NVMP – StEP E-waste Summer School 2010

Final Report

December 2010

NVMP

StEP
SOLVING THE E-WASTE PROBLEM

PHILIPS
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UNITED NATIONS UNIVERSITY

EMPA
Materials Science & Technology

Cover Photo: The NVMP – StEP Summer School at the High Tech Campus Conference Centre, Eindhoven

Sponsors and Organisers

http://www.nvmp.nl

http://www.philips.com

http://www.umicore.com/

http://www.unu.edu

http://ewasteguide.info

With support from Cisco Systems to host the WebEx Conference

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Executive Summary

The second NVMP-StEP E-waste Summer School took place from 29th August – 7th September 2010. The theme of the Summer School was “Enabling Sustainable EEE Cycles”.

As before, the aim of the summer school was to bring together young e-waste researchers from around the world, looking at solving the e-waste problem from different disciplinary perspectives. Among the main objectives of the summer school were to link the researchers to experts from industry, academia and policy makers and also to develop a sustainable, multidisciplinary network of young scholars who will function as multipliers in their respective academic and geographic areas. On both these counts, and more, the summer school was a success and achieved its objectives.

The summer school was hosted by Philips Consumer Lifestyle in Eindhoven, Holland and Umicore Precious Metals Refining in Hoboken , Belgium. The 19 participants were a highly motivated, diverse and truly international group, and between them represented 18 countries of origin or place of study. The issues discussed during the ten days ranged from environmental justice to toxic hazards in electronics to recycling technology.

The program included expert lectures, workshops and study tours, in addition to a group work assignment for all participants. The summer school culminated with the presentation of the group task by students – a case study set in Ghana looking at three specific aspects - Transboundary movements of e-waste; The development of a Business Case for better recycling in a developing country, and; Producing a “Media Story” on e-waste on both topics. The entire session was broadcast over WebEx, and had viewers from around the world, including StEP members, summer school alumni as well as others interested in the work of the Summer School students.

The feedback received from the students and faculty was overwhelmingly positive and very encouraging. The outstanding success of the summer school was in large part thanks to the support provided by the main sponsors, NVMP, Philips Consumer Lifestyle and Umicore, as well as Swiss Federal Laboratories for Materials Testing and Research (EMPA) who contributed significantly in the development of the program and conducted the group work. A special thank you also to Cisco System who made it possible to broadcast the final group presentation over WebEx. Of course, the Summer School owes a huge debt of gratitude to the expert faculty who took time out from their busy schedules to come to the Summer School and share their expertise without which the entire Summer School experience would have been incomplete. And last, but not least, a huge vote of thanks also to all StEP members who supported the summer school, specially TU Delft, Ecoped, Dell, Institute for Applied Ecology (Oeko-institute), SAT Austria, Telecom Business School, MIT, BCRC Nigeria, Fraunhofer Institute, TU Braunschweig and PCRR, for reviewing applications and providing comments and feedback.

United Nations University was the lead organiser of the Summer School, with Empa and Umicore providing technical support in the program and content development. Deepali Sinha Khetriwal, Wesley Crock and Claudia Luepschen formed the core team at the UNU, under the overall supervision of Ruediger Kuehr.

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Concept and Objectives

The vision driving the NVMP-StEP E-waste Summer School was to provide a forum to young scientists from all over the world involved in e-waste related research to share their knowledge, interact with experts and develop collaborative partnerships fostering high quality cutting-edge scientific research on all areas related to e-waste - from policy to technology to economics to social aspects. The aim was to nurture young scholars by providing a unique interdisciplinary learning experience and encourage further development of research in this field.

Following the success of the NVMP – StEP E-waste Summer School in 2009, the aim for the second NVMP-StEP E-waste Summer School 2010 was to continue to be the foremost forum available to young scientists involved in e-waste research, looking at the e-waste issue in its entirety, rather than through the lens of a specific academic discipline.

Objectives

The aims of the Summer School 2010 were similar to those in 2009: to offer participants a diverse curriculum in an innovative framework supported by various teaching and learning methodologies including lectures, workshops, participant presentations, group projects and study tours with an international interdisciplinary faculty and experienced facilitators.

