

# **ENERGY BARGE**

**Building a Green Energy and Logistics Belt**

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

**Output Evidence Document**

**Output 3.2**

**Good practice value chain integration ICT tool**

***30 June 2019***

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## **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 facilitate 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 project with its fourteen partners from Austria, Bulgaria, Croatia, Germany, Hungary, Slovakia and Romania.

### Project coordinator

Agency for Renewable Resources /

Fachagentur Nachwachsende Rohstoffe e.V.	FNR	Germany
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### 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 3.2 – Good practice value chain integration tool”. It has been prepared by:

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Version	Date	Author(s)	Reason for modification	Status
1.0	2019-06-06	Ann-Kathrin Kaufmann, Anne Weinfurtner, Kristina Wanieck	Draft evidence document	finalised
2.0	2019-06-14	Ann-Kathrin Kaufmann, Anne Weinfurtner, Kristina Wanieck	Final document before QAM	finalised
3.0	2019-06-30	Ann-Kathrin Kaufmann, Anne Weinfurtner, Kristina Wanieck	Final Document after QAM	finalised



## 1 General information

This evidence document refers to the “Good Practice value chain integration ICT tool”, which is an integral part of the ENERGY BARGE “Modal Shift Platform for Green Bioenergy” and provides additional information about the tool, its features and content, supplementing the information in the output factsheet. Together with the evidence document for the Outputs 3.1 and 4.1, it provides information about the development and functionality of the Modal Shift Platform as a whole.

For a content-related overview, see the factsheet for Output 3.2 as well as the Implementation Manual of Output 4.1, which covers the entire Modal Shift Platform.

The “Good Practice” tool was designed under Activity 3.3 of the project. The underlying objective was to easily and intuitively provide actors from both the bioenergy and the logistics sector from the Danube region as well as from other regions with information about the bioenergy landscape along the Danube. In addition, it provides information about lessons learned regarding the integration of different types of bioenergy production into decentral and central biomass supply chains. Also, these lessons learned should include options to integrate inland waterway transport and port locations into the respective logistics system. To this end, good practice examples from the ENERGY BARGE partner countries were identified and the relevant information was gathered in a pre-defined way, using factsheets with relevant characteristics, visualisations of the underlying supply chains, a set of lessons learned on biomass availability and logistics modes and exemplifying pictures. For each “Good Practice” case, this information is systematically displayed in the tool, using the Modal Shift Platform’s central map view functionality as central point of orientation.

The good practice tool is accessible on the project’s Modal Shift Platform via [www.energy-barge.eu](http://www.energy-barge.eu) and is optimised for common web browsers (Mozilla Firefox, Internet Explorer, Microsoft Edge, and Google Chrome) as well as for mobile devices.

## 2 Output evidence: objectives, content & design

The objective and content elements of the tool are:

- Depicting cases along the Danube, in which biomass is transformed into bioenergy on different levels and where ideally, Danube logistics are used or could be used;
- Transferability to other regions → benchmarking of/learning from good practice cases via detailed information and targeted lessons learned;
- Tool content: visualisation of cases, visualisation of exemplifying supply chains, definition of good cases, lessons learned per case for benchmarking, general recommendations, tool to suggest own good practice case;
- Data was acquired by project-internal case studies.

The “Good Practice Tool’s” durability is an integral part of the Modal Shift Platform durability strategy. At project start, BCG and VIA declared their readiness to transfer the Modal Shift Platform into their activities and websites after the project’s end. This plan was kept in mind

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during programming, with respect to technical and legal aspects, but also in view on practicality and efforts required to keep the information maintained and updated. This refers to the fact that no personal data are collected, the data input is excel-based and publicly available data are utilised. To document this strategy, an integrated implementation plan for the Modal Shift Platform including a durability strategy was presented in period 4. The “Good Practice Tool”, together with the remaining tools, will be accessible online for at least three years after the official project end. Based on a service contract with BCG (private funds), DIT will ensure technical feasibility and updates. BCG and VIA will get access to the platform after the project end in order to keep the content updated.

