

# **ENERGY BARGE**

**Building a Green Energy and Logistics Belt**

**Project Code: DTP1-175-3.2**

## **Output Evidence Document**

### **Output 3.1**

#### **Danube transnational biomass and bioenergy atlas**

*June 2018*

*For the implementation of the project “ENERGY BARGE – Building a Green Energy and Logistics Belt” a subsidy is awarded from the European Regional Development Fund under the Danube Transnational Programme.*

*The sole responsibility of this publication lies with the authors. The European Regional Development Fund is not responsible for any use that may be made of the information contained therein.*



## Table of contents

|    |                                     |   |
|----|-------------------------------------|---|
| I  | About the ENERGY BARGE project..... | 3 |
| II | About this document.....            | 5 |
| 1  | Background.....                     | 6 |
| 2  | General information .....           | 7 |
| 3  | Output summary.....                 | 8 |
| 4  | Output evidence .....               | 9 |

## Figures

|  |    |
|--|----|
| Figure 1: Green Energy and Chemistry Belt.....   | 6  |
| Figure 2: Joint landing page, part 1, <a href="http://www.energy-barge.eu">www.energy-barge.eu</a> .....                   | 10 |
| Figure 3: Joint landing page, part 2.....  | 11 |
| Figure 4: Atlas map view.....  | 12 |
| Figure 5: Atlas map view, zoom to city of Straubing.....   | 13 |
| Figure 6: Atlas map view, zoom to Lower Bavarian Danube level. ....  | 14 |
| Figure 7: Atlas map view, minimum zoom, flow direction visualization, export of defined biomass from Croatia in 2016. .... | 15 |
| Figure 8: Map view, minimum zoom, biomass land cover.....  | 17 |
| Figure 9: Subpage “Biomass and bioenergy sector” .....   | 18 |
| Figure 10: Biomass and bioenergy company register .....  | 19 |
| Figure 11: Company registration form .....   | 20 |
| Figure 12: Section of the platform’s terms and conditions.....   | 21 |

## **I About the ENERGY BARGE project**

The Danube region offers a great potential for green energy in the form of biomass. The main objective of ENERGY BARGE is to exploit this potential in a sustainable way, considering the Renewable Energy Directive 2009/28/EC, thereby increasing energy security and efficiency in the Danube countries. The project brings together key actors along the entire value chain, biomass companies and Danube ports as well as relevant public authorities and policy stakeholders. The project maps value chains and facilitates the market uptake of biomass, supports better connected transport systems for green logistics and provides practical solutions and policy guidelines. The Agency for Renewable Resources (FNR) coordinates the ENERGY BARGE project consortium with fourteen partners from Austria, Bulgaria, Croatia, Germany, Hungary, Slovakia and Romania.

## Project coordinator

Agency for Renewable Resources /

|   |     |         |
|---|-----|---------|
| Fachagentur Nachhaltende Rohstoffe e.V. | FNR | Germany |
|---|-----|---------|

## Project partners

|   |               |          |
|---|---------------|----------|
| BioCampus Straubing GmbH  | BCG           | Germany  |
| Deggendorf Institute of Technology  | DIT           | Germany  |
| Austrian Waterway Company   | VIA           | Austria  |
| Port of Vienna  | PoVi          | Austria  |
| Bioenergy2020+ GmbH   | BE2020        | Austria  |
| International Centre of Applied Research and Sustainable Technology                       | ICARST        | Slovakia |
| Slovak Shipping and Ports JSC   | SPaP          | Slovakia |
| National Agricultural Research and Innovation Center                                      | NARIC         | Hungary  |
| MAHART-Freeport Co. Ltd.  | MAHART        | Hungary  |
| International Centre for Sustainable Development of Energy, Water and Environment Systems | SDEWES Centre | Croatia  |
| Public Institution Port Authority Vukovar   | PoVu          | Croatia  |
| Technology Center Sofia Ltd.  | TCS           | Bulgaria |
| Romanian Association of Biomass and Biogas  | ARBIO         | Romania  |
| Federation of owners of forests and grasslands in Romania                                 | Nostra Silva  | Romania  |

## II About this document

This report corresponds to “Output 3.1 - Danube transnational biomass and bioenergy atlas”. It has been prepared by:

|                                 |            |
|---------------------------------|------------|
| <b>Due date of deliverable:</b> | 2018-06-30 |
| <b>Actual submission date:</b>  | 2018-06-30 |
| <b>Start date of project:</b>   | 2017-01-01 |
| <b>Duration:</b>                | 30 months  |

|  |  |
|--|--|
| <b>Work package</b>                    | WP3  |
| <b>Output</b>                          | O3.1   |
| <b>Lead contractor for this output</b> | BCG, DIT   |
| <b>Editor(s)</b>                       | Ann-Kathrin Kaufmann (BCG), Anne Weinfurtner (DIT) |
| <b>Quality reviewer</b>                | Birger Kerckow, FNR                                |

