

ENERGY BARGE

Building a Green Energy and Logistics Belt

Project Code: DTP1-175-3.2

Output Evidence Document

Output 3.3

Bioenergy Site Delegation Exchange Programme

30 June 2019

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I About the ENERGY BARGE project

The Danube region offers a large 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, and 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 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 3.3 – Bioenergy site delegation exchange programme”. It has been prepared by:

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Editor(s)	Ann-Kathrin Kaufmann (BCG)
Quality reviewer	Dr. Wibke Baumgarten (FNR), Birger Kerckow (FNR)

Version	Date	Author(s)	Reason for modification	Status
1.0	2019-06-06	Ann-Kathrin Kaufmann, Marko Ban, Ivan Chodak	Draft evidence document	Completed
2.0	2019-06-14	Ann-Kathrin Kaufmann	Final document before QAM	Completed
3.0	2019-06-28	Ann-Kathrin Kaufmann	Final document after QAM	Completed

1 General information

This evidence document refers to Output 3.3 “Bioenergy site delegation exchange programme”. The document serves as evidence of the output implementation and gathers the minutes of the three site visits that took place from end of 2018 to early 2019 in three countries along the Danube, namely:

- **21.11.2018:** Workshop in Bratislava and site visit to ENERGY EDGE CHP plant in Zarnovica, organised by ICARST;
- **05.02.2019:** Workshop in Vukovar and site visit to Spacva d.d. pellet production, organised by SDEWES;
- **19.03.2019:** Workshop in Straubing and site visit to Clariant bioethanol plant and KoNaRo Center of Excellence for renewable raw materials, organised by BCG.

The participant lists of the respective events are provided in the section 2.1, 3.1 and 4.1 of this document.

For a broader content-related overview, see the output factsheet and the transnational implementation plan (Deliverable D3.3.2).

The site visits took place under Activity 3.3 of the project and as an entirety functioned as transnational documented learning interaction facilitating experience and know-how exchange from bioenergy actors in Germany, Slovakia and Croatia amongst each other and with the project partner experts. In the transnational implementation plan (Deliverable D3.3.2), the setup of the site visits was designed and communicated to the partners organising the events. Also, it includes an assessment of the site visits.

As output evidence, the respective minute documents as well as the video tape recorded during the workshop in Straubing (19.03.2019) are provided.

2 Site visit Slovakia

Brief intro site visit location

CHP power plant operated by company Energy Edge ZC (Figure 1), is located in Žarnovica, in the mid Slovakia region. The power plant built and in operation since December 2013, represents one the most outstanding CHP power plants currently operated in Slovakia.

Technology consists out of the following areas:

1. Commodity / raw material input, storage and pre-processing, including storage for chips and pellets, dryer, and conveyors
2. Central boiler, running on biomass (wooden chips, wooden pellets, straw, waste wood, residuals)
3. Steam condenser turbine, including installations
4. Condenser, cooler

Technical parameters:

Boiler with installed capacity of 25 MWt

Steam turbine capacity: 11,145 MWe



Figure 1: Energy Edge ZC (picture: ENERGY EDGE ZC)

2.1 List of participants

Surname	First Name	Institution	Acronym	Workshop	Site Visits External
Fellenberg	Thies	Agency for Renewable Resources	FNR	x	x
Kaufmann	Ann-Kathrin	BioCampus Straubing GmbH	BCG	x	x
Dorner	Wolfgang	Deggendorf Institute of Technology	DIT	x	x
Weinfurter	Anne	Deggendorf Institute of Technology	DIT	x	x
Dißauer	Christa	Bioenergy2020+ GmbH	BE2020	x	x
Bakos	Dusan	International Centre of Applied Research and Sustainable Technology	ICARST	x	x
Chodak	Ivan	International Centre of Applied Research and Sustainable Technology	ICARST	x	x
Miertus	Stanislav	International Centre of Applied Research and Sustainable Technology	ICARST	x	x
Veselko	Rastislav	Slovak Shipping and Ports JSC	SPaP	x	x
Vojtela	Tibor	National Agricultural Research and Innovation Center	NARIC	x	x
Erkel	Zoltan	MAHART-Freeport	MAHART	x	x
Szántó	Krisztina	MAHART-Freeport	MAHART	x	x
Sztilkovics	Szávó	MAHART-Freeport	MAHART	x	x
Gavran	Iva	SDEWES Centre	SDEWES	x	x
Grubelic	Nevena	SDEWES Centre	SDEWES	x	x
Eisele	Jürgen	Technology Center Sofia	TCS	x	x
Papageorgiadis	Grigoris	Romanian Association of Biomass and Biogas	ARBIO	x	x
Tobescu	Catalin	Nostra Silva	Nostra Silva	x	x
Jan	Sestina	Energy Edge	Slovakia	x	x
Lagerska	Barbora	UCM Trnava	Slovakia	x	x
Lipnicanova	Sabina	UCM Trnava	Slovakia	x	x
Ondreovic	Miroslav	ICARST	Slovakia	x	
Oszlanyi	Julius	Slovak Academy of Science	Slovakia	x	x
Rychlý	Jozef	Slovak Academy of Science	Slovakia	x	x
Chemlova	Daniela	UCM Trnava	Slovakia	x	x
Chodak	Ivan sr.	ICARST	Slovakia	x	x
Kováč	Barnabáš	IKEA Industry	Slovakia	x	x

2.2 Agenda

Project: [ENERGY BARGE](#) – Site Visit Event Bratislava & Žarnovica

Venue: Hotel Holiday Inn, Bajkalská 25 /A, 825 03 Bratislava & Žarnovica

08:30 – 09:00	REGISTRATION, welcome coffee	Hotel Holiday Inn
09:00 – 09:10	Welcome, Introduction to ENERGY BARGE and agenda	ICARST, BCG
09:10 – 09:30	Burning of wood in a cone calorimeter as a quantitative approach to the potential energy gain. Energetic efficiency of biomass materials	Ing. Jozef Rychly DrSc. / Slovak Academy of Science
09:30 – 09:50	Current stage and future of biomass usage in Slovakia	(TBC)
09:50 – 10:00	Discussion	ICARST
10:00 – 11:30	Workshop ENERGY BARGE modal shift platform: “Tools to strengthen national and trans-national cooperation in the biomass and bioenergy sector and their logistics needs”	DIT, BCG
11:30– 12:00	Discussion & Organisational points site visit location „Zarnovica“	ICARST
12:00	Lunch break	
13:00	Departure to site visit (optional)	
Upon arrival	Presentation of CHP plant Zarnovica: “Operations, success factors, logistics, development goals”, including guided tour through plant	Žarnovica
17.30	Dinner at Slovak Country side Discussion	Hotel Sitno, Vyhne
20.30	Expected arrival to Bratislava	

2.3 Minutes

These minutes reflect the main topics discussed, as agreed during the meeting.