Specifically, the objectives of the E-waste Summer School 2010 were to:

- Develop a multidisciplinary network of young scholars who will function as multipliers in their respective academic and geographic areas
- Link young researchers to experts from industry, academia and policymakers which can lead into concrete research collaboration and projects on the ground
- Provide an opportunity to get their research reviewed by renowned experts in a neutral environment
- Promote innovative and rigorous scientific research, to identify research gaps in order to establish an international research agenda and develop a holistic view on e-waste research

Theme

The theme for the NVMP-StEP E-waste Summer School 2010 was "***Enabling Sustainable EEE Cycles***". This underlying theme was reflected in the overall curriculum.

The idea behind the Summer School's theme is to provide a 'red-thread' through the expert lectures, group work and study tours, with special emphasis on the "Enablers" of sustainable EEE cycles such as **Solid Technological Capabilities**, **Strong Legal Frameworks**, **Sound Finances**, **Effective Controls**, **Efficient Logistics** and **General Consumer Awareness**.

Sponsors and Organisers

As in 2009, NVMP is the main sponsor for the Summer School. Philips Consumer Lifestyle also continued their support and hosted the Summer School in Eindhoven, making available the venue at the High Tech Campus as well as transportation (i.e. cycles), refreshments and lunch at the High Tech Campus and a highly appreciated farewell dinner at the PSV Eindhoven which included a tour of the stadium. Umicore Precious Metals Refining were much more closely involved in the Summer School 2010, hosting it for three days in Antwerp, including not only a study tour of their facility, but also support for the venue, accommodation, transport and meals in Antwerp. Cisco Systems provided live Web-conferencing hosting via WebEx for the group work presentation.

The United Nations University was the lead organiser, with scientific inputs from Empa.

Organisation Committee

The organisation and administration of the Summer School was led by the United Nations University, with the core team comprising Deepali Sinha Khetriwal as Project Manager, Wesley Crock in the role of Project Administrator and Claudia Luepschen providing strategic inputs, especially in her role as Coordinator of the Task Force Capacity Building within StEP. Ruediger Kuehr provided the overall oversight of the project, with additional strategic and technical inputs provided by the Technical Committee consisting of Empa (Rolf Widmer) and Umicore Precious Metals Refining (Christina Meskers).

The first Technical Committee call was held in February 2010, largely focussing on the dates, application and selection procedure, participation fees, advertising of the call and possible speakers and topics.

Thereafter, intermittent Technical Committee Calls largely focussed on content and structure of the Summer School program.

Marketing

The Summer School is branded as the **NVMP-StEP E-waste Summer School** to highlight the support provided by NVMP and to also identify it as a StEP project. Linking it closely with the United Nations University and Empa has brought additional credibility and interest in the Summer School. The Summer School logo emphasises one of the main objectives of the Summer School which is to build interdisciplinary networks of research.

The Call for Applications was open from 5th March 2010 – 30th April 2010 originally, with an extension provided until 9th May 2010.

The publicity vehicles for the Summer School included used various channels, largely focussed on online and direct email contacts.

Online

Online marketing was considered the most efficient and effective way to target potential participants. The Summer School has a dedicated website address at: www.step-initiative.org/summerschool

The website was refreshed with new content for this year, updating the graphics and content as well as providing additional information regarding last year's Summer School, the participants and their presentations. The website continues to be hosted on Google Sites (www.sites.google.com), an online content management and web-hosting service available for free from Google. Google Sites was chosen as it was easy to set up and update, available at no cost and had features such document storage for downloads of forms etc.

The Summer School was also announced prominently on websites such as www.unu.edu, www.step-initiative.org, www.ewasteguide.info, www.globalwatchonline.com, www.scidev.net, ELMAR community, ISIE students also posted notices about the call for application for the Summer School. Additionally, announcements were also made on relevant groups on social networking sites such as Facebook (www.facebook.com) and LinkedIn (www.linkedin.com).

StEP membership:

The StEP membership includes several top educational institutes around the world, as well as other stakeholders such as manufacturers, government and non-government organisations. The call for applications for the Summer School was sent to all StEP members, who in turn circulated in within their organisations and networks.

