

WASTE NEWS

WASTE 10TH ANNIVERSARY, 2002 - 2012

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WHEN GRADUATION CEREMONY 2012 COINCIDES WITH THE 10TH ANNIVERSARY!



Since this year's traditional WASTE Graduation Ceremony was held together with the 10th anniversary of the study program, it was even more unique and commemorative. The event took place on Saturday, Nov. 17th, 2012, at Pfaffenwaldring 47. Its schedule was very heavy and consisted of three main parts: anniversary colloquium, graduation ceremony and evening reception.

The three-hour-long colloquium in honor of the 10th WASTE's jubilee was entitled: Progress and Development in the Internationalization of University Education and Research. It started at 2 p.m. in the lecture hall V47.03 and hosted presentations of University representatives and WASTE alumni. The common message followed from all the speeches could be described by the brisk expression: Happy birthday WASTE! Keep up the good work! Prof. Dr.-Ing. Michael Schmidt gave a welcome word to everybody

and emphasized the exceptional character of the annual WASTE Graduation Ceremony at the University of Stuttgart. Prof. Dr.-Ing. Günter Baumbach introduced motivation for national and international study programs on environmental engineering and focused on the development of WASTE from its very origin. Ms. Jennifer Bilbao, alumna from generation 2005, presented her admirable career in one of the well-known German research institute and shared guidelines for the future for her younger colleagues. Thanks to Ms. Marta Escoto, Ms. Kristy Pena and Mr. Samuel Sasu (alumni from generation 2006) the participants had the opportunity to learn about all the graduates from year 2008; where do they work now professionally and what does the WASTE meant for them, *Improvement, a window to the world, great time, opportunity, diversity, change of perspective, bridge etc.* were among the answers. Prof. Dr.-Ing. Martin Kranert presented the meaning and scope of international cooperation in ISWA institute. Short break during the colloquium was a good chance for networking with a cup of coffee and scrumptious cakes. Afterwards Dr. Wolfgang Holtkamp, the International Adviser of the Rector of the University of Stuttgart, described the advantages of internationalization of our University, its intensive collaboration with industry as well as an open approach for combining the sciences with the humanities. Swedish student of newly established Chalmers - Stuttgart Double Master Program Energietechnik / Sustainable Energy Systems, Ms. Lisa Lecerof, shared her first impressions of studying in Germany. Representatives from „Ingenieure ohne Grenzen e.V.“, Mr. Sebastian Nuber and Ms. Wei Wu, spoke about organization's activities on the example of its projects consisting in reliable energy and water supply for two educational institutions in Zimbabwe. At the end participants could find out about career opportunities for environmental and chemical engineers in BASF from Dr. Susanna Voges. After the colloquium there was a little time for relaxation and oriental belly dancing was performed.

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THE BEST STUDENTS OF WASTE GENERATION 2010

The RECOM Services GmbH donated as last two years a prize of 1000 euro for the best WASTE students. This year the amount was divided into three parts. At the Graduation Ceremony on Nov 17th, 2012 the best three students of WASTE generation 2010 got this award. They are: Mr. Daniel Wehner (Germany), Mr. Chenzheng Yu (China) and Mr. Alexandros Manettas (Greece).



Mr. Daniel Wehner's Master Thesis has the title „Generic Life Cycle Assessment (LCA) of the Production of Aircraft Components for Implementation in Eco-Design Software Tools“. At the moment he is preparing his doctoral thesis in Taiwan but he would like to do his Ph.D. at the University of Stuttgart.



The topic of Mr. Chenzheng Yu's Master Thesis is „Distillation under forced oscillation of vapour phase“. His future plan is to join the BASF innovation campus Asia Pacific in Shanghai.



Mr. Alexandros Manettas wrote his Master Thesis about „Experimental investigation of the oxyfuel combustion in a 150 kWth circulating fluidized bed combustor“. He plans to work in a company in the energy sector or as a scientist at a German university for couple of years.

▪ Marja STEINLECHNER
WASTE Administration Secretary

>>> WHEN GRADUATION CEREMONY 2012 COINCIDES WITH THE 10TH ANNIVERSARY!



The second primary part of the event, WASTE Graduation Ceremony 2012, was interspersed with musical performances of WASTE students of different generations: Ms. Marni Mallari, (generation 2009), Mr. Sumate Khankaewphap (generation 2010), Mr. Anish Bajracharya and Mr. Don-Hugh Gooden (generation 2011). These „professional musicians“ were supported by „two semi-professional singers“ from WASTE generation 2010, Mr. Sergio Gligor and Mr. Arif Karahaliloğlu for the first song „Wish You Were Here“ from Pink Floyd. Subsequently Prof. Baumbach explained humorously the meaning of the phrase WASTE in context of study curriculum - it does not mean a garbage as someone could think, it is an essential component of the modern world, which should have the right approach towards it by Air Quality Control, Solid Waste, and Waste Water Process Engineering. On the rostrum stood also class speakers from generation 2010. They thanked everybody who organized the course and firmly expressed their belief of finishing one of the best study programs at the University of Stuttgart. His satisfaction and pride of being a godfather of outgoing generation 2010 expressed Dr. Ulrich Eiden, who playfully presented life advice for the WASTE students: when there is too much disorder (entropy) in your life, try to do what thermodynamic system does: just cool down - that will allow you to go

ahead. Handover of certificates to graduate students of WASTE generation 2010 was done by Prof. Schmidt and Dr.-Ing. Ulrich Vogt. Although not all of the students have finished their master thesis, the joy on their faces with symbolic certificates of graduation in their hands was great. Awards for the best students of generation 2010 were presented to: Daniel Wehner, Chenzheng Yu and Alexandros Manettas. Younger generations prepared a nice surprise for their older colleagues: a projection of goodbye video with scenes from the last two-year student's life. Do you know that WASTE has its own cover version of the famous pop song „Go West“ by Pet Shop Boys? „Go WASTE! In the open air (...) Together! We will work and strive!“ These meaningful words were sung loudly in the hall V47.03 by all generations, especially by generation 2010, at the end of graduation ceremony 2012.

After that the evening program could finally start. All the current WASTE students were involved in preparation of the event. This resulted in a unique variety of dishes on the table. Anyone could satisfy his plate choosing from more than 50 delicious specialties from almost each part of the world! A special 10th anniversary cake was prepared by Ms. Clio Gamardo with the help of Ms. Sinda Mendizabal and Ms. Ginna Gonzalez. Prof. Dr.-Ing. Wolfgang Ressel, the rector of the University,

himself graced the reception and gave his speech. Rector Magnificus congratulated this year's graduates, wished them success in dealing with the great task to improve the world by constructing a better environment as well as invited them to join the alumni network of our university. There were also diverse artistic performances. Participants could admire Indian, Indonesian and Kurdish dances, Diabolo show, accordion music played live and tenor singing. Party began with amusing mass dance (called later WASTE dance) introduced by one of the students from generation 2012. It consisted in performing specific steps by everybody following the rhythm of Tunak Tunak song. Then the dance floor was already full and the party boomed. Latin spirits of good mood were spread and the event lasted cheerfully until 2 pm as scheduled.

