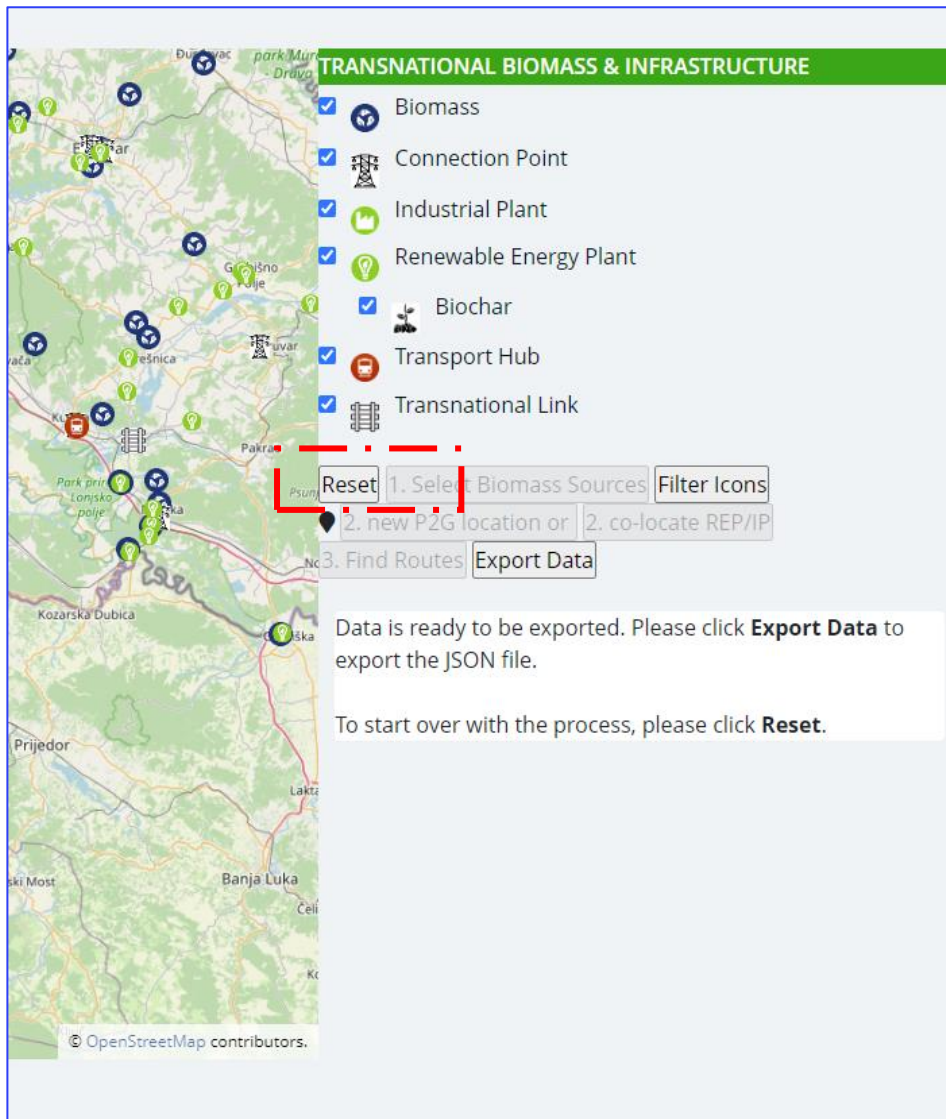
Datoteko lahko odprete v katerem koli programu za pregledovanje datotek in preverite podatke.

