

6th ASCENT AFTER REPORT

13 Mar. – 23 Mar. 2015
Tokyo, Japan



Student Association for
Global Exchange in Tokyo Tech

Acknowledgement

We have immense pleasure in successful completion of this program titled “6th Asian Students Collaboration Encouragement Program in Technology -6th ASCENT-”.

The special thanks to the fundamental supports extended for the program, by Tokyo Tech Fund and Office.

A special note of thanks to Prof. Nishihara, a supervisor of SAGE, Prof. Hirakawa, a consultant, Mr. Tsugihiko Shimura and Prof. Hope, supporting advisors.

We also feel grateful to International Affairs Division of Tokyo Institute of Technology, Chulalongkorn University, De La Salle University and Bandung Institute of Technology for supporting this program.

We greatly appreciate to all the cooperating organizations, companies and laboratories below (put in order of visit, lecture):

- Companies / Institutes

NEDO (New Energy and Industrial Technology Development Organization)

Neo Morgan Laboratory

TOSHIBA Corporation, Keihin Product Operations

TOKYO GAS Co., Ltd, Yokohama Laboratory

- Laboratories in Tokyo Tech

Ihara Lab., Department of Chemistry

Egashira Lab., Department of International Development Engineering

Hara Lab., Department of Innovative and Engineered Materials

- Lecturers

Mr. Hiroyasu HORIO, Director General for International Affairs, NEDO

Prof. Tom Hope, International Student Center, Tokyo Tech

Abstract

1. What is ASCENT?

ASCENT stands for Asian Students Collaboration Encouragement Program in Technology, and is one of the international exchange programs in Asia. This program aims to establish further international networks among students in Asian countries by studying and discussing worldwide problems in recent years and leading edge technologies as considering Asian industry together. ASCENT is held in Japan about 10 days every March and contains company visiting, laboratory visiting in Tokyo Tech, special lecture, group discussion, presentation and more on the settled theme.

2. Motivation

ASCENT was first held in March 2010 by Student Association for Global Exchange (SAGE) in Tokyo Tech (Tokyo Institute of Technology), one of the top universities in the world, by the alumni of JAYSES (Japan-Asia Young Scientist and Engineer Study Visit) program which is organized by International Office of Tokyo Tech from 2007 and now the predecessor of Tokyo Tech-AYSEAS (Tokyo Tech-Asia Young Scientist and Engineer Advanced Study) program. Whereas Tokyo Tech students visit other Asian countries in JAYSES program, ASCENT welcome students from Asian countries to Japan and introduce Japanese technologies, researches and cultures, complementing the existing student networks. ASCENT aims to strengthen the connections more and to lead Asian development of economy and technology in the future.

3. Outline

Theme:	The Future Image of Energy
Date:	March 13th (Fri) 2015 - March 23th (Mon) 2015
Place:	Ookayama campus, Tokyo Institute of Technology, Japan
Universities:	Tokyo Institute of Technology (Tokyo Tech / Japan) Chulalongkorn University (CU / Thailand) De La Salle University (DLSU / Philippines) Bandung Institute of Technology (ITB / Indonesia) University of Indonesia (UI / Indonesia) Diponegoro University (UNDIP / Indonesia)

4. Schedule

Date	Activities	Place
Mar. 13 (Fri.)	Welcome Party	Iidabashi
Mar. 14 (Sat.)	Opening Ceremony, Pre-study Presentations, Discussion	Ookayama Campus
Mar. 15 (Sun.)	Special Lecture (NEDO) Cultural Exchange Party	Ookayama Campus
Mar. 16 (Mon.)	Neo-Morgan Laboratory visit	Mizonokuchi
Mar. 17 (Tue.)	TOSHIBA visit TOKYO GAS visit	Yokohama
Mar. 18 (Wed.)	Presentation Lecture, Discussion	Ookayama Campus
Mar. 19 (Thu.)	Lab visits, TSUBAME visit, Discussion	Ookayama/Suzukakedai Campus
Mar. 20 (Fri.)	Interim Presentation, Discussion	Ookayama Campus
Mar. 21 (Sat.)	Final Presentation Closing Ceremony, Exchange Party	Ookayama Campus
Mar. 22 (Sun.)	Sightseeing Farewell Party	Mt. Takao

5. Companies, Institutes, Laboratories and Lecturers

Companies/ Institutes	Neo Morgan Laboratory TOSHIBA Corporation, Keihin Product Operations *In order of schedule TOKYO GAS Co., Ltd. Yokohama Laboratory
Laboratories	Ihara Lab. (Dept. of Chemistry) *In order of schedule Egashira Lab. (Dept. of International Development Engineering) Hara Lab. (Dept. of Innovative and Engineered Materials)
Lecturers	Mr. Hiroyasu HORIO (Director General for International Affairs, NEDO) Associate Prof. Tom Hope (International Student Center, Tokyo Tech)

6. ASCENT committee



Student Association for Global Exchange

Email: sage.tokyo.tech@gmail.com

Website: <http://www.siengp.titech.ac.jp/~sage/>

Facebook page: <https://www.facebook.com/sage.titech>

Twitter: @SAGE_TokyoTech

Staffs (2014-2015)

Consultant	Prof. Yahiro Hirakawa (International Student Center, Tokyo Tech)
Supervisor	Prof. Akinori Nishihara (Dept. of Human System Science, Graduate School of Decision Sciences, Tokyo Tech)
Advisors	Prof. Tom Hope (International Student Center, Tokyo Tech) Mr. Tsugihiko Shimura (Project Specialist, International Exchange Group, International Affairs Department, University of Tokyo)
Student members	Leo Hiramoto (Representative), Tomoki Ishimaru, Shingo Kato, Kou Lee, Takuya Niioka, Keisuke Okumura, Ryohei Suzuki, Yuki Taoka, Miku Ueoka, Shangze Wu, Li Xiuyang, Chieri Yabu, Fumika Yamaguchi

7. Participants

University	Name	Nick name	Nationality	Semester
Tokyo Tech	Ayaka Saito	Ayaka	Japan	B8
	Daisuke Kikuchi	Daisuke	Japan	B8
	Takahito Ayabe	Taka	Japan	B4
	Timothy Alexander Tandian	Timmy	Indonesia	M1
	Yuka Morimoto	Yuka	Japan	B6
	Yuki Tokunaga	Yuki	Japan	B6
	Yuko Kuroki	Yuumin	Japan	B4
CU	Chaiyathat Lee	Oat	Thailand	M1
	Natthapatch Ratanachaijaroen	Mint	Thailand	B3
	Supidsara Thantanaporn	Mink	Thailand	B1
DLSU	Joshua Collado	Joshua	Philippines	B8
	Paul Vince Arcena Abe	P.V.	Philippines	B6
ITB	Aditya Luhut Sibarani	Luhut	Indonesia	B7
	Ferdi Pangestu	Ferdi	Indonesia	B3
	Karizki Hadyanafi	Kariz	Indonesia	B9
	Seshana Junisa Aviananda	Ai	Indonesia	B7
	Tjan, Marco Orlando	Marco	Indonesia	B3
UI	Suci Fadhilah	Suci	Indonesia	B6
UNDIP	I Gusti Agung Aditya Surya Wibawa	Adit	Indonesia	B7

Activity report

6th ASCENT program contains not only discussion on the theme, but also other activities such as company visit related to “The Future Image of Energy”, lectures, campus tour in Tokyo Tech, and exchange parties. Those activities could be the wonderful opportunities for participants to communicate each other, know our cultures, learn and get more interesting in something.

Activities		Writers
Pre-study	Japan	Taka
	Indonesia	Ai
	Thailand	Mink
	Philippines	Joshua
Special Lecture (NEDO)		Luhut
Cultural	Japan	Yuki
Exchange Party	Indonesia	Ferdi
	Thailand	Mint
	Philippines	P.V.
Company visit	Neo Morgan Laboratory	Marco
	TOSHIBA	Suci
	TOKYO GAS	Daisuke
Presentation Lecture		Timmy
Lab visit	Ihara Lab.	Ayaka
	Egashira Lab.	Yuumin
	Hara Lab.	Oat
TSUBAME visit		Adit
Final Project		Kariz
Sightseeing		Yuka

Pre-Study Presentation (Japan)

Taka (Tokyo Tech)

I will explain what I learned through the pre-study for presenting energy issues in Japan. I have learned two things. First one is the contents of the presentation, second one is how to present others.

Firstly, we have prepared a lot of slides to tell energy problem in Japan. We've learned the way Japan use energy and history about Japanese energy producing. Almost of all contents had already imputed in my knowledge, but it was fresh things for me because we had to use English to explain.

Secondly, we've learned the way of telling something. When we make slides, we have to care about the order of the information. We gathered about 3 times for preparing presentation and we mainly discussed order. It was really difficult to think about that. Firstly we don't plan to insert history slides, but we changed our stance to make them understood easily.

These two things are very important to make presentation using power point. Even if it is Japanese, it must be hard work, so this opportunity to make slides in English was really novel for us Japanese team.

Pre-Study Presentation (Indonesia)

Ai (ITB)

Pre study aims to introduce our country, both on general information and culture, and also our universities itself. Besides, pre study would help us to learn more about the energy condition in our country before doing further discussion about energy in larger scope with other participants in ASCENT.

Indonesian members in 6th ASCENT came from 3 different universities which is Institut Teknologi Bandung (ITB), Universitas Indonesia (UI), and Universitas Diponegoro (UNDIP). All these universities are located in Java Island and belong as the top universities in Indonesia.

As an archipelago which is located in the equator zone, Indonesia with more than 13.000 islands spanning from Sabang to Merauke contained cultural diversity supported by the vast natural resources wealth and biodiversity. Nowadays, Indonesia still reliance their primary source of energy from coals and fossil fuels. Access to electricity, as the basic human needs, is one of the main energy issues in Indonesia while Indonesia has

so many energy resources and reserves scattered all over Indonesia. Also subsidiary issues and limitation of domestic infrastructure are the other energy problem in Indonesia. Moreover, Indonesia has very large potential in renewable energy, such as geothermal, hydro power, solar power, wind power, and biomass, which haven't been exploited well up until now. Therefore, Indonesia needs to develop its potential renewable energy.

Pre-Study Presentation (Thailand)

Mink (CU)

1. About Thailand

Firstly, We talked about some facts about Thailand. For example, The population is 66.5 million. Then, it is about interesting places in Thailand. For the capital of Thailand, Bangkok, there are many popular places for shopping like Siam Paragon and Asiatique.

In Bangkok, The traffic is not so good especially in rush hour. We have the well known transport called tuk-tuk which many foreigners come to try this. About Thai food, you will never be hungry if you are in Thailand. We have many popular dishes. For example, Tom yum koong.

2. Chulalongkorn university and faculty of engineering

Chulalongkorn University is Thailand's first institution of higher education founded in 1917 by King Vajiravudh. Consists of 18 faculties, three schools, three colleges and six institutes, including 10 international programs. Students have to wear uniform. The campus is located in the heart of downtown Bangkok. For the faculty of engineering, it is the one of the first founding faculty of Chulalongkorn university which is the leading research institute in the field of Science & Engineering in Thailand.

3. Energy situation in Thailand

u Thailand rely heavily on importing fossil energy from neighboring countries and domestic reserves is declining.

u Global price of fossil fuel is fluctuating, and political instability in the region also affect policy of the government.

u Promotion of renewable energy source to replace fossil fuel source following Renewable Energy development Roadmap for Solar power, Hydropower, Biomass, Wind utilization.

Pre-Study Presentation (Philippines)

Joshua (DLSU)

The Philippines is a country composed of more than 7,000 islands with a population of about 100 million people. Its economy originally depended on the fertility of its lands and the richness of its oceans making it an agricultural country, but nowadays its economy is now inclined towards the services and manufacturing industries.

As a developing nation with an aggressive market and economy, its promising future all depends on energy just like with anywhere else. As its market rises, the country consumes energy exponentially delivering a blow to the country's energy resources. In order to cope with the problem, it is either the country turns to alternative solutions in creating renewable energy or the country imports more fuel but will hamper the growth of its economy.

This year, certain cities in the country suffered from rotational brownouts, which were implemented by energy resources authorities to save on electricity.

With the goal of conserving and producing renewable energy, JICA has partnered with Cebu city to convert its wastes into energy, which are now being used to provide lighting for nearby communities. Also, DLSU and its student body have been promoting energy conservation through its partnership with One Million Lights Philippines with a mission to "Improve the daily lives of children and adults by providing clean and healthy lighting by distributing safe, rechargeable solar lights around the world, replacing dangerous and polluting kerosene lamps." There are several other energy programs being carried out in the country, be it small-scaled or big-scaled projects, and hopefully the Philippines, together with the whole world, may find a way to power our lives with reliable and sustainable energy that is friendly to our environment.

Special Lecture (NEDO)

Luhut (ITB)

NEDO is a government organization that undertakes the development of new energy and energy conversion technology, verification of technical results, and introduction and dissemination of new technologies. It combines the efforts of industry, government, and academia, and leverages established international research networks, to eventually contribute to the resolution of energy and global environmental problems and further enhancing Japan's industrial competitiveness.

Prof. Hiroyasu Horio from Kyushu University represented New Energy and Industrial Technology Development Organization (NEDO) to give us a very important lecture about the future image of energy. He opened the lecture with question about which disaster that will cause holocaust to humanity. Is it nuclear leak or explosion? Emerging virus? War? Terrorism? Or climate change? Though all those threat are possible, in this lecture, he focused the discussion on prevention of climate change. The main cause of climate change was CO₂ emission. He introduced a conceptual CO₂ emission equation as follow. P represents population, S represents service per person, E represents efficiency, and C represents conversion of emission.

$$CO_2 = P \times S \times E \times C$$

The first two variables, population and service, belonged to economy issue and the later two, efficient and conversion, belonged to technology issue. Increasing population and service of energy per person will increase the emission of CO₂. On the other hand, the increasing performance on energy efficiency and higher conversion rate of emission will decrease the CO₂ emission. Therefore, the supply and demand of energy that resulted in CO₂ emission and revolved around economy and technology issue will need total effort not only from nations government, but also companies and society. Some of NEDO's current projects were smart grid project, Zero Energy Nano (ZEN) building project, and electric vehicle project.

At the end of the lecture, Prof. Hiroyasu Horio challenged us to define our own idea of the future image of energy, especially in our own country, that brought us to the next sessions of 6th ASCENT. All in all, I really enjoyed the lecture and wished that we had more discussion time since he was so inspiring and thoughtful throughout the lecture.

Neo Morgan Laboratory

Marco (ITB), Timmy (Tokyo Tech), Oat (CU),
Joshua (DLSU), Kariz (ITB)

1. Introduction of Company

Neo Morgan Laboratory Incorporated is one of the biotechnological research companies developing technologies for continuous human progress in an environmentally sustainable manner. Its main businesses are to conduct research and development of breeding useful microbes, develop useful substances by means of micro-organisms, and consult breeding and fermentation technologies. Neo-Morgan

Laboratory Incorporated has three main projects: Bio-energy, Bio-material, and other business fields. In Bio-energy project, the main objective is to develop the yeast, which produces bioethanol, especially Xyno™, one kind of unique yeast with high efficient ability to produce ethanol from biomass waste. Furthermore, this company pursues further improvement of fermentation efficiency by adaptation of such yeasts. In Bio-material project, Neo-Morgan Laboratory's development themes are creating microbes which can contribute to fermentation field, adapting them to severe fermentation environment, and improving enzyme reaction efficiency by using such microbes. With these researches and endeavors, Neo-Morgan Laboratory aims to produce plastic material made from waste materials. In other business fields, Neo-Morgan Laboratory is working in the fields related to our daily life such as fermentation drug, fermented functional foods, and also cosmetics.

