

I. Principles, Organization, and Management System of the “Green Asia Program”

1. Features and Principles of the Program

1.1. Candidate Cultivation

The program aims to develop exceptional leaders who can contribute to the achievement of “Green Asia”. Successful candidates have the opportunity to be trained in one of the program’s three specialized fields: materials science, system engineering, and resources engineering, with additional lectures on environmental science, basic sociology, and economics. Furthermore, candidates can network with other professionals in Asia through educational training offered domestically and abroad. Candidates who have completed all the required training can assume leading roles in the field with the five abilities of research, practical understanding, global perspective, system landscape, and leadership.

1.2. Program Features

1. Education System Development:

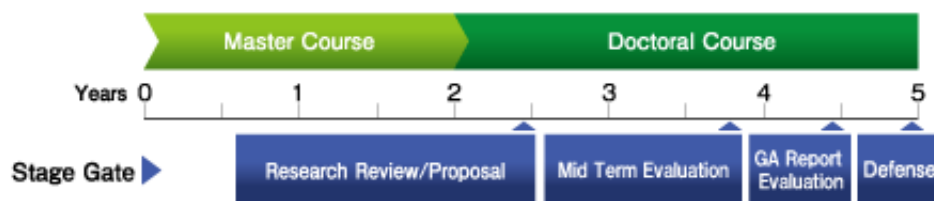
Accepting a wide range of domestic and international students, the program provides interdisciplinary graduate education in addition to promoting reform in the educational system.

2. Curriculum:

Apart from the science and engineering studies (including international and industrial internships and international exercises), humanities and other social-science subjects are included in the curriculum (Green Asia research paper) (**Figure 1-1**).

3. Mentoring Care Unit (MCU):

The program also contains an evolutionary guidance care unit.



- **5-year Consistent Doctorate Program**

After being accepted into the University in April, you can start the course in half year.

- **Learning and Growing Together**

Enrollment Quota per Year : 10 Japanese students; 10 International students

- **Financial Aid : Scholarship is provided**

Figure 1-1. Educational System and Curriculum in the Green Asia Program

4. Asia Collaboration Network and Government-Industry-Academia Partnerships:
The program connects more than 30 research institutions across Asia and works with 58 organizations within Japan to construct an industrial system in Green Asia through the application of both humanities and sciences.
5. Education Quality Assurance and External Assessment:
Preparing educational results and guidance portfolio by students.
6. Added-Value-Oriented Green Engineering:
The program trains individuals to acquire the abilities of upstream thinking, problem analysis, and expansion to accomplish the goal of Green Asia (**Figure 1-2**).
7. Establishment of the Green Asia Education Center