We hope that WASTE Graduation Ceremony 2012 combined together first two-digit anniversary of the study program made a good impression on invited guests and graduates' families. Thanks to all the people who were involved in preparation on such a big event. Again, we showed that we can afford a lot and make the WASTE program move forward successfully.

• Adrian Artur STRZALKOWSKI,
student of WASTE generation 2012

ALSO SPECIAL THANKS TO THE FOLLOWING SPONSORS!



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STUDENT ABOUT „THE GOD FATHER“ OF GENERATION 2010



Choosing a godfather for our generation did not have a religious connotation. Doctor Eiden was chosen because he played an outstanding role, setting the course in our professional development and exceeding the basic task of transferring the fundamental knowledge of thermodynamics.

His lectures were fully prepared. The material that he used was well written and documented. Every slide was done with impeccable care, updated data, and historical insight. He motivated us to embrace future assignments with complete dedication and numerous perspectives.

Eventhough the technical terms were difficult, he always made his lectures interesting. He used an excellent pedagogical method and with valuable applications as well as a variety of exercises, permeate

the students with his love for the science which is difficult to achieve. He instructed and encouraged us with great ability and humanity. He instilled enthusiasm in the research process in order to discover practical findings to contribute creatively towards improving the processes.



On top of his efforts for instructing us in the accuracy of concepts, he also wanted to educate and shape human beings, a never-ending pursuit. He taught us the modesty of a successful engineer, the humility of a wise man, the talent to get through

others with the message, and, more importantly, the daily knowledge of science and its applicability for human welfare.

He showed us the importance of following our passions over a great job. He didn't mind waking up early and traveling a far distance to meet us on time in the classroom. He shared with us his experienced knowledge without any self-righteousness but with words of wisdom. And the inspirational slides at the beginning of the lectures were wonderful tips for our personal growth.

Ultimately, it was a great pleasure to have had the opportunity to have him as a teacher. He was a role model for our still young task of becoming scientist and professionals like him. For all this, I only want to say: *Vielen Dank, Herr Dr. Eiden, dass Sie uns mit Schlichtheit und Können ein nachahmenswertes Beispiel gegeben haben, damit wir bessere Ingenieure sein können.*

• Andrea Milena CHITIVA RODRIGUEZ,
WASTE alumna generation 2010

„THE GOD FATHER“ OF GENERATION 2010 ABOUT HIMSELF AND THE GRADUATION CEREMONY



I have been teaching the subject „Thermal Process Engineering“ since 2006, thus I already got to know seven generations of WASTE-students.

From the very beginning, it was a pleasure to instruct the students, on the one hand because I always got to work with young people full of interest, passion and curiosity, and on the other hand because I find the internationality of the WASTE Program extremely appealing. Yet, I had never attended the graduation ceremony in the past!

This year, however, I did attend, because I had been chosen to be the Godfather for Generation 2010. This choice made me very proud and I still take it as a big compliment.

Of course, to prepare a reasonable speech took me some time, but after completion I felt very satisfied and looked forward to the celebration.

Together with my wife, we decided to join the ceremony and to stay overnight in

Stuttgart, since my home village is in the Palatinate, more than 170 km away.

I was eager, of course, to see the students, to hold the speech and to take part in the ceremony, but I had no specific expectation for the evening.

I can say that the evening exceeded our expectations by far. It was definitely an extremely enjoyable and entertaining evening!

The Course Director Dr. Ulrich Vogt led through the program very competently and Prof. Baumbach gave insight on the history of WASTE. Before I had the pleasure of holding my speech, the class representatives Arlett Baltazar and Arif Karahalioglu handed me a certificate documenting my „Godfatherness“ and a lovely bottle of Chateau Mont-Redon, which we still can't wait to open. I genuinely hope that my speech was an adequate answer to these amazing presents.

After this, Prof. Schmidt individually called up the students to hand them the outcome of their efforts over the last years. Everyone in the lecture hall felt great respect for the graduates and shared their pride of receiving the Master Certificates. Likewise, the awarding of the prizes for the best grades was an emotional highlight.

„Professional“ and „non professional“ music from students, as well as a video, covering the highlights of the

student's special events during the last two years, were a wonderful framework for the celebration.

The ceremony in the lecture room was great, but the subsequent celebration in the foyer was even more outstanding. A big buffet was waiting for us, delicious international food prepared by the other students. There followed a dancing night with numerous performances of different kind: great musicians, dancing groups, Diabolo performance, and much more.

The fact that the principal of the university, Prof. Ressel, attended the celebration and held a remarkable speech about international activities and networks of the University of Stuttgart was certainly another highlight of the evening.

It did not take long until my wife and I were absorbed from lots of frisky students on the dance floor. We had a wonderful time and enjoyed the evening within the WASTE family until we had to leave at around midnight in order to catch the last subway to Stuttgart downtown. Immediately we decided to have also next year's celebration in our time schedule 2013.

I would like to express my gratitude to everyone who helped to organize and execute this wonderful Graduation Ceremony!

• Dr.-Ing. Ulrich EIDEN,
BASF SE

ADDRESS OF THE STUDY DEAN AT THE GRADUATION CEREMONY WITH 10TH ANNIVERSARY OF WASTE

Dear students and dear guests,

An overview on the history and the foundation of the M.Sc. study program WASTE was given in the 10th issue of the Waste News. Therefore, this contribution shall be concentrated on the second part of the address:

The intention for establishing 10 years ago the WASTE program was based on the worldwide increasing of environmental problems and the necessity of their solution. Some aspects are given in the following examples:

- Global dimension of environmental problems: e.g. air pollution does not recognize borders
- Global warming and increase of CO₂ concentrations
- Solid waste and waste water problems in growing cities and metropolitan areas
- Shortage of clean drinking water etc.

The idea was to educate foreign engineers to learn environmental technologies, solutions and environmental thinking for the application of environmental managements in their own countries.