Naslednji korak je uvoz datoteke v "orodje za optimizacijo".



```
1 {
2   "REP_para": {},
3   "IP_para": {},
4   "CP_investment_prices": {
5     "elec_grid": {
6       "cp_id": 246,
7       "grid_type": "Distribution",
8       "distance_to_eCP": 5.215382235770896,
9       "unit_cost_transmission": 4.5,
10      "unit_cost_distribution": 13,
11      "capacity_cost_transmission": 220,
12      "capacity_cost_distribution": 193
13    },
14    "gas_grid": {
15      "cp_id": 150,
16      "grid_type": "Transmission",
17      "distance_to_gCP": 105.69898867714743,
18      "unit_cost_transmission": 0.46,
19      "unit_cost_distribution": 0.46,
20      "capacity_cost_transmission": 385,
21      "capacity_cost_distribution": 100
22    },
23    "water_grid": {
24      "unit_cost": 2,
25      "capacity_cost": 2
26    }
27  },
28  "electricity": {
29    "day_tariff": {
30      "price": 0.3866,
31      "transmission_fees": 0.0053,
32      "distribution_fees": 0.019
33    },
34    "night_tariff": {
35      "price": 0.2274,
36      "transmission_fees": 0.0027,
37      "distribution_fees": 0.0093
38    },
39    "wend_tariff": {
40      "price": 0
41    }
42  }
43 }
```

JSON file length: 7,080 lines: 328



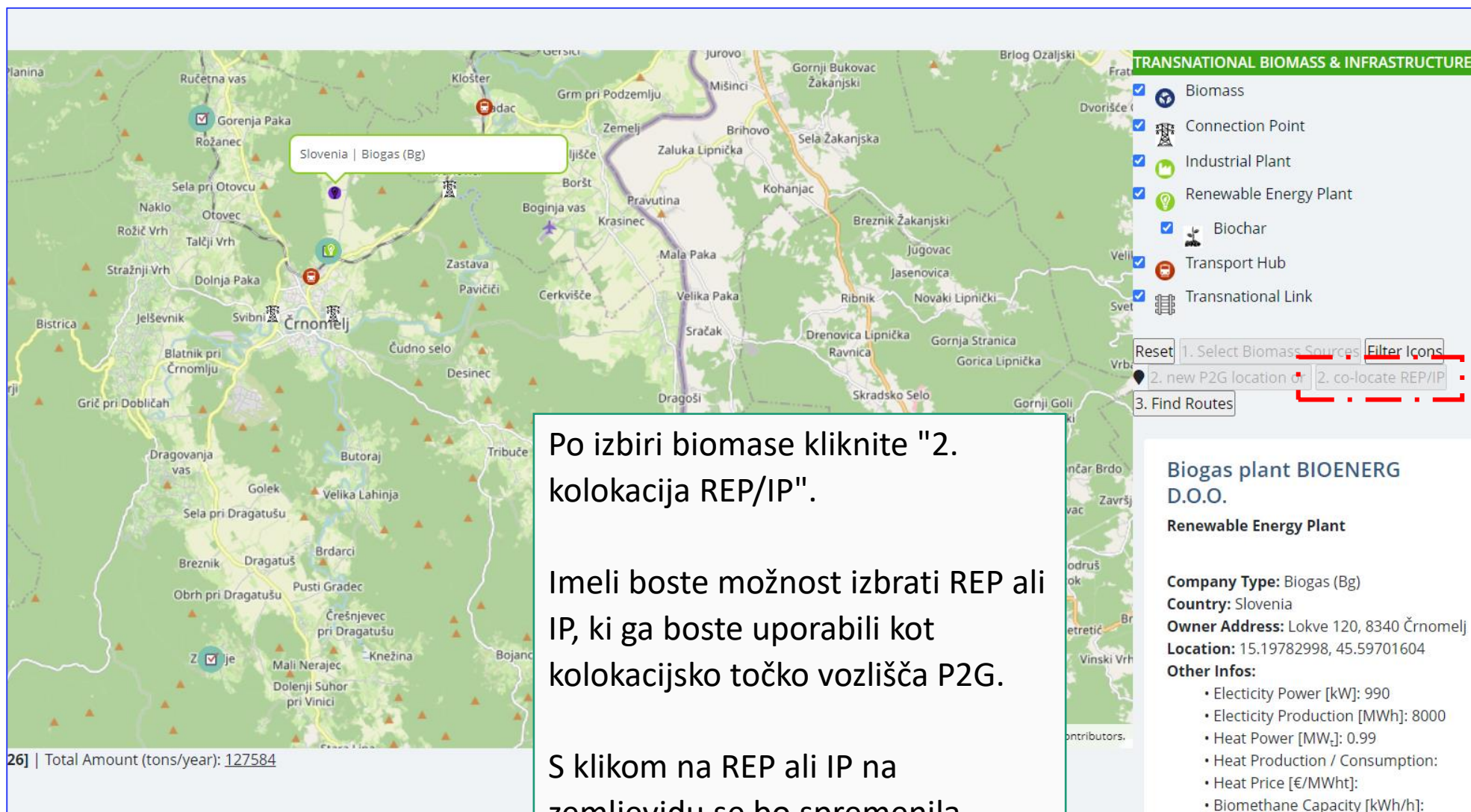
The screenshot shows a map of the Balkan region with various icons representing biomass and infrastructure. A green header bar at the top of the interface reads "TRANSNATIONAL BIOMASS & INFRASTRUCTURE". Below this, a list of icons with checkboxes is visible: Biomass, Connection Point, Industrial Plant, Renewable Energy Plant, Biochar, Transport Hub, and Transnational Link. All checkboxes are currently checked. At the bottom of the map area, there are buttons for "Reset", "1. Select Biomass Sources", "Filter Icons", "2. new P2G location or 2. co-locate REP/IP", "3. Find Routes", and "Export Data". A red box highlights the "Reset" button. A text box at the bottom of the interface states: "Data is ready to be exported. Please click **Export Data** to export the JSON file. To start over with the process, please click **Reset**."