2. What We Learnt

In Neo Morgan Laboratory visitation we had a company tour consisting Spirullina sp. production and Xyno™ cultivation process. In Spirullina sp. production tour, we were informed about the strength of Spirullina sp., which is the high percentage of protein in its product. Spirullina sp. is freshly stored and so that it has low number of nutrients loss. In addition, Spirullina is so tasteless that it can be mixed with our preferred meal such as yoghurt, tea, etc. However, Spirullina sp. product still has green color. Perhaps in the next development Neo Morgan Laboratory can make Spirullina sp. product colorless as some people probably don't like the green color of this product. Spirullina sp. is now commercially sold, but instead of being sold to consumers directly, it is sold via business to business. In Xyno™ cultivation process tour, we were told about the percentage of oil contained in bacteria, which is around 90%. Also, we were informed about how to increase solidity of Xyno™ and chemistry process to make the yeasts float in the surface of the water. This process will make the process of filtering yeasts from the water become easier and reduce the cost of filtering. Recently, Neo-Morgan Laboratory planned to implement large-scale of Xyno™ cultivation in Asia. However, Neo-Morgan is still engaging local government, as the large-scale cultivation of Xyno™ requires a very wide area.

Overall, we learnt that energy problems are not solved only by developing conservative engineering projects related to energy, such as petroleum engineering,

gas engineering, and so on, but biotechnological field can also take a part. In Neo-Morgan Laboratory, we are reassured that biotechnology could have an important role in the future image of energy. Xyno™ ability to produce oil is just one example of biotechnology role in overcoming energy problem. We hope to see other developments of biotechnology in the future image of energy.

TOSHIBA

Suci (UI), Ayaka (Tokyo Tech), Yuumin (Tokyo Tech),
Mint (CU), Ferdi (ITB)

Introduction

What is the first thing that you will imagine when you heard the name “TOSHIBA”? PCs? Laptops? Air conditioner? Or washing machine?

TOSHIBA is very popular in our countries. Most of our electronic devices and home appliances are produced by TOSHIBA, including Ferdi and Ayaka’s laptop. Yes, probably almost everyone think that TOSHIBA is only focusing their products in electronic devices. But the fact is, they are not.

TOSHIBA, Keihin Factory is one branch company of TOSHIBA that is focusing their product in technology that related to energy production. It is located outside the Honshu Island, Tsurumi. We went to Toshiba Keihin Factory on 17th March 2015.

Research Coverage

In Toshiba Keihin Factory, Toshiba focus on their research in technology innovation and production that support energy issues. Two of their current projects are new hydroelectric power stations and GE power systems. One of Toshiba Keihin’s main products I turbine system that is used for generating electricity. Turbine usually used in hydropower plant and geothermal.

Toshiba Keihin also used to produce turbine for nuclear power plant. But, because nowadays Japan is no longer using nuclear energy to support their energy demand, Toshiba Keihin is trying to focus on three other reusable energy sources: Wind, Solar, and Water. Therefore, they are now also doing researches to develop wind, solar, and water power plant. The goal of Toshiba Keihin is for making sustainable society by supporting it to get a sustainable energy.

Impression

In our visit to Toshiba Keihin, we were invited to see the process of how Toshiba make their turbine system. Toshiba Keihin Factory is so clean, neat, and of course very huge. Even though the process in making turbine is somehow quite difficult and complex, Toshiba Keihin's staffs tried their best to explain it to us. We learnt a lot of new things that day, they are very precious knowledge that probably cannot we get from another event except this 6th ASCENT. When we saw the turbine made for Indonesia (Suci and Ferdi's country), it is a proof that we can't stand alone in solving problems, we need help from others and collaborate to make a better world.

Tokyo GAS

Daisuke (Tokyo Tech), Yuka (Tokyo Tech), Yuki (Tokyo Tech),
Mink (CU), Ai (ITB)

1. Introduction

Tokyo Gas Co, Ltd founded in 1885, is the primary provider of natural gas to the main cities of Tokyo, Kanagawa, Saitama, Chiba, Ibaraki, Tochigi, Gunma, Yamanashi, and Nagano. The number of customers is more than 11 million. Main businesses are production, supply and selling of gases, energy and electrical service, and construction for gas supply. At Yokohama Research Institution we visited, Fundamental Technology Research Institute, Energy System Research Institute and Smart-meter & ICT Development Center are working together to develop unique technologies, including key technologies, so that they develop an a comprehensive energy company in the future. Main research areas are combustion and explosions, earthquake-resistant evaluation, hydrogen production, biomass and so on.

2. What we learned

What we observed mainly are PE Pipe Technology, Ene-Farm, and Biomass Technology. PE (Poly-Ethylene) Pipe Technology is applied to develop reliable pipe materials. With Noncorrosive property and lightweight, it exhibits a tensile elongation approximately five times as the original dimension, providing excellent earthquake-resistance performance. The application has increased since this kind of pipe had little damage when the 2 biggest earthquakes in Japan happened. They use EF (electro fusion) method to connect each pipe, which is very easy and secure.

Ene-Farm is the system that can produce both electricity and warm water with city gas for household. Ene-Farm includes the unit of fuel cells and one of the water storage. Heat generated in the fuel cell is collected to make water warm. The efficiency of energy usage is up to 85.8% and the amount of CO₂ reduction is about 1.3t per year. In terms of Biomass Technology in the institution which is for producing biogas, its raw materials are not only seaweeds or food wastes but also sewage sludge. In the former, the methane fermentation reaction produces the biogases. In the latter, we get the biogases by burn biomass under low density of O₂. These kinds of biogases are mixed with the stable city gas, which lead reduction of energy and economic costs.

Cultural Exchange Party (Japan)

Yuki (Tokyo Tech)

In the cultural exchange party, we Japanese group prepared Tea ceremony for oversea students. Actually, because we were not so familiar with Japanese traditional tea ceremony, we had needed to learn about it before planning the party. Furthermore, the ceremony's manners are too complicated to teach others. We practiced tea ceremony in advance and also practice Ayatori, which is a Japanese traditional game, for extra time of cultural exchange party. Unfortunately, since we did not have extra time for explaining Ayatory in the party time, we introduce it in transit time or other free time. I was so nervous because I was in charge of Japanese presentation, however really glad to introduce one of the best Japanese cultures and wish everyone could enjoy it.

On the other hand, I was so surprised that all other groups prepared own cultural presentations very well. They brought many things, for example their traditional clothes, food, souvenirs and so on, and practiced and prepared their dances, slides, games and a play! This event was much more enjoyable than I though and we could know each culture through it.

Cultural Exchange Party (Indonesia)

Ferdi (ITB)

In this culture exchange session, we presented some of unique culture of Indonesia. We presented about Traditional dance, traditional food, folksong, and traditional clothes. The concept of Indonesian team in this culture exchange session is Suci the Explorer of Indonesia. Suci walked around Indonesia and visited some places in Indonesia and

tried to find out their unique culture and we also explained some of traditional site in Indonesia. We could see the beauty of Indonesia here. Started from the west of Indonesia Ai and Luhut show the wonderful of Sumatra (The Island in West Indonesia). Luhut showed us traditional dance from North Sumatra, Tor – Tor Dance accompanied by its music. He also used traditional clothes called Ulos, very famous traditional cloth from Indonesia. Same with Luhut, Ai performed an attractive dance from west Sumatra, Plate Dance or Tari Piring in Bahasa Indonesia. And she danced beautifully. From Sumatra we went to Java. We shared the sweet taste of traditional Java food called Dodol. It made from sugar, squeezed milk from coconut and other traditional ingredient. After we tasted the food Ferdi performed traditional dance from west java called mask dance. Using his unique batik ferdi used artistic mask while dancing. Next, we went to Bali, the most popular place in Indonesia and also for the foreigner. Adit as a Balinese featuring with Ai, Marco, Ferdi, Luhut, and Kariz, performed the famous traditional dance from Bali, Kecak Dance. Lastly, we went to the east part of Indonesia, Papua. Kariz performed Sajojo Dance and he invited all the participants including the committee to join the dance. Everyone looked confusing but they also looked enjoy the dance. To end the culture exchange from Indonesia, we asked all of participants and committee to do Poco – Poco Dance. The dance was easy to be followed. Ai act as the leader of the dance and all of the people enjoyed the dance. After that, we gave souvenir for all participants and SAGE staff. We gave batik pocket, Indonesian money and Dodol. Everyone looked so happy. We really enjoy this session.

Cultural Exchange Party (Thailand)

Mint (CU)

Cultural Exchange is one of the objectives of this ASCENT program because this program is included the students from three Asian countries; Thai, Indonesia and Japan. These three countries have different cultures and life styles. Fortunately, SAGE staffs had arranged lots of activities that gave us opportunities to exchange our cultures. For example, pre-study presentation that included the information about each countries, exchange party and etc. Moreover, we also shared room with two Indonesian girls.

I have learned so many things about Japan and Indonesia from this two weeks participating in ASCENT. For Japan, I always love to know about Japanese cultures and traditions but for this time I got to know and work with Japanese people which I haven't

done before apart from just sightseeing in Japan. I found that Japanese people are so punctual and dedicating. They are also hard working and inspiring. For Indonesia, after I have acquainted with the Indonesian students. I would say they were so intelligent and great-English speakers. They had great sense of humor and fun to work with.

For Thailand, we taught everyone the thai traditional greeting gesture called “wai”, which thai people do the movement and say “Sa-was-dee” means “Hello”. In thailand, we have our own currency called baht and have our pwn Thai language including alphabet. We showed and taught everyone how to do thai traditional dance called “Fon-rum” was performed along with thai traditional music. We also taught everyone how to make nail decoration that thai people use to wear during "Fon-rum" dance performace. We usually do it for all 10 fingers, they are made out of gold paper that is folded in to cone shape. We also introduce some famous and interesting facts and figures of Thailand such as it is about 500,000km² big with a population of about 70 million. Moreover, we showed everyone the famous places in Bangkok, the capital city, such as Siam Paragon Mall, The Asiatique riverside market, JJ local market, and floating market. “Tuk-tuk”, the most famous and well-known 3-wheels car ride in Bangkok city was also presented along with the roller-coaster motor bike ride. Thai food and desserts such as tom-yum, papaya salad, and sweet sticky rice with mango were also shown.

Overall, I am so happy and blessed to get to know all of the students from different countries and their traditions and cultures. One day, I hope to come back and visit Japan again. Also I wish to travel to Bandung, Indonesia where I have never been before. It would be so nice to meet all the people from ASCENT again and set up a reunion party. Moreover, if any of the students plan to visit Thailand, all the Thai students are ready to be your guides and show you around.☺

Cultural Exchange Party (Philippines)

P.V. (DLSU)

The third day of ASCENT marked the cultural exchange party. It was an avenue to showcase the uniqueness of one culture through traditional dance, games and ceremonies. All is done in order to deeply engage and immerse the participants with one another in having a glimpse of each country.

Philippines showcased a neo-cultural game called Pinoy Henyo. It was popular game

that involved guessing a word within two minutes. Gathered in dyads per country, the guesser shall ask questions, and the answerer shall only speak the yes, no and maybe. Team JAPAN won the game in roughly 30 seconds with the word being Tomoki from SAGE! Another game was Concentration. Each participant was assigned a number and each has to call another with a rhythm accompanied. And it showed how competitive each country is!

In all these, I felt blessed to have experienced all these. Seeing the similarities and differences of cultures remind us of how much we should take care of our own culture. Because, it defines who you are. And that is what I learned from this activity: experiencing diversity.

Presentation Lecture

Timmy (Tokyo Tech)

Professor Tom Hope opened his lecture by asking the difference between presentation and speech. Speech and presentation are similar in their nature as public speaking. However, we can see the different of speech and presentation from the tool used. In speech, we can rely on script or small note while delivering the message. While presentation, we rely more on visualization rather than a long script that we read for whole presentation. Thus, in the lecture, Prof. Hope put emphasize on how to plan the overall presentation as well as how to design the content of slides. Here I would like to mention several remarkable points from Professor Tom Hope's lecture.

1. Key message

This is the first thing that we need to do. This is what we want to convince our audience. It is useful to list the key message as 1-3 sentences. Based on key message, we can develop the structure/outline of presentation, and keep the topic/discussion under the right track.

2. Mind your time

Time management is a hard thing. Sometime we make mistake by putting too much slides or talk too much. So, the key for managing time is not only lie when the presentation is being delivered, but also before the presentation – when we design the slides.

3. More picture, less text

Visualization aid is the main tool in presentation. It is not a bad idea to make one

picture fill the entire slide. Compared to a slide dominated by text, the picture-slide can pull the attention of audience to our voice. The audience don't divide their concentration to comprehend both text and our voice at the same time.

4. Keep eye contact

No body like to be ignored, thus maintaining eye contact with audience is important. If we feel not confident enough to keep the eye contact, we can choose 3 or more audience that are scattered around the room and focus only to them. This way, we can maintain eye contact with entire audience without feeling too much pressure.

5. What do you want to say?

We already decided the key message and deliver it as small partition along the body of presentation. To complete our presentation, we need to make a conclusion and rephrase the summary to audience. By doing this, we can make sure that audience get our message.

6. Practice, practice, practice

"Practice makes perfect", a proverb said. It also true for presentation. The more we practice, the more we can know our favorite mistake, the spot where we can put more emphasize, and moreover we can focus more on making eye contact with audience.

Lab Visit (Ihara Lab.)

Ayaka (Tokyo Tech)

Ihara Laboratory in Department of Chemistry in Tokyo Tech, researches about energy conversion systems. Prof. Ihara is also one of the designers of Energy Environment Innovation (EEI) building, which produces almost enough electricity for itself. We visited there and got some information about EEI building and the researches of Ihara lab.

EEI building is applied some cutting-edge technologies. So many solar panels are attached on its surfaces and generate electricity as much as 650 kW. The angle of each solar panel is optimized according to the usage of the floor having the same height. Not only solar panels, fuel cells and heat pumps are also used in the building. As a result, EEI building produces almost enough amount of electricity to consume by itself and its carbon dioxide emission has reduced more than 60 %. The building like EEI must be useful for environment protection.

I could see apparatuses for making energy devices and a clean room for making solar

cells in Ihara lab. Some of the lab members told us the mechanism of solar cells and solid oxide fuel cells. Frankly speaking, I didn't understand all of it, but I found that it is so complicated and difficult to make them.

Japan has few energy resources and it is promising alternative to apply solar cells for energy generation. However it is needed to do research on this field more and more to get high efficiency and reduce the cost of production.

Lab Visit (Egashira Lab.)

Yuumin (Tokyo Tech)

1. What is Egashira labo?

In Egashira laboratory, they are researching the process of bio diesel product. They use inedible material for producing bio diesel. That means they can avoid competition between food crisis and producing bio energy. They also use shell waste or waste oil to produce glycerol and pyrolysis oil. These contributes 3 goal. One of them is Enhance sustainability and diversification of biomass feedstock. Second, Reduce production cost. Lastly, Improve fossil resource substitution.

2. What I thought through the visit

Actually, I have not thought bioenergy is promising method for solving energy problem. For that reason, I changed my major from biotechnology to social engineering. But when I visited this laboratory and listened to their lecture, I learned that there is research which aims to produce bio energy in efficient way.

Lab Visit (Hara Lab.)

Oat (CU)

The Hara – Kamata research team of Material & Structure Laboratory is investigating the advanced material and catalyst technology that can be employed to increase the performance and efficiency of chemical reaction process. We visited the Laboratory at Susukakedai campus and got introduced to the various ongoing research topics from prof. Hara and Asso. Prof. Kamata. Such as

- Biomass conversion research: development of solid catalyst to increase the yield of normally benign reaction for biomass conversion from lignocellulosic material in chemicals and energy production with water tolerant Lewis acid catalyst for effective conversion of glucose into HMF.