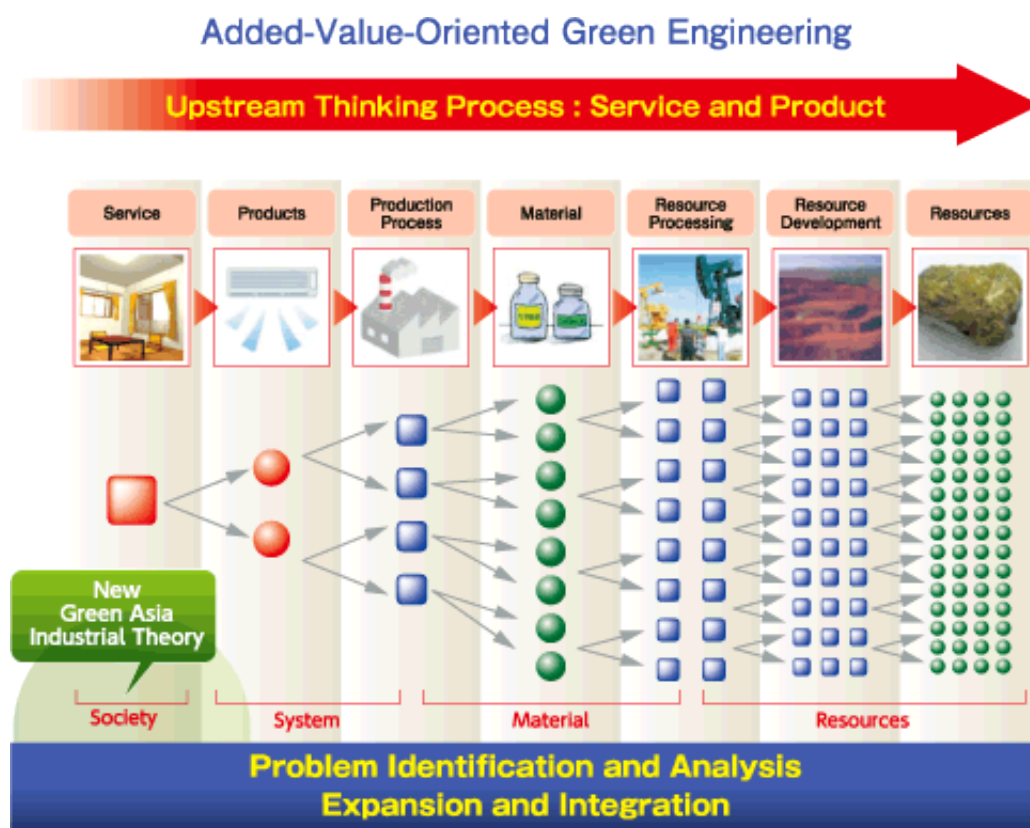


Figure 1-2. From Current Technology to Added-Value-Oriented Green Engineering.

1.3. Basic Principles

The “Program for Leading Graduate Schools” seeks to recruit talented individuals with traits of creativity and foresight who can play an active role in the government, industry, and academia on a global scale. The program offers the highest quality of education available in the field and trains students to work across a wide spectrum of platforms. With this approach, the government is supporting a radical reformation of the graduate school system in Japan and promoting the formation of future-oriented renowned educational institutions of global significance.

At Kyushu University, the Interdisciplinary Graduate School of Engineering Science and the

Department of Earth Resources Engineering have teamed up to build a unique curriculum for this particular program. Graduate students who are enrolled in one of the three specialized majors (materials science, system engineering, and resources engineering) will also complete coursework in environmental science, basic sociology and economics. Furthermore, with the knowledge and practical experiences gained domestically and overseas, students will attain the five abilities (research, practical understanding, global perspective, system landscape, and leadership) required to be a part of a human resource network in Asia. Furthermore, they will receive the doctoral degree with “Advanced Graduate Program in Global Strategy for Green Asia” certification upon completion of the program.

Our educational program aims at developing leadership in science and engineering to realize a balanced between greening and economic growth in Asia. The entire world faces a challenge of maintaining positive economic growth while drastically reducing resource consumption. Asia encompasses great cultural and social diversity; it is a typical melting pot model of an area with complex economic and environmental problems.

An effective strategy has never been implemented to enable countries to accomplish sustainable economic growth while dealing with environmental and resource restrictions related to the mass consumption of fossil fuels. In this century, our country’s role is to develop a global model that distinguishes itself from the Western-centric model so as to realize a green Asia. Negative influences from globalization have emerged, such as the ever-widening gap between the rich and the poor, rapid energy consumption in Asia, and rising price of fossil resources. The Global Strategy for Green Asia is a flexible approach based on socially, industrially, and economically independent development that has arisen from within Asia and Oceanic history and culture. Such approach with a strong global network generates a synergistic effect between greening and growth.

2. Modification and Improvement

2.1. Development of the Management Organization

In our initial plan, we designed the management organizations as shown in **Figure 1-3**. Several months after starting the Green Asia Program, however, we have observed that maintaining a large number of separate committees is an ineffective way to oversee different topics on Green Asia education, and thus we have modified the management organizations as shown in **Figure 1-4**. The new approach gives high priority to the Academic Affairs Committee and establishes related working groups. This change makes it possible to manage the Green Asia Program effectively, mainly by reducing the number of unnecessary meetings.

2.2. Admission in 2012

We had initially planned to start our first program course on November 1, 2012. However, we instead had to grant tentative admission to students at that point because the examination for admission did not take place until November. The course then officially started on December 1 (see **Appendix 1**).