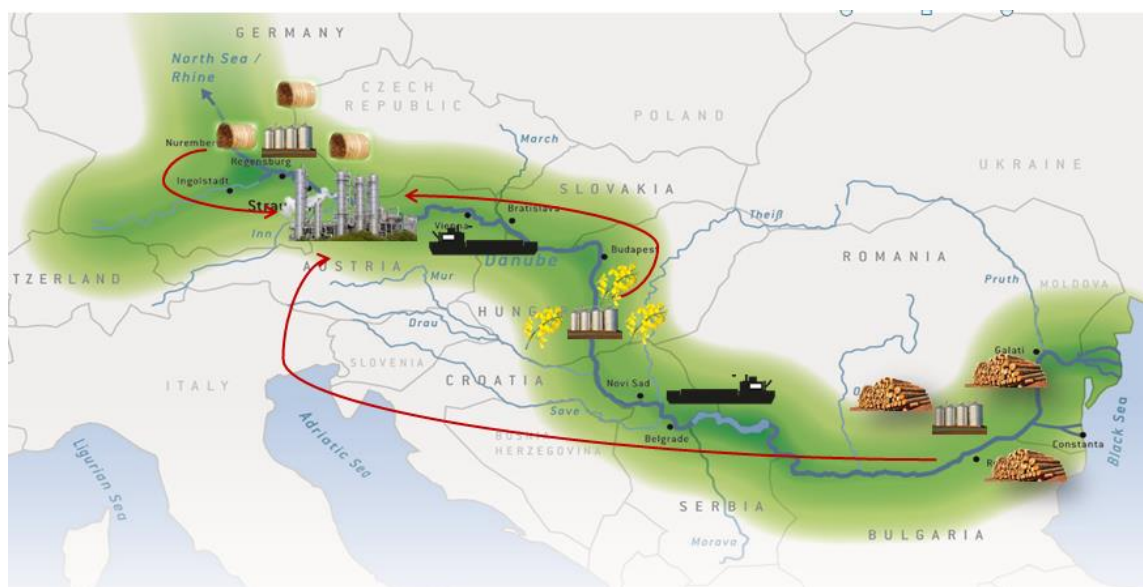
| Version | Date       | Author(s)                              | Reason for modification             | Status    |
|---------|------------|--|-------------------------------------|-----------|
| 1.0     | 2018-06-15 | Ann-Kathrin Kaufmann, Anne Weinfurtner | Draft evidence document             | Completed |
| 2.0     | 2018-06-29 | Ann-Kathrin Kaufmann                   | Final document after QAM assessment | Completed |



## 1 Background

ENERGY BARGE aims at exploiting the Danube macroregion's bioenergy potential to increase energy security and diversification of energy sources by establishing secure, efficient and sustainable bioenergy supply chains along the river. To this end, a holistic view on the bioenergy market and underlying value and supply chains is needed. Given national and regional disparities in theoretical, geographical and market potential for bioenergy, deployment, public support, and also cooperation between private and public actors, it is necessary to identify levers for tapping potential and options for market actor cooperation, business development and market uptake.

A theoretical model designed to increase the market uptake of bio-based feedstock for both material and energetic (ideally cascading) use in the Danube region and thus to address the objectives also set out in the EU Strategy for the Danube Region (EUSDR) is a concept called "Green Energy and Chemistry Belt" (see Figure 1). It was developed by the BioCampus Straubing GmbH (Project Partner 1) and aims at using the Danube River as a natural biomass corridor and sustainable transport axis for biomass. The underlying principle follows the logic of "local harvesting – decentral processing into more transport-worthy states (e.g. oils, pellets, liquids) – central refinement or end use", so that added value creation can mainly stay in rural areas along the Danube. This concept forms the basic idea of the ENERGY BARGE project.



**Figure 1: Green Energy and Chemistry Belt (Source: BioCampus Straubing GmbH, own visualization).**

In order to reach the targets outlined above, Work Package 3 provides market-oriented mapping of the Danube region's value chains from biomass feedstock production and residues to energy generation from an integrated, transnational perspective, giving regional and transnational guidance for market development along the river (green bioenergy belt) and setting the stage for increased use of Danube logistics in the bioenergy sector. This will be achieved through a transnational market study compendium including biomass flows and sustainability aspects

(macro-perspective, Activity 3.1), business landscape mapping, case studies and identification of best practice locations for bioenergy value chain integration (micro-perspective, Activity 3.2).

## 2 General information

The Danube transnational biomass and bioenergy atlas is an online tool to improve energy security and efficiency. It is one of two ENERGY BARGE output tools visualizing the Danube biomass and bioenergy market, its actors and underlying supply and value chains. It will be integrated in the overall ENERGY BARGE modal shift platform for green bioenergy logistics in period 4 ([www.energy-barge.eu](http://www.energy-barge.eu)). Until then, the atlas is not publicly accessible online but can be reached for review, testing and control purposes.

The access data are:

<https://energy-barge.eu/>

**User: partner**

**Password: Danube2018**

The atlas has been optimised for most common browsers (Mozilla Firefox, Microsoft Internet Explorer, Chrome).

The output will be, in accordance with the work plan in the Application Form, an integral part of the project's output 4.1., the final overall modal shift platform for green bioenergy logistics. The platform shall be a 'one-stop-solution' for all target groups, an interaction between the different tools is therefore of utmost importance. The finalization of the different tools is planned in consecutive steps, output 3.1 has been finalized with the end of period 3. However, the go-live of the modal shift platform including outputs 3.1. and 3.2. is planned for the end of period 4. Hence, a comprehensive transnational implementation plan for the online outputs including a dissemination strategy as well as detailed methodological and technical documentation will be provided in period 4.

For reasons of evidence provision and documentation, the finalized isolated elements of output 3.1 are documented and visualized via screenshots below.

The output may be accessed via the log-in data provided above for review and control purposes.

For a content-related overview, see the output factsheet.



### 3 Output summary

The atlas provides an intuitive and easily navigable overview on the transnational biomass and bioenergy market for relevant market actors. It covers the company landscape and related business contacts, land cover aspects of the Danube region and biomass feedstock trade flows between the Danube countries. The logic behind the atlas is to start with a comprehensive set of company entries but to allow for growth and development through the option for companies to register and to consequently provide a growing transnational market actor data base.