Summer School Alumni:

The Summer School alumni from 2009 are very strong champions of the Summer School and have been very supportive in forwarding the information to their networks as well as providing information to prospective students about their experiences of the Summer School 2009.

Direct emails and personal contacts:

A brief flyer announcing the call for application and brief information on the Summer School was sent by email to researchers with published papers on topics relevant to e-waste as well as research students having previously done or working on e-waste related dissertations.

Online Marketing Effectiveness

The Summer School website is configured to Google Analytics to gather data on site usage and identify trends in search keywords, traffic sources etc. The traffic to the Summer School site for the period 5th March 2010 – 9th May 2010 is shown below. Over this period, the website had 2,632 visitors, of which 1,698 were new visitors and over 600 returning visitors.

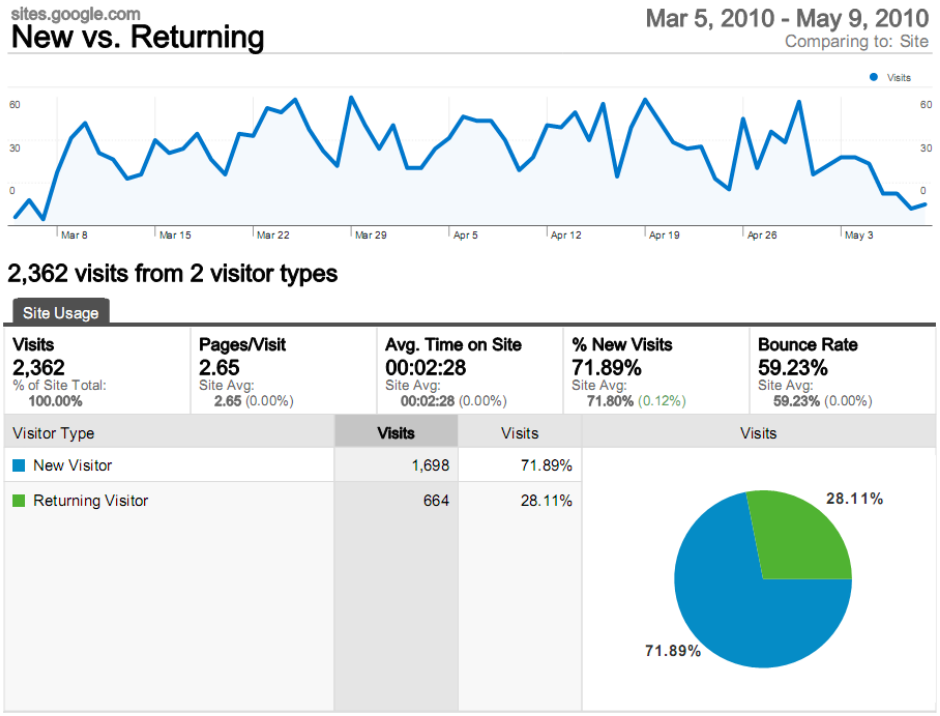


Figure 1: Visitors to Website

The geographic distribution of the visitors to the site shows the wide coverage the Summer School received, with visitors from 130 countries.

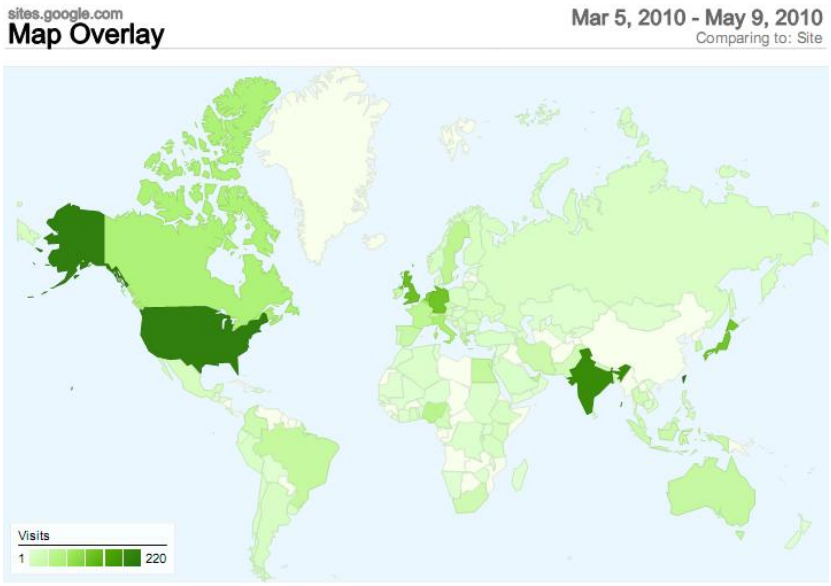


Figure 2: Geographic Distribution - Visitors to Website

The country conspicuous by its lack of visitors is China – however this was because all Google domain URLs were blocked by Chinese authorities during this period. As a result,