I think to be committed to improve the environmental situation a motivation for environmental engineering is necessary. There are different reasons for this motivation which may occur in combinations:

1. There are national, European and international rules with limit values which have to be met: Young engineers are the first to have to realize the new requirements in companies. So, in this case environmental protection is done because there is a legal pressure. For that environmental engineering education improves the chances for employment
2. Environmental technology is a growing market. So, it seems to be possible to make business and earn money with environmental technologies
3. The horror scenarios let us fear the end of the world. So, we have to act against this apocalypse. In this case fear may be the driving force for actions
4. We love our nice environment and nature and we want to save it against damage. For that we must have a relation to the nature to meet it with respect and to build up a connection to it. A precondition for such a relationship with the environment is that we must know and feel what to protect. It is not enough to know only from the newspaper that the average temperature increased the last 20 years up to 1 Kelvin. We have to stay in contact with the nature to form this relation and to understand their cycles.

The function of our nature is based on cycles and exists in cycles, e.g. the CO₂, water, biomass cycles etc. in the nature.

To promote environmental protection we have to learn thinking in cycles too. Industrial or human processes should be assessed using this scale of cycles whether they are environmental friendly or not. If they fulfill this condition we name them „sustainable“. But, what is the main principle of our worldwide economy? Growth! Without growth an economical recession is declared. We have to ask whether this growth thinking is in agreement with environmental processes. Are there financial cycles or are there undefined monetary sinks so that we need always this growth? Please, ask the questions whether what we are doing is in agreement with environmental cycles, whether it is sustainable.

My last wish is: Please have in mind that if you want to implement environmental protecting measures that you yourself should be an ideal in your living behavior based on an environmental conscience. Otherwise your concern will not be very convincing. You can try to create a personal list for your behavior, e.g. concerning noise, sustainability in food, mobility, helpfulness etc.

Have my best wishes to commit yourself for a better environment!



• Prof. Dr.-Ing. habil. Günter BAUMBACH,
WASTE Study Dean

News and announcements

OUR NEW WASTE TEAM



Right now the WASTE Office-Team consists of five members: Starting from left to right:

Robin Lauber, Hiwi and student of „Umweltschutztechnik“; Adolf Neuwirth, Examination Office; Dr. Ulrich Vogt, Course Director; Marja Steinlechner, administration secretary; Lu Liu, Hiwi and Ph.D. student of „Verkehrsplanung“.

We, the members of the WASTE Of-

fice like our job a lot and we like the very good atmosphere within the Office Team and the students and the lecturers, the entire „WASTE family“.

We are open for suggestions to improve the WASTE program and to requests. Please contact us.

• Dr. Ulrich VOGT,
WASTE Course Director

DATES TO NOTE

- Waste Intercultural Meetings “WIM” in upcoming winter semester every 3-4 weeks
- 22 Dec. 2011 - 06 Jan. 2013: Christmas Holidays
- 18 Jan. 2013: Registration deadline for exams (1st semester)

- 15 Feb. 2013: Application deadline for 12th generation
- 25 Feb. - 22 Mar. 2013: Exam period
- 25 Mar. - 5 Apr. 2013: Re-exams period
- 8 Apr.- 19 Jul. 2013: Lecture period of summer semester 2013

- 3 May 2013: Returning deadline for individual study plan (2nd semester)
- July 2013: summer party

Studying WASTE

WELCOME EXCURSION AND BARBECUE FOR GENERATION 2012

This year, the WASTE Program is celebrating its 10th Anniversary, at the same time the 12th Generation was warmly welcomed and have started the first semester of this well known International Program.

After a week of being in Stuttgart, the growing expectations for the first meeting of all the students of generation 2012 were quite big. Taking the decision to go abroad and spend two years far from our home countries is never easy, however being accepted in the WASTE Program and maybe getting a grant from our home countries or from Germany is not a work of „a couple of days“, so the fact of having reached goals like these always motivates and gives a satisfactory feeling. After arrival the most important thing was: to finally meet the ones that for the next two years would be in a certain way our new “Family”.

Finally the date of the first meeting arrived, as every year a warm and very friendly welcome meeting was organized to introduce all the new students and the Course Director, as well as presenting the main points of our studies and a little bit of the history of the WASTE Program at the Universität Stuttgart. The presentation was held by the Course Director Dr. Ulrich Vogt and took place in the IFK Institute, place that have been and will continue gathering all the WASTE students during most of the courses.

The 12th generation has 55 students that contribute to the complementation of an international network of more than 57 countries along the history of the WASTE Program, for the first time we have one student from Egypt and another from France.

After the introduction of all the students, Mr. Tabish Alam, class speaker of the generation 2011 shared his experience with us. After this emotive presentation, 5 students decided to participate as candidates for this interesting task and after voting Mr. Panos

Oikonomopoulos, Ms. Natalia Restrepo and Mr. Marc Wutscherk were selected as the class speaker of our generation. At the end of the presentation, the environment of the whole group was very warm, you could see how the students started to introduce themselves and share experiences.

After that we started to prepare ourselves mentally and psychologically to a 12 km walk to the Schloss Solitude, excursion that was also organized by the WASTE Team in order to continue with

this emotive first meeting. During the walk we could admire the peaceful forests that surround the Campus Vahingen. The Schloss Solitude surprised us sooner than we expected. A guided tour through the castle was a very nice experience. Finally we could have some minutes to eat something, admire the amazing view and take some nice pictures.

Unfortunately we had to prepare for the way back, that was, as usual, more exhausting than the first trip! However it was also nice to know that a delicious barbecue was waiting for us. After a few breaks we were finally back to IFK. We refreshed ourselves

with German beer and started enjoying the delicious meal and also a very nice atmosphere, not only with our generation, but also with some other students from the generation 2010 and 2011.

The time passed faster than expected, and the moment that tables were nicely lighted with candles that made us feel really comfortable, and motivated us to continue sharing some nice time. In the moment, realizing that this WASTE first get together was almost gone and the next step was to start with the „Real“ objective: finish our study, seemed to occupy an important part of our thoughts. And we are ready, our new WASTE Experience!!

▪ Carolina RODRIGUEZ-GONZALEZ,
student of WASTE generation 2012

EXCURSION TO THE BASF -- THE CHEMICAL COMPANY

At first class of thermodynamics with Dr. Eiden when he introduced himself and I saw the BASF logo in the header of his slides, it reminded me when I first saw that logo in my father's company in Iran. It was on the most expensive and important chemicals that they used, when all of other chemicals failed in plastic injection or BMC production. Then they started to use BASF products because it was the last chance to get the quality they wanted. I remember once I tried to take some of „Polyester resin“ from the BASF barrel, I messed up and splashed it all around! Suddenly I looked at my dad's eyes, they were saying „it is a precious chemical do not waste it...“

I am a chemical engineer, of course,



I am in love with distillation columns, reactors in high pressure and all these kind of systems. I knew that in BASF I would see all of them but not in that way! After taking two courses with Dr. Eiden, finally we had the chance to visit the biggest site of BASF in Ludwigshafen. So on October 15th, in the early morning of a Monday, The journey began. we arrived there in a

cold German weather. First impression was a big tower and a security entrance so we just got the permission and entered but something was different after the entrance. We were in a new city with streets and all kind of shops (like barber shop!) there were lots of employees walking around and going from one unit to another. We entered an office and listened to Dr. Andre's presentation about how this big company is working toward future, how they care about the new technologies and also how they support small companies to produce new methods of process. It was so interesting that just in Germany how many branches they have that each branch works in a special area.