Its main elements are:

- a dynamic map view of the Danube region with zoom function based on open street map source
- a specific side bar menu with selection functions to search for information layers and icons, covering: biomass and bioenergy companies, institutions, clusters, research; import and export feedstock flow visualization of selected biomass types relevant for bioenergy production (flow directions, volumes, shares) per country and per year; biomass land cover layer based on CORINE spatial data; all functions and layers are visualized on the dynamic map and derive the information from a joint data base; mouse-over effects on the selection criteria provide detailed definitions and information about the single criteria
- a sub-page “biomass and bioenergy sector” with additional information and access to all relevant project deliverables including recommendations for market actors
- sub-pages “biomass and bioenergy companies” and “clusters, institutions and research” with registered companies, their basic information on biomass feedstock used/bioenergy products produced, as well as option to register a/o update company information
- Shared with the other output tools: landing page with general information

In the atlas, the results/deliverables from all project activities in WP 3 thus far are merged. The content was filed by all biomass partners of WP 3 (BE2020, FNR; ICARST, NARIC, SDEWES, TCS, ARBIO, Nostra Silva), reviewed by the logistics partners and merged and prepared for output utilization by WP leader BCG. DIT was responsible for programming, visualization and data management including safeguarding of data protection regulations and compilation of terms of use.

#### 4 Output evidence

The following section provides evidence of the finalized output “Danube transnational biomass and bioenergy atlas”. This evidence is presented in the form of exemplifying screenshots taken from the portal on which the output tool is presented (ENERGY BARGE modal shift platform, [www.energy-barge.eu](http://www.energy-barge.eu), 2018).

The following elements of the output are visualized with exemplifying screenshots:

- Joint landing page
- Atlas map view, several versions of layer selections and zoom levels (companies, filtered by product groups, institutions, feedstock flows direction version, land cover)
- Company register view
- Company registration form
- Terms of use

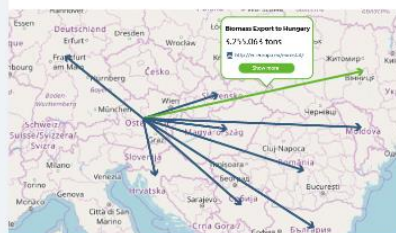
## JOIN US

and benefit from the bioenergy and modal shift platform - a place where info on the Danube region's biomass and bioenergy business and the Danube logistics meet

Fully utilize the synergies between the bioenergy & biomass industry and the Danube logistics sector. [Register your company free of charge!](#)

The three ENERGY BARGE tools are:

### BIOMASS & BIOENERGY ATLAS



Get an overview on the company landscape, business contacts, potentials and feedstock flows along the Danube in our atlas

### MODAL SHIFT PLATFORM



Find practical guidance and partners for green bioenergy logistics along the Danube.

### GOOD PRACTICES

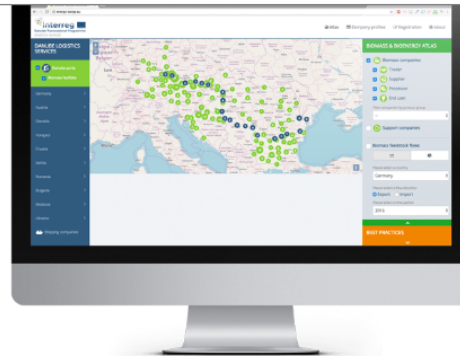
Coming soon! 

Learn from working examples utilizing biomass as well as the benefits from inland waterway transport and port locations and benchmark your case

Figure 2: Joint landing page, part 1, [www.energy-barge.eu](http://www.energy-barge.eu)

Become part of platform supporting key actors and stakeholders from the bioenergy industry in gaining access to suitable Danube logistics services. The website promotes the building of new partnerships, improves cross-sectoral cooperation and provides information to support the development of innovative value and supply chains.

Register company now for free



#### The ENERGY BARGE platform at a glance



##### Bioenergy markets

Explore the national and transnational biomass and bioenergy markets in the Danube region.



##### Green Danube logistics

Learn what Danube logistics can do to facilitate biomass transport and how Danube ports can become biomass and bioenergy hubs. Get practical guidance on the transport, handling and storage of biomass along the Danube.



##### Find your partner

Use the ENERGY BARGE platform to find new partners along bioenergy value and supply chains and discover possibilities for new logistics solutions.



##### Value chains

Get an overview over current biomass import and export flows relevant for the bioenergy sector and explore potentials for improved and sustainable utilization of biomass for bioenergy purposes.