Date: 21.11.2018

Location: Hotel Holiday Inn, Bratislava

Responsible for minutes: Ann-Kathrin Kaufmann (BCG), & Thies Fellenberg (FNR)

Documents/Presentations: The presentations as well as accompanying picture material, the tool brochures and the feedback sheet are available at Alfresco.

Start of the meeting

1. Welcome by the host (ICART)

Prof. Stanislav Miertus welcomes all participants to Slovakia and gives an introduction to the activities and structure of ICARST.

Ivan Chodak jr., in charge of the organisation of the site delegation exchange visit in Bratislava and Zarnovica, gives an overview to the agenda, consisting of the stakeholder workshop and the site visit to the good practice location, incl. organisational aspects regarding bus transfer and information on the visited plant.

2. Welcome by the Lead Partner (FNR)

Brief introduction message from Thies Fellenberg, FNR, Germany, providing an overview to the objectives and status of the ENERGY BARGE project (Figure 2).



Figure 2: Welcome by FNR (picture: ICARST)

3. Introduction to the objective of the event by the Work Package Leader (BCG)

Ann-Kathrin Kaufmann (BCG), leading the work package under which the bioenergy site delegation exchange programme is organised, gives an introduction to the programme itself, containing three visits to different bioenergy production sites with integrated local, regional or transnational supply chains as well as one stakeholder workshop each, discussing relevant national bioenergy topics and introducing the ENERGY BARGE online tools “biomass and bioenergy atlas” and “good practice tool” on the modal shift platform for green bioenergy logistics to national stakeholders. The goal is to disseminate the project outputs, generate validated expert feedback for improvement of the outputs and to achieve transnational learning by incorporating both external national experts and stakeholders.

Ms. Kaufmann further introduces the accompanying project material, namely the handbook, the English and Slovak version of the tool brochure and the ENERGY BARGE print map and asks the participants to take these materials with them.

4. Presentation Slovak Bioenergy Situation I – Dr. Jozef Rychlý

Mr. Rychlý focusses on the most significant technological aspects of wood burning facilities such as a cone calorimeter currently in use in Slovakia since wood is still the bioenergy feedstock prevailing the Slovakian bioenergy market. With a perspective on increased performance, Mr. Rychlý discusses the main advantages of the cone technology and the research done in this field in Slovakia.

5. Presentation Slovak Bioenergy Situation II – Ivan Chodak jr.

Mr. Chodak provides an overview of the EU’s achieved rates regarding National Renewable Action Plans before going into more detail regarding the status and future of bioenergy in Slovakia. Mr. Chodak stresses that technology and technological innovation will drive the future and that this is also applicable for the bioenergy sector. However, the political situation might complicate this development. A challenging situation in Slovakia at the moment is arising for the biogas market. Slovak law currently only supports agricultural biogas installations; private company investors do not profit from subsidies. Biofuels plants are in a delicate legal state, which also affects investments made in Slovakia.

6. Discussion – moderated by ICARST

In the following discussion, the main aspects mentioned from the audience revolve around sustainability. Only if economic and environmental sustainability are achieved and market reality allows for profitable and competitive investments, these investments will be made. Important here are the realisation of higher value production chains (e.g. biorefineries), utilisation of wood residue material, and domestic investments.

7. Workshop on ENERGY BARGE online tools (DIT & BCG)



Figure 3: Live demo and validation workshop
(picture: ICARST)

Ann-Kathrin Kaufmann (BCG), Prof. Wolfgang Dorner and Anne Weinfurtner (both DIT) follow up on the earlier discussion by introducing the online tools developed within the project and their aim to strengthen national and transnational business actor cooperation and bioenergy supply chains and logistics (Figure 3).

Ann-Kathrin Kaufmann encourages all participants to actively participate and to fill in a feedback sheet with validation questions in parallel and hand it back after the workshop.

Prof. Dorner and Anne Weinfurtner invite all participants to use their mobile devices to enter the platform via www.energy-barge.eu and guide the audience through the platform.

The following elements are presented in a live demo (standardised workshop structure for all three site visits), while focussing on Slovak examples, e.g. the site visited, Slovak ports and companies:

- Joint landing page
- Modal shift platform: intro to main map view
- Biomass & Bioenergy Atlas: tool & info page
- Good practice tool (upcoming)
- Danube logistics services
- Data base: companies, ports, logistics services & support
- How to register? – Company registration option

After the live demo is finished, Ann-Kathrin Kaufmann and Prof. Dorner introduce two sets of feedback questions (content-related and usability-related). For each set of questions, the participants get five minutes to discuss and write down their answers. After this working time, the moderators ask the participants to give their answers and feedback to discuss about it.

The following oral feedback was provided:

- Quantitative information on single companies could be useful; e.g. performance data, input / output data, investment sums, etc. – important: actuality, validation!
- The platform has high relevance for the bioenergy sector, but also for other biomass-related sectors.
- In order to allow for more interaction in the company register, a box “we are looking for” or any other option to update information for each company could be provided.
- Optimise content for the actor groups “supplier, trader, processor, end user”.
- Strategic dissemination is of highest importance; consortium should invest efforts into finding the right dissemination channels.
- Country profiles on the bioenergy market situation should be available in a more straightforward manner directly on the map view, not only in the subsection pages.
- In order to improve an interactive character, elements such as an event calendar or a registration counter could be implemented on the main page.
- The google metasearch should be ideal so that the page can be found easily.
- An expansion towards stakeholders from the agricultural sector and traders might be useful.
- It should be visible how many companies per country are registered.
- The cross-sectoral approach is not completely clear to all participants.

The written feedback on the sheets was summarised and analysed by BCG and DIT after the workshop. All feedback will be checked for validity and feasibility and incorporated based on the results of this check.

Closure of the meeting by Thies Fellenberg (FNR) and Ivan Chodak jr. (ICARST)

End of the workshop meeting; Lunch

Afterwards: bus transfer to site visit

Site visit: Energy Edge CHP plant in Zarnovica, Central Slovakia

1. Introduction by Energy Edge CEO

Upon arrival, Mr. Sestina welcomes the group in front of the newly opened CHP plant and gives an introduction to the general facts and figures of the CHP (Figure 4).