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>>> EXCURSION TO THE BASF -- THE CHEMICAL COMPANY

After lunch we started our journey with bus through the site. It was awesome! In every corner were pressure vessels, reactors, distillation, absorption or scrubber column; there were bunch of pipes all around the CITY (I call it a CITY because it is 10 km² big and has around 33,000 employees). Also its streets have rails for train. It is a little bit funny when in one street you can see one train is coming, on the other side there is a bus or a big truck and on the corner one employee riding a bike. Moreover you can find lots of bus stops inside the site, additional to its own train station and port

in the river Rein. After the bus tour, that took around 30 minutes (you can imagine the size of site), we went to research part where you could see many labs running experiment. It is unbelievable how many staff with high tech devices are working in one project that will lead to new technology, and this part is the beating heart of BASF that keeps it the best chemical company after 150 years of experience.

We also had a chance to visit one unit which was formaldehyde unit. How it works, how they control it, how they do energy recovery was fascinating. More

over, it is mind blowing how these units work individually. They buy their energy and materials and they sell their products to the BASF. That's how they define „BASF dollar“. It is the way that we measure how profitable one unit is, if it can work on its own, we will let it work, otherwise it is not profitable for us so let us shut it down.

It was a wonderful experience for me to see what I have learned in the real world working together perfectly.

• Hesam OSTOVARI
student of WASTE generation 2011

EXPERIENCE WITH FINDING ACCOMMODATIONS FOR INTERNATIONAL MASTER STUDENTS

Currently more than 22,000 students are registered at the University of Stuttgart. With a share of international students of 20%, it is far above the average. Some international students participate in scholarship programs like the ERASMUS program, others come to Stuttgart as bachelor or master students.

Today the University of Stuttgart offers 8 international master degree programs, which are all taught in English. Students of these international master programs come from countries all around the world. For some of them it is the first time being abroad. As most of the master programs start in the winter term, arriving students are not just confronted with the different language and culture but also with the specific German climate, which can be very uncomfortable in autumn and winter.

Stuttgart is a prosperous city located in a densely populated region. Finding affordable accommodations in Stuttgart is challenging especially for students and even more difficult for international students who usually do not know the German language and are not yet used to the German habits and administrative procedures. Several institutions among others like the "Centre of international affairs, IZ" as well as the "Studentenwerk Stuttgart" try to support international students with consultancy services, special welcome programs, language courses and the provision of affordable accommodations. Further on the respective course directors and admission offices try hard to make the arrival of all students as comfortable as possible. However at a certain point resources in time, manpower and rooms in student hostels are limited.

For the starting winter semester 2012/2013, the University of Stuttgart provided an additional service due to an expected rising number of students from Germany and foreign countries and fol-

lowing increasing pressure on the housing market. This temporal service was supposed to support exclusively students of the international Master Programs to ensure that all students will get appropriate and affordable accommodations if necessary also on the private market.



Now after three month of experience figures and feedback show that the „experiment“ has been successful. All students who applied for an accommodation in time could get an affordable room in the student dormitory already by their time of arrival. Other students who have not applied for the student hostels or could not confirm their rooms due to existing uncertainties with their visa were put on the waiting list and were provided with a room on the private market. Nobody had to postpone his study due to lacking options for housing. Thereby this new service could serve as a link between all other institutions providing even consultancy for the first steps in Germany especially for emergency cases. This was always done in close cooperation with the IZ and the Studentenwerk Stuttgart and the respective course directors.

Finding adequate accommodation on the private market has often been a challenging duty. This was because on the one hand competition was high and expectations of applicants differed with the existing situation. Rooms should be close to university and as cheap as rooms in the

student hostels provided by the municipality. On the other hand available appropriate apartments were not convenient for applicants cause students had preferences with whom to stay with e.g. girls just wanted to live together with girls or students were not willing to share the apartment with students from specific countries and so further. Sometimes unfortunately even current political developments had to be considered. Much effort and communication with the students and landlords was necessary to achieve that everybody could feel satisfied and comfortable.

Arriving in a country far away from home and family is an intensive experience. Sometimes I could see the frustration in faces of students who had to wait some time till we could find an accommodation fulfilling their desires and needs. Basic knowledge about language and culture of course is very helpful for a good start in Germany. It increases flexibility and opportunities of each. However an appropriate accommodation is a basic need for everybody to settle and being able to create a new personal specific „home-base“ within an unfamiliar environment. It is also prerequisite for successful studies. One student told me: „I already asked myself why I came to Germany but you helped me and that was so important for me“.

I am very pleased getting in contact with so many different personalities from all around the world and learning so much from all of you. I wish everybody successful studies and a pleasant stay in Germany.

At this place many thanks to all protagonists who always try their best with understanding and patience to make the impossible possible. At first place the IZ, Studentenwerk Stuttgart, course directors and all who work in the admission offices.

• Johannes DÖRLE,
MIP alumnus generation 2009

MY EXPERIENCE AND PERSPECTIVES OF THE OPPORTUNITIES RELATED TO THE WASTE PROGRAM

In the end of 2011 I graduated in Sanitary and Environmental Engineering. So, one and a half years ago I was looking for a company to do my last semester internship and my final thesis about biogas and energy. I was thinking about doing it in Germany since it is one of the leading countries in biogas technologies. So I went to an event about Renewable Energy in Brazil, where there were some presentations about the German experience in this field.

There I got to know more about the company GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit) and talked to Mr. Torsten Schwab, who liked the idea of my thesis. So I sent him my curriculum and a few months later I was moving to Rio de Janeiro to do my internship at GIZ.

While working there I realized how much knowledge in the field of environmental technologies and its regulations Germany has to offer.

It turns out that Mr. Schwab is a former student of the WASTE Program (WASTE generation 2004). So he asked me what I was going to do after my graduation and told me to have a look at the WASTE Curriculum. So I did and after finishing



my thesis I applied for the program.

I believe that the knowledge that I am going to acquire here and also knowing the German language will improve my career perspectives.