Figure 3: Joint landing page, part 2

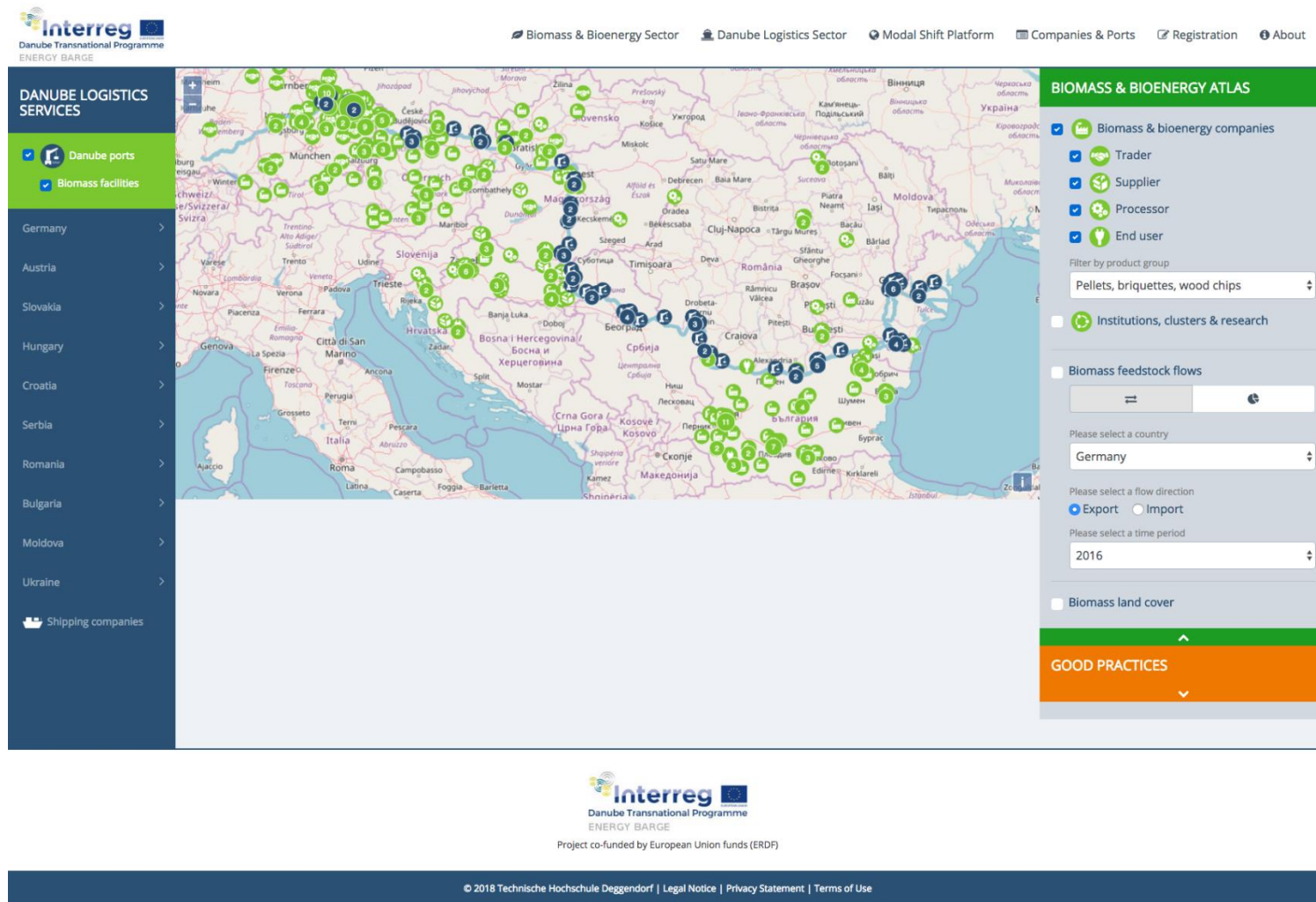


Figure 4: Atlas map view, minimum zoom, layer “biomass and bioenergy companies” covering all company types selected, product group “pellets” selected.



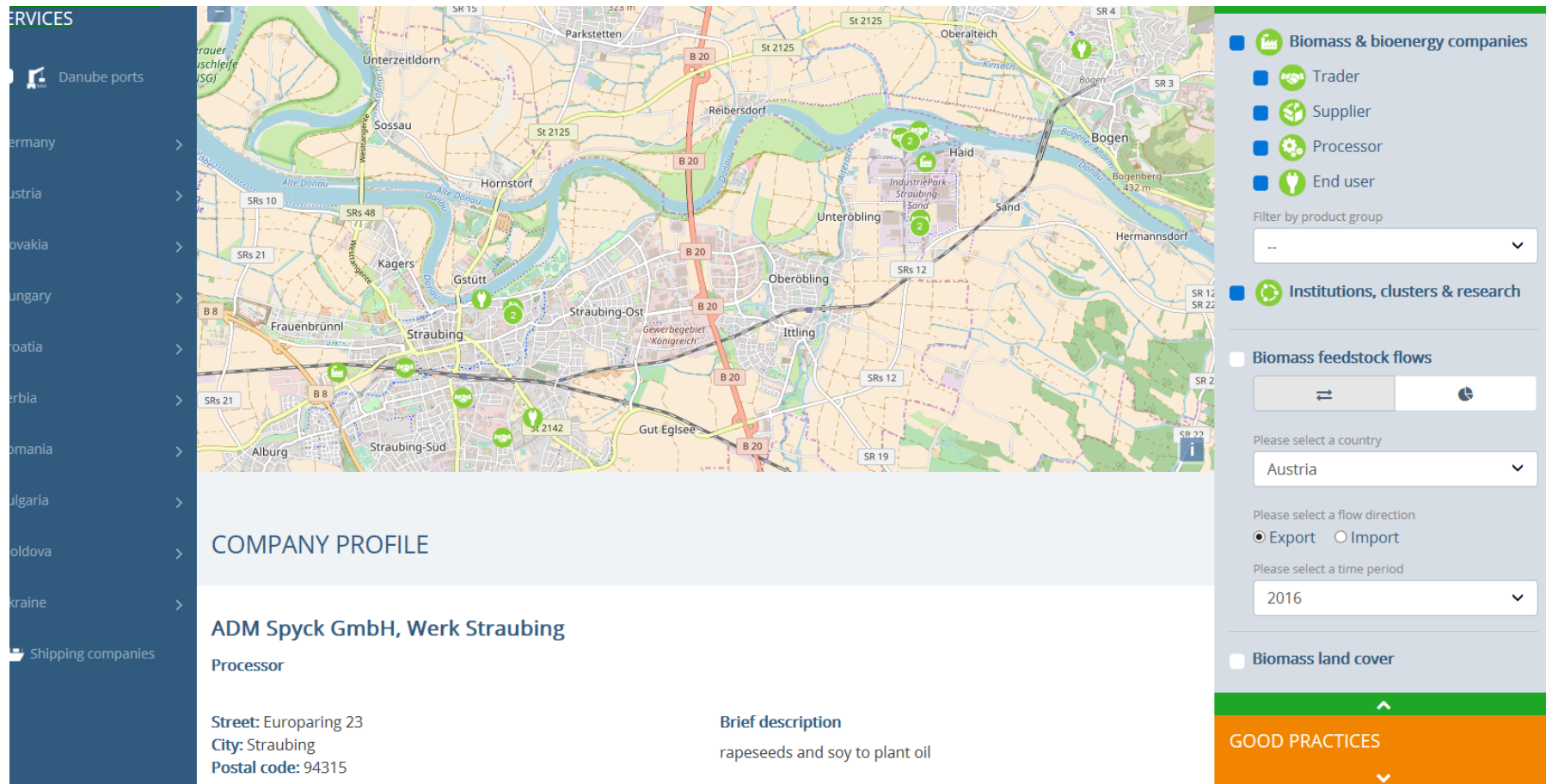


Figure 5: Atlas map view, zoom to city of Straubing, layer “biomass and bioenergy companies” covering all company types selected, “institutions” selected, company profile of ADM selected