the large number of visitors from Taiwan therefore reflects visitors from China as well as Taiwan, as shown in the table below.

Visits	Pages/Visit	Avg. Time on Site	% New Visits	Bounce Rate
2,362 % of Site Total: 100.00%	2.65 Site Avg: 2.65 (0.00%)	00:02:28 Site Avg: 00:02:28 (0.00%)	71.89% Site Avg: 71.80% (0.12%)	59.23% Site Avg: 59.23% (0.00%)

	Detail Level: Country/Territory	Visits ↓	Pages/Visit	Avg. Time on Site	% New Visits	Bounce Rate
1.	Taiwan	220	1.60	00:00:50	14.09%	86.82%
2.	United States	203	2.35	00:01:18	84.73%	64.53%
3.	India	187	3.11	00:04:15	84.49%	52.41%
4.	United Kingdom	124	3.60	00:03:31	60.48%	54.03%
5.	Germany	120	2.75	00:02:09	77.50%	52.50%
6.	Japan	117	2.88	00:01:55	88.03%	58.12%
7.	Netherlands	103	2.51	00:01:35	71.84%	56.31%
8.	Italy	69	3.04	00:02:51	68.12%	50.72%
9.	Belgium	68	2.79	00:02:37	88.24%	58.82%
10.	Canada	62	3.44	00:01:22	83.87%	51.61%

Figure 3: Top 10 Countries - Visitors to Website

A snapshot of the top 10 traffic sources shows that most visitors came through the UNU website (www.unu.edu) or directly, presumable though links sent in their email, though quite a few visitors also came through the www.step-initiative.org or www.ewasteguide.info.

All traffic sources sent 2,362 visits via 63 sources and mediums

Show: Source Medium

Site Usage | Goal Set 1 | Views:

Visits	Pages/Visit	Avg. Time on Site	% New Visits	Bounce Rate
2,362 % of Site Total: 100.00%	2.65 Site Avg: 2.65 (0.00%)	00:02:28 Site Avg: 00:02:28 (0.00%)	71.89% Site Avg: 71.80% (0.12%)	59.23% Site Avg: 59.23% (0.00%)

	Source/Medium	None	Visits ↓	Pages/Visit	Avg. Time on Site	% New Visits	Bounce Rate
1.	unu.edu / referral		974	2.19	00:01:33	88.40%	66.84%
2.	(direct) / (none)		643	2.60	00:02:44	57.08%	61.28%
3.	google / organic		319	2.92	00:02:33	53.29%	54.55%
4.	ewasteguide.info / referral		93	3.78	00:05:44	64.52%	32.26%
5.	step-initiative.org / referral		78	3.99	00:04:35	62.82%	29.49%
6.	isp.unu.edu / referral		54	3.91	00:03:20	77.78%	37.04%
7.	sites.google.com / referral		33	7.73	00:07:46	12.12%	15.15%
8.	images.google.com / referral		26	1.62	00:00:12	88.46%	76.92%
9.	cedare.int / referral		24	1.83	00:01:11	66.67%	62.50%
10.	scidev.net / referral		21	3.29	00:05:17	90.48%	42.86%

Figure 4: Top 10 Sources - Visitors to Website

Applications and Selections

Application Procedure

The call for applications was published on 5th March 2010 and open until 30th April, with an extension until 9th May.

An application consisted of a short research paper (2-5 pages) as well as a full CV and completed application form. The application form included a question on the motivation of the student to attend the Summer School and also requested for information on travel costs, in case they wanted to apply for the travel grant. Call for application, application form and paper template can be found in Annexes 1,2 and 3 respectively.