- Ammonia synthesis research: Industrial scale Haber-Bosch process for Ammonia production with conventional metallic catalyst require high temperature and pressure, which accounting for 1% of world's energy consumption. But with high performance catalyst the reaction could undergo at a milder condition.

Which we had the opportunity to experience the actual experiment in the brand new lab facility for ammonia synthesis reaction with the catalyst composed of Ruthenium nanoparticle enclosed in calcium aluminate cage. This technology hold a promising future for eco-friendly pathway for ammonia production if industrialized.

TSUBAME Visit

Adit (UNDIP)

The Lessons Learned:

This technology helps the entire access either academic and non-academic part which took place in Tokyo Tech. With immediate visit to the operations center of the TSUBAME all of participants can find out how the process equipment is operating in. As described in this visit, TSUBAME can be accessed by all students and academic staff in Tokyo Tech. TSUBAME not only able to help the improvement of the education's quality that exist in Tokyo Tech, but TSUBAME also can help the improvement of bureaucratic secretariat field in Tokyo Tech. To advance science by computational modeling and simulations, a large-scale supercomputer TSUBAME was deployed at GSIC in 2006, and has been providing computing and storage resources for research at Tokyo Tech. The machine has also been made available to select projects at outside research institutes and industries. TSUBAME has a peak of 2,288 Tflops and in June 2011 ranked 5th in the world. It was developed at the Tokyo Institute of Technology in collaboration with NEC and HP, and has 1.400 nodes using both HP Proliant and NVIDIA Tesla processors. The name of TSUBAME means swift in Japanese, which is the same meaning as that of the NASA's gamma ray observation satellite "Swift". In addition, swift is adopted in Tokyo Tech's symbol mark. Compared to swift, TSUBAME can change its attitude more rapidly, and it observed polarized x-ray. Base on the presentation in that time, TSUBAME project has three goals. The first one is to demonstrate a student leading system design and to obtain a development principle of several tens kg class satellite. The second goals of the project is to promptly conduct high technology demonstration in orbit. The third goal is to share with space engineering

researchers, students and other enthusiasts the rate experiment opportunities.

Perceived:

With the implementation of TSUBAME at Tokyo Tech, would be better if it could be a reference for the existing campus in Asia to develop their academic field better. This is important because many of the developments which will be felt by developing a system of academic technology. In terms of access to literature that will be easier that will make a systematic study and learning will be more qualified, lecture system will be easier especially in case of communication with the academic staff and also resolve the bureaucratic affairs, as well as several other academic fields development activities.

Final Project

Kariz (ITB)

ASCENT participants were given a final project to propose an original idea about future image of energy. For this task, participants divided into 4 groups. We can create the idea based on what we learned during ASCENT program. The idea will be presented to some professors and invited guests in one session called “final presentation”. Before “final presentation”, we had “interim presentation”, which was a trial presentation where our ideas, slides, and presentation techniques will be evaluated by professor Tom Hope.

First, synthesizing the idea. We had 7 discussion session to create the idea. Earlier discussion session didn't go really well, since we just met each other. But after some days being together, we started to work like a team. Ideas flow freely during discussion, and we managed to collaborate individual's opinions. Finally, each group had their own idea.

Our next job is to present the idea using slides as the media. Thankfully we had a presentation lecture from professor Tom Hope which gave us a new point of view regarding slides. He suggested us to think visually. In order to convince people about our ideas, we need to make it visually convincing by using powerful pictures and eye pleasing design. He also mentioned some presentation do's and don'ts

Suddenly interim presentation day came, which is a day before final presentation. We made the slides in the morning on the same day. During the interim presentation session, in addition to evaluation from Prof. Tom Hope and Ms. Yabu, we also got

evaluation from fellow participants. Each participant had responsibility to evaluate every group's presentation. In common, the evaluation is regarding the visual, and presentation technique and duration.

From the interim presentation to final presentation, each group polish up their slides. Every group managed to pass through the final presentation, although there were some difficult questions asked by the guests. In fact, it was a quite tense situation.

There were many things I learned by doing the final project, from technical issues such as renewable energy sources to non-technical issues such as organizing and presenting ideas. It was a fantastic experience.

Sightseeing

Yuka (Tokyo Tech)

Last day, we went to Mt. Takao using a train. Actually, I got a serious cold and I thought I couldn't join it in the morning, but thanks to messages from friends, I decided to go. I enjoyed so much and got a lot of power from other participants and felt better. I did the best decision.

In the train, Japanese showed Ayatori and taught the way of it to foreigners. At first, it was difficult for them, but they were able to do some magic and make a ladder! After arrived at the station, we climbed up using a cable car and took a lot of pictures together. Then we went to the monkey park and walked in the forest. We enjoyed talking and practicing whistle using own hands. Finally, all participants gathered and started walking to the top. We enjoyed eating dumplings or miso konnyaku and we prayed a lot of times in front of shrines. Sometimes I was asked what is daruma and ojizosan, but I wasn't able to answer because I hadn't thought about it. It became a good opportunity for me to think about Japanese culture carefully. Since we were heading to the top enjoying a lot, it took more than 2 hours. SAGE staffs were so upset because they already reserved a place for farewell party. We had a lunch at the top and went to the fare-well party in a hurry and enjoyed it. We made more and more good relationship each other but it was so hard for us to say good-bye to the others.

Group report

The final goal of ASCENT program is to suggest our ideas/solutions to the problems related to the theme as students who would play a crucial role in the coming future in Asian community. Each group chose their topics and summarized their ideas in reports and presentations, which is held at the end of the program.

Topic/ Title	Group	Writers
Clean Technology of Biomass	A	Taka (Tokyo Tech), Ayaka (Tokyo Tech), Mint (CU), Joshua (DLSU), Ai (ITB)
Exchange of technology & resource for Energy Diversity	B	Daisuke (Tokyo Tech), Yuumin (Tokyo Tech), Mink (CU), Kariz (ITB), Luhut (ITB)
The Power of Milestone for Future Energy in Asia	C	Yuki (Tokyo Tech), Timmy (Tokyo Tech), Ferdie (ITB), Adit (UNDIP)
THE FUTURE OF ENERGY IN A SOUTHEAST-ASIAN PERSPECTIVE	D	Yuka (Tokyo Tech), Oat (CU), P.V. (DLSU), Marco (ITB), Suci (UI)

Clean Technology of Biomass

GroupA: Ayaka (Tokyo Tech), Taka (Tokyo Tech), Mint (CU),

Joshua (DLSU), Ai (ITB)

Introduction

Nowadays, energy becomes a basic need in human daily life. But what happen with our world today? What happen with the energy resources? Both in developed and developing country are mostly using fossil fuels and coals as their primary resources of energy which will be run out in the near future if the energy consumption still be the same like today. Meanwhile, we definitely need energy for the next generation to live. Therefore, we need to convert our baseline of energy resources from coals and fossil fuels to renewable energy yet environmental friendly, which is biomass.

We define the “future” as a time when we no longer rely to coal and fossil fuels as the baseline of energy resources, but renewable energy do. It’s impossible to convert the baseline of energy resources to renewable energy directly in a short time, it’s a long term program with a step-by-step system. We believe that it’s possible to realize this idea in 2050, according to Ecofys’ (energy consulting firm) energy usage prediction.

Biomass

Biomass is the term used for the biological material from living or recently living organisms that has stored energy. As an energy sources, biomass can either be used directly via combustion to produce heat, or indirectly after converting it to various forms of biofuel.

1. Type of biomass

- Fermentation

Biomass used to feed the fermentation process to produce energy is an organic material most commonly in the form of crops, agricultural wastes and food wastes. This process takes place in the absence of oxygen known as anaerobic process wherein the sugars present in the biomass is converted into ethanol. Also in other processes, waste products are fermented by adding

bacteria and in turn produce methane, which can be further processed into energy. The fermentation process is done by bacteria and/or yeast as they breakdown the sugars in the form of carbohydrates and ethanol is produced. Ethanol is then processed through distillation and dehydration to achieve a level of purity for automotive fuel, as there are already cars that run on 100% ethanol bio-fuel, such as in the case of Brazil. Beside crops that are rich in sugar, plants that are lignocellulosic, meaning containing both cellulose and hemicellulose, can also be converted into energy but a more complex process is required, but the fundamental steps are the same such as fermentation, dehydration and distillation.

- Photo bio reaction

Beside biomasses that require the process of fermentation to derive energy, there are also other organic and renewable sources in which we can derive energy from, such as the algae *Botryococcus braunii* (BB) that is a photosynthetic algae. The main advantage of developing photosynthetic biomass over fermentation-based biomass is that it would not compete with the rising food demand over time as the world's population continues to increase exponentially. What happens in this process is that algae cultivated in the presence of sunlight for sustenance, the algae is then harvested and oil is then extracted through squeezing methods. This oil is then processed for biodiesel production. Another advantage of using photosynthetic algae for biofuel is that it consumes carbon dioxide that is abundant in our atmosphere as byproduct from several processes especially byproduct of industrialization. If mass-produced this will in turn help alleviate the rise in carbon dioxide production and this has the potential of reducing the world's carbon footprint. Lastly, being algae, this source is easily cultivated and is renewable.

2. Application of Biomass

The biogas produced by fermentation of organic materials such as food stock and waste and manure, mostly consists of methane and carbon dioxide. Methane is the main component of city gas and the biogas can be applied to gas water heaters, gas clothes

dryers, gas cookers, gas stoves and so on. Furthermore, it can be used as a resource of fuel cells like ENE-FARM (Tokyo Gas) technology.

On the other hand, the oil from algae BB is composed of hydrocarbon, which has the same component with the oil we use as energy, whereas the oil from other algae and vegetable oil such as rapeseed, sesame and olive oil, consists of triglyceride. Hydrocarbon has much more combustion energy than triglyceride. Therefore, the product oil from BB can be used as the conventional oil. The hydrocarbon from BB consists of 67 % of gasoline, 15 % of aviation fuel, and 15 % of diesel and residuals. We can apply it directly to the transportation energies like gasoline for vehicles and aviation fuels.

Our Ideas

There are still problems with the recent research about biofuel from algae right now; firstly, the quantity of the product (oil), which is very low. Secondly, the energy required for the process. Thirdly, the difficulty of food and nutrient supply and lastly, the cost of these production. So we are going to introduce our idea of a combined-reactor for making sufficient biofuel from algae. According to the picture shown in the presentation slide, that is the building of algae. It is at least 4 floors with rooftop. The building will contain the bio-reactors with algae and cover with solar panels from all sides and top. The side of the building is designed to a slope that is wider at the bottom; this is to maximize the sunlight that hit the solar panel. In the building, the first floor will contain the coil of algae (BB) wound around light sticks like in the picture all the way from one end of the building to another end, and this coil tube of algae and stack up into many layer to increase the product (oil) quantity.

In addition, the light source is powered by the energy from the solar panel, reducing the use of energy. The algae is supplied from the second floors or layer above these coils so we can use the gravity as a force to flow the algae through the tube and exposing to the light source. The third floor will be the cultivation floor, which is the big container to contain the algae that is ready to be cultivate. The method of cultivation we proposed is similar to the one we visit in the company. We will add chemical to the algae to make density different and let the algae float up to the surface and use a net that

is move in a vertical movement to lift all the algae up. After we gathered all the algae by the net, these algae will be press and dry in the fourth floor, floor above the cultivation floor. Our group believe that if more people promote the action of producing clean energy in clean way, more people will joy and do it, thus reducing its' cost and lead the society toward a sustainable one.

Conclusion

As we mentioned in introduction part, if we continue to use energy resources in such interval, we are going to run out of energy and our comfortable life will be collapsed. Of course our goal is not to keep using energy until it is diminished but our goal is to find new way that will make our energy consumption style sustainable and comfortable. We thought these two things are very important for realizing our goal.

1. Using only biomass for energies to run vehicles such as cars and ships.

As you know, there are a lot of energy resources such as fossil fuels, however it is limited and it is bad for the environment to use fossil fuel for energy because it arouses CO₂ emissions. We have one solution. The answer is to use biomass. Biomass comes from plant such as corn or seaweed, so before their changing form from plant to oil, they had absorbed CO₂ and the same amount of CO₂ will give off when they are used as oil for vehicles. It has kind of CO₂ emission cycle. This is why we have to use biomass as the energy.

2. Establishing photosynthetic biomass plants.

Recently we have a lot of magical tools to gather sun light or breeding some plants by human hands. We can control the development of plants such as seaweed and we can even control the characteristic of the plant. During this program, we encountered special seaweed named *Botryococcus braunii* (BB). If we successfully invent plant which grow BB efficiently, we can gain a lot of oil and this can be eco-friendly and we can get stable energy resources.

When we realize these two things, the life become very sustainable and comfortable. We hope the day will come when we make it real to use biomass energies.

Exchange of technology & resource for Energy Diversity

GroupB: Daisuke (Tokyo Tech), Yuumin (Tokyo Tech), Mink (CU),
Kariz (ITB), Luhut (ITB)

Asia's current condition

After Fukushima accident, Japan rely on only few resources and import much energy. What if something happens to one resource? Japan cannot provide enough energy. That is one reason why it is important to have diversity energy. By contrast, Indonesia have much resources. But 70 % of resources is fossil fuel. It means not renewable. Now, Asia countries don't have diversity energy like Japan and Indonesia. So our goal is energy diversity.

Potential energy resource and technology

We focus on the energy potential in 3 countries participants live, Indonesia, Thailand and Philippines. The land in Indonesia has more than 130 active volcanos. It means this country has the great potential to develop the geothermal energy plants. In fact, the number of the generators ranks 3rd in the world. However, their efficiency and facility is not sufficient yet. In Thailand, there is large cultivate area for grain which is very useful to gain the bioethanol. Though the amount of ethanol exploitation has been increasing recently, the efficiency is very low. In Philippines, they has huge amount of water resource. The energy consumption ratio of hydroelectric power is high even in the present. Its government also expects the potential of electricity generated by hydroelectric power is much higher than actual one.

From these backgrounds about the energy potential in 3 countries, we consider each solution and effective application of geothermal, bioenergy and hydropower for each 3 country, respectively.

Solution/Our approach

Win-win relationship

The four represented countries in 6th ASCENT (Indonesia, Japan, Thailand, and The Philippines) can achieve energy diversity through a win-win relationship between each other for each country has different needs and offers. This win-win relationship is based on each country's potential in term of energy resources and technology. For example, Thailand with its agricultural technology and production competitiveness, Indonesia with a huge potential of geothermal and other kind of natural resources, The Philippines with a big contribution of hydropower, and Japan with cutting-edge technology development can work together to benefit each other in the future as the effort to achieve energy diversity. As this is a multilateral relationship, it cannot only based on goodwill and social motives, but it also has to be beneficial economically for each country. Therefore, the right strategy between the four countries will be very important and eventually be a focus on this solution.

Bioenergy in Thailand

More than half of Thai people work in agriculture field. Their products can be the major potential biomass energy source. For example, cassava, coconut, rice or sugar cane. biomass waste from rice and sugar cane are chaff and bagasse , respectively. Then we will combust the biomass waste, so we get the electricity. There are some problem with bioenergy in Thailand. The electricity price per unit is low if we compare to electricity price per unit from other source , fossil fuel, so not so many people want to do this process. However, government has a plan to set the specific price so that the price will increase.

Actually, Thai people produce less electricity than their ability. They can produce much more electricity by turn foster rural area into agricultural area. another key challenge is this process still has low efficiency, they can use high technology to improve the efficiency.

In japan, the Neo-morgan laboratory can produce oil from algae. There is strong sunlight in Thailand, so this laboratory can place their company in Thailand where the surrounding is suitable for producing oil by algae.

Hydropower in Philippines

The government policy expects that the generation capacity of hydropower will be up to about 3 times in 2030 as 2010. Though the generation capacity depends on the fossil fuel whose ratio is 65%, hydropower can replace the fossil fuel as renewable energy with the expectation and aid from the government in the future.

