



Luleå University
of Technology



Piteå Kommun

Project Management Unit cooperating between
An Giang and Sweden



Ho Chi Minh City University of
Natural resources and Environment

REPORT

RICE HUSK TO ENERGY COURSE

DEVELOPMENT AND IMPLEMENTATION OF RICE HUSK POWER PLANT PROJECTS

From 26 to 30 October 2015 in An Giang Province, Vietnam



(From the left: Mr. Huy Cuong, Mr. Quang Truong, Ms. Hoang Oanh, Ms. Kim Duyen, Ms. Nhu Quynh, Mrs. Thanh Kien, Mrs. Xuan Lan, Ms. Kim Vo, Ms. Hong Nhat, Mr. Bjorn, Mr. Jan, Mr. Huu Thinh, Mrs. Ngoc Xuan, Ms. Ngoc Hien, Mr. Son Luan and Mr. Thanh Phong who was taking photo)

ACTIVITIES THROUGH THE TRAINING DAYS

1. Date: 26 October 2015:



- At the first day of the training course, Mr.Vo Hung Dung – Vice Director of An Giang Natural Resources and Environment Department (Deputy Head of Steering Committee of An Giang – Sweden cooperation program) had opening speech.
- Professors and all trainees introduced themselves and also shared what they could gain together from this course.
- Professor em. Björn Kjellström introduced objectives, training schedule and started his well-prepared lessons.
- + Presentation of case studies
- + Basics of thermodynamics
- + Elementary theory of combustion and gasification
- + Mass and energy balances for rice mills
- Organization of working groups.

In the afternoon:

- There were a small group went to Tuyen Phat Rice mills. They are Professor em. Björn Kjellström, Mrs. Agneta Kjellström, professor Jan Dahl, Assoc.Prof Nguyen Thi Van Ha, Mrs. Pham Ngoc Xuan, Ms. Huynh Thi Ngoc Hien, Mr. Duong Huu Thinh, Mr. Tran Huy Cuong and Ms. Nguyen Hong Nhat.



- Other people came back to class after lunch for working in groups.

There were 4 mixed groups that decided by Assoc.Prof Nguyen Thi Van Ha:

+ Group 1: Pham Ngoc Xuan, Le Kim Duyen, Bach Thanh Phong and Nguyen Hong Nhat.

+ Group 2: Nguyen Minh Triet, Huynh Quang Truong, Pham Tan Phuong and Trinh Thi KimVo.

+ Group 3: Huynh Thi Ngoc Hien, Duong Huu Thinh, Tran Huy Cuong and Nguyen Thanh Kien.