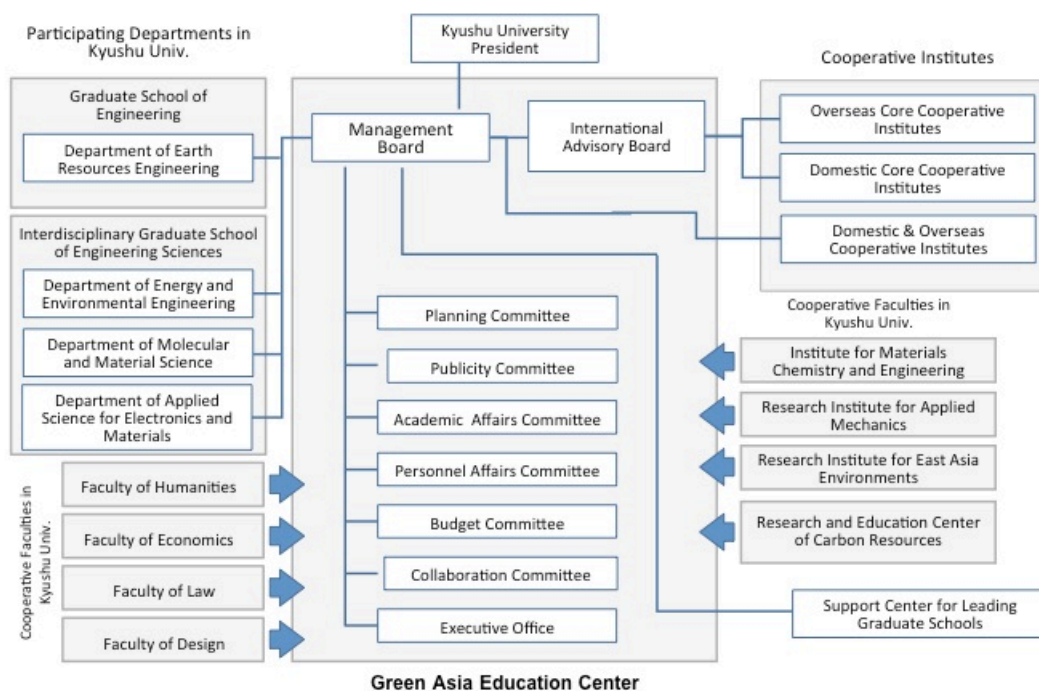


Figure 1-3. Management Organization in the Initial Plan

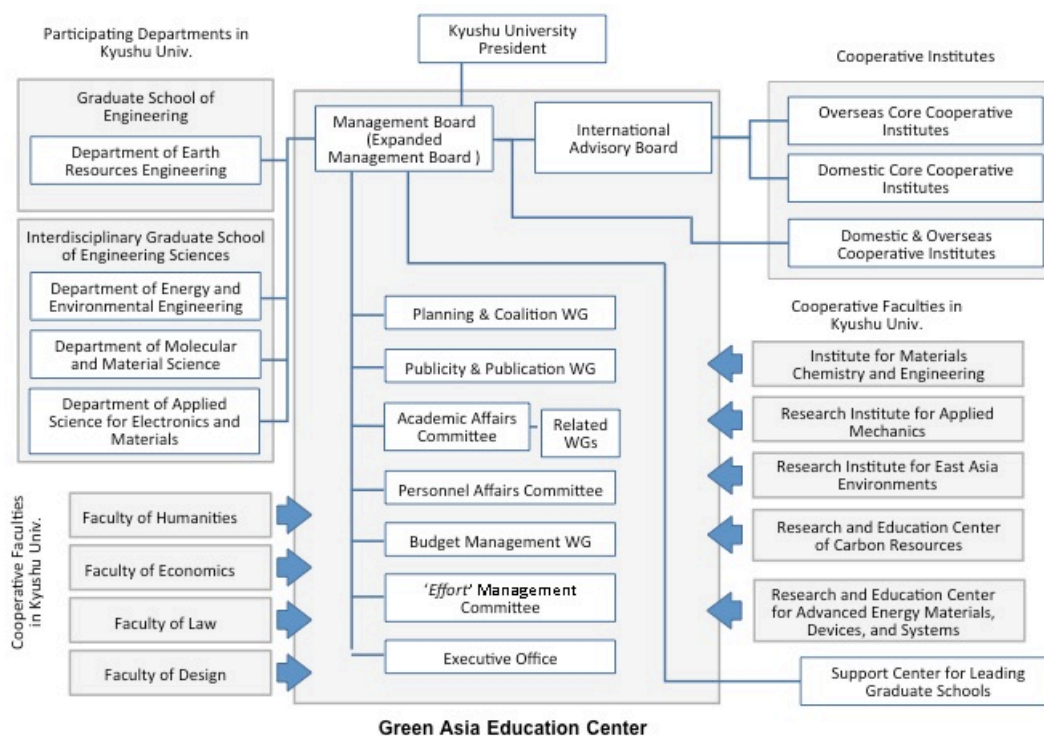


Figure 1-4. Modified Management Organization

Seven applicants took the admission test in 2012, and six of them passed. In our initial plan, we intended to accept fifteen students as the first batch. However, because there was not enough time to

announce and introduce the program to students, we did not make an effort to force the number of students up to a particular quota, and instead focused on starting the course with an adequate number of qualified students.

2.3. Faculty Members

We initially planned to engage twelve faculty members (special project) (four professors, four associate professors, and four assistant professors). As of May 2014, two professors, one associate professor, and seven assistant professors belong to the Green Asia Education Center as staff of the Laboratory of Special Fixed Term Faculty in the Interdisciplinary Graduate School of Engineering Sciences or the Office of Special Fixed Term Faculty in the Graduate School of Engineering.

3. Establishment of the Administrative System

3.1. Green Asia Education Center

The Green Asia Education Center was established as the organization with the responsibility of implementing the Green Asia program on December 1, 2012. The preparatory committee for this center was launched previously.

3.2. Rules

The relevant rules and regulations of Kyushu University, its Graduate Schools, and the Green Asia Education Center that govern the Green Asia Program have been newly adopted or changed as follows (**Appendixes 2-9**):

Regulations for Kyushu University

- Regulations of Kyushu University; Article 13
- General Regulations of Graduate Schools of Kyushu University; Article 17
- Regulations for Kyushu University Program of Leading Graduate Schools