After graduating I worked as a consultant for GIZ and for another German company called "Rotária do Brasil", in the field of waste water treatment and biogas. That experience just reinforced the feeling that I should come here.

I strongly believe in the partnership between Germany and Brazil and in the knowledge exchange. It is just a pity that the Brazilian Program of Scholarships „Ciência sem Fronteiras“ or „Science wi-

thout Borders“ does not offer scholarships for Master students. They say that Brazil already has good master programs and therefore there is no need to finance master students abroad. That may be true in some areas of study but I strongly disagree with that when it comes to waste water treatment, renewable energy and environmental technologies. This is a relatively new field of study in Brazil, especially when you compare to the German background.

I hope that the Brazilian government realizes that soon enough, because lots of good students end up not studying abroad because there is no financial support. And those students would add a lot to the sustainable and planned development of Brazil. I think that applies for almost all the other countries.

So last but not least, I strongly believe that we are all going to have good jobs opportunities and even leaderships posts after being in the WASTE Program. Let us make the most of this time here and when we are putting our knowledge in practice always remember to insure liberty, equality and fraternity. With the best wishes of success to all of us, I salute all the WASTE Program students and professors!

• Carolina BAYER GOMES CABRAL,
student of WASTE generation 2012



STUDYING IN WASTE AND BECOMING A MOTHER AT THE SAME TIME



After having worked in engineering industries in Iran, my husband and I chose the modern field of studies WASTE and COMMAS in Germany to continue our studies. Although we were eagerly waiting for continuation our studies, we had a lot of stresses regarding leaving our families, resigning from our jobs in which we had some years work experience in top companies and starting from the first step in Germany. I remembered when I received my admission from WASTE-Office, I found that I am pregnant. At first this was not welcome for me, because it was a good reason to hinder me from persuading my goal. According to some friends, I wanted

to do everything at once! In addition, after searching I realized that since I am over 30 years, I can't be insured by German public insurances and the private insurances will not pay for the child birth, furthermore no dorm was found for us as a family.

In spite of all these worries, we changed our life path and came to Stuttgart in Sept. 2011, while I was 5 months pregnant. After a short time these problems were solved with the great help of Dr. Vogt (WASTE Course Director), Ms. Habel (advisor of the International Center) and Mr. Köhn (AOK representative at the University).

I attended all of the lectures until 20th of Dec, when God gave me a small daughter as a Christmas gift! Becoming a mother for the first time was a wonderful feeling, but it was a big responsibility because all the time she was in need of me! During classes, exams and studying, I was always suffering from lack of sleep besides I was obliged to prepare myself for the upcoming exams in February. By task sharing with my husband who had also exams and the help of my mother who was a great

help till the end of February, I passed all of my exams with good results.

Up to one month ago, I could not find any place in kindergartens, so my husband and I were to take care of baby and attend the lectures intermittently.

As our daughter grows up, she becomes more curious, playful and always needs to be watched; the difficulties just convert from one type to another. I try to overcome the problems due to the fact that I believe there is always a way out for any situation, moreover have faith in my capabilities.

Although I am project planner it is impossible for me to have an exact time schedule because now my child is planning for me! However I try to prioritize my tasks and use the available times efficiently. I get use to study in the middle of toys, while my baby likes books and papers rather than toys!

• Shiva POURSALEH,
student of WASTE generation 2011

SOME CONSIDERATIONS ON ENERGY DEBATE

When we take a look on the activities and the objects that we use everyday in order to meet our purposes as individuals and society, it is impossible to neglect the relevance of energy as an entity that makes us easy to live. Mankind along time has used energy at different extents during its history, but has been just since 200 years ago that intensive use of energy has totally transformed the relationship between human beings and their environment. The energy became a way to get better perspectives of live for humans, comfortability in their houses, security against elements of nature, better and powerful transport, access to a continuous supply of potable water, and consequently a higher expectancy of live, it was a real revolution.

As usually in life, all the benefits of energy have been accompanied also for new problems or inconvenients that have been also faced by the society. The new perspectives and potencialities of the intensive use of energy have not been always used in order to guarantee the wellbeing of the majority of the individuals, and during the last century there were world conflicts that seeded terror and sorrow in a very efficient way thanks to technology and improvement of the intensive use of energy in a lot of different manners specifically designed to destroy and annihilate another human beings.

Besides the human lifestyle became extremely dependant on the use of energy in almost every activity of life. Just think about the indispensable need to prepare your breakfast in order to get your own life energy every morning, without a continuous supply of energy in the form of natural gas or electric power, it would be at least challenging to get it; or the wish to take a warm shower in the mornings after waking up, that would be just really nothing if you compared it with the fact that maybe you need to go, without any locomotion artifact, to your work place or bussiness located several kilometers away from your home. In this context it is better not to think about the possibility to be informed as efficiently as today, or to make our tasks, as fast as we can do now, without the help of a computer, a network and other peripheral devices that require a safe, continuous and reliable energy supply.

But where does the energy come from? According to the International Energy Agency (IEA) in 2008, total worldwide energy consumption was 474 exajoules ($474 \times 10^{18} \text{J} = 132,000 \text{TWh}$). Oil and other

liquid fuels are at the top of the consumption rate list between the different fuels, followed by coal, natural gas, renewable energies and nuclear energy. On the other hand, China, United States and India are leading the ranking of energy consumption around the world, as it is possible to see in the International Energy Outlook 2011 of the U.S. Energy Information Administration, and also in other related reports from similar agencies.

The energy rate consumption is growing, as is obvious to expect, while the world population is also doing the same. The United Nations (UN), in its long-range population projections, has reported for year 2300 a world population of 8.97 billion people. It is also considered the existence of a growing peak of 9.22 billion in 2075. If the energy supply shortage is considered, what will be the energy sources that our society is going to use in the future in order to satisfy these growing needs?

Another issue is the global warming and the pollution which are favored and generated during the utilization of the different energy sources. Fossil fuels like oil and coal are used in power plants in order to get energy, but simultaneously are released huge amounts of carbon dioxide (CO_2) and pollutants like sulphur dioxide (SO_2), unburned hydrocarbons (HC), volatile organic compounds (VOC), nitrogen oxides (NO_x) and another different compounds that cause health and environmental problems. Nevertheless, abatement pollution control technologies are becoming more and more efficient reducing the amount and concentration of pollutants that are released to the atmosphere, and also the energy efficient practices which have been implemented in the production and industrial sectors are getting satisfactory results, but if a region or country is improving its Gross Domestic Product (GDP) it means a more intensive use of energy, and consequently, a higher amount of CO_2 and pollutants released to the air.