DIT has designed a technical solution allowing the ENERGY BARGE platform to be online for three more years while another follow-up project, which has recently applied for DTP funding, could use the platform’s structure, backend and logic for their project on biomethane in the Danube region. This way, synergies can be created and functioning structures could be further used and improved.

The following section provides evidence of the finalised output. This evidence is presented in the form of exemplifying screenshots<sup>1</sup> taken from the online platform [www.energy-barge.eu](http://www.energy-barge.eu).

The following “Good Practice” cases are included in the tool (Table 1). Information are provided about a set of currently six cases from six countries, i.e. Austria, Bulgaria, Croatia, Germany, Hungary, Slovakia. The section on the platform comprises systematically selected corporate and public bioenergy cases, their value chains and integration of inland waterway transport (logistics, location, or future strategy) and lessons learned. Together with the “Biomass and Bioenergy Atlas”, it visualises the Danube biomass and bioenergy market and is integrated in the ENERGY BARGE Modal Shift Platform for green bioenergy logistics ([www.energy-barge.eu](http://www.energy-barge.eu)).

**Table 1: Cases displayed in the tool.**

Country	Case	Type	Role in supply chain	Location
Austria	AGRANA	Company; Bioethanol plant; large-scale	Processor, Trader	Pischelsdorf
Bulgaria	OLIVA JSC	Company; Sunflower and rape seeds oil producer, SME	Processor, Trader	Polski Trambesh
Croatia	Spačva	Company; Integrated wood-manufacturing plant incl. wood pellet & wood chips production; decentral/medium-scale	Processor, Trader, End user	Vukovar
Hungary 1	Association of Hungarian District Heating Enterprises (MATASZSZ), example Bioenergy-Duna Ltd.	Company; Biomass powerplant for district heating, based on wood chips; decentral/small-scale	End User	Mohács
Hungary 2	Hungrana Starch and Isosugar Manufacturing and Trading Co. Ltd.	Company; Bioethanol plant; large-scale	Processor, Trader	Szabadegyháza

<sup>1</sup> Screenshots (Microsoft Edge) were taken on 12 June 2019.  
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Germany	Region of renewable raw materials, ADM Rapeseed Plant & Clariant Bioethanol Plant	Cluster region; corporate examples: Oil mill (large-scale) & bioethanol plant (demo-scale)	Processor, Trader (ADM), Processor (Clariant)	Straubing
Slovakia	Intech Energo / Narodna energeticka	Company; Organizational roof for set of decentral biomass powerplants (small-scale)	Trader, End user	nationwide