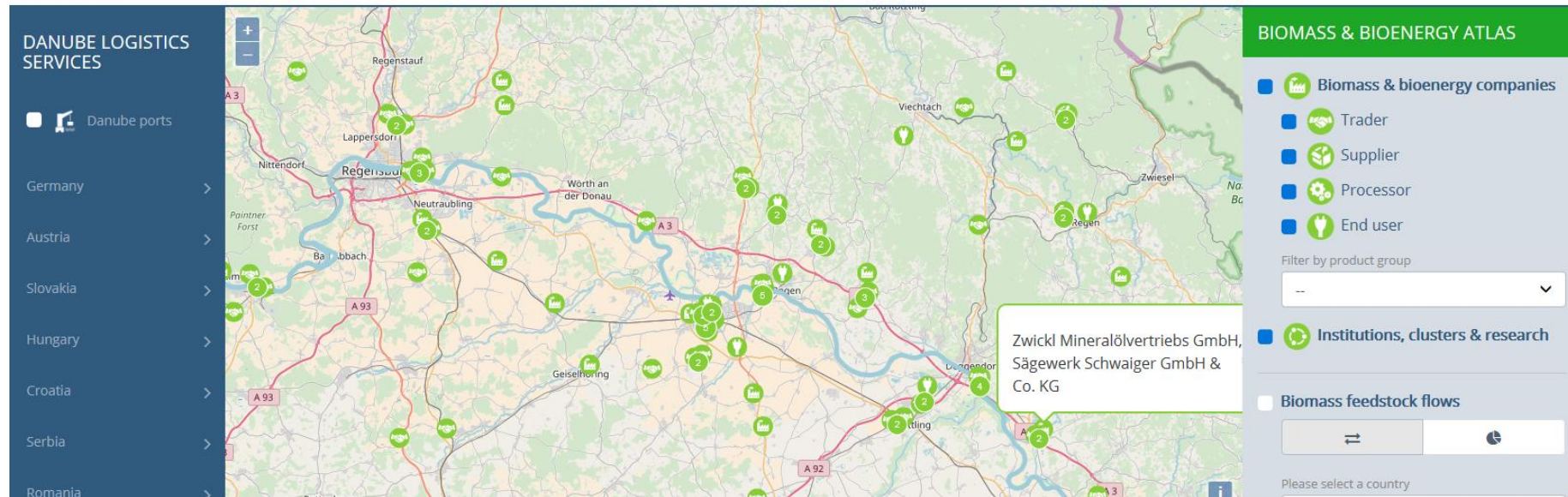


Figure 6: Atlas map view, zoom to Lower Bavarian Danube level, “biomass and bioenergy companies” covering all company types selected, “institutions” selected, Pop up info on conglomerate of two companies selected (Link to company profiles selectable in white box).

