



# **EURO PhD School on Sustainable Supply Chains**

**Koblenz and Aachen**

**June 26 – July 2, 2016**

**Final Report**

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# General information about the EPS on Sustainable Supply Chains 2016

## Dates and venue

The first EURO PhD School on Sustainable Supply Chains took place in Aachen and Koblenz, Germany, from June 26 to July 2, 2016.

The school started in Koblenz on June 26 and continued in Aachen from June 30 until July 2. On June 30, there was a bus transfer for all PhD students free of charge.

During the days in Koblenz, the students were accommodated in the youth hostel *Festung Ehrenbreitstein*. During the days in Aachen, the students stayed at the Guesthouse of the RWTH Aachen University and in the hotel IBIS Budget Aachen City.

## Organizing Committee

- Grit Walther (RWTH Aachen University)
- Jacqueline Bloemhof (Wageningen University)
- Erwin van der Laan (Erasmus University Rotterdam)

## Aims and scope

The school aimed at training PhD students in the area of Sustainable Supply Chains and was organized with the financial support of the Association of European Operational Research Societies (EURO).

Topics of the school were:

- Concepts and models for Sustainable Supply Chains: multicriteria decisions, trade-offs between economic, environmental and social objectives
- Inter- and multidisciplinary approaches, e. g. combining optimization and life cycle assessment, development of sustainable business models
- Specific characteristics of e.g. Biobased SCs, Closed-Loop SCs, Food SCs, Automotive SCs

## Terms and conditions

30 PhD students were admitted to take part in the school.

A registration fee of 150 € was charged. The EURO support and the registration fee covered accommodation, all meals, social activities, and all traveling within school activities. Travel costs to and from the school had to be covered by the participants, either themselves or through external funding.

The students were awarded 3 ECTS (50 hours: classes 3h/day, supervised training 2h/day, supervised work on case studies 3 h/day). Students had the possibility to gain 2 extra ECTS for presenting a poster at the 1<sup>st</sup> Conference of the EURO Working Group on Sustainable Supply Chains. A short abstract had to be submitted in order to present a poster.

**Contact:** [eps-sustsc@om.rwth-aachen.de](mailto:eps-sustsc@om.rwth-aachen.de)

## Website:

A website with the relevant information was developed:

<http://www.sustainable-sc.rwth-aachen.de/eps-sustsc/>

## Academic program

### Schedule and methodology

The schedule of the school (excluding social activities) was as follows. In the morning, theoretical classes were given by researchers in the area of Sustainable Supply Chains. After lunch-break, supervised training and exercises were carried out based on the theoretical classes to enable the students to apply their new knowledge.

Furthermore, two case studies on Sustainable Supply Chains were presented by industry representatives at the beginning of the school. The case studies were presented by Maira Magnani (Researcher at Ford Research & Advanced Engineering Europe) and Dr. Eva-Barbara Fürst-Wiesmann (Director International SHEQ, Henkel Global Supply Chain B.V.). Each case study presented the current situation and challenges of the company and ended with questions to be solved by the students. Based on this information, the students then worked in groups on the case studies throughout the school and presented their results at the end of the school.

In addition, the PhD students had the opportunity to gain insights into research by attending presentations of the “1<sup>st</sup> Conference of the EURO Working Group on Sustainable Supply Chains”. In the course of the conference, students worked on and presented their case study results. Also, some of the students presented a poster about their current research topics during the conference.

Besides, an excursion to INFORM GmbH took place on Thursday, where the PhDs got an insight into the “Practice of OR”. A presentation of the company and the work of an OR researcher in this field was given by the Chief Technical Officer Dr. Ulrich Dorndorf, as well as by Dr. Stefan Droste and Dr. Thomas Wensing. Afterwards, a lively discussion resulted, and many questions of the PhDs were answered by the company representatives.

### Lecturers

Tutorials as well as exercises/supervised training in a computing classroom were presented by researchers in the area of Sustainable Supply Chains:

- Jacqueline Bloemhof (Wageningen University, the Netherlands)
- Erwin van der Laan (Erasmus University Rotterdam, the Netherlands)
- Ana Paula Barbosa-Póvoa (University of Lisbon IST, Portugal)
- Martin Grunow (Technical University of Munich, Germany)
- Renzo Akkerman (Technical University of Munich, Germany)
- Grit Walther (RWTH Aachen University, Germany)

### Focus on case studies

Students worked in groups of 4-5 students on 2 case studies provided by FORD Motor Company and Henkel Global Supply Chain B.V.. Thus, 3 groups were working on the same case each. The cases were presented by the company representatives and assigned to the students on the first day of the school. Students worked on the assigned problem throughout the school, whereas there was the opportunity to ask questions to the company representatives the first day personally as well as the following days by E-mail.