Figure 4: Site visit in Zarnovica (picture: ICARST)

The plant is financed fully privately and operates solely on biomass (straw, wood), which is fed into the plant in the form of chips and pellets. The supply chain is currently focussing on regional supply, the biomass is transported to the plant from a radius of approx. 80 km via road transport. The electricity generated is fed into the grid; heat is used to fuel a number of surrounding buildings at the moment but shall be used to fuel the expansion of a circular production unit of wood composite materials to be built in the next years in direct neighbourhood of the plant. For this, increased wood biomass feedstock supply will be needed. Options to import from Romania or Croatia via the waterway are discussed.

2. Guided tour through the plant

Afterwards, the group is shown around the plant, visiting the architecturally innovative office areas, the main CHP operations, the turbine vicinities and the storage area.

End of the meeting

2.4 Conclusions and lessons learned

Energy Edge CHP operations represents the top of available technology in Slovakia regarding energy biomass. This is a very good example for a well-planned and efficiently executed project which can be feasible and sustainable in long-term view.

Even though raw material supplies are currently being transported mainly from local areas (in average approx. 100-200 km range), wooden pellets, due to higher energy potential and higher price as well, are significantly less sensitive to transportation costs.

Particular examples of potential usage of Danube inland waterway have been already discussed directly during the site visit between site owner and CEO and project partners, the focus was on a potential import of Romanian wood into Zarnovica. This is connected to existing CHP operations as well as further development production of special wooden materials, with special utility properties for construction businesses, which shall be put in operation in the course of 2019. Since there is limited capacity of certain wood supplies available in Slovakia, imports from Romania and potentially other Danube countries, might be a feasible solution.

3 Site visit Croatia

Brief intro site visit location

Spačva d.d. being located in the east part of the country has a long tradition of processing wood, both having a successful flooring and doors production and a drive to become the biggest pellet/briquette producer in the country within the next few years, making them an important actor in the Croatian biomass market. It also uses biomass residues from the processes producing the heat for the company needs on site. One of the key points is that, although depending strongly on the export of their bioenergy products, it has the largest share of both pellets and briquettes being placed on the national market (mostly through the big retailers). Being located on the far east of the country, the transport of the products to the countries located to the west lowers the overall profitability of such endeavours. However, since the company is located within 20 kilometres to the port of Vukovar on the Danube river, it seems a viable option to have the company's reach extended to the east/north by using alternate modes of transport (rail, waterway) which can prove to be more energy and environmentally efficient.

The second stop for the site visit was the Port of Vukovar, which is the only river port located on the right side of the Danube River and enables 365 days of navigability. It has an "E" technical certificate according to the European Agreement on Main Inland Waterways of International Importance (AGN), international port status and is of a high economic importance for the Republic of Croatia.

3.1 List of participants

Site Visit	Name	Surname	Institution	Type
	Šemsa	Alimanović	Privredna/Gospodarska komora FBiH	regional stakeholder
	Ivan	Ambroš	Centar kompetencija d.o.o.	regional stakeholder
x	Marko	Ban	International Centre for Sustainable Development of Energy, Water and Environment Systems	Project consortium stakeholders
	Ivan	Barović	Lučka kapetanija Vukovar	regional stakeholder
	Đuro	Bičanić	Lučka uprava Vukovar	Project consortium stakeholders
x	Danijel	Bilušković	Luka Vukovar d.o.o.	regional stakeholder
x	Krunoslav	Boban	TÜV Croatia	regional stakeholder
x	Antonio	Bolanča	HROTE	regional stakeholder
x	Ana	Bošković	Centar kompetencija d.o.o.	regional stakeholder
x	Iva	Božić	Centar kompetencija d.o.o.	regional stakeholder
	Anita	Čuljak	Lučka uprava Osijek	regional stakeholder
	Damir	Dekanić	Hrvatske šume UŠP Vinkovci / Croatian forests	regional stakeholder
x	Erik	Dimov	SLOVAK SHIPPING AND PORTS JSC	Project consortium stakeholders
	Ivan	Domac	Vukovarsko-srijemska županija	regional stakeholder
	Franjo	Domiković	Poljoopskrba PMT	regional stakeholder
	Katarina	Draškić	Vukovarsko-srijemska županija	regional stakeholder
x	Vedrana	Džoić	Razvojna agencija Vukovarsko-srijemske županije	regional stakeholder
	Dinko	Đorđević	Energetski institut "Hrvoje Požar"	regional stakeholder
x	Thies	Fellenberg	Agency for Renewable Resources	Project consortium stakeholders
	Antun	Gabrić	Savez energetičara Slavonije i Baranje	regional stakeholder
x	Iva	Gavran	International Centre for Sustainable Development of Energy, Water and Environment Systems	Project consortium stakeholders
x	Nevena	Grubelić	International Centre for Sustainable Development of Energy, Water and Environment Systems	Project consortium stakeholders
	Marijana	Grubišić	Grad Vukovar	regional stakeholder
	Thomas	Hemmerich	Euro Bevrachting Germany AG	Project consortium stakeholders
	Iva	Horvat	Lučka uprava Vukovar	regional stakeholder
x	Zoltán	Hudoba	National Agricultural Research and Innovation Center	regional stakeholder
	Vinka	Ivanković	HGK Županijska komora Vukovar	regional stakeholder
	Alen	Jakumetović	Lučka uprava Vukovar	Project consortium stakeholders
	Denis	Janžić	Lučka uprava Vukovar	Project consortium stakeholders
	Vlado	Jumić	HŠ UŠP Osijek	regional stakeholder
	Ana	Jurić	Lučka uprava Osijek	regional stakeholder
x	Ann-Kathrin	Kaufmann	BioCampus Straubing GmbH	Project consortium stakeholders
x	Marijan	Kavran	Hrvatski drveni klaster	regional stakeholder