Kliknite "Ponastavi" ali ponovno naložite stran, da ponovno začnete postopek.





S klikom na  
"Ponastavi" boste  
morali izbrati vire  
biomase kot prej.

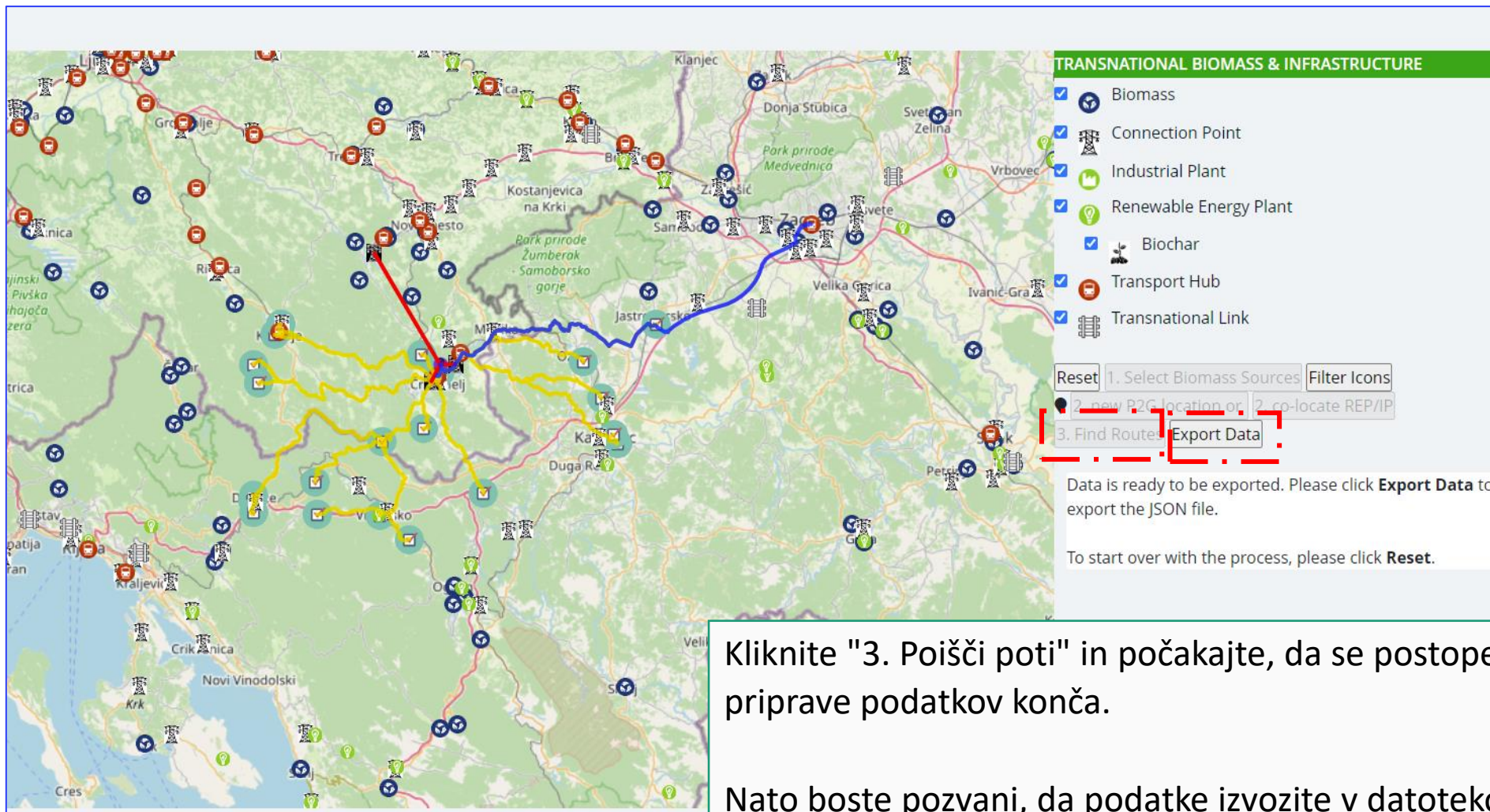


Po izbiri biomase kliknite "2. kolokacija REP/IP".

Imeli boste možnost izbrati REP ali IP, ki ga boste uporabili kot kolokacijsko točko vozlišča P2G.

S klikom na REP ali IP na zemljevidu se bo spremenila ikona, ki označuje njegovo izbiro.





Kliknite "3. Poišči poti" in počakajte, da se postopek priprave podatkov konča.

Nato boste pozvani, da podatke izvozite v datoteko JSON z gumbom "Export Data" (Izvozi podatke), tako kot prej.




# ORODJE ZA OPTIMIZACIJO P-2-G VOZLIŠČ

Samodejno shranjevanje ☐ DanuP2Gas Optimization Tool

Datoteka Osnovno Vstavljanje Postavitev strani Formule Podatki Pregled Ogled Pomoč

Razveljavi Izreži Kopiraj Prilepi Preslikovalnik oblik Odložišče Pisava Poravnava Število Pogojno oblikovanje Oblikuj kot tabelo Slogi Vstavi Izbrisi Oblika Samodej Zapolni Počisti