In order to use huge amount of water resources to realize ideal environment, we suggest the application of mini hydropower. This system is very simple. In some place where has stream of water such as rivers, we set the wheel, which leads to generating the electricity by the stream of water. This system can achieve very stable energy generation and high energy usage efficiency. It also needs no big investment because the scale is very small.

In Philippines, irrigation system is developed well especially in rural area. If we apply this technology to this large irrigation network, we can get a lot of electricity and develop the tangible electric transfer which contributes to the increase of electrification ratio in rural area. In the industrial area or some big cities, we can put that system in the water pipe. It may reduce energy loss in some factory

Geothermal in Indonesia

It was estimated that Indonesia held around 40% of world's geothermal reserves, the biggest in the world. However, Indonesia was still in third position of world most biggest geothermal electricity production (after US and The Philippines) due to lack of supporting government policy, current law over land use, and competition against other energy source exploitation, such as oil, natural gas, and coal, that dominated energy consumption mix in Indonesia. But lately, there were some changes in the law and government policy made to push geothermal exploitation for the next following years in Indonesia. From the win-win relationship solution, we can expect involvement of Japan, Thailand, and The Philippines to boost this geothermal exploitation. Some of the initiatives to be done are technological knowledge and equipment from Japan, capital investment from Thailand, and mentorship and partnership from The Philippines.

Energy Transfer Technology

In order to establish the win-win solution, developed country should be able to obtain the benefit in form of resources, e.g energy generated from the renewable technology in developing countries. However, most renewable energy cannot be transferred in form of raw resources. We came up with the solution to transfer the energy in form of electricity, which is the product of most renewable energy processes. Usually, electricity is transferred using cable network. But to create a cable network between two countries separated by ocean needs a lot of effort. Therefore, we propose an idea to store electricity in a container, and transfer the container using existing transportation network, such as freight ship. Currently, a lot of electricity storage technology is being developed, but in our opinion, the most suitable storage technology for transportations are Compressed Air Energy Storage (CAES) And Flywheel.

Compressed Air Energy Storage

Compressed Air Energy Storage Technology is basically a technology to store energy by using energy generated at one time to compress air into a tank. To use the energy in the future, pressure is removed and the expanding air will rotate a turbine connected to an electric motor. In our concept, electricity generated by renewable energy plant will be used to compress air into tank. The tank then will be transported by freight ship to another country, where the air will be released and the force will rotate turbine. The main challenge in CAES development is how to conserve heat, since air produce heat when compressed, and air needs heat to expand.

Flywheel

Another promising of storage system is flywheel method. Flywheel is a rotating mechanical device. By rotating, we can convert electricity into kinetic energy. Inside container, by magnetic levitation and vacuum container there is no friction. So we can transfer energy to the destination and again we can convert into electricity. Some Japanese company (including NEDO) now researching this system.

What is advantage of storage and transfer system? If this system develop, we can transfer electricity easily. So we can import and export from or to many other countries. That means storage and transfer system contribute creation of energy diversity in Asia.

Conclusion

Relying on one energy source possess various threat. In order to increase energy diversity, Asian countries should create a transfer network of resources and technology. Developed countries such as Japan could provide technology development to developing countries regarding renewable energy while also developing energy transfer technology. On the other hand, developing countries could provide resources such as energy resources and land to support the technology development. Once the technology established, both countries could enjoy abundant renewable energy.

The Power of Milestone for Future Energy in Asia

GroupC: Yuki (Tokyo Tech), Timmy (Tokyo Tech),
Ferdie (ITB), Adit (UNDIP)

Future Image of Energy and Asia, What is Going On?

As we know, nowadays majority countries in the world still relying on fossil energy; and fossil energy is not sustainable. It may be cheap to produce, but it has negative effect to environment, and moreover the stock of fossil energy also decreasing continuously. Because of energy scarcity, many countries are start looking toward renewable energy as a solution to achieve more sustainable condition. Unfortunately at this moment the renewable energy is still have three big problems: low efficiency, expensive, or low supply. As a visualization of price comparison, see table¹ below.

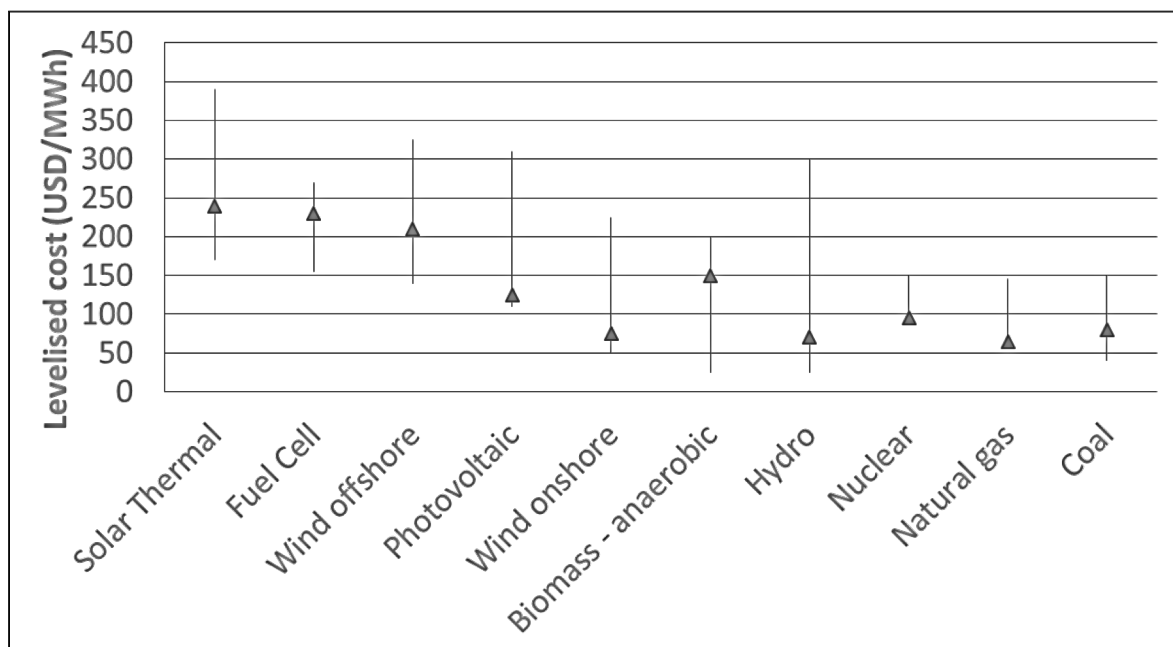


Figure 1. Price comparison of various energy

¹ World Energy Council, 2013. World Energy Perspective - Cost of Energy Technologies.

http://www.worldenergy.org/wp-content/uploads/2013/09/WEC_J1143_CostofTECHNOLOGIES_021013_WEB_Final.pdf

Now let's take a look at Asia. Asia is a large continent accommodating a lot of countries, both developing and developed countries. Lately economic activity also start shifting from Western towards Eastern countries. Asian countries became either stronger, take example of China and India, or have rapid growth that attract overseas investors like what is happening in South East Asia. Of course the growth of economic situation in one country does not depends solely on manufacturing, raw material, or service transaction, it depends also on energy pillar which support overall activity in that country. Energy acts as a driving force of economic growth. The importance of energy was discussed also in Asian Development Bank Report, published in 2013. Based on the report, Asian countries will consume twice as much energy – reaching 51% of world energy consumption, and furthermore there will be a rise of 3% energy demand in Asian countries each year.

As in most parts of the world, Asia's primary energy mix is dominated by fossil fuels, with oil, natural gas and coal making up more than three-quarters of demand. Over recent decades, there has been an ongoing shift towards coal and natural gas, primarily at the expense of oil in power generation and industry, and traditional biomass in the residential sector. But oil remains the dominant fuel, with demand currently at 4.4 million barrels per day (mb/d), and a 37% share in the primary energy mix. Natural gas is second at 21% of the primary energy mix with demand around 141 billion cubic meters (bcm) (which is comparable to current gas demand in China). Asia's coal use has been rising at double-digit rates since 1990, tripling its share of the energy mix to 16%. Efforts are underway to boost the deployment of modern forms of renewable energy, which currently account for 12% of the primary energy mix, made up mainly of hydro, geothermal and biomass power, co-generation technologies and solar photovoltaic (PV). Traditional biomass plays a major role, representing some 12% of total demand (bringing the share of renewable in total to 24%), with the vast majority being used for cooking by people living in rural areas with low incomes and/or a lack of infrastructure restricting their use of modern fuels. At this moment we are in the state of fossil energy dependent. Our long term target is quitting the dependency on fossil energy, and utilizing

renewable energy 100%. But to move toward that goal, 3 big problems of cost, efficiency, and supply must be resolved first. To achieve it, a transition state must be surpassed first. In this report, milestone technologies, a transition state toward the 100% renewable energy dependency, in Asia will be covered. Looking deeper into some of developed and developing countries in Asia like Indonesia, China, Arabic and Japan make us able to define the real conditions of energy itself. Indonesia which is one of developing country in Asia with a population of up to 255.993.674 people with great natural resources, especially geothermal and natural gas still experiencing problems in electricity distribution. About 50 million people in Indonesia (20% from the population) still can't access electricity for their life. That problem will directly impacted the development of some core activity in Indonesia such as education, household life and the other work activity. In Japan, as one of highly developed countries in technology and research, Japan still feel the problem to develop their renewable energy resources because of very limited space for doing renewable energy development. China as one of developed country in Asia still facing the problem of pollution because coal utilization and have very high dependency to coal resource for full fill national energy demand. The last one Saudi Arabia, famous as the largest oil producing and exporter country in the world make energy consumption in Saudi Arabia is almost equal with production energy number. Utilization of renewable energy is needed in case of maintaining oil exports activity increase foreign exchange and also to fill their domestic energy demand.

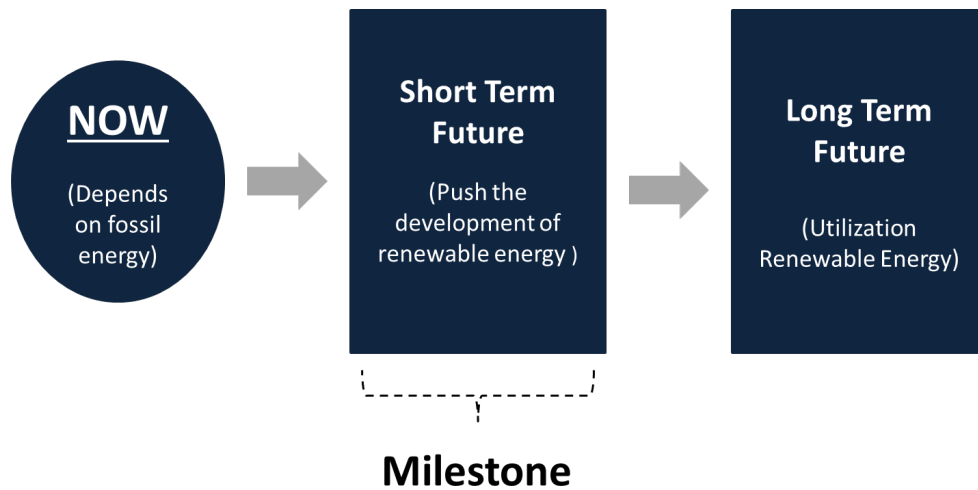


Figure 2. Model of present condition, long term goal, and short term goal as a milestone.

Energy in Japan

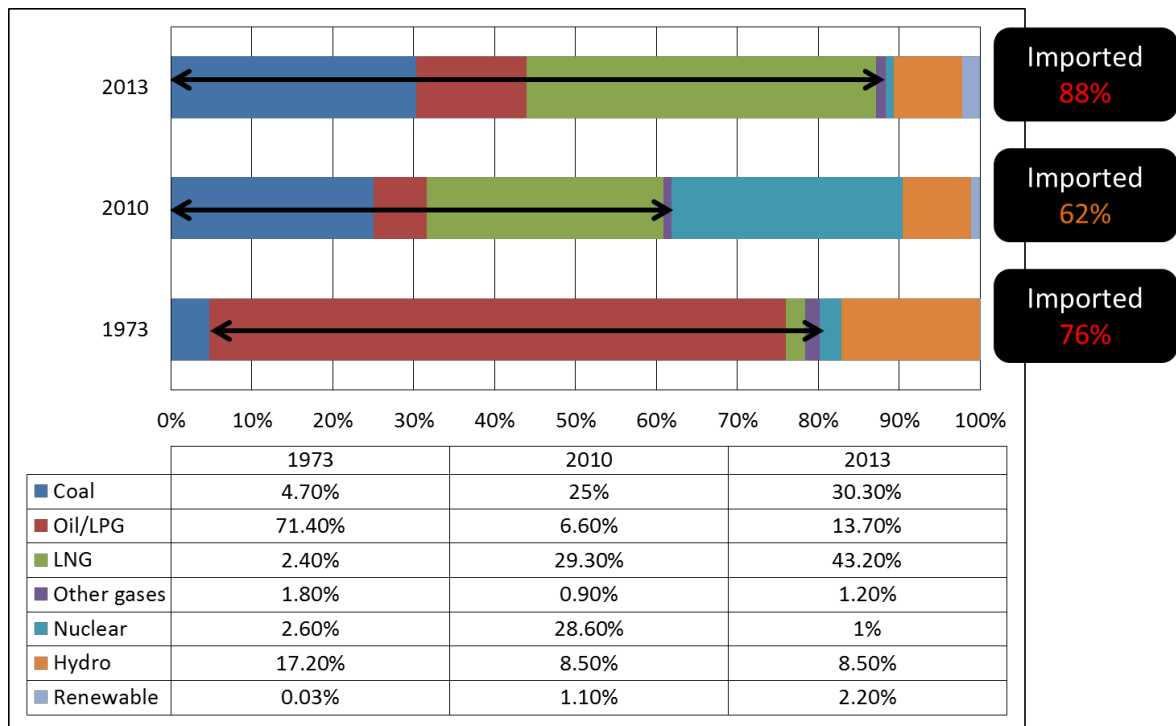


Figure 3. Japan energy condition. Source: <http://www.insc.anl.gov>.

Figure above shows energy condition in Japan. In 1973, Japan depended on Oil/LPG energy, and most of them were imported because there were few fossil fuel resource in Japan. Thanks to technology development, LNG and nuclear power lowered the ratio of imported energy in 2010. However,

because one of the worst earthquakes in the world happened in Tohoku in 2011, the ratio of Nuclear power reduced, and dependence on imported energy resources increased again in 2013. Unfortunately nowadays Japan do not have any alternative resource yet and still depends on imported energy resource. Japan has been searching for a new form of energy that is clean, safe, and sustainable.

As a reaction of the great earthquake in 2011, Japanese government shut off all nuclear plant making Japan become more dependent on fossil energy import from other countries. This condition brought a dilemma for Japan. On one hand Japan want to build its macro-economy by reducing import energy expenditure, but on the other hand Japan has very limited choice to supply national energy needs. Although nuclear power is clean and cheap (because Japan has nuclear technology), still it is seen as risky because Japan has a lot of natural disaster like typhoon, earthquake, or tsunami.

One of the potential solutions is Floating Nuclear Energy Plant developed by Massachusetts Institute of Technology (MIT)². Japan is archipelago country with small amount of land but huge area covered by sea. There are three major advantages of floating nuclear power plant for Japan. First, this floating plant would not be affected by earthquakes because it is located offshore. Second, the natural property of floating object on sea makes the nuclear power plant flexible, as it can disperse the earthquakes energy. Furthermore, a safer power plant can be implemented. As the nuclear containment is located inside sea water, which acts as heat sink, the nuclear reactor containments will not suffer overheating and meltdown when the plant was broken by particular incident. MIT scholars estimate that the floating nuclear plant can be designed to generate up to 1,100 MW of electricity.