Site Visit	Name	Surname	Institution	Type
x	Petar	Kljajić	Banija Pal d.o.o.	regional stakeholder
x	László	Kocsis	National Agricultural Research and Innovation Center	regional stakeholder
x	Marijan	Kuprešak	Luka Vukovar d.o.o.	regional stakeholder
	Željko	Kuprešak	Biomass to Energy Županja d.o.o	regional stakeholder
	Ivan	Lajtman	Ministarstvo regionalnog razvoja i fondova EU	regional stakeholder
	Kristijan	Lovrenšćak	Tehnostan	regional stakeholder
	Miroslav	Mađarac	Lučka uprava Vukovar	regional stakeholder
	Miroslav	Maroš	Centar za poduzetništvo općine Orašje	regional stakeholder
	Andrija	Matić	Vukovarsko-srijemska županija	regional stakeholder
x	Tibor	Matyas	DDSG Mahart	Project consortium stakeholders
x	Bettina	Matzner	viaDonau	Project consortium stakeholders
	Rainer	Mueller	Eurovienna	Project consortium stakeholders
	Dinko	Mujkić	Drveni Klaster	regional stakeholder
	Ivan	Murar	Spin Valis d.o.o.	regional stakeholder
	Mihajlo	Nagy	Eko-sustav d.o.o.	regional stakeholder
	Tea	Nemet	HEP d.d.	regional stakeholder
x	Milica	Nikolić	viaDonau	Project consortium stakeholders
	Igor	Njegovan	HROTE	regional stakeholder
	Magdalena	Parat	Vukovarsko-srijemska županija	regional stakeholder
	Ivan	Perković	Spačva d.d.	regional stakeholder
x	Radovan	Petrović	Univerzitet Union „Nikola Tesla“, Fakultet za Informacione Tehnologije i Inženjerstvo (FITI)	regional stakeholder
	Andrej	Plevnik	Enerkon d.o.o.	regional stakeholder
	Stanko	Plevnik	Enerkon d.o.o.	regional stakeholder
	Andrea	Poslek	HGK Županijska komora Virovitica	regional stakeholder
	Toni	Primorac	Pelet grupa d.o.o.	regional stakeholder
	Viktor	Radić	Polytechnik	regional stakeholder
	Krešimir	Raguž	Eko-sustav d.o.o.	regional stakeholder
	Valentina	Rakić	Dunavski Lloyd	regional stakeholder
x	Silvio	Ridzak	Ministry of the sea transport and infrastructure	Project consortium stakeholders
	Luka	Sabrić	Domino d.o.o.	regional stakeholder
	Lejla	Sadiković	Privredna/Gospodarska komora FBiH	regional stakeholder
	Krešimir	Skočić	Ministarstvo poljoprivrede	regional stakeholder
x	Radovan	Slavković	Univerzitet Union „Nikola Tesla“, Fakultet za Informacione Tehnologije i Inženjerstvo (FITI)	regional stakeholder
x	Szavó	Sztilkovics	Mahart Freeport Ltd.	Project consortium stakeholders
x	Rosana	Šimunović	Hrvatski drveni kluster	regional stakeholder
x	Vjekoslav	Šimunović	Lučka uprava Vukovar	Project consortium stakeholders

Site Visit	Name	Surname	Institution	Type
	Božo	Šparelić	Biomass to Energy Benkovac d.o.o	regional stakeholder
	Sanja	Štol	Luka Tranzit Osijek d.o.o.	regional stakeholder
x	Catalin	Tobescu	Federation of owners of forests and grasslands in Romania	Project consortium stakeholders
	Milan	Vandura	HGK Županijska komora Virovitica	regional stakeholder
x	Rastislav	Veselko	SLOVAK SHIPPING AND PORTS JSC	Project consortium stakeholders
x	Darko	Vicković	Luka Vukovar d.o.o.	regional stakeholder
	Tomislav	Virkeš	HEP d.d.	regional stakeholder
x	Tibor	Vojtela	National Agricultural Research and Innovation Center	Project consortium stakeholders
x	Anne	Weinfurtner	Institute for Applied Informatics	Project consortium stakeholders
x	Petra	Zadro	Lučka uprava Vukovar	Project consortium stakeholders

3.2 Agenda

07:30 – 10:30	SITE VISIT <ul style="list-style-type: none"> • Company Spačva d.d. (Vinkovci) • Port of Vukovar (Vukovar)
10:30 – 11:00	REGISTRATION <ul style="list-style-type: none"> • Coffee / Snack
11:00 – 11:20	OPENING OF THE CONFERENCE
11:00 – 11:10	WELCOME SPEECH <ul style="list-style-type: none"> • Port Authority Vukovar -Alen Jakumetović, director (2') • Croatian Chamber of Economy - VUukovar Office - Vinka Ivanković, President (2') • City of Vukovar - Ivana Mujkić, Deputy Mayor(2') • Vukovar-Srijem County - Andrija Matić, Department for Agroculture and Infrastructure, Head of Department (2')
11:10 – 11:20	INTRODUCTORY PART- OPENING <ul style="list-style-type: none"> • ENERGY BARGE - Creating Sinergy between RES and Logistics. Scopes and abjectives - Thies Fellenberg Agency for Renewable Resources (Germany) (10')
11:20 – 12:25	THEMATIC SESSION I / Examples and Mobilisation of Biomass and Wood Chips in Danube Countries (65') <ul style="list-style-type: none"> • CASE STUDY I: <i>Needs of HEP d.o.a. for the Mobilization of Chips on the Danube Transport Route</i> - Tomislav Virkeš, HEP d.o.o. (10') • CASE STUDY II: <i>Alternative Supply of Chips for the Functioning of Cogeneration on Wood Biomass in Županja</i> - Željko Kuprešak, Cogeneration Županja (10') • KEY-NOTE EXPERT PRESENTATION; <i>Identificatian of Biomass Potentials along the Danube</i> -Ann-Kathrin Kaufmann, BioCampus Straubing GmbH (Germany) (45')
12:25 – 12:55	THEMATIC SESSION II / The Danube - Green Logistics Potentials for Bioenergy and Biomass Industry (30') <ul style="list-style-type: none"> • PRESENTATION: <i>Storage and Transhipment of Biomass: Possibility for the Biomass Centre</i> - Marijan Kuprešak, Port of Vukovar (10") • CONVERSATION 1 on 1: <i>Intermodal Transportation - Passible Solution for Logistics and Transport on the Danube</i> - Marko Ban, SDEWES (10') • DISCUSSION (10')
12:55 – 13:40	LUNCH
13:40 – 15:00	MATCHMAKING
15:00 – 15:50	THEMATIC SESSION III / Initiatives for Local Use of Biomass and Wood Chips near the Danube (50') <ul style="list-style-type: none"> • PRESENTATION: <i>Biomass Transport from a Perspective of a Carrier</i> - Valentina Rakić, Dunavski Lloyd Sisak (10') • CASE STUDY IV; <i>Characteristics of the Two Cogeneration Plants in Požega</i> - Ivan Murar, Spin Valis Internacional d.o.o, (10') • PANEL DISCUSSION (30') <i>Participants Enerkon, CEKOM d.o.o., Chamber of Economy FBiH</i>
15:50 – 16:30	THEMATIC SESSION IV / R&D in the Field of Agricultural and Forest Residue and Possibilities for New EU Projects

	<ul style="list-style-type: none"> • PRESENTATION: <i>National Framework for the Biofuels</i> - Silvio Ridzak, Ministry of the Sea, Transport and Infrastructure (10') • CASE STUDY V: <i>ImplementatioN of R&D in Logistics and Transportation of Biomass and Pellets</i> - Ivan Perković, Spačva (10') • CONVERSATION I on 1: <i>AdvaNtages of Standardisation and certification of Chips in Riye r Transport</i> - Krunoslav Boban, TUV Croatia (10')
	DISCUSSION / CONCLUSIONS AND RECOMMENDATIONS
16:30	END OF THE CONFERENCE
17:30	DINNER

3.3 Minutes

These minutes reflect the main topics discussed during the workshop and site visit.