Applications Received

During the two month period, 60 enquiries were received, of which 39 were completed applications. Encouragingly, a large number of the applications were from developing countries, especially Africa, Middle East and Asia-Pacific. Additionally, several applicants studying in universities in developed countries are from developing and emerging countries.

The geographic distribution of applications is as below:

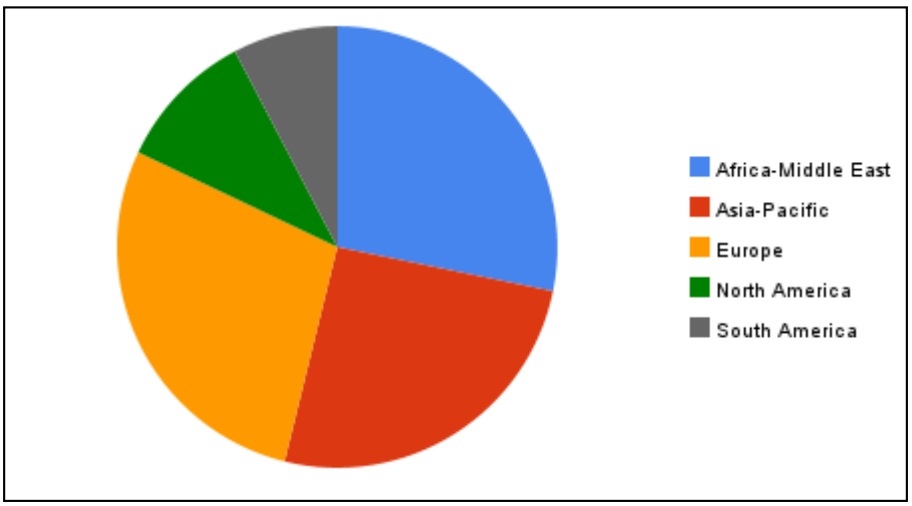


Figure 5: Geographic Distribution of Applications

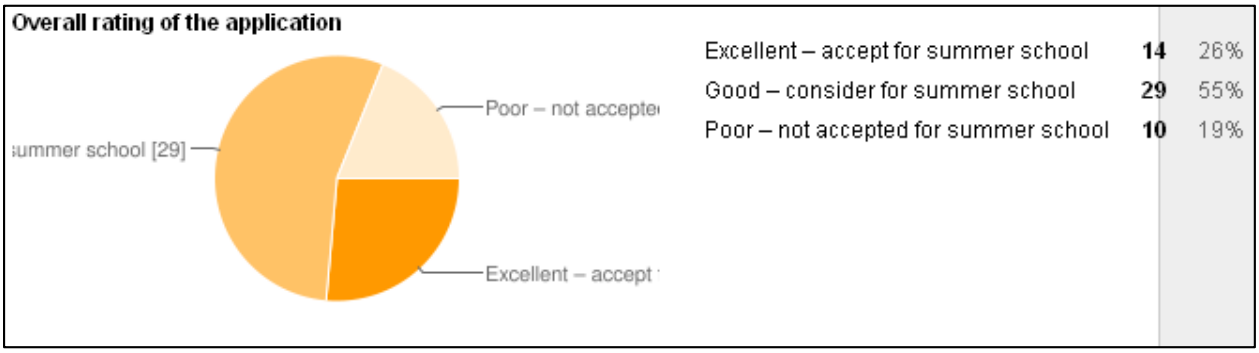
Review and Selection Procedure

Each application was pre-screened, to check for completeness and basic quality in terms of relevance to e-waste, language etc. Thereafter, each application was sent to two reviewers for comments and feedback regarding the suitability of the applicant for the summer school. The reviewers were chosen on the basis of their area of expertise from within and outside the StEP network. The evaluation form (see Annexe 4), sent together with the application documents and also available online to fill as a google form, requested reviewers to evaluate on various aspectes such as originality, importance of issue, content of the research paper as well as motivation and overall application and suitability for the Summer School.