There is not just one solution to these problem. It is not possible to say that our society is going to decline its quality of life in order to diminish the quantity of pollutants and global warming gases when its

standards of life are not guaranteed to the majority of the population. If it is desirable to have worthy life conditions in the whole world, then is unavoidable to cause environmental damage in a certain extent. Therefore it is necessary to get an agreement as a society about the damages that could be acceptable, from a realistic and quantitatively point of view, in a wide social and technical discussion, without fanaticisms and prejudices. Whatever, be the nature of them.

One the most controversial purposals is increasing the use of nuclear energy instead of fossil fuels. Regarding accidents like Chernobyl or Fukushima just few years ago, this alternative looks not so popular, but from a technical and pragmatical point of view it does not sound so bad. The fact that nuclear energy produces the most electricity in relation to its environmental impact, in comparison with other energy sources, has to be considered.

The use of another alternative energy sources is also of great importance. Solar, wind, geothermal, biomass and other sources have been improved in terms of its efficiency and reliability. The price of Oil and fossil fuel play a negative role against the development of a better capacity and higher intensive use of these sources making them not very economically competitive till now, but there are very admirable efforts to encourage and subsidize their use, for example in Germany and another countries of the European Union (EU).

Finally, is better to consider all the alternatives that are available in order to get the better answer. It is strongly necessary to continue promoting further developments in the field of renewable energies, they have to be part of the solution and are going to contribute in a considerable share to the energy budget. Nevertheless, in the mean time, available energy sources have to be used, efficiently, as clean as possible, and using economic incentives for the

renewable energies that could come from the fossil fuel use. Nuclear energy is also an alternative, its use has to be considered and subject to a comprehensive analysis, because if a decision is taken considering only misconceptions and prejudices and not real facts also, the competitiveness of a society can be put into question.



Recent events

VISIT TO THE CARL ZEISS PLANETARIUM

On Nov. 29th 2012, students from WASTE and other international master programs offered by the University of Stuttgart, had the opportunity to visit the Carl Zeiss Planetarium, located in Stuttgart downtown (Schlossgarten), the event was organized by the Course Director of MIP, Ms. Schneider. The planetarium opened its doors on Apr. 22th 1977, since then and despite hard efforts for its opening, The planetarium has overcome its challenges and is today one of the most frequented attractions in the region of Stuttgart.

For some students, it was the first time in a planetarium, what made it even more exciting. Once inside students got comfortable in their seats, the show started up with the amazing view of Stuttgart's night sky then gradually the star lights turned shiny since the city lights suddenly turned off, like one blackout, the differences were significantly.

Even if outside Stuttgart's sky was totally cloudy the sensation of a clear and

bright night sky was almost real, that was possible thanks to the ZEISS UNIVERSUM high fiber optic technology projector, which can simulate different brightness of the night sky view, persuading spectators



of those conditions, and giving them the feeling to be somewhere in the universe that is not the earth anymore.

Instead of mechanical clockwork gears, the stars showed by the ZEISS UNI-

VERSUM projector are digitally controlled through computers, so that time jumps of several thousand years are possible within seconds. The entire show took a little bit more than one hour, during that time students were swiftly involved into old mythology stories, solar system tips and explanations and a great lightshow for electro parties, in other words students were totally disconnected of reality.

At the end of the show students of all Master programs were fully satisfied and grateful for such experience, once again fellowship and organization were manifested within the study programs of the University of Stuttgart.

In addition for those who are space fans, the Carl Zeiss Planetarium offers consultation time every Thursday from 2 pm to 3 pm, so if you are one, do not hesitate to contact them.

• Carlos GARCIA,
student of WASTE generation 2012

INSIGHT FROM THE INTERNATIONAL FOOTBALL TOURNAMENT 2012



So I found myself walking to this tournament. I couldn't avoid a competitive instinct accumulating in me. As I arrived there, people were preparing the fields and setting up the benches for the „fans“. At the beginning, it at all seemed quite familiar. I had participated in tournaments before but it would take a little bit of time to recognize how different this one really was. I have participated in football and volleyball tournaments before but nevertheless this one had more to offer for some reason. I was part of the WASTE-2 team.

The WASTE Program had two teams; each one went to a different group for the start of the tournament. The tournament was arranged so if you did not classify to the next round you would still keep playing for a position in the table. There were 10 Teams. 2 from WASTE, 1 WAREM, 1 MIP, 1 IHAR, 1 GeoEngine, 1 InfoTech,

1 Physics, 1 COMMAS and 1 Lecturers. The WASTE-1 team got disqualified in the semifinals by another tough team in the tournament, WAREM, who went on to win the final against Infotech by 1-0. Congratulations from my part to the WAREM team. It was a tough semifinal. Some would say that it wasn't fair due to an uncalled penalty, yet at the end that is all part of the past.

Returning to an introspective view of the tournament, I believe I have lost contact with the incredible usage of my whole body. Be the senses of reaction, muscle capacity or any other; mostly due to my sedentary lifestyle. This tournament gave me back something about the meaning of sport. These thoughts all came down after I reminisced of the tournament; as I sought to write this article. Unorthodox I know, but a true human perspective.

One of the most interesting thoughts that came to be was concerning the reactions we take while playing the sport. Some inadvertent reactions being taken in millisecond by a past practices through our life, an imagined play, a watched play by some professional athlete or any other inspiration being taken in a blink of an eye. I find this truly inspiring and an astounding concept. As if for moments you are no longer in control, it is a bond of the body and the subconscious mind. A moment of true freedom. To let yourself go and give in is quite

overwhelming. Is this what football (in my case) has always meant for me? Another true moment of being here and now. These type of ideas concerning a sport on an existential plane had crossed my mind but for seldom moments. Before I just took it for granted, football has always fascinated me and I have been playing it almost all my life. I have always had fun with it. Few analyses came to mind on the path in life. Nevertheless I find this last one, one of the most significant. And it doesn't go without saying that the fact that I am able to provide an existential analysis of the topic at hand never stops amazing me. The tournament did something more than just entertain me for a day and for that I will ever be thankful.

• Oscar Antonio CASTELLANOS DIAS,
student of WASTE generation 2011



EDUCATIONAL FAIR IN MEXICO, COLOMBIA AND VENEZUELA

During November 2012 the ninth edition of the biggest educational fair was carried out in Latin America, which focuses on higher education in Europa. *Europosgrados* is a big event that started in 2003 and has been gaining recognition and reputation during the last years. This year Mexico, Colombia and Venezuela were the scenarios where more than 90 universities from Germany, France, Spain, Great Britain, Holland, Italy and Sweden exhibited academic programs for future students.