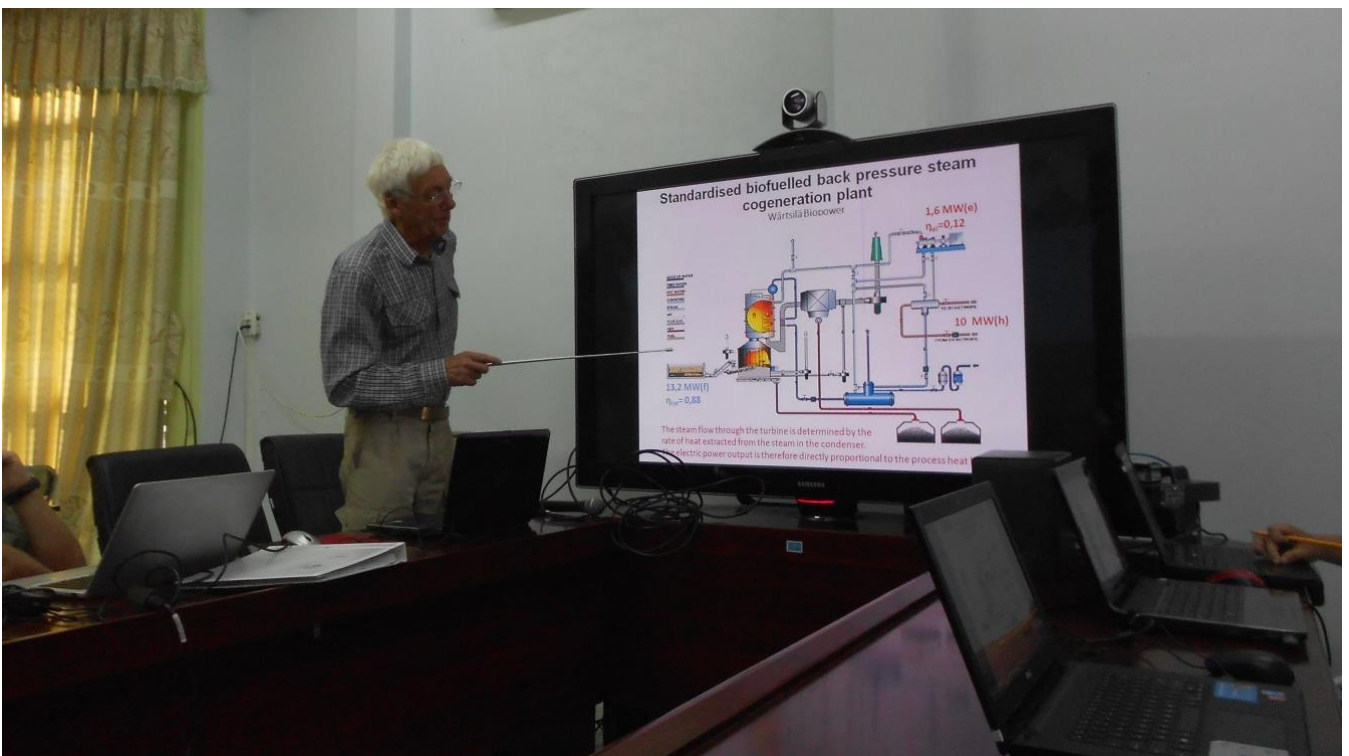
+ Group 4: Ly Ha Nhu Quynh, Nguyen Son Luan, Nguyen Minh Trang, Nguyen Hoàng Oanh and Nguyen Xuan Lan,



They calculated capacity of their factories, applied knowledge for lectures in the morning to fill site data in Excel file (**Sheet 1**). Representatives for Rice mills prepared necessary information so it seemed easy for them to finish this task.

2. Date: 27 October 2015: Professor continued to teach them:

- Professor em. Björn Kjellström introduced some technologies and case-studies:
- + Power plant options. Overview
- + Characteristics of steam power plants
- + Characteristics of gasifier/engine power plants
- + Integration of power plant with rice mill



- In the afternoon:

+ After giving instruction for 4 groups, a small group including: Professor em. Björn Kjellström, Mrs. Agneta Kjellström, Assoc.Prof Nguyen Thi Van Ha, Mrs. Pham Ngoc Xuan and Mr. Tran Huy Cuong visited Japanese company where are doing CHP plant in Phu Tan district.

+ Others stayed at classroom, discussed and worked with their data in **Sheet 2** of Excel file. During discussion, Professor Jan Dahl who didn't go to factory answered many questions asked by trainees when they were confused about their input data.



We also have very nice dinner together

3. Date: 28 October 2015

- They gained a lot useful information on that day:

+ Assoc.Prof Nguyen Thi Van Ha had interesting lectures on **Regulations and incentives for on-site generation**. There are some policies that encourage biomass power plants in Vietnam. Other participants also added some information on Regulations regarding to selling electricity that are generated by private business.

+ Assoc.Prof Nguyen Thi Van Ha and Professor em. Björn Kjellström talked about **Environmental aspects and hazards** to announce other to be careful when work with technical suppliers to make sure safety and efficiency of power plants.

+ Professor em. Björn Kjellström showed how to deal with **Cash flow analysis and estimation of financial indicators**



(Memorial photo which was taken by Mrs. Pham Ngoc Xuan)

- In the afternoon: Worked in group to calculate data of financial indicator (in Sheet 3)



4. Date: 29 October 2015

- Reviewed investment cost for CHP with different technologies
- Responded inquiries, questions and misunderstanding of groups
- Instructed trainees what need to be done with their designed CHP plants in Excel file (**Sheet 3**)
- Helped participants on calculations
- Showed expectation for Presentation of results from group work.