Date: 05.02.2019

Location: Vukovar, Croatia

Responsible for minutes: Vjekoslav Šimunović, Port Authority Vukovar / Marko Ban, SDEWES Centre

Documents/Presentations: All presentations and relevant documents are available on Alfresco

Presentations external speakers

The programme was hosted and moderated by Ms Rosana Šimunović and Mr Marijan Kavran from the Croatian Wood Cluster.

The workshop, held at Hotel Lav in Vukovar, started as scheduled at 11:00 with the welcoming speeches from the organiser, Port Authority Vukovar, represented by the general manager Mr Alen Jakumetović (Figure 5). Mr Jakumetović was followed by the local representative of the Croatian Chamber of Economy (Ms Vinka Ivanković – president), City of Vukovar deputy mayor (Ms Ivana Mujkić) and the Head of the counties office for agriculture and infrastructure (Mr Andrija Matić) with short welcome speeches. Mr Jakumetović welcomed all participants and explained the role of the Port Authority and what would be the benefits of the ENERGY BARGE project for the port development. Furthermore, Mr Jakumetović stressed out that the joint cooperation is needed in order to use a great potential of the Danube waterway. Ms Ivankovic emphasised the importance of projects like ENERGY BARGE for the region around Vukovar. It is widely known that this region is one of the richest regions in Europe in terms of oak forests. Slavonian oak is one of the highly respected timber due its quality and durability. Ms Ivana Mujkić welcomed all participants on behalf of the City of Vukovar and thanked them all for bringing such an important project to Vukovar. Mr Matic stressed the crucial role of biomass for the rural development and depopulation, especially its potentials in Vukovar-Srijem County.



Figure 5: Workshop in Vukovar (picture: Croatian Wood Cluster)

The ENERGY BARGE project was introduced by the lead partner representative, Mr Thies Fellenberg, FNR, Germany. The presentation was followed by a short talk by Mr Tomislav Virkeš from Hrvatska Elektroprivreda (Croatian national energy company - HEP), addressing the need of the company to utilise wood chips along the Danube. Mr Virkeš explained the work and the role of the company as a national power utility company with strong presence across energy value chains. Speaking of biomass, HEP is owner of two biomass power plants in the cities of Sisak and Osijek with installed capacities of 3MWe and 12 MWt, which is used for the heating systems in the cities. The company has signed long-term contracts for biomass supply with the Croatian forest management company Hrvatske šume and some private suppliers. Mr Virkeš expressed the support for the ENERGY BARGE project and the initiative to find alternative transport possibilities for biomass along the Danube.

The biomass fired co-generation plant of Županja has been presented by the managing director Mr Željko Kuprešak who mentioned the high demand for raw material and the interest of using the Danube as a means of alternative transport route. The annual demand of the power plant is 50-60,000 tons of biomass (wood chips and agricultural residues). Mr Kuprešak expressed the importance of the goals of the ENERGY BARGE project and potentials of transport via the Danube. The company started negotiations with suppliers from Serbia to discuss the possibility to use the Danube as a new transportation route that could be beneficial for the regional mobilisation of raw material.

The modal shift platform has been presented by the project partners from BioCampus Straubing GmbH (Ms Ann-Kathrin Kaufmann) and Deggendorf Institute of Technology (Ms Anne Weinfurtner). Marijan Kuprešak from the Port of Vukovar held a presentation on the topic of biomass storage and transshipment with a focus on the possibilities on having a local biomass storage centre close to the Danube River in Vukovar. There are positive trends in terms of an increased port traffic with 341,000 tons of goods that were handled in 2018. For 2019, the target is to tranship 500,000 tons in the port. The plan for the future development is to revitalise the port with modern transshipment facilities, develop distribution and trade processing zones, and a logistics centre for Central and Eastern parts of Europe.

The workshop programme continued after the lunch break with the matchmaking session (75 minutes).

The thematic block “Initiatives for local usage of the biomass alongside the Danube” included two presentations and a panel. The presentations were held by Valentina Rakić from Dunavski Lloyd Sisak, one of the few inland waterway logistic companies in Croatia, who talked about the logistics of biomass from the perspective of the logistic companies as well as agency jobs in the ports of Osijek and Vukovar. The second presentation was given by Mr Ivan Murar from Spin Valis International d.o.o. describing their experience of running two co-generation plants in the city of Požega. Mr Murar also mentioned the briquette production unit with 3,500 tons per year for which they mostly use their own residues. Their plan is to enhance production to 10,000 tons per year. Half of the briquettes are sold to local markets, the other half of it mostly to Austria and Germany by road transport. Mr Murar highlighted that the inland waterway transport could be a good transshipment alternative and improve business networks in the region, but in order to change already established means of transport, they would need to make thorough prices comparison and analyses of alternative routes in order to reduce transport costs.

The panel discussion (Figure 6) gathered international speakers, including Ms Lejla Sadiković from the Chamber of Economy of the Federation of Bosnia and Herzegovina, Mr Stanko Plevnik (Enerkon Ltd., Croatia) and Mr Ivan Amroš (Centar kompetencija Ltd, Croatia), who discussed the possibilities of international collaboration on the usage of the Danube waterway. Mr Plevnik confirmed that the idea of transshipment biomass along the Danube is feasible in technological and technical terms. It would be useful especially for smaller biomass power plants to expand the biomass supply chain. Mr Dekanić also confirmed the high demand of biomass on the Croatian market, which affects the prices. Mr Dekanić emphasized that the demand for using firewood or second generation fuels is increasing by 5 to 6% per year. Ms Alimanović presented some general facts about the Federation of Bosnia and Herzegovina considering forestry and wood industry - 56% of the country is covered by forests, of which 80% are state-owned. The wood industry is highly developed, amounting to 15% of the total exports. Ms Alimanović highlighted the problem of air pollution in BIH due to a strong use of fossil fuels.