² Nancy W. Stauffer, *A new look for nuclear power*, online article from MIT News. June 24, 2015. <http://news.mit.edu/2015/new-look-floating-nuclear-power-0624>

Energy in Indonesia

Current & Future Energy Demand

Today's, Indonesia has considerable position in regional and global level. Recorded as one of the fastest growing economic countries, Indonesia existence is becoming increasingly aware. In energy sector, Indonesia endowed with various energy resources including renewable and fossil fuel. Total Indonesia's fossil energy resources was equivalent to 137.000 Million tons of oil equivalent (Mtoe) in 2012. Renewable energy was accounted for 155.3 GWe in 2012. Geothermal and hydro are the biggest renewable energy resource, accounted for 49% and 19% respectively of the total renewable energy resources in 2012, potentially to reduce dependency of fossil in future generation energy mix, while solar and small hydro are used to aim electrification ratio target especially in remote areas.

Indonesia's total primary energy demand is estimated to have increased by 1.1% in 2012 from 212.2 Million tons of oil equivalent (Mtoe) in 2011 (Figure 4). Oil still dominates the primary energy mix. Oil's share was accounted for 48% of the overall primary energy demand, whereas coal and gas was accounted for 27% and 20% respectively in 2012. The number of energy demand not only increased because of the growing number of human needs in various sectors, but that growing energy needs are also affected by the number of energy import. With conditions as illustrated in Figure 5, estimated national energy needs will be greater than the amount of energy possessed by Indonesia.

The biggest amounts of energy consumption are coming from industry and household sectors (Figure 4). Industry sector consume around 40% of total final energy in 2012, remaining the biggest among the other sector. Natural gas industry consumption reached 17.24 Mtoe in 2012, rise 3% from 2011. Approximately there was 23% of total natural gas in industry that used as petrochemical and fertilizer industries feedstock. Household final energy consumption (include traditional biomass) continue to increase by 2.4% in 2011-2012 in line with growth of population. Oil consumption has sharply decreased since the LPG conversion program. The share of oil was 2% of total final energy consumption in household sector in 2012, while LPG

consumption increased 16% from 4.9 Mtoe in 2011 to 5.8 Mtoe in 2012, followed by electricity which rose around 11% from 5.6 Mtoe in 2011. Gas consumption was not showing significant number on household. Even though government has started to develop gas distribution pipeline network for household, gas consumption on household is still not more than 0.5% of total household final energy consumption. While biomass consumption has been rising gradually every year. In 2012, biomass consumption rise 0.3% from 234.943 Mtoe in 2011. Biomass increasing trend is little strange when it is compared to the increasing of people energy access. The trends should be in contrary way in terms of biomass consumption and access energy also urbanization rate.

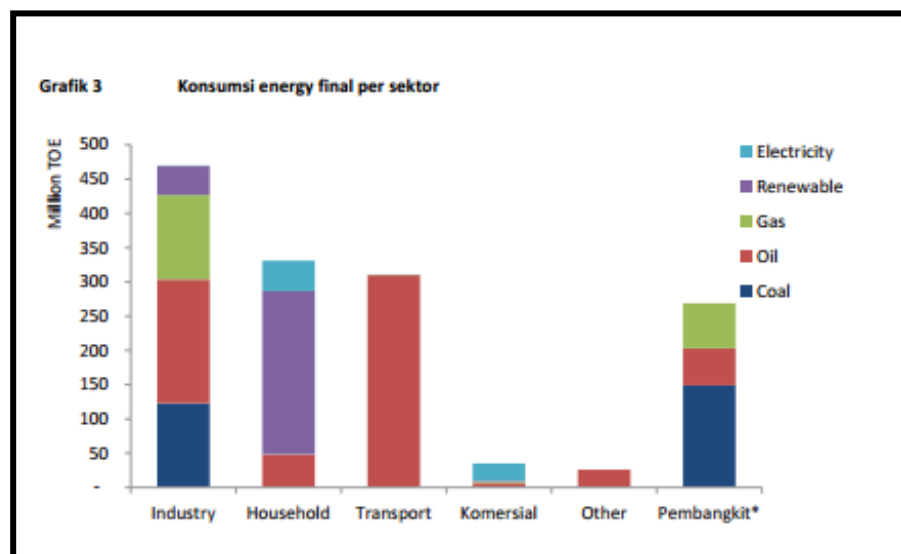


Figure 4. Energy Consumption in Indonesia

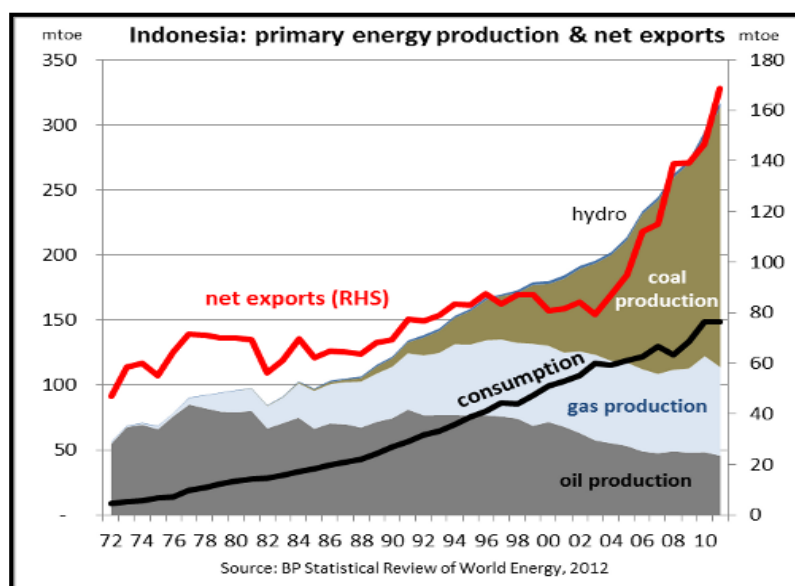


Figure 5. Indonesia Primary Energy Production and Consumption

Opportunity for Geothermal Energy in Indonesia

Geothermal energy is a relatively environment friendly energy source that is derived from the earth's inner heat. Water that is pumped into the earth by men or by natural causes (rain) is collected at the earth's surface in the form of steam, which can be used to drive turbines for the production of electricity. Exploration costs as well as the capital cost of the geothermal plant is higher than for plants that run on fossil fuels. However, once in use, production costs are low compared to the fossil fuel-fired plants. With about 40% of the world's geothermal reserves being located below the surface of Indonesia, the country is estimated to contain the world's largest geothermal energy reserves and therefore contains huge potential for this renewable energy. However, this potential remains largely untapped. Today, Indonesia only uses four to five percent of its geothermal capacity.

Based on Figure 6 below we can know Indonesian geothermal potation about 27,140.5 MWe. That fact show, if Indonesia can utilize the potation with effective and intensive exploration the geothermal resources can cover 61,5% Indonesia's energy need on 2022 which have energy needs up to 44,04 GW.

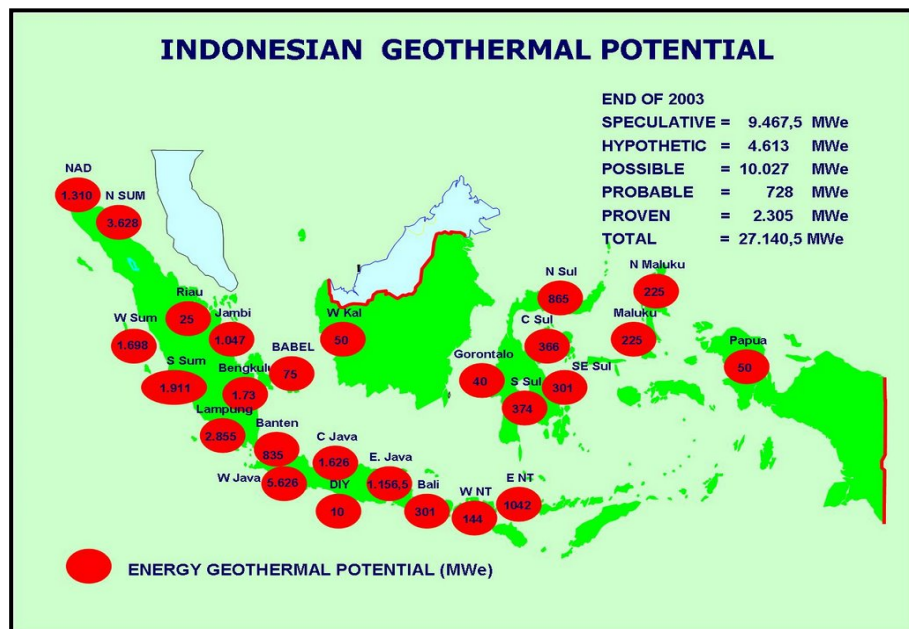


Figure 6. Indonesian Geothermal Potential

Geothermal Exploration

Geothermal resource exploration, development, and production draw on the techniques of both the mining and oil/gas industries. The geologic setting of geothermal resources is similar to deposits of metal ores, and geothermal systems are thought to be the modern equivalent of metal ore-forming systems. Hence, exploration draws most heavily on the techniques of the mining industry. Development of the resource and its production as hot fluid uses the techniques of the oil/gas industry with modifications because of the high temperatures and the much higher flow rates needed for economic production.

Exploration begins with selection of an appropriate area based on general knowledge of areas with above average heat flow. The best guides for more detailed investigation are the presence of thermal springs (the equivalent of oil seeps). However, to develop undiscovered resources, geologists must rely on other techniques. Because the target is a region of above average temperature, heat flow studies can indicate elevated subsurface temperatures. Among other methods being used and investigated for regional exploration are remote sensing of elevation changes, age of faulting, and geochemical techniques.

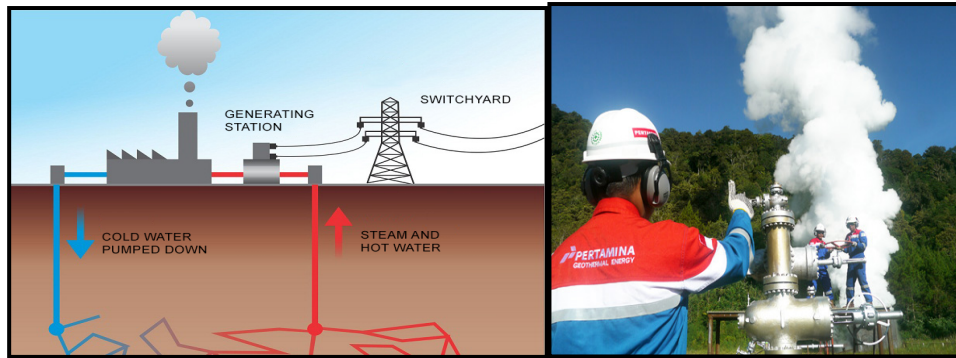


Figure 7. Geothermal exploration overview and the application of geothermal exploration in Indonesia

Hydrothermal systems suitable for geothermal development must have adequate temperature and sufficient flow for economic production. Geochemical techniques can be used to determine subsurface temperatures when hot springs are present, and shallow temperature-gradient holes can be used to project subsurface temperatures below the level of drilling. Geophysical tools are also used to determine the approximate size of the reservoir. Because high flow rates are needed for geothermal production, most geothermal production comes from highly fractured reservoirs. Geophysical methods that can determine fracture intensity are of great importance to the explorationist.

Energy in China



Figure 8. Air pollution in China

China is the largest producer and consumer of coal in the world³. Thanks to its natural coal resource, China can supply its national energy needs cheaply. About 3,959 trillion watt-hours per year, or 74% of its electricity come from coal as of 2014⁴. However the rapid growth of Chinese industry doesn't come without any cost, inefficient and huge coal combustion has brought air pollution problem in China (Figure 8).

In 2011, the average efficiency of coal power plant was 37% in China⁵. World Coal Association states that by moving the world average efficiency of coal power plant from 33% to 40% can reduce CO₂ emission up to 2 gigatonnes⁶. This amount of CO₂ is equivalent to running the Kyoto Protocol three times over.

There are at least 4 ways for China to fix its air pollution problem. First, using coal with higher quality. Using low quality coal sulfur compounds contaminator will result in worse air quality. Second, closing small, old, and inefficient power plant can help reducing carbon footprint. Third, by applying local carbon trade program. With this program, industry will be more motivated to shift and use cleaner energy, thus this program can help the transition towards 100% renewable energy utilization. Fourth, cleaner air can be achieved by using more advance technology for coal electric-generation. As discussed in lecture by NEDO, there is a technology called integrated gasification combined cycle (IGCC) to generate electricity from coal with higher efficiency. Basically in this technology coal is

³ Source:

<http://www.wsj.com/articles/chinas-coal-consumption-and-output-fell-last-year-1424956878>

⁴ Source:

<http://theenergycollective.com/michael-davidson/335271/china-s-electricity-sector-glance-2013>

⁵ Mao, J. and W. Feng (2012), "Ways to Further Improve Efficiency for Ultra-supercritical Coal-fired Power Plants in China", presented at the IEA CCC Workshop on Advanced USC Coal-fired Power Plants, Vienna, Austria (19-20 September)

⁶ Source:

<http://www.worldcoal.org/reducing-co2-emissions/high-efficiency-low-emission-coal>

converted into synthesis gas (syngas), then syngas is cleaned and is utilized to fuel turbine and produce electricity. The IGCC technology can reach up to 42% of net efficiency.

IGCC work first by pumping air into air separation unit to produce nitrogen and oxygen. Next, coal and oxygen have chemical reaction with high temperature in gasifier; $C \text{ (as Coal)} + O_2 + H_2O \rightarrow H_2 + CO$. The output of gasifier are heat and clean synthesis gas (syngas). Then syngas is cleaned to remove contaminator like mercury or sulfur compounds. After that, clean syngas is used as combustion fuel to move turbine and generate electricity. The combustion of syngas not only producing kinetics energy, but also thermal energy as heat loss. The heat loss from combustion turbine then is collected together with the output of gasifier output into heat recovery steam generator. Finally by using those heat loss, steam can be produced and move steam turbine to produce extra electricity. This technology allows cleaner electricity generation and higher efficiency thanks to the re-utilization of heat loss.

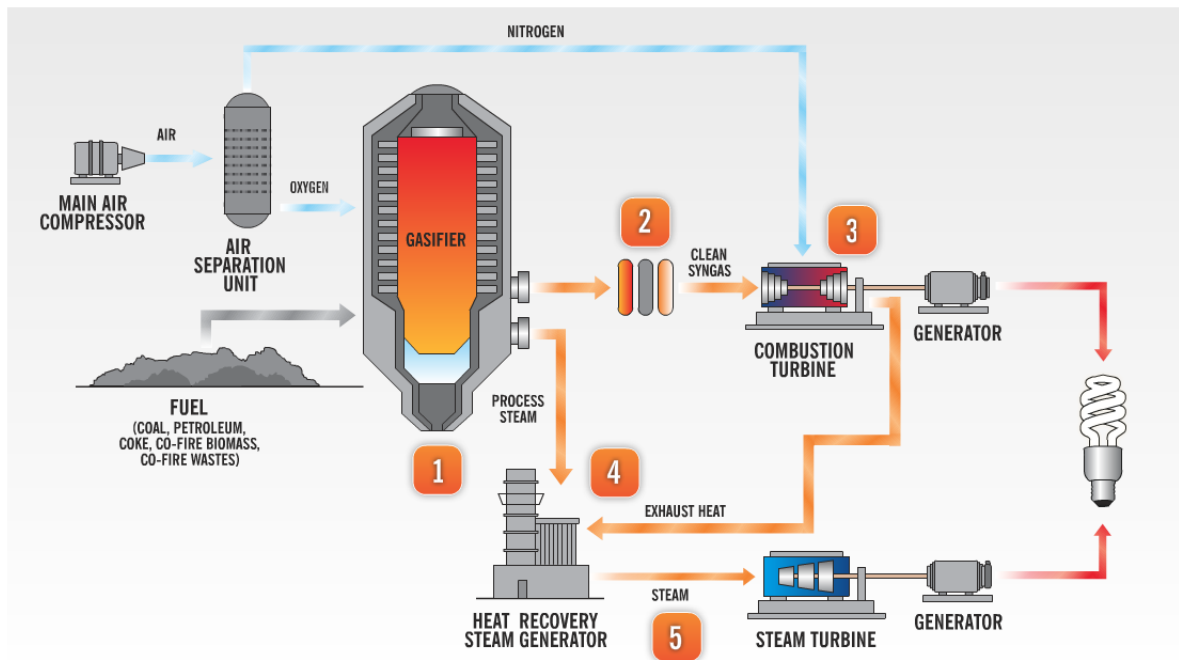


Figure 9. Schematic of integrated gasification combined cycle (IGCC).