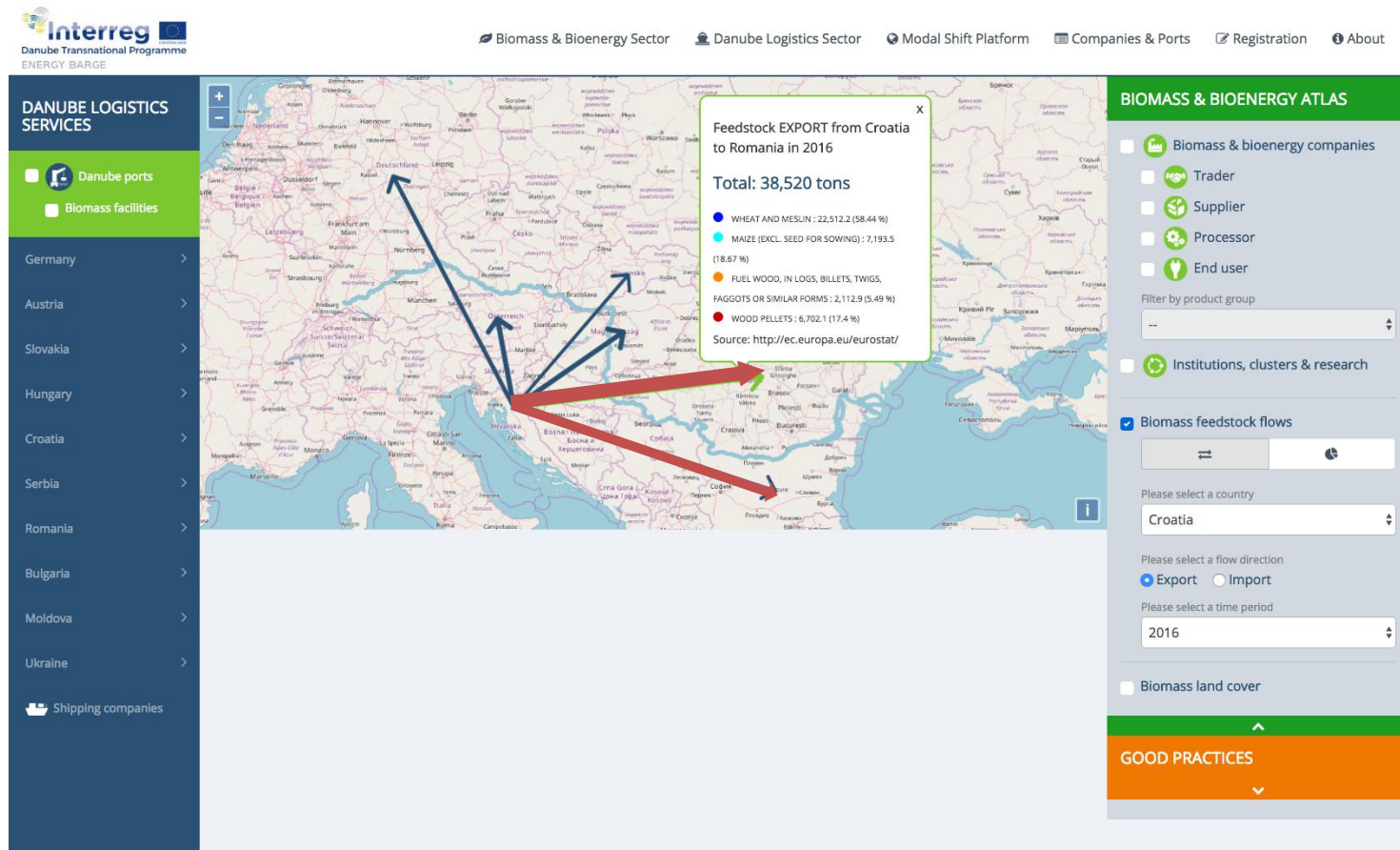
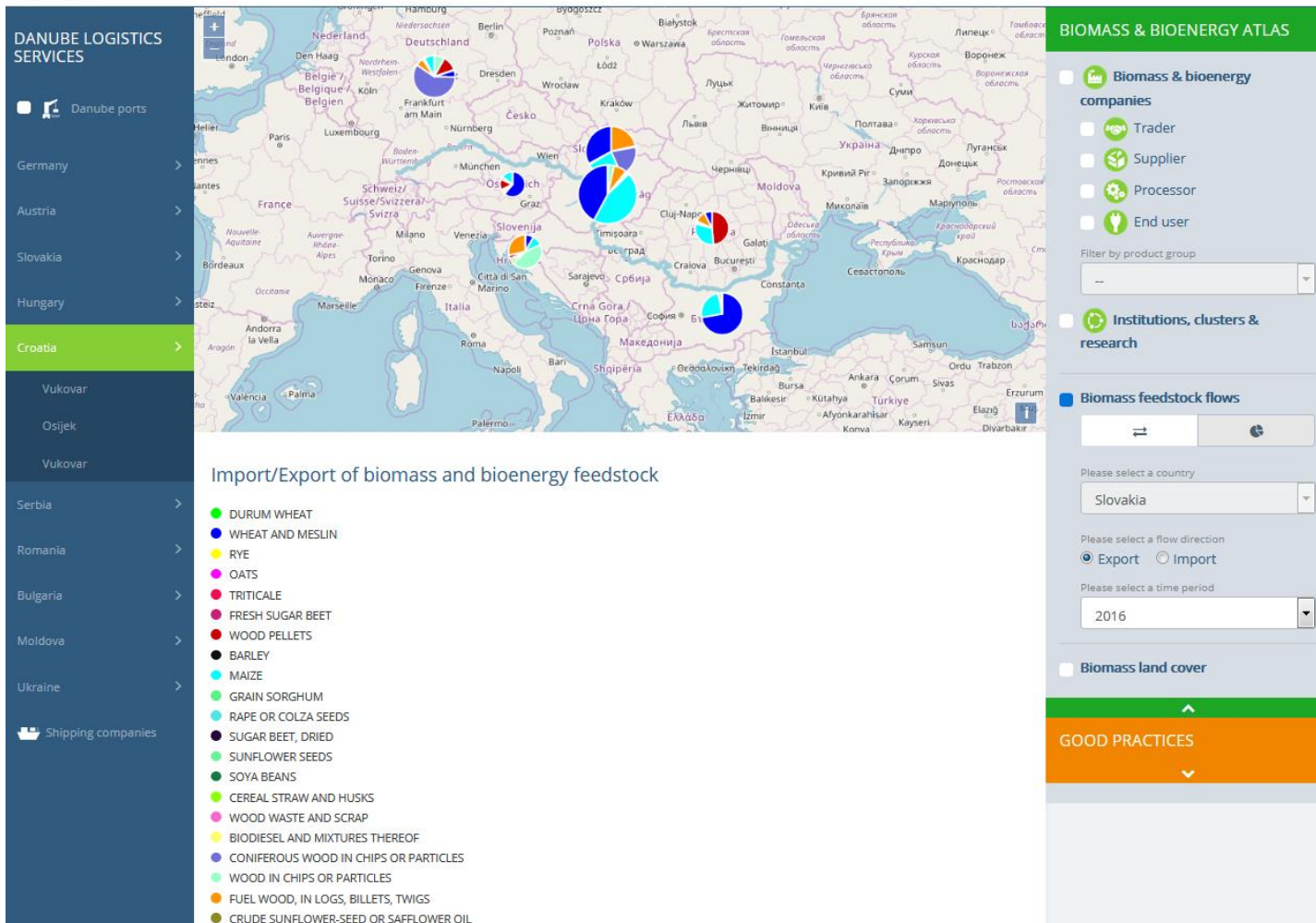


Figure 7: Atlas map view, minimum zoom, flow direction visualization, export of defined biomass from Croatia in 2016, detail selection: Romania.