The results of the cases were presented by the students on the last day of the school before the conference started. The best group of each case was awarded, whereas the winners were offered the opportunity to present their case on the 1<sup>st</sup> Conference of the EURO Working Group on Sustainable Supply Chains.

Both cases focused on Biobased Supply Chains and renewable materials, whereas the Henkel case dealt with optimal configuration of a transport network under consideration of sustainable aspects. The FORD case however, focused on the sustainability assessment of natural fibres.

### Excursion to INFORM GmbH

An excursion was carried out in order to give the students an insight into the “Practice of OR”. First, students presented the results of their case studies they worked on during the week. They got feedback on their work by the instructors of the school as well as the company representatives of Ford Motor Company and Henkel Global Supply Chain B.V., but also from the company representatives of INFORM GmbH.

After the presentations, the Chief Technical Officer of INFORM GmbH Dr. Ulrich Dorndorf gave an introduction on and overview about the company. Subsequently, Dr. Thomas Wensing and Dr. Stefan Droste from INFORM GmbH reported on completed projects of their company. After that, students asked the three company representatives questions relating to the work of INFORM GmbH and their projects.

### Program:

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<b>Topic</b>	<b>Welcome</b>	<b>Life Cycle Assessment (Bloemhof/Walther)</b>	<b>Reverse Logistics Business Models (van der Laan)</b>	<b>Design and Planning in Sustainable Supply Chains (Povoa)</b>	<b>Food Supply Chains (Grunow/Akkerman)</b>	<b>Cost Structures in Supply Chains (Letmathe)</b>	<b>Closed Loop Supply Chains (Spengler)</b>
<b>9:00-12:30</b> (with coffee break)		·Tutorial ·Mini Case	·Tutorial ·Mini Case	·Tutorial ·Mini Case	·Tutorial ·Mini Case	·Keynote ·Sessions ·Discussions	·Keynote ·PhDs present case study results to conference audience
<b>12:30-13:30</b>		Lunch break	Lunch break	Lunch break	Exercise Food Supply Chains	PhDs present Poster at conference	PhDs present Poster at conference
<b>13:30-15:30</b> (with coffee break)		·LCA Software Exercise (SimaPro)	·Exercise on Business Models	·Software Exercise MCDM/Optimization	·Lunch & Bus to Aachen	Discussion of Industry Cases Ford & Interface	·Session on Recycling and Remanufacturing ·Discussions
<b>15:30 – 19:00</b>	Welcome to the EPS (Bloemhof/Walther)	Industry Presentation Case I: Ford Industry Presentation Case II: Henkel	Supervised Group Work on Industry Case	Supervised Group Work on Industry Case	·Presentations of Industry Cases ·INFORM: Working at an OR Company	·Session on RevLog Models ·Discussions	Farewell and Debriefing of the EPS

## Social program

Besides the academic program, a social program was included to strengthen ties between the participants in order to establish a future network. The following social activities were carried out during the EPS:

- Saturday, June 26, 2016: Kickoff barbecue
- Tuesday, June 28, 2016: Cable car tour from the fortress Ehrenbreitstein down to *Deutsches Eck* and guided city tour of Koblenz
- Wednesday, June 29, 2016: Bonfire and drinks
- Friday, July 1, 2016: Guided city tour of Aachen
- Friday, July 1, 2016: Participation in the social dinner of the 1<sup>st</sup> Conference of the EURO Working Group on Sustainable Supply Chains SustSC 2016
- Saturday, July 2, 2016: Closing session/farewell

## Participants

### Application process

Participants had to be from a EURO member society country or studying in a EURO member society country. They had to be enrolled in a PhD program and, preferably, had to be in an early stage of their studies. A maximum number of 30 participants was accepted. The participants were selected by the organization committee.

Interested students had to send the following documents to [eps-sustsc@om.rwth-aachen.de](mailto:eps-sustsc@om.rwth-aachen.de) until February 15, 2016:

#### 1. Application letter including:

- Name, affiliation and E-mail address
- Enrolled PhD program, current stage of studies, supervisor's name
- Background in Sustainability and in Operations Research
- Motivation to attend the school
- Possible motivated request for financial support from EWG Sustainable Supply Chains (the registration fee of two students will be covered)

#### 2. Curriculum vitae (including academic track record)

#### 3. A recommendation letter from the supervisor

The notification of acceptance was sent to the participants by February 29, 2016.

### Admission process

In total, we received 41 applications from students coming from 13 countries. We have carefully analyzed the documents sent by the applicants and selected 30 candidates based on:

- Specific interest in the topics of the school
- Motivation as presented by the applicant and the supervisor
- Early stage of a PhD program

- Distribution over countries and universities
- Gender balance

The table below summarizes the admitted students. We admitted 30 students. Three students had to cancel their participation at short notice, and two students could be found to replace these students on the short notice. The students taking part in the school came from 12 countries, whereas the gender balance was 14 female and 15 male students.