Image source: <http://www.duke-energy.com>

Energy in Saudi Arabia

As we know, Saudi Arabia is the country which has abundant of oil source. Based on British Petroleum Data Statistics, Saudi Arabia has 265,9 billion oli stock and 290,8 trillion natural gas stock, that is what makes Saudi Arabia as a the biggest oil producer and exporter in the world and one fifth of world oil stock exist on it.

Based on the data, more than 50% electricity consumption in Saudi Arabia is spent for buildings and the rest of it spent for industry sector. Eventhough Saudi Arabia has huge energy resources, Saudi Arabia must prevent itself from energy crisis. There are more than twenty five million people reside in Saudi Arabia. Every year the population of people in Saudi Arabia is increasing. They are really depend on oil for their energy resorces. In the other side, Saudi Arabia has other potencies in energy resources that is solar energy. Intensity of sunlight in Saudi Arabia is high and we think this potency must be developed because solar cell energy is renewable energy which give many advantages to us. From the table below we see that solar energy potential in Saudi Arabia is 6 until 8 KWh/m²/day which classified as high potency. Solar cell energy is environtmental friendly and long lasting energy resources. Eventhough solar cell is relatively expensive, we think that cost is not a problem for a rich country like Saudi Arabia, that is why we believe that it is good option for Saudi Arabia to invest more in solar cell energy resources as a renewable energy because the benefit that Saudi Arabia can get will be higher.

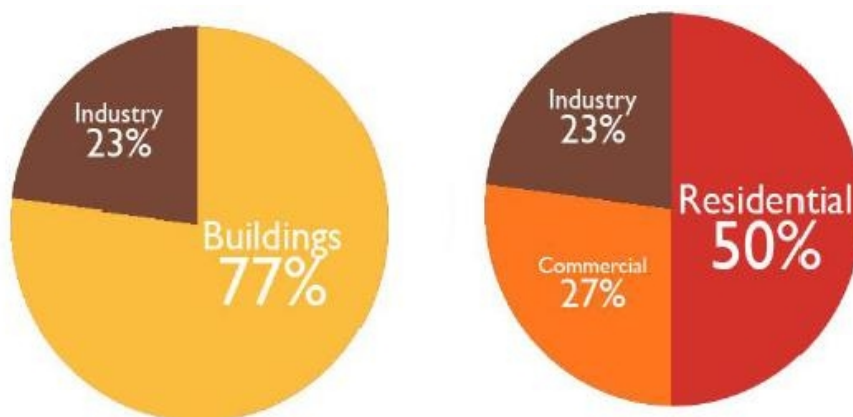


Figure 10. Electric consumption in Saudi Arabia

Country	Solar energy
Oman	5–6
Palestine	4–6
Qatar	5–6
Saudi Arabia	6–8
Sudan	5–8
Somalia	6–9
Syrian Arab Republic	5–6
Tunisia	5–7
United Arab Emirates	5–6
Yemen	4–6

Figure 11. Arabian countries solar energy potential in kWh/m²/day⁷.

Conclusion

The future image of energy is total utilization of renewable energy. At present day, total utilization of renewable energy is still hard to be reached, it is either expensive, low in supply, or not efficient. To reach this future goal, a milestone must be passed first. Different countries has different strategies in this milestone. Japan can use nuclear energy, with floating power plant concept; Indonesia can do more exploitation and exploration for geothermal energy; China can install higher efficiency coal power plant, for instance by utilizing IGCC technology; and Saudi Arabia can taking advantage of its abundance in sunlight by using solar energy.

⁷ Source: Renewable-energy developments in Arab countries: a regional perspective. R. Chedid, F. Chaaban. American University of Beirut, Faculty of Engineering and Architecture

THE FUTURE OF ENERGY IN SOUTHEAST-ASIAN PERSPECTIVE

GroupD: Yuka (Tokyo Tech), Oat (CU), P.V. (DLSU),
Marco (ITB), Suci (UI)

Introduction

The forefront in the discipline of energy is having us think of how the riddling problem of *energy management* be given an answer. Perhaps, by possessing a long-term mindset, acknowledging what is readily available and understanding the reality of its necessity are some ways to concur the future image of energy. Knowing the implications of energy in the aspects of economy and environment are alarmingly affecting each country, it is but important to address the shortcomings and sacrifices we make on why in the first place we direly need energy for—that is progress.

Sustainability can prove its worth on how we can redefine our stand for progress—in connection, our stand on how we renew our practice of energy. What we propose for our final output governs the idea of establishing a cycle that can provide for itself, the idea of giving importance to the wastes produced everyday and applying these mindsets (ideally) to the practice of every energy resource we have. That is, to achieve a sustainable living society.

I. Problem Faced in The Region

When we talk about big problems of energy and environment in South East Asia, these would be lack of energy problem, CO₂ emission, and wastewater problem. Based on International Energy Agency publication, 20% of South East Asia population does not have access to electricity. It is because energy demands in South East Asia expanded 2.5 times since 1990. Moreover, International Energy Agency forecasted that energy demands would rise above 80% in 2035. One sided with energy; environment condition in South East Asia is also bad and becoming worse. International Energy Agency stated that CO₂ emissions in South East Asia tripled since 1990. In 2011, CO₂ emissions amounted to 1.2GigaTons, and it is increasing following the growth of industry. Wastewater is also an environmental problem in South East Asia. Based on Asian Development Bank publication, only 30% populations in Manila (capital of Philippines) have good sewage system. In Bangkok (capital of Thailand), only 25% of wastewater is treated and only 3% of that is recycled. It is worse in Jakarta (capital of

Indonesia). In Jakarta, only 3% of the populations have good sewage system. Unfortunately, the wastewater problem also occurred in Japan. Based on Japan Sewage Work Agency publication, only 27% of rural area in Japan has good sewage system. Lack of energy, CO₂ emissions, and wastewater are serious problems in South East Asia Region, therefore there should be a comprehensive approach to overcome these problems.

II. Current Situation of Each Country's Energy

Yes, of course, there is no one wanting the darkness to be our future image of energy. The group agrees that a sustainable city supported by a sustainable energy is the future that we together want to aim for. But, are we ready for a change? Are we all ready for making a better future?

Speaking of making a change. As a first step to build something new for future, we should first see the conditions of our countries nowadays.

Indonesia, as a very huge archipelago country still has a problem in terms of energy distribution. It is still very hard to reach every part of Indonesia to distribute energy. Therefore, still there are some places in Indonesia that cannot get access to electricity. Besides, Indonesia is also known had become a net oil importer in 2002.

Philippines still import theirs for roughly almost 80% of oil. Philippines's government is spending on infrastructure, but it has not really matched the country's increasing energy demand.

Thailand has limited domestic resources of natural gas, coal (lignite grade), and biomass. Thailand is also still dependent on energy import from other countries.

Japan, even though they have a very advance technology and are also known as a developed country, Japan is a very active in importing. It is also because they have very minimum energy resources. This condition is also getting worse since they stop using nuclear energy in 2011.

So, with this condition, is the sustainable city possible to reach? Or is it just a bunch of dreams?

III. Ideal image of Future Energy: Sustainability

With all the problems we are facing today the lack of energy, high CO₂ emission and waste problems, if we incorporate these issues together into the thought for energy solution in the future. Can we solve these problems altogether?

The image of future energy we would like to see in the future is the developing of sustainable cycle with cleaner, more efficient sources of renewable energy and that the cities in Asia would be able to be independent in term of energy. As cities activities create large amount of waste product and is the main source of CO₂ emission, and to maintain the cities functions it is also required high amount of energy.

Our goal is to creating a sustainable cycle of energy production. As long as there are human activities in the cities, there are going to be creation of waste products and if we could reuse the waste and turn it into a source for energy production. That also will help to reduce the creation of new waste and reduce CO₂ emission. The idea of sustainability is not new and we have already seen the example in this program visit to Tokyo Gas Company that they are research on the technology of utilizing microbes for biogas fermentation from household wastewater that can be used to produce electricity though both the conventional power plant system and the production of Hydrogen for uses in fuel cell. So in the future we think this technology hold a promising potential to be the solution for sustainable energy issues.

IV. Biogas

What should we do to realize these images!?

We thought biogas as one of the solution. Biogas is made by drain-water or food garbage. The drains come from farms or food stores and they are put in a tank and fermented using bacteria, then we can get biogas. So we can reduce the waste while producing gas. If ENE-farm, which can make electricity and heat and emits low CO₂, is used at the same time, we can use not only electricity, but also heat. The ENE-farm energy efficiency is 85.8% while that of factory is only 37%. So it's so effective. Actually, the waste of biogas is left in the tank after making biogas, but we can also make a use of it, because it can work as a fertilizer for plants. Then it's also good for crops. So biogas system is so sustainable. Now, this system is mainly used in farms and 67 biogas plants are formally used in Japan. And Germany has better skill than Japan. So we can improve and use it more.

Conclusion

This has been the reality that we all face. The trade-off we are having from the advancements of technology is that we are blinded by the competition between countries and the deterioration of the environment—to name a few, towards the race of industrialization. As such, it is very pleasing that we are recognizing these shortcomings into something more meaningful. In fact,

we are now making use of these mistakes as the roots of our solution in preventing them to happen yet again. It can never be better for everyone than to think prospectively as to how we can be able to maintain, if not to improve further, the quality of living we have and what the future generations will have. It is this responsibility of not leaving behind every detail that would have that potential to be of use in *moving forward*. And this idea of sustainability inspires such thinking.

Having been part of this program, it is very timely to start thinking of the future image of energy. And, as members of the new generation, it is our duty to make sure that we take responsibility of managing energy—as shown to us by our elders. It is our duty to pave the future for our successors; no matter how much the struggle is. From all the technologies shown in this program, we are given light of the potentials and capabilities of our minds to *define the future image of energy*.

Starting from the biogas technology versus other ones, our waste generation is becoming rampant. In this reason, reiterating “*acknowledging what is readily available*,” we must address this issue. And, with the usage of bio-wastes and material wastes, we give these worthless wastes into a resource; which turns the *past problem* into a *future solution*. With this, biogas is the start of achieving sustainability. Noting that advancements in technology now look into the potentials of natural gas, this proves it so. In turn, this technology is variously applied to different ones. Unfortunately (an example is fuel cells), the fields of biogas applications are either too expensive or too inefficient as compared to the existing ones (e.g. fossil fuels, etc.). It is still in its early stages. Imagine more if we continually develop this? Perhaps, we must be motivated so, from these drawbacks, that we make *sustainability* as the solution. If we make sustainability as our formula in achieving this future of nothing-is-put-to-waste or renewability, slowly we grow into appreciating the balance in living. This way, we learn to have this common vision; the hope of collaboration among everyone.

Because having a vision shared by many is the best way to catalyze the future. It is our choice to experience a future shaped by *everyone* (and not by *some*). Come to think of it, will this future be the one you want to *take part in*? Or the one you just want *to see without experiencing*?

Personal report

In this section, participants report their experiences in ASCENT, what they've learned, gained, felt and also enjoyed.

All reports are ordered in Tokyo Tech, CU, DLSU, ITB, UI and UNDIP.

Tokyo Tech

Ayaka

I had a very valuable experience during 6th ASCENT.

I am interested in the issue of sustainable development like 6th ASCENT theme “The Future Image of Energy”. The energy problem will be more and more serious because it is really difficult for us to get back to the previous lifestyles once we get known the convenient lives with consuming energies. All the people including the next generation are eager to enjoy comfortable and convenient lives. Therefore, we need to consider the environment protection thoroughly, not only our lives.

In 6th ASCENT, we visited several laboratories in Tokyo Tech and companies related in the energy production. And I found that there many kinds of energy plants such as solar cells, fuel cells, nuclear, geothermal, and biomass plant. I think the optimized way of energy production is different for each country. For example, Thailand has enough area to cultivate the crops for biofuel production, and Indonesia contains a lot of geothermal energy resources. Then, how about Japan? Japan has few energy resources. Actually I haven't hit on a good idea about it so far, but I consider that a combination of energy production technologies is the key because each energy production method has both pros and cons. More researches are important for the future.

During the discussion, I often realized my poor English skills. Other members speak English very well and the conversations were sometimes too fast for me. I sometimes feel so hard to catch up with the discussion. However this experience encouraged me to use more time to improve my English skills and now I learn and use English almost every day.

The most important thing I got in 6th ASCENT is friendships with 6th ASCENTers. We went sightseeing every day after the program. I wish I could have joined them all days. All 6th ASCENTers were so interesting and full of curiosity. They often asked me questions about Japan, and it made me reconsider Japanese cultures and like Japan more. Meanwhile I learned the Asian countries from them. I got more interested in these countries.

Thanks to 6th ASCENT, I had FANTASTIC days in this spring vacation. I learned a lot from this program. I could deepen my knowledge of the energy issue, and I got many

precious friends. I cannot thank 6th ASCENTers and SAGE staffs enough. I hope we will meet again someday and talk a lot.

Daisuke

This is the second time to participate in this kind of program. Last summer, I took part in "AYSEAS2014". In this program, I could make a lot of friends who have various unique back grounds. I enjoyed chatting with them in English about something petty. Exchanging each culture enabled me to know that we could share a lot of fun things even though place each of us lived is quite different. However, through the discussion and presentation, I found that I really had little skill to express my opinion sufficiently and organize my own group in English. Feeling that I wanted to grow up to organize the group works much better still remained in my mind. With the motivation that I wanted to not only broaden my friendship but to realize what I could not have achieve in the program, I decided to join this program, "6th ASCENT".

What was happy for the first time since this program started was to meet a friend who we had known each other in the previous program. I could feel that we had the strong relationship. Since all participants from Asian countries were very kind and, we talked to them and make friends soon. Enjoying the silly chatting, communication with them in English is joyful again. I remember forever that some students called me "Charao" or "Sensei" absolutely.

During the group works or discussion, I always tried not only to express my opinion strongly and clearly but also to organize the whole discussion to make our presentation successful. I sometimes was confused because of various ways of thinking and ideas of our group members. When we consider environmental and resource problems in Asia, each situation and background is also widely different. Consequently, I could not make the contents of discussion and presentation comprehensive sufficiently. However, our group came up with our own tangible answer to the future image about the environmental problems in Asia. This achievement is thanks to the devoted cooperation from our group members and definite advices from SAGE staffs. Their smart ideas and kindness helped me so many times.

One of the most important things I found through this program is "cooperation" with each other. Though it is difficult to describe our opinion and organize the group in the way we want in English, we can cooperate and overcome anything if we have much

passion to show our ideas and don't stick to how we organize but "enjoy" everything with kindness to others.