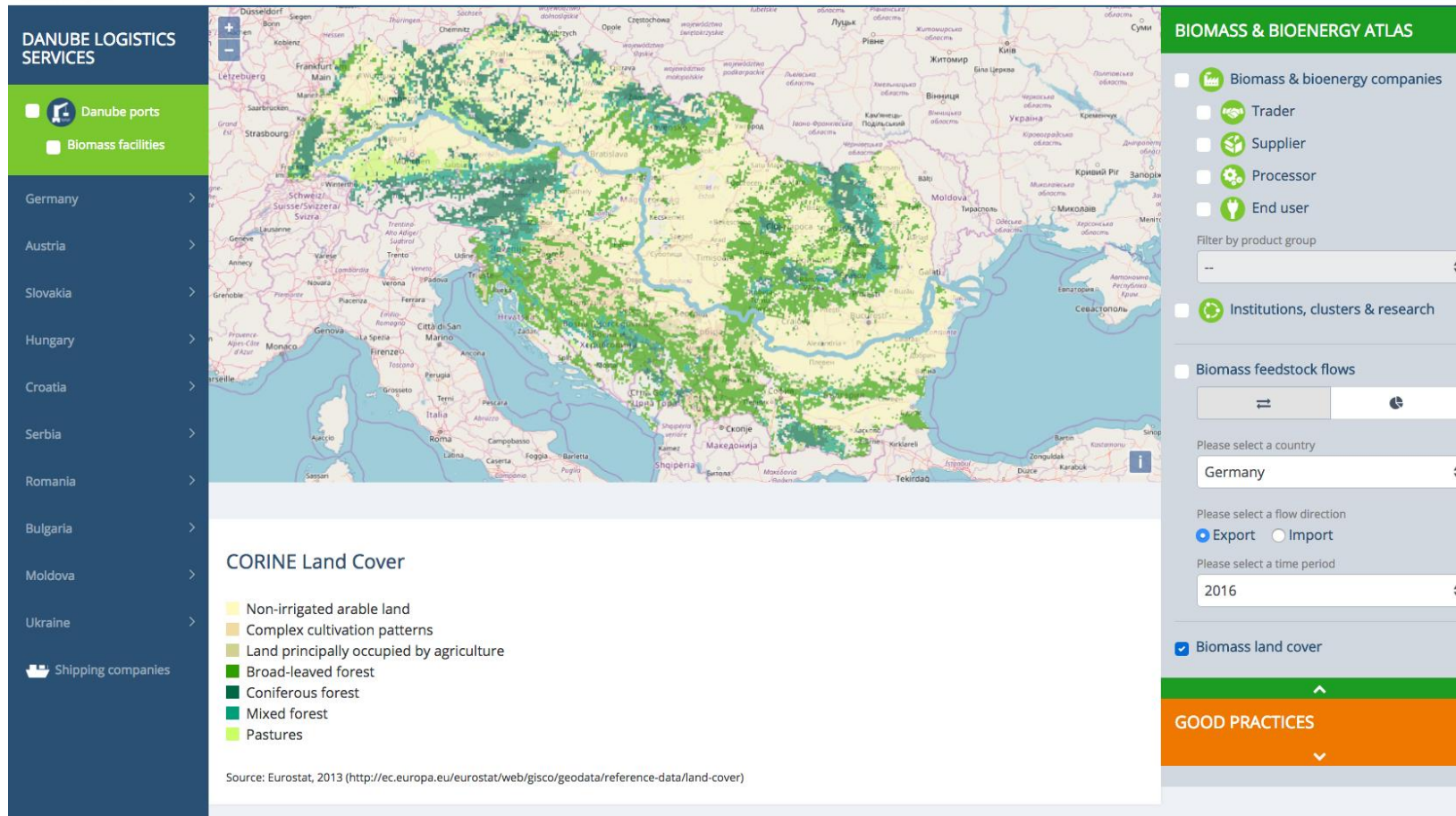


Figure 8: Map view, minimum zoom, biomass land cover based on selected CORINE criteria.

## BIOMASS & BIOENERGY SECTOR

The Danube region has a theoretically high potential for biomass use, especially for energy purposes. In the Strategy for the Danube Region, utilizing the biomass potential for energy generation is highlighted as one important pillar in the strategy. Even an own Danube Biomass Action Plan (LINK: <https://www.danube-energy.eu/the-danube-region-biomass-action-plan>) has been drafted. On these pages, you find useful background information on different aspects of the biomass and bioenergy utilization in the Danube region as explored in the ENERGY BARGE project. Here, you can read up on the project reports which back up the modal shift platform tools.



### Bioenergy markets - conditions, actors and demand

How advanced are the Danube countries in fulfilling their National Renewable Energy Action Plans (hyperlink: <https://ec.europa.eu/energy/en/topics/renewable-energy/national-action-plans>)? How does biomass contribute to the energy mix?

What are the countries' strengths and bioenergy sectors with highest potential? Explore these and other information on national and transnational biomass and bioenergy markets in the Danube region and check out what they can do to improve EU renewables goals and sustainability. Read up on the market situation on the ENERGY BARGE compilation of national market study reports for Austria, Bulgaria, Croatia, Germany, Hungary, Slovakia and Romania.

Market study reports

How the potential of biomass in the Danube region will be used in the future and whether the bioenergy market will be a main user of this potential is unsure. It highly depends on how the demand for bioenergy will develop in the Danube countries and on the transnational energy market. A number of criteria are shaping this development. Also, differing developments can be assumed in the three bioenergy sectors electricity, heating/cooling and transport. In order to better project how the demand will materialize, an ENERGY BARGE demand scenario analysis of the bioenergy market has been set up.

Read up on the three ENERGY BARGE scenarios soon here



### Sustainability

In recent years, as the utilization of biomass for various non-food purposes has increased, aspects of sustainability throughout the entire supply and value chains have gained in importance. A number of instruments on multiple legislative, but also on voluntary industry levels have been introduced. In how far are these consistent and effective in ensuring sustainable use of biomass? And are countries acting differently in pursuing sustainability goals for biomass and bioenergy production? Answers to these and other question on the Danube-adjacent countries' national sustainability framework conditions and approaches to sustainability in the field of biomass and bioenergy production can be read up in our ENERGY BARGE report.