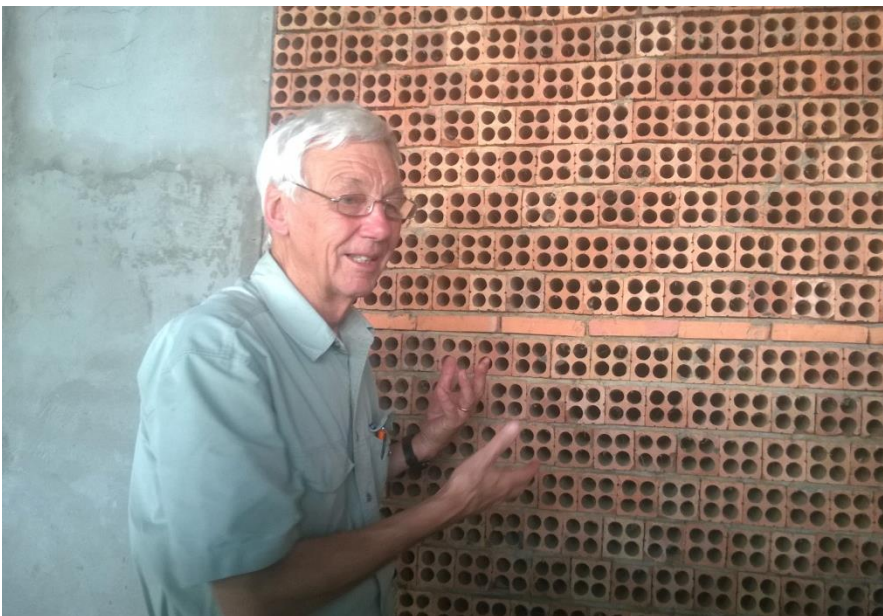
In the afternoon:

After finishing CHP data, they visited case study rice mill in Chau Phu district.

Professor em. Björn Kjellström have worked and analyzed data for Pre-feasibility studies for a CHP-plant at the Chau Phu Rice Mill in An Giang Province, Vietnam but just on data and information through email of Assoc.Prof Nguyen Thi Van Ha and Ms. Huynh Thi Ngoc Hien.

Therefore, that was a chance for him as well as for others to come and see “real factory” to have overview information about its situation.

People were in the bus to the Chau Phu Rice mill including, Professor em. Björn Kjellström, Mrs. Agneta Kjellström, Ms. Huynh Thi Ngoc Hien, Ms. Nguyen Hoang Oanh, Ms. Ly Ha Nhu Quynh, Ms. Trinh Thi Kim Vo, Mr. Duong Huu Thinh, Mr. Bach Thanh Phong and Mr. Tran Huy Cuong.



5. Date: 30 October 2015

- Presentation of group work results: Each group presented their group work results. After each presentation, teacher gave comments and other groups had questions.

+ Group 1: Steam CHP Plants at Thot Not rice mill

+ Group 2: Gasification CHP-plant at the Chau Phu Rice Mill (belong to An Giang Food Company)

+ Group 3: Gasification CHP-plant at Milling Cluster - Tuyen Phat, Hien Phat & Vinh Phat in An Giang Province

+ Group 4: Gasification CHP plant at Thanh Dat Limited Company

A detail list of participants and information of all group work results was included with this report in Appendix 1 and Appendix 2

- Course evaluation: All participants made evaluation by Make a cross in the box and wrote down their comments

- Closing of course - Diplomas awarded

❖ Reflections

- Thanks to professors, we had chance to approach knowledge of rice biomass and increased awareness on value of rice husk in rice mills and how we can utilize it for improve and develop rice mills, Power plan business as well as local economic development.
- This course has brought the dream that could use rice husk for power plants of An Giang come nearer.
- All mixed groups were worked hard together. There were so much noise from discussion of group-working and we have learnt from other members a lot.
- Trainees paid attention to lessons and teacher's instructions. Teacher also worked hard to explain for many questions and request of help on how to calculate data of CHP plants.
- All participants were in friendly atmosphere and teaching method was highly evaluated.
- In short time, they could not approach all information and formulas but we tried to apply what have learnt into assignments of 4 groups. Each group worked with representative for rice mills and decided what kind of technology, capacity of CHP plants that are suitable for their pre-feasibility study for an on-site power plant.
- For every presentation, teachers had comments and suggestion better solutions for effective investment. Other groups also asked questions and gave comments to each others.
- Trainees made evaluation of the traing course. They all hope professors will back to them in future when there have CHP plants in An Giang./.



(Prepared by Kim Vo)