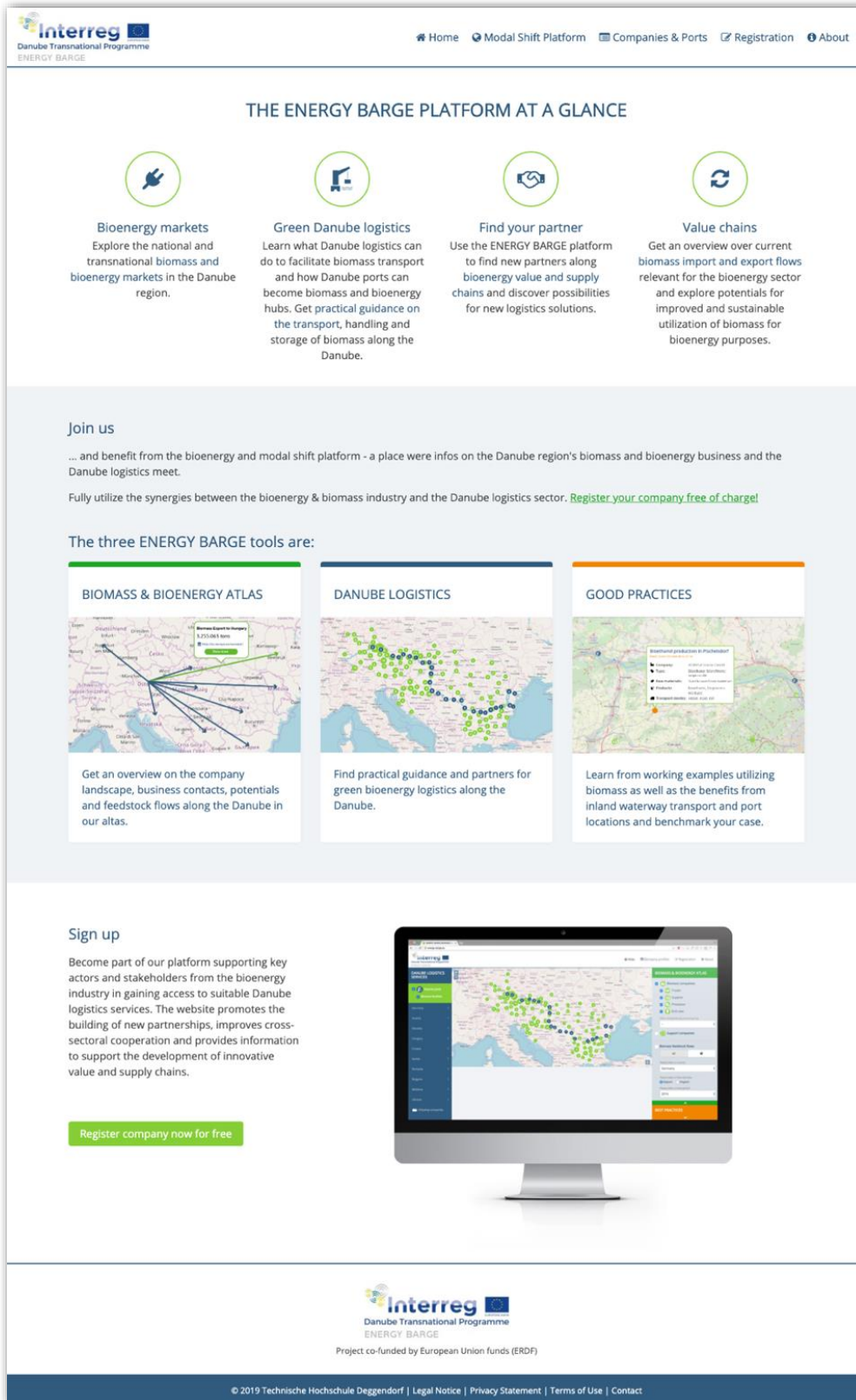
For all cases, the following factsheet information is available (Table 2).

**Table 2: Criteria of factsheet per case.**

<b>Title:</b>	TITLE OF COMPANY / CASE
<b>Location:</b>	Name of City & Country
<b>Bioenergy segment:</b>	Liquid biofuels for transport, Bioheating & cooling, electricity
<b>Biomass feedstock used:</b>	Pellets, oil seeds, round wood
<b>Bioenergy products:</b>	Pellets, round wood, oils, diesel, ethanol, heat, power
<b>Other biobased products:</b>	Main products, residues
<b>Proximity to next Danube port:</b>	Km
<b>Modes of inbound logistics:</b>	Road and/or Rail and/or Inland Waterway
<b>Modes of outbound logistics:</b>	Road and/or Rail and/or Inland Waterway
<b>Utilization of inland waterway transport:</b>	Currently in use, not in use with potential (in this case: what are the hurdles?)
<b>Scope of supply and value chains:</b>	Feedstock: Regional, national, Danube region, EU wide, or international Products: Regional, national, Danube region, EU wide, or international

The “Good Practice” tool has been integrated into the “one-stop-shop” solution of the Modal Shift Platform for Green Bioenergy Logistics. It is accessible from the landing page by clicking on the respective teaser box, indicated in orange colour code (Figure 1). Alternatively, it can be reached via the main menu at the top by selecting “Modal Shift Platform – Good Practices”, which leads the user to the subpage of the tool. This page presents the applied good practice case selection criteria as well as general lessons learned. From there, the tool is also accessible by clicking on the map image (Figure 2). Additional information, e.g. reports, deliverables or external information as well as the websites of third parties open in a new window.