H9 20

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T																														
1	 <b>TOOL FOR OPTIMAL SIZING OF POWER-TO-GAS COUPLING HUBS</b>																																																	
2																																																		
3																																																		
4																																																		
5																																																		
6																																																		
7	<b>Investment parameters</b>																																																	
8	<table><thead><tr><th>Parameter</th><th>Value</th><th>Unit</th></tr></thead><tbody><tr><td>Maximal investment payoff period</td><td>20</td><td>years</td></tr><tr><td>Administration and building period</td><td>5</td><td>years</td></tr><tr><td>Maximal investment</td><td>1.000.000.000</td><td>€</td></tr><tr><td>Use same subsidy for all parts of the P2G hub?</td><td>Yes</td><td></td></tr><tr><td>Investment subsidy</td><td>0,0</td><td>%</td></tr></tbody></table>																				Parameter	Value	Unit	Maximal investment payoff period	20	years	Administration and building period	5	years	Maximal investment	1.000.000.000	€	Use same subsidy for all parts of the P2G hub?	Yes		Investment subsidy	0,0	%												
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15	<b>Additional sales parameters</b>																																																	
16	<table><thead><tr><th>Parameter</th><th>Value</th><th>Unit</th></tr></thead><tbody><tr><td>H<sub>2</sub> Price for selling hydrogen</td><td></td><td>€/kg</td></tr><tr><td>H<sub>2</sub> Limit of daily hydrogen sale</td><td></td><td>kg/day</td></tr><tr><td>O<sub>2</sub> Price for selling oxygen</td><td></td><td>€/kg</td></tr><tr><td>O<sub>2</sub> Limit of daily oxygen sale</td><td></td><td>kg/day</td></tr><tr><td>CH<sub>4</sub> Price for selling methane</td><td></td><td>€/kg</td></tr><tr><td>CH<sub>4</sub> Limit of daily methane sale</td><td></td><td>kg/day</td></tr><tr><td>BC Price for selling biochar</td><td></td><td>€/kg</td></tr><tr><td>BC Limit of daily biochar sale</td><td></td><td>kg/day</td></tr><tr><td>Tax on CO2 emissions</td><td></td><td>€/kg</td></tr></tbody></table>																				Parameter	Value	Unit	H <sub>2</sub> Price for selling hydrogen		€/kg	H <sub>2</sub> Limit of daily hydrogen sale		kg/day	O <sub>2</sub> Price for selling oxygen		€/kg	O <sub>2</sub> Limit of daily oxygen sale		kg/day	CH <sub>4</sub> Price for selling methane		€/kg	CH <sub>4</sub> Limit of daily methane sale		kg/day	BC Price for selling biochar		€/kg	BC Limit of daily biochar sale		kg/day	Tax on CO2 emissions		€/kg
Parameter	Value	Unit																																																
H <sub>2</sub> Price for selling hydrogen		€/kg																																																
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CH <sub>4</sub> Price for selling methane		€/kg																																																
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**Optimization parameters**

Parameter	Value	Unit
Starting date of simulation	1.01.2022	Pick date
Last date of simulation	31.12.2022	Pick date
Sampling time for electrical part	24	h
Amount of memory required (cca)	1,37	GB

**Monthly precipitation**

Month	Value	Unit	Month	Value	Unit
January		mm	July		mm
February		mm	August		mm
March		mm	September		mm
April		mm	October		mm
May		mm	November		mm
June		mm	December		mm

**Start Optimization**

**Optimization output**

Date and time	Message	Type
---------------	---------	------

Optimization tool Plants and sources P2G segments Results Charts +

Priljubljen Dostopnost: preverite priporočila



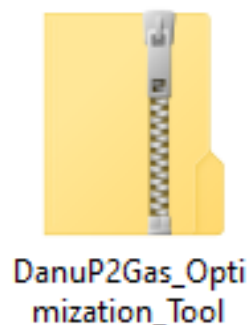


# ORODJE ZA OPTIMIZACIJO P-2-G VOZLIŠČ

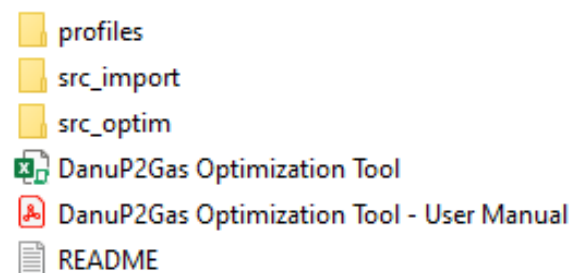
SEDAJ PA POGLEJMO DVA PRIMERA !

ORODJE ZA OPTIMIZACIJO P-2-G JE TRENUTNO NA VOLJO NA TEJ POVEZAVI:

[https://danup2gas.fer.unizg.hr/FbgzafLZ/DanuP2Gas\\_Optimization\\_Tool.zip](https://danup2gas.fer.unizg.hr/FbgzafLZ/DanuP2Gas_Optimization_Tool.zip)



EKSTRAHIRAJ VSE V NOVO MAPO



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# DanuP-2-Gas

## Delavnica za usposabljanje uporabnikov orodja za optimizacijo P2G vozlišč

 12. 10. 2022 | Velenje |

 DanuP-2-Gas projekt

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