As a student of the international Master program WASTE, I had the opportunity to represent the University of Stuttgart in this magnificent event with Mr. Konrad Wenzel, assistant of the course director of another international program GEOENGINE at the University of Stuttgart, with the idea to pass on my experience of studying and living in Germany. I was surprised with the amount of visitors in this fair. More than 20.000 people in Mexico D.F, San Luis Potosi, Bogota, Cali and Caracas are willing to study abroad, research

stays, bachelor, master and Ph.D.

I was very glad to show that Germany has more than 1000 international programs; the well known engineering, science and technology programs, plus social sciences, business, administration, law, philosophy, languages and a wide range of possibilities for everybody. Beside that, research institutes around Germany were very attractive for students, like the Max Planck Institute, Fraunhofer Institute and the DLR (Deutsches Zentrum für Luft- und Raumfahrt, *German Aerospace Center*).



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Mexico and environmental impacts in oil production in Venezuela, are arguments from the students to study abroad, to be well prepared and contribute on the solution.

After having this experience I can say that we have to encourage our people to study abroad, to learn about other countries experience, to interact with other cultures and to live as an independent person, because countries such as Germany are willing to open the doors for people from all around the world, to teach, to transfer, to support and specially to make dreams happen for students who wish to bring their knowledge to the development of their own countries.

• Maria Jose VILLALOBOS,
student of WASTE generation 2011

Life after WASTE

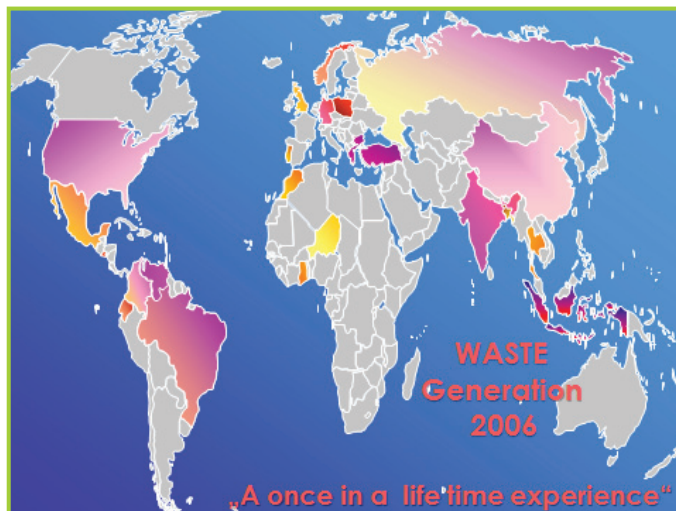
WHAT HAPPENED WITH THE STUDENTS OF WASTE GENERATION 2006?

One of my best friends, Tahnee González, from Venezuela, WASTE Alumna (generation 2006), who made a Ph.D. at Karlsruhe Institute of Technology (KIT) and is now working in Research and Development at Linde AG, Munich, was invited to give a speech during the WASTE Anniversary Colloquium held on November 17th about her experience during and after WASTE.

For Tahnee, WASTE was what it was, „a once in a life-time experience“, because of all the people that took part in it. She had the great idea of preparing a map showing the international character of WASTE and, especially, showing what WASTE has meant to all of us and what has happened with us within the 5 years after our Graduation in 2007.

In order to do so, she started a survey contacting by e-mail and via Facebook all the students from generation 2006 (in total

43 students, from 23 different countries). All of us were supposed to express in one or maximum two words what WASTE



meant or means to us and include the city where we currently live. I must say, the reaction to her message was impressive! After five years we are still connected! More

than 20 classmates answered and many of them gave a very nice update on what they are currently doing and expressed, in more than two words, how important WASTE has been to us, not only in terms of professional development but also in terms of personal growth.

Unfortunately Tahnee needed to go on a business trip and could not hold her presentation... In spite of this, she finished the map encompassing reactions of more than 20 students from Generation 2006. I will try to summarize some of these ideas: for us WASTE has been an amazing experience, a key, a bridge, a door to a world of great and exciting challenges and opportunities. WASTE has made the world smaller, has been about learning to be tolerant, to appreciate the richness of diversity and multicultural environments.

>>> continues

>>> WHAT HAPPENED WITH THE STUDENTS OF WASTE GENERATION 2006?

During the WASTE Anniversary Colloquium, two friends of mine – Kristy Peña Muñoz from Mexico and Samuel Sasu from Ghana – and I had the opportunity and great pleasure to share with the audience this wonderful presentation prepared by Tahnee and show that the WASTE spirit is

still in us, even after 5 years! At this point, I would like to cite the analogy used by one of my WASTE-friends (Noon): „WASTE program brings people from around the world and puts them together. It is like a puzzle, whose pieces may gather together again when the chance comes“.

In the name of all my colleagues and friends from WASTE Generation 2006, I just would like to say: THANK YOU WASTE!

• Marta ESCOTO DE TEJADA,
WASTE Alumna generation 2006

SCHOLARSHIP FOR A PHD AT FRAUNHOFER INSTITUT FOR INTERFACIAL ENGINEERING IGB

My name is Fabiola Salguero and I am originally from Guatemala. I came to Germany in July 2008 and started my studies in WASTE Program. As many other international students, I came with the purpose to learn a lot about environmental technologies and return to my country to apply them. Nevertheless, with the time I realised the possibility to continue my studies here with a Ph.D., to increase my knowledge and experience in Germany and also after looking how difficult is in my country to apply environmental politics.

After finishing my master thesis at Fraunhofer IGB in February 2011, I got the opportunity to start with my Ph.D. at the same institute. However, I had to do a brake: I started a new family and got a baby. But the idea to continue with my Ph.D. was always there and I started with



it on May 2012 on the topic „Kinetic and thermodynamic principles for the implementation of pressure change technology (PCT) for biological stabilization of low viscous fluids“. During the first months of my Ph.D. I worked with the design and construction of a novel technology to stabilize liquids, especially beverages. This technology, called PCT, is a novel technique that involves mixing a pressurized inert

gas with a liquid product and then rapidly releasing the pressure. The sudden pressure release causes microbial cell walls to rupture, inactivating microorganisms. In the next years of my Ph.D. I have to deal with simulation, modelling and design of a pilot plant.

Due to my bachelor in mechanical engineering, the topic of my Ph.D. work and my condition of woman and mother, my

supervisors and the institute director, Prof. Dr. Thomas Hirth, proposed me to a doctoral program offered by Fraunhofer Corporation. This program consists in supporting women who are doing their Ph.D. with the aim to support and increase the proportion of female scientists at the Fraunhofer Corporation. With this program, this proportion has increased from 1999 to 2012 in more than 7%.