Sustainability report



### Feedstock flows and usage

Different types of biomass have a wide array of fields of application, regions of origin and location of usage. Therefore, all kinds of biomass are traded on a global scale. With the Danube region being one of the hotspots for biomass potential for different usages (food/feed, material use, energetic use), it is important to analyse in how far the transnational trade in biomass is performing within the Danube region. Based on EUROSTAT data, a first insight into flow directions on qualitative and quantitative level as well as in terms of direction has been analysed. Besides the visualization in the Biomass & Bioenergy Atlas, a background report provides deeper insight as well as an analysis of so-called Sankey-diagrams to further depict the usage of the different types of biomass.

Feedstock flow report

Figure 9: Subpage "Biomass and bioenergy sector" with supporting information and access to reports  
Project co-funded by European Union funds (ERDF)

## BIOMASS AND BIOENERGY COMPANIES

Numerous actors work in the biomass and bioenergy markets and along the relevant value chains. In this overview, you find a comprehensive - but by no means complete yet - landscape of companies active in the biomass and bioenergy sectors of the Danube-bordering countries. We would like to welcome you here! The categories listed are supplier, trader, processor and end user (excluding biogas plants). Most companies listed are classified as more than just one category. For example, most pellet processors are also active in trading. In case you don't find your company in this list, we would like to have you on board - register here.

If you want to update your company's information, please send an email to: [webmaster@energy-barge.eu](mailto:webmaster@energy-barge.eu)

| Name   | Country | City          | Company type      |
|--|---------|---------------|-------------------|
| ADM Spyck GmbH, Werk Straubing                                   | Germany | Straubing     | Processor         |
| Bayernhof Erzeugergemeinschaften Vertriebs GmbH                  | Germany | Straubing     | Trader            |
| BayWa AG   | Germany | Straubing     | Trader            |
| Raiffeisen Straubing GmbH  | Germany | Kirchroth     | Trader            |
| Clariant Produkte (Deutschland) GmbH                             | Germany | Planegg       | Processor         |
| TTW Waldpflege GmbH  | Germany | Straubing     | Supplier / Trader |
| 1heiz Pellets AG   | Germany | Straubing     | Trader            |
| Max Schierer GmbH  | Germany | Cham          | Trader            |
| Biomasse Heizwerk Dingolfing GmbH, Stadtwerke Dingolfing GmbH    | Germany | Dingolfing    | End User          |
| Biomasseheizwerk Drachselsried, Biomasse-Heizwerk Zellertal GmbH | Germany | Drachselsried | End User          |
| AS Agency and Trade UG (haftungsbeschränkt)                      | Germany | Straubing     | Trader            |
| Biomasseheizwerk Furth GmbH & Co. KG                             | Germany | Furth         | End User          |

**Figure 10: Biomass and bioenergy company register: overview on all currently registered companies (548) (here: small section depicted)**

## COMPANY REGISTRATION

Register your company free of charge now and join us to build up a bioenergy and logistics network along the Danube. This website contains comprehensive features for building new partnerships and improving cross-sectoral cooperation. It provides a new way of visualisation of biomass and bioenergy value chains as well as involved actors and an overview of relevant logistics services along the Danube. If you want to update your company's information, please send an email to: [webmaster@energy-barge.eu](mailto:webmaster@energy-barge.eu)

### \* required fields

Please do not enter any personal data!

#### Company name \*

Please provide us with the full name of your company including legal status information

#### Country \*

#### Postal code \*

Please insert the postal code of your city

#### City \*

Please insert the city of your business

#### Street \*

#### Company category \*

- ☐ Port
- ☐ Trader
- ☐ Supplier
- ☐ Processor
- ☐ End user
- ☐ Shipping & Forwarding
- ☐ Research & Development

#### Bioproducts

Figure 11: Company registration form





## ENERGY BARGE TERMS OF USE AND SERVICE

### Introduction

Thank you for using the ENERGY BARGE online platform (<https://energy-barge.eu>), which is a service provided by the consortium of the ENERGY BARGE project (<http://www.interreg-danube.eu/approved-projects/energy-barge>). These Terms of Use and Service, which we refer to as the "Terms", cover your use of and your registration to the online platform. Our Privacy Policy explains how we collect and use your data.

Your use of the online platform, in particular your registration, requires that you agree to these Terms.

### Your use of the ENERGY BARGE online platform

When visiting the online platform you get access to all information presented. You can also register as a company, and the information you provide will be presented on the platform. Your registration does not create an account; you merely give us your data to represent your company online.

Please register general information of your company, no personal data. And make sure that you are granted to provide the information, e.g. by your employer.

Please do not misuse the registration. We expect that your data is true and that it serves the purpose of the project. We will check registered data and are free to delete entries, if the registration is misused.

When you submit your information you give the consortium of the project the right to collect, process and save your data in the framework of the project. Your data will be shared among the project partners, as the online platform is collaborative work and several partners need the data to accomplish their assigned tasks in the project.

No personal data is collected or stored.

After the duration of the project, the online platform will be processed by BioCampus Straubing GmbH and via donau - Österreichische Wasserstraßen-Gesellschaft mbH. The DIT - Deggendorf Institute of Technology will host the platform and will process the data in the future.

Figure 12: Section of the platform's terms and conditions

## Contact

BioCampus Straubing GmbH  
Ann-Kathrin Kaufmann

E-mail: [ann-kathrin.kaufmann@biocampus-straubing.de](mailto:ann-kathrin.kaufmann@biocampus-straubing.de)

<http://www.interreg-danube.eu/energy-barge>