In the following section, the elements of the tool are visualised with exemplifying screenshots.



The screenshot shows the landing page of the Energy Barge Platform. At the top, there is a navigation bar with links: Home, Modal Shift Platform, Companies & Ports, Registration, and About. The main heading is "THE ENERGY BARGE PLATFORM AT A GLANCE". Below this, four circular icons represent the platform's pillars: Bioenergy markets, Green Danube logistics, Find your partner, and Value chains. Each pillar has a brief description of its function. Below the pillars, a "Join us" section encourages users to register for free to benefit from the platform's resources. The "The three ENERGY BARGE tools are:" section features three cards: "BIOMASS & BIOENERGY ATLAS", "DANUBE LOGISTICS", and "GOOD PRACTICES", each with a map and a description of its utility. A "Sign up" section provides more details about the platform's goals and includes a "Register company now for free" button. At the bottom, there is a footer with the Interreg logo, project funding information (ERDF), and a copyright notice for Technische Hochschule Deggendorf.

**Figure 1: Joint landing page.** [www.energy-barge.eu](http://www.energy-barge.eu). The three pillars of the online platform are presented, which offer the entry point to the main page, the Modal Shift Platform (dynamic map). Project co-funded by European Union funds (ERDF)



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[Registration](#)
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## GOOD PRACTICE CASES OF VALUE CHAIN INTEGRATION

The bioenergy landscape in the Danube region is diverse. The portfolio ranges from centralized biomass processing for transport fuel production and complex supply and value chains, to small-scale combined heat and power plants using regional feedstock. The ENERGY BARGE good practice tool provides in-depth insight into a representative selection of these actors. The aim: understanding the characteristics, advantages and challenges these different cases face and presenting lessons learnt from their experiences of establishing a bioenergy business model, value chains and suitable logistics in the Danube region.

**>> Visit the Good Practice Cases here!**

Get detailed insight into selected good practice cases from different bioenergy sectors along the Danube. How do they manage their supply chains? Do they use Danube logistics yet or do they have a strategy for future use? Additionally, lessons learnt for benchmarking and a tool to suggest further good practice examples are provided!





### Good practice cases - definition & selection criteria

What defines an ENERGY BARGE good practice case? Before the Danube region was screened for corporate examples from the bioenergy sector to study their respective value and supply chains and their current and future options to integrate inland waterway transport and port sites into these chains, this question needed an answer. In the ENERGY BARGE context, a good practice case for value chain integration thus was defined as: "A corporate or public actor or consortium of actors that works successfully along the bioenergy value chains of power, transport fuels and/or heating while already using the waterway and/or port infrastructure in its logistics system. It therefore can serve as a guiding reference for other actors working for cases of similar characteristics who are looking for lessons learnt and success factors."

In order to facilitate the good practice case selection, the following set of selection criteria were defined. They form the basis of all ENERGY BARGE good practice cases:

- Fit with the definition for ENERGY BARGE good practice cases
- Effective and successful business model (i.e. active on the bioenergy market / value chain)
- High relevance of bioenergy and sustainable biomass use in the overall business model
- Existence of biomass supply chains and respective logistics on regional, domestic, and/or transnational level
- Current integration of inland waterway transport in the overall logistics; alternatively strategic outlook for future integration
- Location of processing site in proximity (< 100 km) to an inland port