Taka

1. What had changed thorough the program

As I mentioned in the introduction of myself during this program, it was first time for me to participate in such kind of international program. So at first, I couldn't imagine everything; what kind of people will come to this program? How could I communicate with people? Was my English enough for making international people understood? I didn't know. However, the more time I spend with the program members, the more I melt into their culture. I mean that I could understand what they want to tell me, and I also could tell my will in English. I was astonished by the fact that people can become friends easily. Just 10 days brought me different place. I was really stimulated by the way of their thinking, their face expression, their consideration like Japanese. At first I made barrier to prevent them from intruding my area, but it was broken. I was surprised because I am very obstinate by nature and it is very hard for me to open my mind. I got over my wall.

2. What I want to do in the future

Nowadays, there are a lot of environmental problems in the world especially about the energy. Energy issue we have is very serious, and we have to deal with as soon as possible because energy is limited. Under the status quo, we pay attention for generating new energy resources such as solar panels and wind power, however it is not enough for our sustainable life. I want to solve this problem. If we improve efficiency of generating energy, we can gain sustainable energy resources. When I went to laboratory in Midorigaoka, Toshiba, Tokyo gas, I strongly felt that it is my mission is to be involved in energy problem. Now, I major in physics and in the future I want to make some research about superconductivity. This phenomenon has no resistance when electricity flows in the metal, so I believe this research will connect with the energy transportation. Visiting places that is related to the energy issues was really stimulating for me, and I was inspired to study physics more. I also want to go abroad for my research or broadening my perspective toward international way of thinking.

Timmy

I got many things from 6th ASCENT: goods/souvenirs, photographs, experience, friends, and knowledge about energy. Well, maybe we can get things like I mentioned before from other event or place. But, something that make 6th ASCENT really special and can't be missed is its international scope. Not only that, what I really like from 6th ASCENT is the opportunity to visit either big or innovative Japanese company (Japan is well known for its advancement in technology).

As I said before, one of the best part of 6th ASCENT was company visit (and laboratory visit). From those activities we can know concretely how professionals build and develop real technological product to meet energy-related demand. The emphasis on technology in 6th ASCENT is very good, and it will be much better when some insights from business/market side are included. I hope we can balance the knowledge from technology perspective with business/market perspective.

As four countries (Japan, Indonesia, Thailand, Philippine) participating this program, of course my view about nation's energy problem was enriched. My nationality is Indonesian, but I represented Tokyo Institute of Technology in 6th ASCENT. This gave me very valuable opportunity to learn more about difference between Indonesia & Japan, and strategies to overcome energy problem. Previously when Great East Japan Earthquake in 2011 happened (I was in Indonesia), I thought it was not a big problem. Indonesia also had great disaster, tsunami, that damaged Aceh in 2006 and Indonesia managed to move on. So, in 2011 I thought Japan would be okay since Japan is developed country. But after participating in 6th ASCENT, I realized that Great East Japan Earthquake made serious problems in macro economy, energy security, and social. Running a nuclear power plant became hard, on one hand the need to fulfill energy demand is high, but on the other hand society seemed don't trust nuclear energy, mainly because of its safety. Similar problem about nuclear energy controversy is exist in developing countries as well; for example Philippine, nuclear energy issues is mixed with politics. In my opinion, there are 2 ways to solve this problem. First, improve the safety of nuclear-based energy production. Second, we should invest more in renewable energies like solar, wind, biomass, fuel cell, and so on.

Participating in 6th ASCENT motivates me to learn more about energy, especially relating to Indonesia's energy potential. Furthermore, it is not only my motivation to learn that changed after participating in 6th ASCENT, this experience also opened my

mind as well. Previously I don't have any idea to work in energy-related industry, but now I have more interest in energy field. Hopefully I can reach a decision-maker level in my future profession related to energy field. Eventually I want to apply the knowledge and use the network that I got from 6th ASCENT to reach my dream – a safe and secure world in food, health, and of course energy.

Yuka

I enjoyed this program so much!! And it was so fantastic!!! Through this program, we became so close friends and it was a good opportunity for me to improve my English skill. I really appreciate SAGE staffs preparing and making efforts for us.

Before this program, I was worrying about whether I can make this program wonderful. Actually, I joined a program which was held in Vietnam and similar to ASCENT. Vietnamese people are so kind and they took us a lot of place, and we became so nice friends. So this time, I want to host foreigners as well as Vietnamese. I made plans of sight-seeing after program every days, and we went to a lot of sight -seeing place such as Odaiba, Kamakura Minatomirai and so on altogether. We took a lot of pictures and saw beautiful landscapes and ate various Japanese foods. We walked so much and got tired, but it made us so close.

Cultural exchange was also good experience. It was first time for me to see Thai dance and use gold big nails. And I was able to see various Indonesian dances. I was surprised to see all Indonesian can dance well. And I had to guess what picture was behind me in the Philippine game. I asked a lot of question to the others, but it was difficult for me to hit up on the answer, pineapple! Japanese session held a tea ceremony. I was worrying about whether foreigners can enjoy eating Japanese sweets and drinking green tea, but they looked having fun and they learned strict Japanese manners. I was also able to learn about the way of drinking tea and I recognized the deliciousness of green tea!

Of course, I enjoyed visiting companies and laboratories. I was able to extend my knowledge of environment or energy problem. Especially, I learned about biomass energy through this visiting. I knew a lot of kinds of experiment are being done and there

are a lot of potentials to improve current energy situation. Our team decided to make a presentation about biogas, but sometimes, we had hard time to make it connect to the theme, The Future Energy in Asia But finally, we were able to explain about the sustainability and give some suggestions.

Yuki

Through 6th ASCENT, I learned so many things. My aim was just making international friends before joining it though, I got much more experiences than I thought in these 10 days.

I wanted to have opportunities of speaking English with international students because usually I do not have many chances in Japan and I am busy to take classes. I really want to study abroad, however, after belonging to my laboratory in Tokyo tech, I won't have long vacations any more. Moreover, since studying abroad needs much money, I do not decide to study abroad or not yet. Therefore, this ASCENT program was really suitable for me. I could have many chances of making international friends, communicating with them and practicing English in Japan. The program gave me good chances to think what globalization is and what merits and demerits of studying abroad are. Furthermore, we could know and think about each culture during the program, especially in cultural exchange party and sightseeing time.

In ASCENT program, there were many discussions which were based on some visiting and studying. I could learn how difficult discussions with foreigners are because I needed to think energy problems and explain my opinions to others in English. Since my listening skill is not good enough, at first understanding what they talk about is also hard for me. Some Asian students had typical own accents. During this term, I could be accustomed to hearing them more than before. I was not familiar with energy problems and some technology of energy, therefore studying the topics were also interesting.

There were many good merits of joining ASCENT though, the best one was being able to get fantastic friends, not only oversea friends but also Japanese members and SAGE staff. We Japanese members had some meetings and discussions for preparing pre presentations, cultural exchange party, planning sightseeing and presents for foreigners. We took long time for them, but always enjoyed. I am happy to join with the members and deeply appreciate their cooperation. ASCENT was made by only students, SAGE members though, I cannot believe it, 6th ASCENT was so awesome. I would like

to say thank you to SAGE members too. I am really glad to meet all members and wish we keep our relations. If someone is interested this program and read my report, I strongly recommend to join it! Don't miss such a fantastic program!!

Yuumin

6th ASCENT gave big impact to me. The best things among whole program are good relationship with new friends. I could make so friendly and good friends. So many things are unforgettable. And I was surprised that overseas students are so smart. They have many good ideas or opinions about the future of energy. They can speak English so well and are good presenter. I am proud of them. It was so hard for me to separate each other. I did not want to them go back to their own country. Ascent was over on 23th, but I am still in after grow because I really miss them and special 10 days.

It was when I was a first year student that I knew ACSSENT program first. At that time, I thought it was too early for me to join ASCENT since I was not good at communicating and poor at discussing in English. Even after 1 year, My English has not been improved so much. So I couldn't decide to join ASCENT at first. After all, I applied on 2nd application chance. Until ASCENT started, I have been trying to improve my English as possible and study or read some books about energy situation and problems Japan is facing with. Even in Japanese, my own language, it is hard for me to imagine the future of energy and solutions for problems. So I wonder if I could go well in the program. But actually it was no necessary to do so. Of course sometimes it took long time to understand what others are saying and make me understood in English, but it was not big problem. I never thought I could talk with them and really enjoy this program so much.

After all, I could conclude the future image of energy in Asia thanks to other members. Other members gave me the new way of thinking about energy problem and other many things like future of us. In Tokyo tech, it is difficult to meet students who are eager to think of global issues or future of us seriously, I think. So during this 11 days, all things stimulated me every day.

I am really happy to join ASCENT. It gave me a lot of things, which made what I am now. Thank you all so much! I love all 6th ASCENTers and SAGE members!

ITB

Ai

I knew this program from my friend who joined the same program with me in Hanoi last September and later I find out that he is the chairman of the organization, haha sorry boss! Anyway, I never expected before that I could meet up so soon like this with Hanoi-ers.

ASCENT was a priceless yet marvelous experience for me. I learnt so many things from company and laboratory visits, also about the energy conditions in Thailand, Philippines, and Japan. I had a chance to involve in a discussion and work together with other participants from another country, it was a great opportunity to exchange our ideas and also broaden my mind. It really an eye opening program and will be an everlasting good memories.

I had an opportunity to visited several laboratories in Tokyo Tech related to energy research. I was really impressed with Environmental Energy Innovation (EEI) Building with its energy efficiency to be self-sufficient in electricity production and reduce carbon emissions. This building also an earthquake resistant structure without neglecting aesthetic factor by its elegance designs. Moreover, we also visited several companies and research laboratory related to energy, like TOSHIBA, Tokyo Gas, and Neo Morgan Laboratory. I realized that Japan is really serious in doing research and it's totally different with Indonesia which research often hindered with funding and permit issues.

We also had special lectures about the future energy by NEDO and how to make a good presentation by Prof Tom Hope. Surely, it was very interesting how we predict our future energy from various perspectives by considering current situation and how we convince the audiences with our ideas by presenting a good presentation. Such a fun-tastic lectures!

Besides, we had a chance to introduce our culture in cultural exchange. I was very excited with this session since it is one of my dreams to introduce the richness of Indonesian culture. I'm also highly interested to know about other countries' culture. I love cultural differences, it taught us how to live together in peace with others in diversity. I feel grateful that I can meet awesome friends in ASCENT, I love you guys! Thank you for all SAGE staff who made this cool event alive happened!

One is never enough, it's true in some way. I'm going to see the other parts of the world and meet new people in new place. Going out from our comfort zone is the perfect way to learn new things and apply the knowledge that I've gained in the future. I would love to learn as much as I can while I'm still young. I'm sure that my beyond amazing 2 weeks journey in Tokyo will be everlasting, thank you very much Japan for everything!

Ferdi

None of the word that can describe my feeling during ten days in Tokyo even i felt speechless. There were so many unforgettable things during in Tokyo, the people, the activites, the SAGE committee, the place, and others.

During ten days we prepared for the final presentation. To support this, we visited some companies and research project in titech. We also have some lectures from NEDO and Mr. Hope to enrich our knowledge in order to improve our final presentation and also our skill. The activities in 6th ASCENT give me so many lessons. From company visit I can know some big company in Japan, which also related with our country, Indonesia. From research project visit in titech, I learned about how developed the researches in titech that really different with my campus. This research visit really motivated me to improve the researches in my campus. In the classroom we learn so many things. In discussion we can exercise our teamwork and problem solving skill. in prestudy presentation and culture exchange we can see the diversity of background, life, culture, people and so on. This program helps me to improve my english skill because we interact with participants who come from different country. This program also increases our awareness about energy problem that we must pass together as the part of asian society.

Through 6th ascent, I have new friends from different country. I feel so happy. I met the people from thailand, philipine, china, and exactly japan. All of them are very unique. Here, I learn to know each other. We spent ten days together. We share many things with each other, we sightsaw, we took picture wherever we were, we made surprise, we made so many unforgettable moments. It is really hard for me when we must back to our country. I could not save my tears in farewell party. I do really hope we can meet up again.

Since I was child, Japan is very familiar for me. Even in senior high school I learn japanese language for two years. My dream is visiting around the world and Japan is

one of the destination. This program made Japan as the first destination and brought me to Tokyo, a very great city that I have ever seen. As the civil engineer, I observed the infrastructure, transportation system, and water and waste management and for me Tokyo is an ideal example city. From Tokyo I really motivated to make many cities in Indonesia like Tokyo. Everyplace in Tokyo is wonderful, Odaiba, Kamakura, Asakusa, Akihabara, Harajuku, Minatomirai, Takaosan and others are very amazing and four seasons make Japan perfect. I am amazed by Tokyo because its orderliness, cleanliness, and safety. I am also amazed by Japanese people because their punctuality, high awareness, and work ethos. Japanese people also so care to me as the Muslim and I do really respect it. Generally, everything in Tokyo is amazing and I really hope I can back to Japan and enjoy another part of Japan especially seeing Mount of Fujiyama. I could join this fantastic program because the SAGE committee gave me the chances to join. None of the words that I can say except my thankfulness. The committee tried the best to serve the participant especially for the Muslim. I fully thanked for the committee for the halal food and for the pray place and other consideration for the Muslim. We do really appreciate your work hard to make this event and for me this program is more than success. Good Job !!!

I think this one page can not tell you whole of my high amazement but I hope this one page can make you a little smile. Thank You so much 6th ASCENT !!!

Kariz

When I first heard about 6th ASCENT, I thought it is my chance to widen my view about energy and make international friends. And it's true, I learned a lot during my 2 weeks stay in Japan for the 6th ASCENT, from a new insight on renewable energy problems to a Japanese comedian signature pose (Aiin!).

We visited a lot of laboratories and companies and also got lectures from NEDO and Professor Tom Hope. Knowing that Neo Morgan Lab is currently developing oil extraction from algae, or how supportive NEDO in renewable energy development thrilled me and made me realize how far my country Indonesia is left behind regarding renewable energy research and development. And not only renewable technology from the labs and companies, I also learned about Thailand, Philippines, and Japan's energy situation from other participants. I was surprised knowing that Thailand is also rely on fossil fuels, Philippines has a nuclear reactor, and Japan's energy crisis since their

nuclear reactor is currently shutted down following the Fukushima accident.

The main goal of this program is how Asian students picture the future image of energy, and that's why all participants must present their idea about that in groups. We had to build our idea in 7 discussion session. During those discussions, I also learned how to collaborate with students from different countries. Besides my Indonesian friend, my group also consisted of students from Japan and Thailand. It was a new experience for me, working with international students, and I really enjoyed it. Moreover, 6th ASCENT also gave me a chance to improve my presentation skill since there was a special lecture for presentation technique.

Furthermore, during the program I had a chance to learn about other countries culture through the cultural exchange session, where we played a Thailand traditional games, which was chaos, since we had to hold to each other and dodging at the same time. I also learned that Eatbulaga, a famous TV game show in Indonesia was originated from Philippines game show called "Pinoy Henyo". I had delicious Japanese sweets during the tea ceremony held by Tokyo Tech students.

Apart from the lectures and lab visits, I also had a pleasant time exploring Tokyo with all participants. We went to many wonderful spots and magnificent tastes around Tokyo such as Tokyo Tower, Asakusa, Minatomirai, and the Great Buddha Statue. During the sightseeing we talked about many things, and that's when I learned the "Aiin" pose. The Tokyo Tech Students, who guide us through the everyday-after-program sightseeing session always planned the trip well. Everyday, after the program, we rushed to the train station and went to new places. At one occasion, after we visited Suzukakedai campus, we literally run across the campus to the station in order to get the train for Jiyugaoka. They always made sure we could enjoy the trip and arrived to the hostel before 11:00 PM since the hostel had curfew.