I prepared my subject and did the application to the program. At the end of July I received the good news: I got the scholarship. This ensures me a contract of 3 years with Fraunhofer IGB to develop my Ph.D. topic. With this scholarship, I noticed that the fact to be a woman with children and working in an area which is mainly crowded by men is not an impediment and depends on your desire and the support of many people who believes in you and your work. To all these persons I am immensely grateful.

• Fabiola SALGUERO,
WASTE Alumna generation 2008

PRIZE AWARDED TO GOSIA STEIN-BRZOWSKA



Last June the 37th International Technical Conference on Clean Coal & Fuel Systems took place in Clearwater, FL, USA. Gosia Stein-Brzowska, WASTE generation 2006, attended the conference giving a talk on Fireside Corrosion of Dedicated Austenitic Steels in Ultra-Supercritical Coal-Fired Power Plants and as a Ph.D. student participated in the best student paper award. Out of many other international students she was awarded with the First

Runner-Up Reward. Gosia has been working at IFK meanwhile 4.5 years executing and coordinating European and national research projects in the field of corrosion and oxyfuel simultaneously assisting Prof. Seifert in lectures on thermal waste treatment and flue gas cleaning.

The awarded paper and presentation were on fireside corrosion of alloys dedicated for application in coal fired power plants operating at ultra-supercritical parameters. „In the fate of a greenhouse effect and diminishing resources of easily accessible fossil fuels the energy sector displays an increasing interest in technologies with a better performance and a lower ecological footprint. Henceforth, in recent times one of the most significant topics in the energy generation from fossil fuels have been the ultra-supercritical and advanced ultra-supercritical power plants. The idea here is to increase the steam parameters, i.e. steam temperature and pressure in order to increase the net power plant efficiency while simultane-

ously reducing the emitted amount of CO₂ per kWh of electricity. Aiming at higher steam parameters is limited by properties of structural materials used for construction of certain boiler elements.“ In the awarded paper the focus is on fireside corrosion of austenitic materials for boiler heat exchanger tubes. „Although the selected steels are known from application in various industry branches it needs to be clarified if these alloys are appropriate for application in boiler environment. Fireside corrosion is a very complex topic since it encounters the synergy effect of combustion gas atmosphere, real fly ash deposits and the alloy itself. Therefore it's so difficult to forecast performance of dedicated alloys.“ During the performed study three selected alloys were tested in corrosion test set-up at IFK and various German power plants. Following the evaluation of corrosion conditions performance of alloys was studied. The experiments were conducted in the frame of German national project COORETEC. >>>continues



>>> PRIZE AWARDED TO GOSIA STEIN-BRZOZOWSKA



„I am very happy and grateful to be awarded. It is a wonderful feeling to be appreciated for a hard work of more than three years. I owe a debt of gratitude to my co-author, Ms. Diana Flórez Cortes, also a WASTE-graduate from generation 2009. Part of the presented results was gained within her thesis on fireside corrosion, which she did under my supervision. Altogether, it took more than three years to generate the data

published within the awarded paper and talk. Since the work encompassed laboratory experiments together with measuring campaigns in power plants a few people were engaged in various ways. All these people made it possible and I would like to thank them for their feedback. I owe special thanks to my direct boss, Head of Department „Firing Systems“ at IFK, Mr. Jörg Maier for appointing me with the project and for all the discussions we run on the results. The successful corrosion tests in power plants would not have been possible without a great help of Ms. Eva Miller, Mr. Alexander Gerhardt, Mr. Selahattin Babat and further unnamed employees of

the IFK-KWF.

Furthermore I would like to thank in particular: Mr. Ralf Uerlings, RWE – for a fruitful discussion on the corrosion results, and people supporting me during the first analytical steps: Dr. Thomas Theye and René Kull. Finally special thanks to the personnel of power plants where the measurements took place for their commitment and co-operation and to our industrial partners and BMWi for the project funding.“

Gosia STEIN-BRZOZOWSKA,
WASTE alumna generation 2006

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Funny stories



LOOKING FOR A ROOM IN STUTTGART



I have never thought looking for a room in Stuttgart would be that hard!!!

I began looking at the beginning of July, I believed three months would be enough... Oooh I was so wrong. I started by sending emails from some well-known real estate web pages. At the beginning 2 emails per day, then 5, and 3 weeks before my current contract ended I sent 20 per day!!!

I received some answers like: „Sorry, but we are looking for a girl...“ A girl? Are you kidding me??? I am a girl!!! I guess I preferred when they just do not reply. Then, after some days, I had an interview!!! I thought that would be my opportunity. However, there were 30 people in that interview!!! 30 people looking around a small flat with 3 rooms, we had to take turns to see the flat. I was not chosen to get it.

After that, I tried luck in the newspaper. I thought it would be easier and it was in a sore way. First, I found a pretty flat with a really nice old lady, we had coffee in her living room and everything looked perfect. I went home really happy; I finally

had a place to live!!! My cellphone was dead after an all-day of calling people from the advertisements in the newspaper, as soon as I charged it and turned it on, this kind old lady called me but it was a complete different person, she reminded me the witches from the fairy tales, out of nowhere she started telling me I was lying, that I was too old to be a student and that for sure I have at least one or two kids!!! I told her I would visit her the next day so we could talk. And there I was just to find again the sweet old lady with cookies on the table!!! I cleared all questions, said thank you and got out of there. Who knows which kind of curious person I would find in the future???

Later I spoke with a man, the hardest German language test I've ever had (He speaks Swabian so you know what I mean). After I finally understood the address I went there and found a flat with a brand new kitchen!!! He showed me how it was renovated and everything was new but at the end he told me I wasn't allowed to use it!!! I tried to explain him I need a kitchen and he seems to understand but a few minutes later he also told me I could not use any kind of electrical device, even not my laptop, because the energy is included in the price and it is too expensive!!!

Finally I had to escape from Stuttgart and here I am, working on my Master Thesis and writing to you from the sunny Spain. Would I give Stuttgart another chance? Perhaps after the winter.

Ariett BALTAZAR,
WASTE alumna generation 2010

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AUTHORS
see articles

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Master of Science Program „Air Quality Control, Solid Waste and Waste Water Process Engineering“ (WASTE), of the Universität Stuttgart and WASTE Club Stuttgart e.V.

PROGRAM COORDINATOR
Prof. Dr.-Ing. habil. Günter Baumbach

CONTACT
Dr.-Ing. Ulrich Vogt
WASTE - Universität Stuttgart
Pfaftenwaldring 23
70569 Stuttgart
Germany

info@waste.uni-stuttgart.de
www.waste.uni-stuttgart.de
Tel: +49 (0) 711 685 68291
Fax: +49 (0) 711 685 68277