

## EMC-GCP (Game Changer Project) EIT-KAVA project proposal

EMC is looking to strengthen its program, which already excels at involving industry in its teaching activities, as well as entrepreneurship and innovation education. For example, in 2017 EMC obtained the EIT-Label, a quality seal awarded by EIT to Master and PhD programs which excel in shaping a new generation of students into game changers and innovators. Students of EIT Label programs learn how to combine their specialist knowledge with key innovation and entrepreneurship skills to develop solutions to pressing societal challenges. Obtaining the EIT-Label has paved the way for EMC to become involved in further KAVA initiatives (KIC Added Value Activities). In 2017 a call for KAVA proposals for 2019 was announced. Proposals had to be received by the EIT by 28 February 2018. Following is a summary of the application document.

The proposal made by the European Mining Course (EMC) aims at challenging the mining industry to outperform itself. The EMC realizes this by educating the future mining engineers to be critical thinkers, innovators who challenge the status quo from inside or outside a company.

Thus, building upon the experience of over 20 years, the EIT-Labelled EMC Master Program has initiated this EMC-GCP (Game Changer Project), to further strengthen the program to deliver mining engineers of the future to the International Industry. The project establishes a strong entrepreneurial focus in the program by incorporating business oriented case studies provided by the industry, taught to both student and teacher. Interactive field trips provide practical insights for a multitude of case studies, enabling the students to contextualize the theory in the real world industrial setting. Furthermore, the project strengthens the recruitment process, by including an industry challenge to attract the future game changers via online media and international MSc program fairs. Finally, the project will bring together students from three EIT Label Master programs – EMerald, SiNREM and EMC – all addressing different raw materials disciplines, to collaborate on industrial case studies and further build the EIT Label student community.

Obtaining the EIT-Label has paved the way for EMC to become involved in further KAVA initiatives. The EMC-GCP KAVA project will shape a new generation of students into game changers and innovators. Students of EIT Label programs learn how to combine their specialist knowledge with key innovation and entrepreneurship skills to develop solutions to pressing societal challenges.

The proposal considers four challenges faced by the EMC and linked to the overall objectives of EIT, described briefly below. For each challenge, a solution is proposed as part of a work package in this project. The aim of these work packages are described in more detail in the outline of the scope. The work plan describes the specifics of the work, while the budget describes the estimated costs.

The proposal is also used to allocate the AVSA scholarships and TSA travel and subsistence allowance for an estimated 20 students per cohort.

### **Challenge 1** – recruit game changers for the mining industry

The first challenge addressed is the decline of (high quality) applications for the EMC master program, resulting in a smaller group of students who lack an intrinsic motivation and drive. This has the potential to bring down the quality of the program. The root cause of this problem is twofold,

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- 1) the program is not well advertised throughout Europe and
- 2) the current campaigns lacks the link with game-changers, showing that by pursuing the EMC, you are challenging the mining industry.

This project proposes to start a new recruitment campaign to address the two root causes. The overall idea is to link the campaign to an industrial challenge, provided by Sandvik, an EIT RawMaterials Industrial Core Partner in Sweden. The challenge will address the digitalization of mining, which will contain technical as well as economical aspects. The entrepreneurial bachelor students will be attracted by this challenge, which will drive them to apply for the EMC. The prize of the challenge is a visit to the EMC in Delft, Aachen or Helsinki. Three awards will be provided, for creativity, technology and entrepreneurship. The challenge will be animated and distributed throughout social media. Furthermore, major Master Program fairs will be visited, promoting the program and challenging the students to compete.

### **Challenge 2** – Inspire an Entrepreneurial mindset

The current courses in the EMC are well-designed, in cooperation with major industry players such as Rio Tinto, and have a student-centered didactic approach. The EMC would like to continue strengthen the links to the business side of the education content. EMC would like to increase its efforts to challenge students to look and analyze a technique or innovation from an entrepreneurial perspective, not only from engineering foundations.

To address this challenge, this project proposes to educate the teachers of the EMC. This 'Teach-the-Teacher' (TtT) program should provide the teachers with the business insights to evaluate concepts and ideas from a financial perspective. It is believed that this is best achieved by providing an industrial case study to the teachers and challenge them to create a business model. They will then be taught how to incorporate this into their current courses. By Teaching-the-Teacher, this action will create a large impact beyond the project duration, as future EMC cohorts will continue to obtain a deeper training in entrepreneurship and innovation education from their EMC instructors.

EMC will leverage the results and actions from existing KIC projects by involving industrial experts and teachers from the EMENTOR Business Creation & Support Project to carry out the 'Teach-the-Teacher' with EMC instructors. A total of 10 teachers from the EMC program are planned to be trained.