Overall, 6th ASCENT was an amazing experience. Thanks to SAGE for doing a great job. Even though the program is only 2 weeks long, I learned a lot more than I expected and now I had best friends in Japan, Thailand, and Philippines. I'm really glad I had a chance to join this program.

Luhut

They say every first experience will last forever. Yes, 6th ASCENT was my first experience going abroad to join international student program outside of my country and

I will always keep it in my heart. For me, there are at least three important outcomes from joining 6th ASCENT that changed my life.

First, I learned how energy, time, and people matter in the four countries that joining this program: Japan, Indonesia, Thailand, and Philippines. I learned about the energy mix and government plan for energy in the future from each country and the recent technology development regarding new and renewable energy sources exploitation, such as solar, biotechnology, fuel cell, and nuclear, from companies and laboratories that we visited. Getting familiar with information that Japan depended on natural gas from other countries since Fukushima Daiichi nuclear disaster on 2011, Philippines with a huge potential of hydroelectricity, Thailand that had a lot of agricultural related potential, and Indonesia with geothermal potential, I was able to explore and learn the future image of energy in Asia, especially for these four countries.

Second, I learned about how Japanese people, especially Tokyo-ites (people in Tokyo), live their daily life. I was so amazed with all the complex and systematic e-system, such as the train and metro system, weather forecast, and Disneysea with waiting time estimation. Moreover, I really adored the discipline and cleanliness of the Tokyo-ites. One interesting thing was that I found that though it was hard to find a trash can, it was also hard to find people littering around the places. So different in my home country. Lol. Plus, there were also so many convenient stores around the city and, of course, a lot of nice restaurants that we could find anywhere.

Third and the last, I really enjoyed being with all the Ascenters (6th ASCENT participants) and SAGE members. This was the best part of 6th ASCENT for me. I met such a wonderful set of students that were so enthusiastic about each other and committed to emit extra energy for each other's benefit; the Japanese: Yuka, Daisuke, Yuki, Yuumin, Timmy, Ayaka, and Taka, the Filipinos: PV and Joshua, the Thai: Mint, Mink, and Oat, the Indonesian: Kariz, Ai, Adit, Suci, Ferdi, and Marco, and SAGE members: Tomoki, Leo, Keisuke, Ryouhei, Shangze Wu, Shingo, Chieri, Fumika, Kou Lee, and Li, all of them created an unforgettable wonderful memory in that 10 days and more. I missed you guys already.

I personally fell in love with Japan and the people. Lol. Thank you SAGE for this exceptional opportunity.

Can I ask for more?

Marco

Coming to Japan for 6th ASCENT was my first international experience. I learnt a lot of lessons, both formally and informally. Formally, I learnt some lessons by joining special lectures, visiting companies and laboratory, and also doing research during the discussion. Informally, I learnt a lot of lessons by observing Japanese life and also communicating with other participants coming from Thailand, Philippine, and Japan.

In 6th Ascent, I had an opportunity to know and understand more about energy problems and also the future of energy, especially in South East Asia and Japan. First, I got an opportunity to join special lecture from NEDO about the energy problems in Japan and also about related issues. Not only that, I also learnt about energy problem especially in Thailand, Philippine, and Japan through Pre study presentation delivered by each country. I also got a valuable opportunity to visit Neo Morgan, Toshiba Keihin Production, and also Tokyo Gas to learn about how each company try to solve the energy problems and plan for the better future of energy.

It was also very great that 6th ASCENT gave me the opportunity to know about Japanese life and opportunity to intensively communicate with other participants coming from Thailand, Philippine, and Japan. I learnt that each participant has their unique character and way of thinking. It is very interesting for me, since I can learn different things from each participant personally. In addition, the diversity among us gave me a lesson that collaboration is very important.

Now 6th ASCENT is over. But I am looking forward to keep in touch with other participants. I hope that 6th ASCENT would just be a start for our long-last friendship and collaboration. I hope that one day we will gather again and recall the day we first gathered in 6th ASCENT. Thank you 6th ASCENT!

CU

Oat

There is a saying “The world is a book, and those who not travel read only a page...” and after my wonderful time in 6th ASCENT, I am totally agree with this saying. 6th ASCENT not only gave me good experience of visiting many interesting places in Japan, but also a chance to meet and learn from many amazing people gathered in this event and of course it was really fun to spending time with all you guys for almost two weeks,

even in the end it was really hard to say goodbye.

Since the first day when I landed in Tokyo, feeling very cold and confusing with the vast network of trains and subways. Even this was not my first time, still it was really intimidating. And it is very fascinating with how organized but confusing things in Japan really are. Then it was the welcome party where all funs begin, at the local Indian restaurant. I really enjoyed the cultural exchange party with the meeting of all participants, sharing and introducing culture and games. It was my first time to really meet and getting to know people from Indonesia and the Philippines, to learn that we are having some common points and problems, but there are also many diversity in this region. How amazing that it did not take very long for us to change from strangers into friends and we are really crazy and enjoying taking selfie together and I got so many picture of you guys. ^^ Also I was very impressed with the warm welcome and kindness we received from all Japanese, both staffs and the participants, that they are eager to learn about the different culture as well as showing us around interesting Japanese culture and many awesome places.

6th ASCENT theme is about the future image of Energy which is the topic really close to our daily life. Everyone use energy right? 6th ASCENT not only gave us the chance to share our thoughts and problems, but gave us chance to experience the fascinating development of technology. During the visits to Companies (NeoMorgan Lab., Toshiba, Tokyo Gas) and research laboratories in Tokyo Tech campuses, we received a lot of knowledge and hand-on experience on what are the potentials of current technology that could be the future solution for energy problems, like petroleum mass production from algae culturing, or household fuel cells unit for clean energy. And from the fantastic Final presentation works, we shared our current trends and problems and coming up with ideas about what could we do and hope for a better future.

So after all the awesome activities, I have to thank 6th ASCENT very much, for which I could fill in many pages of good memories and knowledge into my travelling book and all the valuable friendship I have fostered during the stay. One day I would like to visits Indonesia and the Philippines as well to explore the new pages of this incredible world...

Mink

Before I joined this program, I felt a little bit worried because this is my first time joining this kind of program. But when I met other participants, I felt comfortable and can

talked almost everything with them just in a few days. The difference of nationalities, cultures and languages make us really interested in other participants, we asked and talked a lot. I found that Japanese people are very punctual and have high responsibility. Moreover, I learned to speak Indonesian, Filipino and Japanese.

The theme of this program is the future image of energy. I don't know much about this but after company & lab visiting, special lecture, discussion and presentation, I learned many things and became more interesting about this which is the important thing nowadays. I also improved myself a lot especially in presentation skill.

During this program, we worked hard and played harder! In each day after the activities finished, we went around Tokyo and outside Tokyo for sightseeing, shopping and dining until 11.00 PM! These 10 days are fantastic. I met many awesome people and learned many new things. I can say that this is the best program I have ever joined.

Mint

The 6th ASCENT program has given me an incredible experience and opportunity to open up my mind and vision. I have learned and seen a lot of advanced technology and innovation, and beyond those; various beautiful and interesting cultures during this program. It was one of the best educational vacations I have ever joined. The atmosphere of learning; gaining knowledge, along with activities, presentations and refreshments was the best part. The interaction from both sides (learners and lecturers) have made learning become easy and enjoyable. The outdoor sightseeing to many of the leading companies and laboratories in Japan such as NeoMorgan Laboratory, Tsubame, Tokyo Gas, and Toshiba was fascinating me. It provides me a better view of how far these day technology have been achieved and improved to and even makes me want to be a part of these great innovations and improvements. The most interesting research in my opinion is the Neo Morgan laboratory. I am very interested about biological research based on energy improvement. The algae and process of how they provide energy was fascinating. Also, the piping system and huge electricity generators of Japan were amazingly designed and developed. Moreover, the trip to the town and temples was a very memorable time with friends from different countries.

I truly want to apply the knowledge I have gained to improve my country or at least implement it to my daily life. The knowledge I have learnt was not only the academic aspect, but also the foreign cultures such as Japanese and Indonesian cultures. This

program is definitely a good way to broaden my perspective both academic and culture, and I do believe that the knowledge and the friendship that I got from the program will be everlasting.

DLSU

Joshua

After being part of Tokyo Institute of Technology's SAGE's 6th ASCENT I have learned quite a lot of important matters surrounding the future of energy, and I have experienced a lot of moments that will be cherished for the times to come.

The great thing about ASCENT is it is organized solely by TIT students as they host informative lectures from professional speakers, and have elaborate lab tours in leading companies such as Toshiba, Tokyo Gas, and Neo-Morgan Laboratory. I have learned a lot of things that I would not learn in school such as a first hand tour in the labs of Neo-Morgan where they cultivated the *Botryococcus Braunii* and process them for bio-fuel extraction. This program has really exposed me to the recent developments in Bio-fuel productions, such as in the field of energy derived from better strains of algae.

Besides learning a lot about energy, I also learned about life in general as I bonded with different students of different cultural backgrounds. This experience gave me the opportunity to travel on my own and become independent, also this event helped me develop my interpersonal skills, and learn several things about the differences of people and how we are all related despite the differences as this program taught me a lot about camaraderie and friendship.

P.V.

I was supposedly not be here. But no; I stared on that single e-mail the whole month. I was filled with hope of still joining. Days have I stared this letter—hoping for the seemingly impossible. I finally received another decision letter saying I am accepted. Finally, I will be having my first International Exchange Program—in Japan.

I never thought that ten days could plant irreplaceable memories with people whom you instantly and unknowingly became friends with. And in this span of days, considering that my college degree is relatively far of discipline with energy, I realized that I have a liking of such aptitude in me. Because, I know, energy is vital

knowledge—everyone must at least have the awareness of it. Thankfully for my professor in Thermodynamics, everything he introduced with me in class was materialized right in front of me through the laboratory tours. From NeoMorgan: (algae to fuel); Toshiba: (large-scale power systems); TokyoGAS (biogas to fuel-cells); EEEI Building (renewable energy as source); TSUBAME (supercomputer systems) and Suzukakedai Laboratories (Catalysts and Bioethanols), the union of Biotechnology, Power Generation, Renewable Energy and SMART Grid Technology paints the picture of the diversity of field of energy. Interestingly enough, these diversities define on how advance studies are on tackling the involvements of energy in different disciplines. Hence, assuring its importance for mankind.

Given how these technologies are flourishing in Japan, these will definitely be the cornerstones on how Indonesia, Thailand and especially Philippines will also take part in this endeavor of renewable energy. Perhaps noting that Philippines is still in the process of adapting to such advanced rigors of research, learning these along with Indonesia's vast supply and technology for Natural Gas and Thailand's validation towards Renewable Energy, Philippines has its own advantage: abundance of resources for all these and is given a visionary outlook on what we can expect to address together with. Perhaps, this is the purpose of this ASCENT: that is, to find that connection in which grounds each participant to collaborate and build a network towards achieving a common goal for energy in the spirit of involvement and camaraderie.

I am thankful that this program harnessed my skill in reporting. Having to experience my reporting skills without any prepared script is my weakness. Through ASCENT, I learned to speak of what I think; to let my mind do the talking. Along with the other nationalities, I grew culturally involved as to how each is unique with the other. This beauty of diversity makes this kind of program so immersive; it goes beyond your purpose—because you are forming a network: different in languages, but same of interests and visions. From the after sessions of exploring the city of Tokyo, we were eager to discover one culture after another. Fond relationships were built from the exchanges of laughter, words, culture, and most importantly from the ideas of others worth sharing back in my home country.

This first-hand experience will definitely seek my enthusiasm for energy. As a matter of fact, these ideas will greatly benefit on how I will be able to contribute my abilities into a meaningful purpose. Apart from the computers, I am now considering the issues of

energy in my study—because that’s how relative energy is with anything. Its future image is something worth seeking for: for generations to come.

My heartfelt gratitude goes to Tokyo Tech SAGE. I can never imagine a better program from what you have shown us. From the attention, conversations and time you gave us, thank you. Now, my standards for exchange programs are set high because of you guys! :D

UI

Suci

“Hi, this is Tomoki ISHIMARU, let’s make the best 6th ASCENT!” probably was the most beautiful line that I had ever received on November 2014.

In 2014, I wrote on my target note that I will be in Tokyo Institute of Technology for joining exchange program. I have prepared every requirement for that. But unfortunately, God had different plan for me. He still answer my prayer with “Yes, you will be at Tokyo in 2015. But not as an exchange student”. Yeah, on 13-23 March 2015 it has been accomplished. I went to Tokyo Tech as a participant of 6th ASCENT 2015.

ASCENT is about getting a new knowledge. Energy issue is not an issue that I am concerned about before. But in fact, there are many problems that are urgent enough related to energy. From ASCENT, I have become more aware for saving energy.

Next, ASCENT is about opening my mind, that Japan and my country are still really different. Japan has a very advanced technology. Innovations are everywhere. This strengthen my dream to develop my country with my knowledge.

After that, ASCENT is about realizing that for creating a better world, one country cannot do everything alone. We need collaboration for giving solutions from problems that existed.

ASCENT is also about having many new friends from many countries! Many perspectives from friends that having different background in knowledge and also country through such discussions is really fun but challenging. It seemed like I had been level up!

Lastly, ASCENT is about tolerance. Even though I am a minority with my religion, my friends in ASCENT never get me out from the circle. They help me in finding a place to pray, stay remember with my praying time, and also strict to my food restriction with

pleasure. I hope although I had made some things became more difficult especially for the committee... they still want to understand my principles.

So, overall. I am very grateful for being 6th ASCENT participant. Thanks SAGE member fot making this fantastic event happened! Keep in touch with strong friendship! KIZUNA! :D

UNDIP

Adit

The lessons learned from 6th ASCENT:

Learning that I gained from this program is very valuable and changed my perspective about Asian energy resources a lot. Which at first time I went to Japan with a very pessimistic outlook regarding energy development efforts in my country, but with the huge amount of information that I learned from this program, especially regarding energy conditions and opportunities that exist in the 6th ASCENT participant's countries made me get up and believe that Indonesia has a very large possibility to improve and utilize existing energy resources towards as the state that can be independence in the energy site. Not only get very useful information and knowledge about current and the expectations of Asia's energy conditions in the future, in this activity I also gained time to develop my way in presenting ideas and speak in front of an international forum. It is very valuable to me, because with this opportunity I can increase my confidence in public speaking, and in addition it also makes me get a lot of opportunity to ask questions and sharing with extraordinary speaker and delegates from some of Asia's countries.

A very special friendship certainly be a thing that will never be forgotten from 10 days of 6th ASCENT 2015. I really never could have imagined previously could feel a very exciting environment, filled with a sense of family and a lot of friends were very kind. Thank for all organizing committee of 6th ASCENT who have worked very very hard to make this event to be very special for me and the others. I believe the entire efforts and also ideas that have been stated in this event will make Asia be able to move on from the energy crisis time to the future with solutional renewable energy innovation.

My plan in the future:

My plan after I joined the program is I want to continuing my step to build one community-based of environmental education and energy comprehension which can be followed by all youth in the city of Semarang. Saw the potential of Indonesia which is rich in natural heritage both in terms of energy and also agro tourism, but in the fact just several people that able to take advantage with positive way, I think this is one of crazy movement that is needed for these conditions. With the community that successfully established later I hope can continuing create the great green cadres who are ready to become pioneers to move and take advantage of the natural heritage of Indonesia for result that would have a positive impact and provide benefits commensurate to the future development of my nation. To start the contribution of this community, first I will do the energy conservation activity in Marina Beach, Semarang to make the existing area in around this beach can stand as energy independent area. The movement will be carried out in cooperation with institutions of local natural resources and that certainly also fully supported by capital experience that I gained from 6th ASCENT program.

Appendix

Summary of Questionnaires is coming soon...



**6th Asian Students Collaboration
Encouragement program in Technology
“The Future Image of Energy”**