A more extensive overview on the selection process can be found soon in the following framework:

Soon: Framework good practice selection criteria (Download PDF)



### Success factors - factors influencing central and decentral bioenergy value chains in the Danube region

As a basis for the good practice tool, case studies of the selected corporate examples were conducted. In order to compare the multitude of cases and their respective characteristics, a synthesis report was compiled. This report not only collects all case fact sheets, but compares them based on their size (processed biomass feedstock volumes and radius of supply chains) as small/medium- and decentral, or large-scale, and central cases. It was found that similar success factors apply for each type. Accordingly, similar lessons learnt regarding success factors for a set of criteria could be derived. The criteria covered include: availability of corporate or political strategies, biomass availability and utilisation, bioenergy production and utilisation, integration of supply chains, and utilization of logistics infrastructure such as inland ports as sites and logistics hubs.

Synthesis case study report (Download PDF)



### Suggest your own good practice case and expand the ENERGY BARGE network

The ENERGY BARGE project covers the bioenergy landscape along the river Danube. Therefore, all good practice examples are located in this region. The selection made by the consortium however is by no means complete. Moreover, other regions might have characteristics comparable to the Danube region; targets to reach high renewables shares in the overall energy mix, and options to use domestic biomass potentials, and/or import bioenergy products via the waterway. If you are aware of such an exemplifying case and would like to add it to the ENERGY BARGE network, please check whether it fits the criteria listed above and then simply click here to suggest your case!




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**Figure 2: Good practice tool information page.** <https://energy-barge.eu/goodpractice>. Definition and selection criteria about the good practice cases.

In order to enable user involvement, the tool allows project-external actors to suggest own good practice examples from either within the Danube region, or also outside of it. These suggestions have to fit the good practice criteria used to select the depicted project cases. Furthermore, the information describing the good practice example to be suggested has to be filled into the digital template (registration form) provided (Figure 3). Also after the project lifetime, each suggested case will be first forwarded to the experts from BCG and VIA to check validity and fit of the suggestion before its final integration into the tool. All reviewed good practice cases will be listed in the right-hand sidebar. After selecting one case, the respective information will be shown in a summary pop-up directly on the map, in detail below the map (Figure 4) and with additional visualisations in the case factsheet that can be downloaded by the user (Figure 5).



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## REGISTRATION OF A GOOD PRACTICE CASE

If you feel you have an example that fits with our good practice criteria, we would be happy if you fill out the fields below, submit your suggestion and join us to build up a strong bioenergy and logistics network along the Danube.

**\* required fields**  
**Please do not enter any personal data (Exception: contact e-mail)**  
**Your submitted case will be reviewed and published soon.**

**\*Title**

**\*Type**

**\*Country**

**\*City**

**\*Company**

  
If you didn't register your company, Please register it first!

**\*Summary**

**\*Raw materials**

**\*Products**

**\*Capacity**

**\*Closest port**

**\*Transport modes**

**\*Contact e-mail**

### Lessons learned

**\*Supply chains and business model**

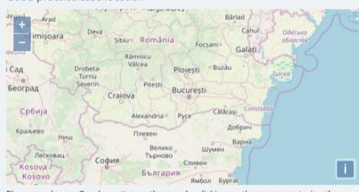
**\*Biomass availability**

**\*Logistics**

**\*Inland waterway transport**

**\*Prerequisites for increased use of Danube logistics**

**Good practice case location**



Please mark your Good practice on the map by clicking on the map or entering the coordinates.

**Longitude**


**Latitude**

**Apply entered coordinates on the map**

☐ I agree to the ENERGY BARGE Terms of Use and Service and its Privacy Statement. I also consent to the ENERGY BARGE online platform, saving, reviewing, processing, presenting online and transferring data relating to my company in connection with the processing activities described in the Terms. I also consent to the transfer of any such data outside of the country in which I live or where the data has been collected or processed, including specifically the countries of the consortium (Germany, Austria, Slovakia, Hungary, Croatia, Romania and Bulgaria), for the purposes described in the Terms. I understand that this consent is voluntary and can be revoked at any time.