- Regulations of Green Asia Education Center
- Provisions for the Financial Allowance of the Program for Leading Graduate Schools of Kyushu University
- Rules for Tuition Support for Students of the Kyushu University Program of Leading Graduate Schools (リーディングプログラム学生に対する授業料援助制度)
- Rules for Assistance in the Use of the Facilities at Kyushu University by Special Education Programs (特定の教育プログラムが学内施設等を利用する際の支援について)

Regulations for the Interdisciplinary Graduate School of Engineering Science

- Regulations of the Interdisciplinary Graduate School of Engineering Sciences of Kyushu University (「九州大学大学院総合理工学府要項」平成 25 年 4 月版)
- Report on the Establishment of the Special Education and Research Course (特定教育研究講座の新設等に係る報告書)
- Plan for the Establishment of the “Global Strategy for Green Asia” Course at the Interdisciplinary Graduate School of Engineering Science (【総合理工学府】コース新

設計画書(グリーンアジア国際戦略)

- Qualification as a Faculty Member and Tutor/Mentor at the Interdisciplinary Graduate School of Engineering Science (総合理工学府における教員資格, 指導教員などについて)

Regulations for the Graduate School of Engineering

- Regulations of the Graduate School of Engineering of Kyushu University
- Report on the Establishment of the Special Education and Research Course (特定教育研究講座の新設等に係る報告書)
- Plan for the Establishment of the “Global Strategy for Green Asia” Course at the Graduate School of Engineering (【工学府】コース新設計画書(グリーンアジア国際戦略))

Regulations for the Green Asia Education Center

- Green Asia Education Center: Internal Regulations regarding the Use of Library Facilities
- Green Asia Education Center: Internal Regulations for lending Laptop Computers
- Program for Leading Graduate Schools Financial Allowance System

4. Consideration and Response

The considerations that were pointed out when Green Asia Program was adopted in 2012 or when the progress was checked on June 5, 2013 and the responses to them are as follows:

- It is extremely important to recruit outstanding students to enable this program to run smoothly.
➔ To recruit outstanding Japanese students, we have strengthened our effort to promote entrance examination-orientation meetings. As for international students, we have sought to foster an understanding of the program and obtain recommendations of outstanding students by visiting individual partner universities, in addition to improving our English website. The effectiveness of our effort is measured by the number of applicants in the next year.
- Along with ensuring that students do not become overburdened, consideration must be given to those students who are expected to face difficulties in completing the program.
➔ To ensure that students do not become overburdened, we have put a system in place, in which teaching staff for specific projects act as mentors, and we have expanded the range of venues at which course the students and teaching staff can exchange views, such as Afternoon Colloquium. Thus far, students have not complained that they are overburdened.
- In developing the Green Asia program and leaders to take charge of it, we must consider whether there is a sufficient level of contribution from the humanities toward understanding the current status of environmental problems in Asian economies and societies.
➔ In addition to hiring two teaching staff for specific projects in the humanities (law and social sciences) and investigating the content of lectures, we have been holding continual

mini-seminars (Afternoon Colloquium), to which we invite guest lecturers from related humanities departments in the university and have established a system that should give students a multifaceted understanding of the current status of environmental problems in Asian economies and societies.

- It is important to ensure that students in this program are given a clear idea of what makes an ideal leader and potential career paths.
- ➔ Students are given a clear idea of what makes an ideal leader and of potential career paths through materials used at the time of application and interviews. However, even those responsible for the program have yet to reach a clear consensus as to the science and technology needed for the realization of Green Asia, or as to the leadership qualities that will enable people to make effective use of these capacities. Plans are in place to launch initiatives aimed at establishing a Green Asia industrial studies program and at clarifying the types of leaders who would be instrumental in such an effort, while consulting with businesses and other collaborating parties throughout Asia.

- Given the lack of collaboration with Europe and America, I have concerns over international standardization and efforts to promote the program's results.
- ➔ While eliciting collaboration with Europe and America has not been emphasized, we are also planning to offer destinations in Europe and America for International Internship. The companies involved have highlighted the importance of international standardization, which, along with promoting the program's results, is one of the future challenges that we face. In this regard, the relevant subjects have been incorporated into the program (such as Industrial Systems course).

- It is not clear what type of education is in place to construct a system for creating and realizing added value from green engineering.
- ➔ Education on how to construct a system that realizes added value from green engineering is a key part of developing multifaceted perspectives of science and technology rooted in the humanities and social sciences, such as economics. While currently at a trial stage, plans are in place to present this feature as a concrete educational component once the program is completed.

- Although students are not required to compose a master's thesis, students in some laboratories are in effect required to submit one. Further consideration is needed with respect to understanding the current situation and presenting a unified response.
- ➔ Following detailed discussions with both graduate schools and the related 4 faculties, it was felt that, from an educational standpoint, it would not be in the best interest to exclude only students taking this track from having to present a master's thesis in related majors. As such, the following measures were put in place. First, it was decided that students would create something equivalent to a master's thesis by organizing the results of their research based on

reports submitted in Fundamental Researches (I), (II), and (III) in laboratory rotation and having these bound in a single volume. Then, a Green Asia section was established in the master's thesis presentation sessions for each major, during which students would present their papers in English.

- International students often have strong professional aspirations; therefore, care must be taken to ensure that this program meets their expectations. Policies must be in place to promote the recruitment of students who have a good understanding of the program's purpose.
- ➔ We are advertising the program through posters, fliers, information sessions, and other such means. In particular, our website provides a comprehensive and easy-to-understand overview of the program's characteristics and goals, along with the types of activities in which course students are engaged.

- The program aims to develop global leaders in industry, academia, and government, but most of these students aspire to become researchers. It would be beneficial to subject their career paths to scrutiny and, if necessary, give them appropriate guidance.
- ➔ We provide guidance regarding cutting-edge career paths in industries that enable students to utilize their research skills developed during the doctoral courses. We do this through lectures on topics such as industrial practices and through events such as Afternoon Colloquium. The purpose of the GA Program, in which students cultivate knowledge relating to a wide range of environmental issues outside the scope of their specialty, becomes more apparent as students progress through the course, such as through the composition of Green Asia papers (which require connecting social or industrial sectors to the student's own area of specialization).