Figure 6: Mr Plevnik, Ms Alimanović and Mr Amroš / panel session (picture: Croatian Wood Cluster)

The final session of the workshop started with the presentation by Mr Silvio Ridzak from the Croatian Ministry of Maritime Affairs, Transport and Infrastructure, focusing on the national framework for biogas, also stating that the share of inland waterway transport in total traffic in Croatia is below the European average. The European Commission's intention is to encourage and implement innovation in inland navigation so that the inland navigation continues to be the most environmentally acceptable transport mode with regard to mitigating greenhouse gas emissions.

Mr Ivan Perković described the efforts of the company Spačva d.d. to expand the energy production also to electricity. Mr Perković welcomed the project idea, which will contribute to revitalise the inland waterway transport. Spačva's capacities are 100,000 tons of raw material and in the surrounding area there are in total up to 400,000 tons of raw material available where also inland waterway logistics should be taken into account in the future.

Finally, the activities of TÜV Croatia have been presented by Mr Krunoslav Boban, mainly addressing the benefits and advantages of standardisation and certification of wood chips in river transport. It was stated that the certification is also important for ports in order to know what goods are being transported. Mr Boban expressed the interest to cooperate with the Port of Vukovar in the near future.

Workshop Platform

BioCampus Straubing's project manager Ms Kaufmann gave a thorough presentation of the ENERGY BARGE modal shift platform. Ms Kaufmann showed to participants how to use the platform and displayed some of the data that can be beneficial to them, e.g. to find information about biomass resources and feedstock flows. The platform also covers data on ports, e.g. available technical equipment to handle biomass products in the ports or storage facilities. Ms Kaufmann invited participants to suggest good practice cases from the biomass and bioenergy sector that are operating on the biomass/bioenergy market in an exemplary manner and good provide solutions for other stakeholders in the Danube region. The participants were asked to provide feedback via a questionnaire on the platform. Ms Kaufmann emphasised that the aim of the project is not to exploit the countries biomass feedstock. It is rather the target to screen the entire Danube region for its bioeconomy potentials and see how the Danube can function to transport certain amounts of biomass on the river.

Site Visit

The site visit took place at the site of the company Spačva d.d., located in the city of Vinkovci, which was already nominated in the project as a good practice example from Croatia (Figure 7). As one of the largest wood processing companies in Croatia it employs around 860 people. The company is mainly producing hardwood floorings, doors and windows. Wood residues are processed to approx. 50,000 tons of pellets and briquettes annually while the rest is used in the company's 18 MW heat production furnaces for own purposes. The host at the company was Mr. Ivan Perković who kindly guided tour at the premises of Spačva d.d.



Figure 7: Site visit – Spačva d.d., project partners and external participants (picture: Croatian Wood Cluster)

Following the site visit, a short stop was made at the Port of Vukovar, where the participants were informed about the current infrastructure and future plans and possibilities to expand the port. The host was Mr Daniel Bilušковиć. The total port size amounts to 26 hectares; the length of the operating waterside is 450 meters. Three railway tracks are in operation, enabling additional transshipment of cargo via the port.

3.4 Conclusions and lessons learned

Overall, the event was a success with around 80 participants from the region. Comments by the speakers and the audience showed that there is a potential for using the Danube waterway as an alternative mode for transport. It was shown that there is a need of feedstock for new bioenergy plants, but it was also pointed out that there are still some obstacles in starting new ventures in bioenergy. It was highlighted that a collection center within (or near) the port would be highly helpful, as well as multi-modal logistic operators who would take care of door-to-door shipping including the river transport.

A site visit to the company Spačva d.d. showed a good way to utilise the raw material comprehensively. The whole processing units were shown to the site visit attendees, who mostly agreed that this is the best way for processing the raw wood material and utilise its full processing and bioenergy potential.

The Port of Vukovar showed the potential and capabilities of biomass transshipment. With its capacity, the port is capable to tranship all types of biomass including types that require special handling and storage in dry and sheltered warehouses. The port still has a potential for expansion and advanced storage and transshipment of bulk bioenergy material.



4 Site visit Germany

The site delegation visit in Straubing took place on Tuesday, 19 March 2019 from 9:30 to 16:00.

The venues were:

- Port of Straubing; Gründerzentrum (Workshop, 9:30 – 13:30)
- Port of Straubing incl. ADM plant info (site visit bus tour, 13:30 – 15:00)
- Clariant sunliquid® plant (site visit, 13:30 – 15:00, in parallel, 2 groups)
- KONARO Center of Excellence for Renewable Raw Materials (site visit, 15:00 – 16:00)

4.1 List of participants

Workshop: "Bioeconomy in the Danube Region"
19.03.2019, Port Straubing-Sand

Participants

Title	Prenome	Surname	Organisation	WS	Site Visit
	Marko	Ban	SDEWES Center	X	X
Dr.	Maria	Bieringer	Micropyros GmbH	X	X
Dr.	Tim	Bieringer	University of Applied Sciences Landshut	X	X
Dr.	Christa	Dißbauer	Bioenergy 2020+ GmbH	X	X
	Verena	Dobler	BioCampus Straubing GmbH	X	X
Prof. Dr.	Claudia	Doblinger	TUM Campus Straubing	X	
Prof. Dr.	Wolfgang	Dorner	Technology Campus Freyung	X	X
	Jürgen	Eisele	Technology Center Sofia	X	X
	Zoltan	Erkel	MAHART Freeport Co Ltd.	X	X
	Thies	Fellenberg	Fachagentur Nachhaltende Rohstoffe e.V.	X	X
	Christian	Hadwiger	Maxbiogas GmbH	X	
	Simon	Hartl	viadonau Österreichische Wasserstraßen-Gesellschaft mbH	X	X
	Thomas	Hoppe	Clariant (Produkte Deutschland) GmbH	X	
	Zoltan	Hudoba	NARIC - Hungarian Institute of Agricultural Engineering	X	X
	Ann-Kathrin	Kaufmann	BioCampus Straubing GmbH	X	X
	Claudia	Kirchmair	BioCampus Straubing GmbH	X	X
	László	Kocsis	NARIC - Hungarian Institute of Agricultural Engineering	X	X
Dr.	Paul	Lampert	Green Survey GmbH	X	X
	Andreas	Löffert	BioCampus Straubing GmbH	X	