**Save**

**Cancel**

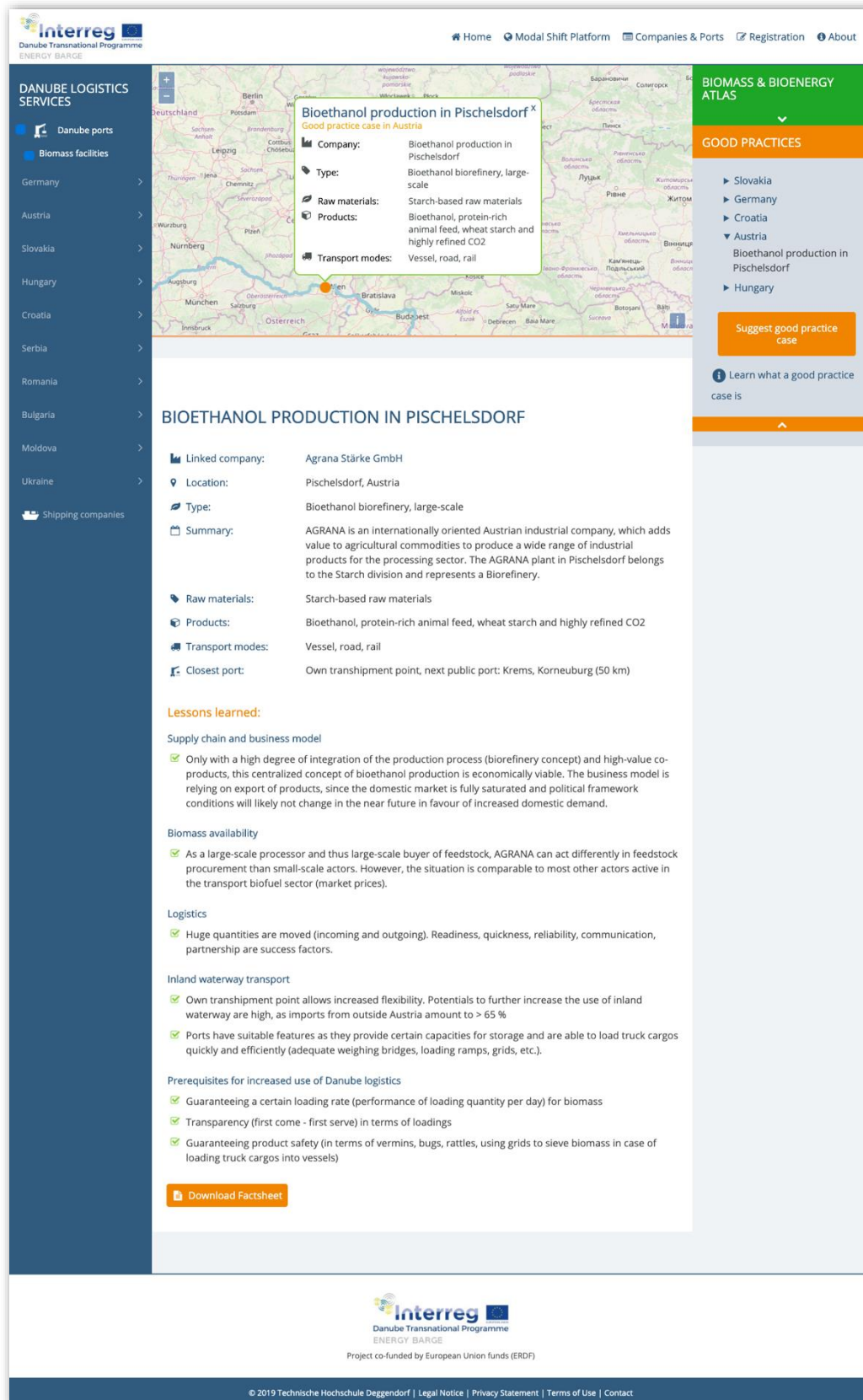


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**Figure 3: Good practice case registration.** <https://energy-barge.eu/goodpractice/register>. Registration form with the fields to describe the lessons learned in good practice cases.  
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Home Modal Shift Platform Companies & Ports Registration About