### **Challenge 3** – Isolated view

The students participating in the EMC program bond really well, forming a very intense and intimate relationship. Such a relationship is founded on the beliefs and concepts provided and taught in the program. Even in a triple degree program, this creates a singular focus: challenges (from the industry) will be faced from a single perspective.

This project proposes to address this challenge by organizing a cross-program case study, grouping students from the EMC program with students from two other EIT Labelled programs - EMERALD and SINReM. Commitment from the EMERALD and SINREM Master programs has already been secured and students from all three Label programs will work together on a case study provided by the industry partner, Sandvik.

Lectures will be recorded and shared amongst all three Label programs which will expand the student's insights, while working in a cross-disciplinary team should broaden their perspective.

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Furthermore, working together while not being at the same location prepares the students for the real-world.

### **Challenge 4** – Real World Industrial constraints

The EMC master program believes that it is of the utmost importance to simulate a real-world, industrial setting for the concepts and techniques which are discussed in each course. The challenge is to organize the industrial experience, since this is a way to truly provide the practical insights in which the students can place their theoretical understanding of the world and apply the knowledge gained to reflect on challenges confronting the industry. At the moment, it is believed that this could be strengthened in the program.

To address this challenge, the project proposes to organize field trips in the Finnish (Aalto University), German (RWTH Aachen University) and Dutch (TU Delft) semesters of the program. The Finnish trip will, for example, visit the companies Dragon Mining, Yara, Normet, Terrafame, First Quantum, Outokumpu, Paekivitoode Tehase OÜ, Wienerberger AS, HeidelbergCement and Eesti AS. During the Dutch field trip, LKAB, Agnico Eagle and Boliden will be visited, as well as Lulea University of Technology for a case study together with local students. The German field trip will visit K+S, RWE, Lhoist and GHH-MineMaster. These field trips are made interactive by organizing case studies from all companies which are visited during the trip.

Prior to the field trip, the students will be introduced to the challenge and have to carry out some preparatory work prior to the actual field trip. During the field trips, students will obtain practical insights which will enable them to finalize the study. At the end students will have to present their results at each company, also challenging them to consider how to effectively communicate technical solutions of a complex challenge to an industrial target group.

The scope of the project per work-package is described below

### **WP 1 – Attract Future Game Changers**

- Develop a case study with the Industrial partner, Sandvik
- Animate the case study, which describes the challenge in a vivid and inspiring manner
- Distribute the case study (animation) across social media (LinkedIn / Facebook) in a focused manner
- Visit Master Program fairs throughout Europe
- Update the EMC website
- Award three prizes based on a to be defined evaluation matrix

### **WP 2 – Teach the Teacher**

- Develop a case study with the Industrial Partner, Sandvik
- Attract suitable mentors from the EIT RawMaterials EMENTOR project, a Business Creation & Support project, who will carry out the Teach-the-Teacher training with a planned 10 EMC instructors from TU Delft, Aalto University and RWTH Aachen University
- Organize a two-day business course between the EMC instructors and EMENTOR teachers, industrial experts and mentors where they will solve a business case and learn how to integrate this into their courses

### **WP 3 – Cross-program case study**

- Develop a case study with the Industrial Partner, Sandvik
- Organize a kick-off meeting for the three EIT Label Program students - EMerald / SINREM / EMC students

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- Organize, record and share (guest) lectures from the three programs and industrial partner, Sandvik, as well as build an assignment around these shared lectures
- Organize (online) evaluation moments with the industrial partner, Sandvik
- Organize a presentation day for all students, where they shall present the results of the cross- program assignment to fellow peers and course instructors.
- Provide a prize for the winning group

### WP 4,5,6 – Empowering field trips

- Develop case studies with the industrial partners visited during the field trips as well as the assignments around which the case studies should be built
- Organize a 5-day field trip in Finland, Germany and Sweden to enable the students to carry out their “fact-finding” necessary for developing solutions to the case studies. The costs of these field trips are covered by the TSA travel and subsistence allowance. [max 4500E/student]
- Organize presentation sessions for the student.

### WP 7 - AVSA Scholarship

- Apply for the scholarships and distribute these among the eligible students, equally over their entire study period [max 9000E/student]

The total budget for the application is 1,740 million euro, which covers a three year period. 23% of this will be co-funded by the project partners, while the remainder will be funded by EIT RawMaterials.

Information about the EIT and the EMC labelled program can be found <http://docs.femp.org/uploads/EMC - EIT labelled program.pdf> . A video about the EMC - EIT labelled program can be watched <https://youtu.be/6Es1PVVgY2c> and for a short FAQ clip, with detailed information about the requirements and procedures to apply, please click <https://youtu.be/aCee0bzuloo> .

### SCHOLARSHIPS AND SUBSIDIES

For students beginning in September 2018, EIT scholarships up to EUR 9.000 per student are available with additional financial support for student involvement in conferences, summer schools and other events. The scholarships will replace the Erasmus+ mobility allowance.