Workshop: "Bioeconomy in the Danube Region"
19.03.2019, Port Straubing-Sand

Title	Prenome	Surname	Organisation	WS	Site Visit
	Rosina	Lohmeyer	BayFor Bayerische Forschungsallianz	X	X
Dr.	Darja	Markova	Energieinstitut Linz	X	X
	Rainer	Müller	EuroVienna	X	X
	Milica	Nikolic	viadonau Österreichische Wasserstraßen-Gesellschaft mbH	X	X
	Benjamin	Nummert	Sachverständigenrat Bioökonomie Bayern	X	
	Gregorios	Papageorgiadis	ARBIO	X	X
	Verena	Pfeffer	Trägerverein Europaregion Donau-Moldau e.V.	X	X
	Peter	Rojko	Port of Vienna	X	X
Prof. Dr.	Hubert	Röder	Hochschule Weihenstephan-Triesdorf	X	
	Jasmina	Schuster	BioCampus Straubing GmbH	X	
	Otto	Schwetz	ProDanube Austria	X	X
Dr.	Christoph	Strasser	Bioenergy 2020+ GmbH	X	X
	Krisztina	Szanto	MAHART Freeport Co Ltd.	X	X
	Szavó	Sztilkovics	MAHART Freeport Co Ltd.	X	X
	Catalin	Tobescu	Nostra Silva	X	X
	Tibor	Vojtela	NARIC - Hungarian Institute of Agricultural Engineering	X	X
	Markus	Walsberger	Clariant (Produkte Deutschland) GmbH	X	X
	Anne	Weinfurter	Technology Campus Freyung	X	X
	Jürgen	Weinreich	RoSE Center Open Innovation Berlin	X	

Blue: external participants

4.2 Agenda



Bioeconomy in the Danube Region
Workshop & site visit to good practice region Straubing
19.3.2019







Rohstoffe
Flexible Units
BioTech
Start-Ups
RENEWABLE RAW MATERIALS
Infrastruktur
LABORE
INNOVATION
energetic and material use

Umweltstoffe
Grüne Chemie
Umweltstoffe
Modulare Materialbanken



Interreg
Danube Transnational Programme
ENERGY BARGE



EUROPEAN UNION

Organised by:



HAFEN STRAUBING-SAND
BIOCAMPUS

Programme

Workshop & site visit
Duration: 9.30 – 16.30
Hafen Straubing
Europaring 4, Gründerzentrum
94315 Straubing

9:00 Registration & business breakfast

9:30 Opening – Workshop & site visit objectives
(Andreas Löffert, CEO Hafen-Straubing)

9:40 ENERGY BARGE - Building a green energy & logistics belt
(Thies Fellenberg, Agency for Renewable Resources / FNR)

9:50 Key Note: Bioeconomy in Bavaria – Potentials and outlook
(Benjamin Nummert, Head of Office, Bioeconomy Council Bavaria)

10:15 Coffee Break

10:30 Biobased economy: An idea with profile for rural areas and inland ports; example Straubing, Region of Renewable Raw Materials
(Andreas Löffert, CEO Zweckverband Hafen Straubing-Sand)

10:50 Power-to-gas – Decentral solutions and perspectives for the Danube region
(Prof. Dr. Raimund Brotsack, CEO micropyros GmbH)

11:15 Your trash is my treasure – Presentation of the Danube-goes-circular platform
(Rosina Lohmeyer, Bavarian Research Alliance (BayFOR) GmbH)

11:30 Strengthening business cooperation and know-how in the biomass and bioenergy sector – Workshop ENERGY BARGE modal shift platform
(Ann-Kathrin Kaufmann, BioCampus Straubing GmbH, Prof. Dr. Wolfgang Dörner, Technologiecampus Freyung)

12:20 Moderated discussion

12:30 Lunch break

SITE VISITS – Shuttle provided

13:30 Clariant sunliquid demoplant, BioCampus Straubing

14:30 Tour through Port of Straubing, info on ADM oilseed mill

15:15 KoNaRo - Center of Excellence for Renewable Raw Materials
(Sabine Gmeinwieser, KoNaRo)

16:30 End

Project co-funded by European Union funds (ERDF)

4.3 Minutes

These minutes reflect the main topics discussed during the workshop and site visit.

Date: 19.03.2019

Location: Straubing

Responsible for minutes: Ann-Kathrin Kaufmann, Verena Dobler (BioCampus Straubing GmbH)

Documents/Presentations: All presentations and relevant documents are available on Alfresco

Speaker presentations & workshop

Andreas Löffert, CEO of BioCampus Straubing GmbH (BCG), welcomed all participants to Straubing.

Presentations

In a brief introductory statement, Ann-Kathrin Kaufmann, project manager for ENERGY BARGE at BCG, gave an insight into the objectives of the workshop and site visit (transnational knowledge exchange on good practices for bioenergy generation and use on regional level including underlying prerequisites and value chains, networking, site visits to increase the aforementioned objectives; disseminate the ENERGY BARGE online tools via a standardised workshop and generate feedback from external participants).

To give the external participants more information about the contents of the ENERGY BARGE project, lead partner Thies Fellenberg (FNR) gave an introduction to the project itself, the status quo and the activities which have been executed in the recent months as well as those planned for the remainder of the project.

Afterwards, Ms Kaufmann welcomed Benjamin Nummert, Head of Office of the Bavarian Bioeconomy Council who delivered an impulse presentation on the strategic goals of Bavaria towards developing a strong biobased economy in the near future. Mr Nummert pointed out current flagship projects like the Clariant sunliquid® demonstration plant, which was also the destination of the site visit in the afternoon. According to the strategy of the council a cascading use of biomass shall be in the centre of activities, putting the energetic use at the end of the cascade. In the discussion afterwards, it became apparent that the biobased economy is a promising concept for the entire Danube region and that learning from each other is of utmost importance. Also, inland waterway transport can be an important facilitator for a suitable logistics concept especially for large-scale biorefineries. This shall be promoted right from the start so that investment projects consider this often overlooked aspect when making a site decision – ports could be excellent locations for these kinds of investments.

One example of such an investment decision linked to the waterway depicts the ADM rape and soy crushing mill located in the port of Straubing. Port-CEO Andreas Löffert introduced this case as the key account for the port of Straubing in his presentation. In his opinion, the green belt along

the Danube still holds true and can be a blueprint for a biobased economy with sustainable logistics in the Danube region. Mr Löffert stressed that being patient and creative in the role of a business developer in such a region is very important. For the region of Straubing, a strong network of public and private actors has been developed over years before some success in terms of business settlement could be realised. Also, increasing the share of biobased cargo in the overall port performance took time.