**DANUBE LOGISTICS SERVICES**

- Danube ports
- Biomass facilities
- Germany
- Austria
- Slovakia
- Hungary
- Croatia
- Serbia
- Romania
- Bulgaria
- Moldova
- Ukraine
- Shipping companies

**BIOETHANOL PRODUCTION IN PISCHELSDORF**

**Linked company:** Agrana Stärke GmbH

**Location:** Pischelsdorf, Austria

**Type:** Bioethanol biorefinery, large-scale

**Summary:** AGRANA is an internationally oriented Austrian industrial company, which adds value to agricultural commodities to produce a wide range of industrial products for the processing sector. The AGRANA plant in Pischelsdorf belongs to the Starch division and represents a Biorefinery.

**Raw materials:** Starch-based raw materials

**Products:** Bioethanol, protein-rich animal feed, wheat starch and highly refined CO<sub>2</sub>

**Transport modes:** Vessel, road, rail

**Closest port:** Own transshipment point, next public port: Krems, Korneuburg (50 km)

**Lessons learned:**

**Supply chain and business model**

- Only with a high degree of integration of the production process (biorefinery concept) and high-value co-products, this centralized concept of bioethanol production is economically viable. The business model is relying on export of products, since the domestic market is fully saturated and political framework conditions will likely not change in the near future in favour of increased domestic demand.

**Biomass availability**

- As a large-scale processor and thus large-scale buyer of feedstock, AGRANA can act differently in feedstock procurement than small-scale actors. However, the situation is comparable to most other actors active in the transport biofuel sector (market prices).

**Logistics**

- Huge quantities are moved (incoming and outgoing). Readiness, quickness, reliability, communication, partnership are success factors.

**Inland waterway transport**

- Own transshipment point allows increased flexibility. Potentials to further increase the use of inland waterway are high, as imports from outside Austria amount to > 65 %
- Ports have suitable features as they provide certain capacities for storage and are able to load truck cargos quickly and efficiently (adequate weighing bridges, loading ramps, grids, etc.).

**Prerequisites for increased use of Danube logistics**

- Guaranteeing a certain loading rate (performance of loading quantity per day) for biomass
- Transparency (first come - first serve) in terms of loadings
- Guaranteeing product safety (in terms of vermins, bugs, rattles, using grids to sieve biomass in case of loading truck cargos into vessels)

[Download Factsheet](#)

**BIOETHANOL PRODUCTION IN PISCHELSDORF**

**Good practice case in Austria**

**Company:** Bioethanol production in Pischelsdorf

**Type:** Bioethanol biorefinery, large-scale

**Raw materials:** Starch-based raw materials

**Products:** Bioethanol, protein-rich animal feed, wheat starch and highly refined CO<sub>2</sub>

**Transport modes:** Vessel, road, rail

**BIOMASS & BIOENERGY ATLAS**

**GOOD PRACTICES**

- Slovakia
- Germany
- Croatia
- Austria
  - Bioethanol production in Pischelsdorf
- Hungary

[Suggest good practice case](#)

[Learn what a good practice case is](#)

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**Figure 4: good practice case.** <https://energy-barge.eu/atlas?show=goodpractices>. The good practice case from Austria was selected in the right-hand sidebar. The pop-up box in the dynamic map gives a short overview of the case. Below the map all detailed information including the lessons learned is given.