It should be noted that after the application deadline and even after the selection of the participants, a lot of requests were received asking if there is still an application possible showing the great interest in the EPS.

#### Participants:

Student	University	Country
Albert Czerny	RWTH Aachen University	Germany
Amalia Rosa Pizarro Alonso	Technical University of Denmark	Denmark
Andrea Tunì	University of Strathclyde	Scotland
Andreas Rudi	Karlsruhe Institute of Technology (KIT)	Germany
Ardian Qorri	Lappeenranta University of Technology	Finland
Boban Djordjevic	University of Ljubljana	Slovenia
Bryndís Stefánsdóttir	Technical University of Munich	Germany
Cátia Rafaela Ferreira Medeiros da Silva	Technical University of Lisbon IST	Portugal
Christian Thies	Braunschweig Technical University	Germany
Elena Pershina (short notice cancellation)	Edinburgh Napier University	Scotland
Floor Verbiest	University of Antwerp	Belgium
Heleen Stellingwerf	Wageningen University	The Netherlands
Ida Græsted Jensen	Technical University of Denmark	Denmark
Jochem Jonkman	Wageningen University	The Netherlands
Juan Hoyos	Deusto University	Spain
Larissa Doré	RWTH Aachen University	Germany
Makbule Kandakoğlu	RWTH Aachen University	Germany
Marije Noordhoek	VU University Amsterdam	The Netherlands
Marko Budler	University of Ljubljana	Slovenia
Marta Elisa Bubicz	Technical University of Lisbon IST	Portugal
Martin Hrušovský	Vienna University of Economics and Business	Austria
Maryam Ghoreishi	Aarhus University	Denmark
Patricia Rogetzer	Vienna University of Economics and Business	Austria
Philipp Sauer	University of Kassel	Germany
Ramin Geramianfar	Wageningen University	The Netherlands
Saeedeh Anvari (cancellation)	Koç University	Turkey
Sofía García Torres	Deusto University	Spain
Teresa Krannich	Dresden University of Technology	Germany
Verena Depping (illness cancellation)	Technical University of Munich	Germany
Yaacov Ozinci	Bar Ilan University	Israel
Yantong Li	University of Evry-Val d'Essonne	France
Zlatan Mujkić	Lappeenranta University of Technology	Finland

Some pictures



Students and instructors in front of the great view of the Rhine & Moselle Valleys at the youth hostel



The classroom in the youth hostel





Kickoff barbecue at the youth hostel



At work...



Discussion with the Industry Representatives



The instructors



Bonfire

## Financial report

### Income

EURO support	€ 13 000.00
Student fees	€ 4 350.00
<b>Total</b>	<b>€ 17 350.00</b>

### Expenditure

Accommodation PhDs Koblenz	€ 3 031.00
Accommodation PhDs Aachen	€ 1 684.00
Meals in Koblenz and Aachen	€ 3 240.00
Rent for rooms	€ 1 400.00
Speakers (accommodation, meals)	€ 1 140.00
Catering	€ 1 418.00
Socialising (barbeque, social dinner, city tours, bonfire, ...)	€ 3 407.00
Transportation (Bus Koblenz – Aachen, Cable Car Koblenz)	€ 838.00
Awards & Prices	€ 247.00
Materials, Prints, IT	€ 224.00
Organization (secretary, student assistants, bank fees)	€ 721.00
<b>Total</b>	<b>€ 17 350.00</b>

## Acknowledgements

The EPS on Sustainable Supply Chains has offered a unique opportunity for young PhD students at the beginning of their research career to get in contact with renowned researchers as well as with industry representatives, and to practice in the field of Sustainable Supply Chains. It has been a great experience for the students, and an important network was created between the PhDs, but also with the lecturers, the industry representatives and the conference participants. This is surely one of the most valuable results of this EPS.

We want to especially acknowledge EURO for this initiative and its support. Besides, an important acknowledgement goes to the speakers of the school for the content and design of the school. We also want to acknowledge Ford Motor Company, Henkel Global Supply Chain B.V. and Interface European Manufacturing B.V. and their representatives Dr. Werner Willems, Heiko Maas, Maira Magnani (all Ford Motor Company), Dr. Eva-Barbara Fürst-Wiesmann (Henkel Global Supply Chain B.V.) and Esther Braaksma (Interface European Manufacturing B.V.) for their contribution with the case studies.

Also, we want to acknowledge INFORM GmbH and their representatives Dr. Ulrich Dorndorf, Dr. Thomas Wensing and Dr. Stefan Droste, which made the excursion possible and therefore enabled the students to get insights into the “Practice of OR”.

Finally, we want to acknowledge the participants of the EPS, instructors and students, by their friendly character. The EPS can be said to have been a success thanks to the dedication of the instructors and student involvement and motivation.