On behalf of CEO Prof. Dr. Raimund Brotsack, Dr. Maria Bieringer introduced the start-up side of the region: the Micropyros GmbH developed a power-to-gas process based on microorganisms and biowaste as well as excess power from renewable sources such as wind. The product of the process is methane, which shall be used for transport purposes. Her outlook on the Danube region: the process can offer decentral solutions especially in areas with access to renewable power.

Based on the idea of making the economy and especially production more circular, the fellow DTP project MOVECO was designed. As circular economy ideas are compatible with those of a sustainable biobased economy, Rosina Lohmeyer (Bavarian Research Alliance) from the MOVECO project was invited to introduce the [Danube goes circular platform](#) to the participants and to investigate, in how far biobased waste streams, especially for energy generation, can be found at their platform.

Workshop

The main part of the meeting was formed by the workshop on the ENERGY BARGE modal shift platform. The same workshop with a live demo of the online platform (www.energy-barge.eu) was already executed at the two previous meetings in Bratislava and in Vukovar. In this workshop, Ann-Kathrin Kaufmann, Prof. Dr. Wolfgang Dorner and Anne Weinfurtner from DIT (Technology Campus Freyung) who were in charge of the technical and visual design of the platform guided the participants through the functionalities of the tools. Before the workshop started, a feedback form (2 pages) covering content- and usability-related aspects, was distributed to the participants and they were asked to fill them in after the live demo. The participants were also invited to click through the platform in parallel on their mobile devices. Besides explaining all three tools of the platform step by step as well as the background information on biobased energy and inland waterway transport in the Danube region, the objectives and target groups of the tools were defined. After the live demo was finished, two sets of questions in addition to the feedback tool were presented in order to guide the discussion.

These were the most relevant feedback items retrieved during the oral feedback round:

- Disaggregate the biomass trade flows so that it becomes visible which transport modes are used and also to bring it to a more regional level (not national!);
- Increase the amount of research actors in the data base so that the platform also can function as a pool for potential project development and research alliances in the region, as well as for the topics of relevance;
- Integrate – if possible – the net value of the biomass types → are they actually freely available e.g. as residue, or already in a functioning value chain and thus hard to acquire?

- For business, costs and volumes of the biomass types used by the registered companies would be of vital interest, at the same time, this info often is confidential and shall keep that way;
- Transport costs on IWT in comparison to e.g. road transport of interest;
- Biogas plants should be included from the perspective of biorefineries as these could be receivers of waste streams;
- A trading platform for residue waste streams could be an idea for a follow-up project;
- Additional inclusion (potentially in a follow-up project) of the chemical-material sphere of the biobased economy (besides energetic use);
- Importance to disseminate the portal also to actors from the general biobased economy (chemical material use of biomass, not just energetic use).

Site Visit

The site visit organised in Straubing had three components. The first part took place directly in the port of Straubing. The participants were split into two groups. The first group started with a guided tour through the Clariant demonstration plant for their sunliquid® process, a biotechnological process to produce ethanol for transport purposes (bioethanol) on the basis of agricultural residue materials, e.g. straw. Markus Walsberger explained the process steps to the participants and showed them how the straw runs through the plant until it exits in the form of ethanol, which is then forwarded to project partners for testing of driving characteristics. The company also just started the construction of a large scale plant in Romania.

At the same time, the second group joined a bus tour through the port area. A main focus of the explanation was put on the logistics of the ADM rape and soy mill for biodiesel production as this company is the port's key account with respect to waterside transshipment. The moderator stressed that it would have been nice to visit the plant as well, but, due to safety and confidentiality reasons, no visitors are admitted at the site. After both groups finished their first stop, the groups were switched.

For the second stop, the participants were brought to the Centre of Excellence for Renewable Raw Materials in the city centre of Straubing. There, they received information about the mainly research- and transfer-oriented activities of the four entities (TUM Campus Straubing for Sustainability and Biotechnology, C.A.R.M.E.N. e.V., Technology and Support Centre and Fraunhofer BioCat) forming the centre while being guided through the extensive premises by Sabine Gmeinwieser. A focus was put on the activities regarding bioenergy. The group visited the lab buildings of the university; saw the technical workshops with test stands for bio fuels for tractors etc., and visited the exhibition "renewable raw materials" in which the general public and users can inform themselves about the different types of utilization paths of biomass (energetic and chemical-material).

Afterwards, the group returned to the starting venue by bus for the conclusion of the site visit.

Pictures

In the following section, some impressions from the workshop and the site visit are provided. Note: no pictures from the site visit at Clariant exist, due to confidentiality reasons; photographs are prohibited on Clariant premises.

All people depicted in the images have been informed prior to the event that pictures will be taken. All pictures were provided courtesy of BioCampus Straubing GmbH.



Figure 8: Workshop in Straubing (picture: BioCampus Straubing GmbH)



Figure 9: Discussion round at the workshop in Straubing (picture: BioCampus Straubing GmbH)



Figure 10: Site visit at the Centre of Excellence for Renewable Raw Materials (picture: BioCampus Straubing GmbH)

4.4 Conclusions and lessons learned

The main conclusions gained from the workshop, presentations and site visits are summarised below:

- In order to develop Straubing towards a flagship region for the energetic and material use of biomass, a long planning process including a broad backing from several players was and still is necessary;
- The supporter portfolio ideally should include not just business actors but also the political level, research, technology transfer experts and the general public;
- This learning is directly transferable to other regions along the Danube interested in picking up the biobased economy as a smart specialisation profile;
- The port connection can play an important role for current but also future actors of the biobased economy and in this respect, early-stage marketing and positioning of inland ports as suitable locations for the biobased economy in the Danube region is important;
- Circular economy is the roof concept above the biobased economy as well and should be part of/considered in any biobased business model;
- Knowledge about biomass availability (especially in the form of reliable data) on a regional but also national and transnational level (Danube region) is barely available but highly asked for;
- The same accounts for residue streams and the actual availability of residues;
- The Modal Shift Platform functions well and is designed in an appealing manner;
- It could be extended by content-related aspects such as actors from the chemical-material use side or price indications, but this would probably have to be realised in a follow-up project.

Contact

BioCampus Straubing GmbH
Ann-Kathrin Kaufmann
ann-kathrin.kaufmann@biocampus-straubing.de

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