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FACT SHEET

## AGRANA Stärke GmbH Bioethanol production in Pischelsdorf

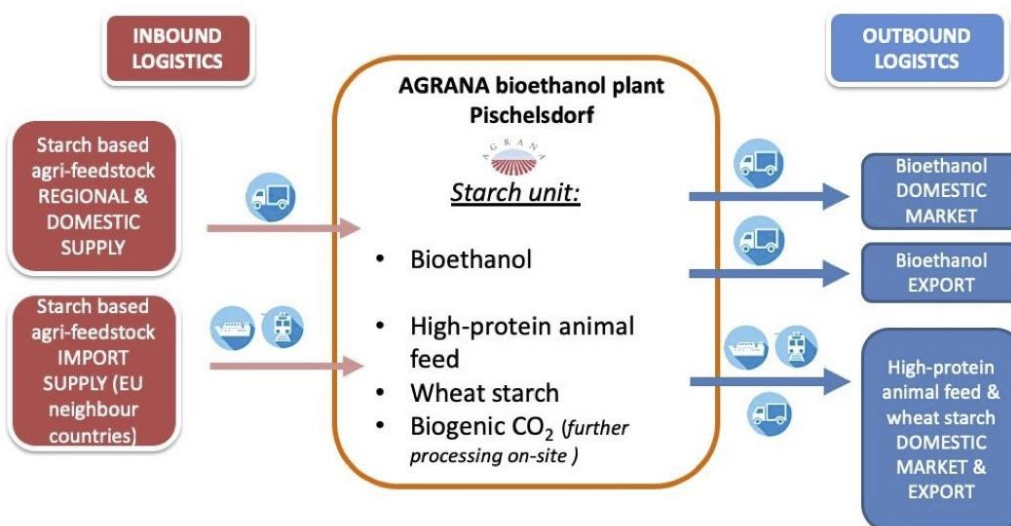
Title:	Bioethanol production in Pischelsdorf
Location:	Pischelsdorf, Austria
Bioenergy segment:	Liquid biofuels for transport
Biomass feedstock used:	In the biorefinery in Pischelsdorf: starch (grains such as corn, wheat, barley)
Bioenergy products:	Bioethanol (240,000 m <sup>3</sup> /a)
Other biobased products:	Wheat starch, biogenic CO <sub>2</sub> for industrial utilization, protein animal feed "ActiProt®-DDGS - Distillers' Dried Grains with Solubles" and bran in a biorefinery system
Proximity to next Danube port:	Own transshipment point at the factory Pischelsdorf; next public port: Krems, Korneuburg (50 km)
Modes of inbound logistics:	Starch segment: trucks / tractors for grains and potatoes; vessel and rail for grains from traders
Modes of outbound logistics:	Trucks and rail (tanker wagons)
Utilization of inland waterway transport:	Currently: 20 – 40 % inbound logistics by vessel via own transshipment point Potential: High growth potential, especially for inbound logistics, 65 %-70 % imported from outside Austria (EU neighbour countries)
Scope of supply and value chains:	Centralized large-scale production site of bioenergy carriers, utilizing all standard types of transport modes, including inland waterway systems Inbound logistics: regional to international Outbound logistics: national and international, mainly Danube region



Bioethanol plant Pischelsdorf  
(Source: www.agrana.com)



Corn field  
(Source: www.agrana.com)



Exemplifying visualization supply chain AGRANA bioethanol plant (own visualization)

[www.energy-barge.eu/goodpractice](http://www.energy-barge.eu/goodpractice)

**Figure 5: Good practice factsheet.** [https://energy-barge.eu/pdf/2019-06-11\\_GP\\_Factsheets\\_Austria.pdf](https://energy-barge.eu/pdf/2019-06-11_GP_Factsheets_Austria.pdf) Example factsheet of the Austrian good practice case. By clicking on the button "Download Factsheet" on the good practice case page the factsheet of the respective case will be opened in a new window of the internet browser.

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