Application Quality

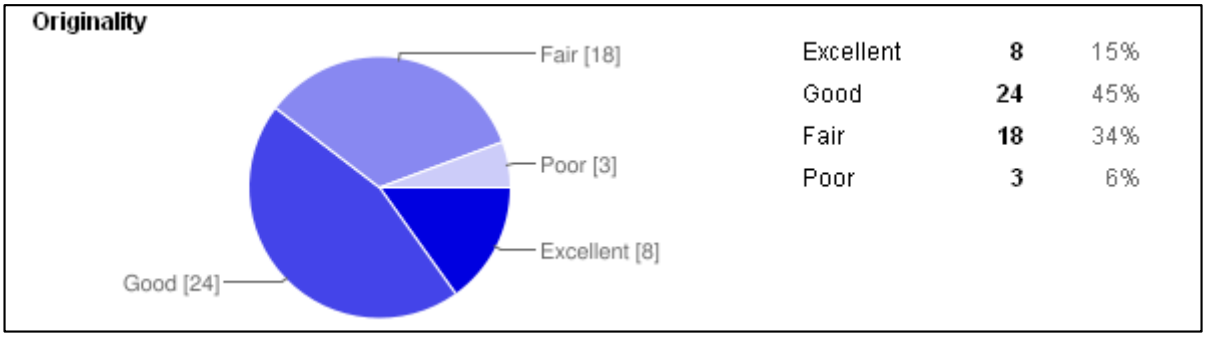
Overall, the applications received were of fairly high quality, with most of them being rated as good or excellent.

Overall rating of the application:



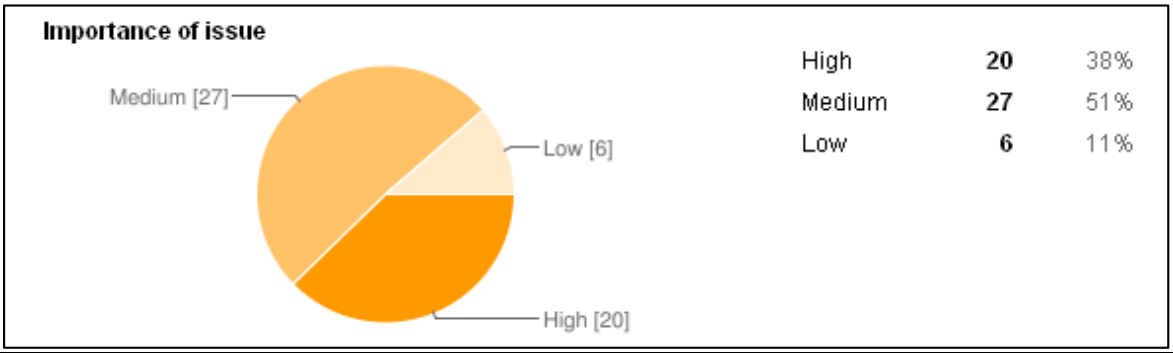
Originality:

Does the paper present new concepts, new approaches, new technologies, e-waste issues in new geographies, etc.? Most reviewers considered the applicant research as interesting and original, with the largest proportion (34%) getting a good grade on originality, with 15% excellent.



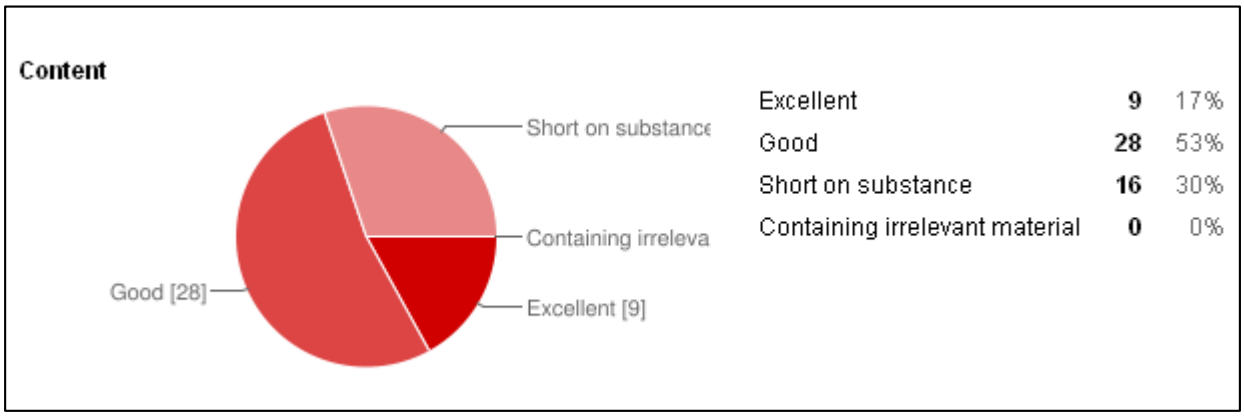
Importance of issue:

Does the paper tackle research questions which are important in their own context or identify important research gaps? Most reviewers felt that the papers were on topics of high or medium importance, with only a few applications being judged as those with low importance.



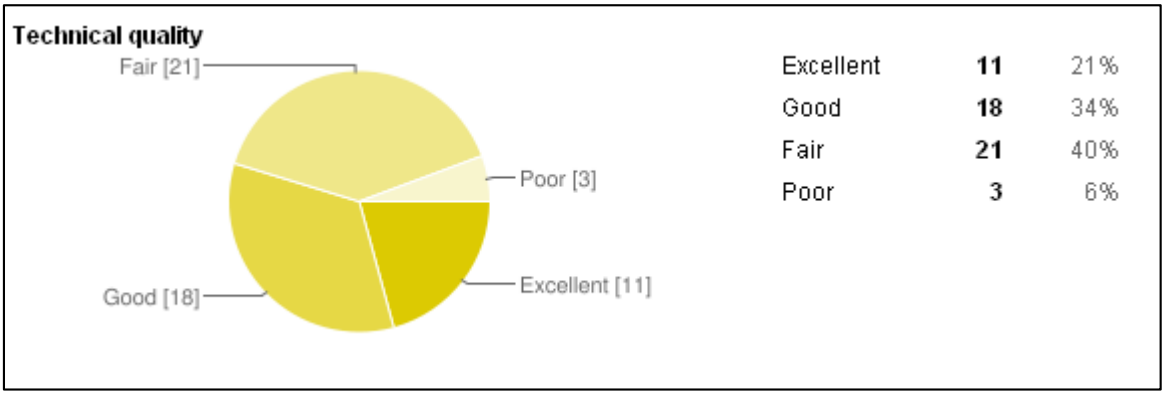
Content:

Does the paper present the subject matter compellingly and comprehensively? While the majority of the reviewers evaluated the content of the papers as favourable, there were quite a few papers found to be short on substance. A reason for this could also be the rather short page limit of the paper.



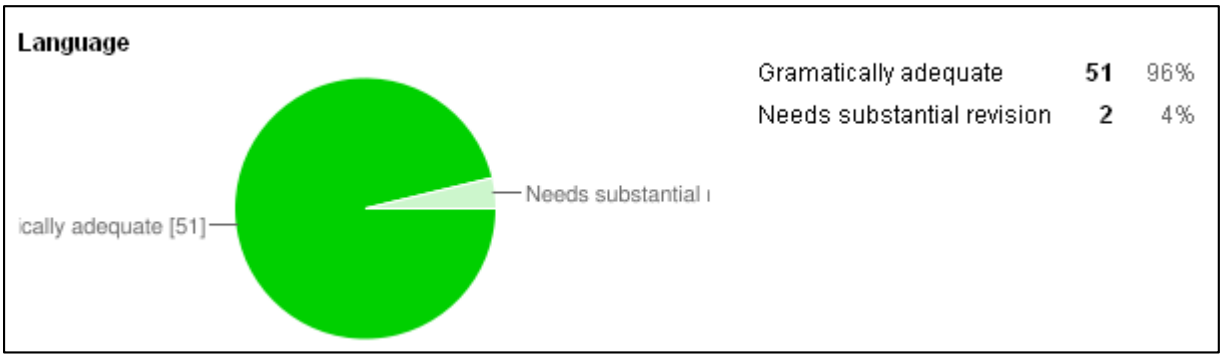
Technical Quality:

Does the paper present technical information such as chemical equations, mathematical formulae, model diagrams etc. clearly and understandably? Of the applications received, the technical quality varied substantially between papers, and though quite a few were excellent or good, there was a sizeable 40% of applications which had only a fair level of technical quality.



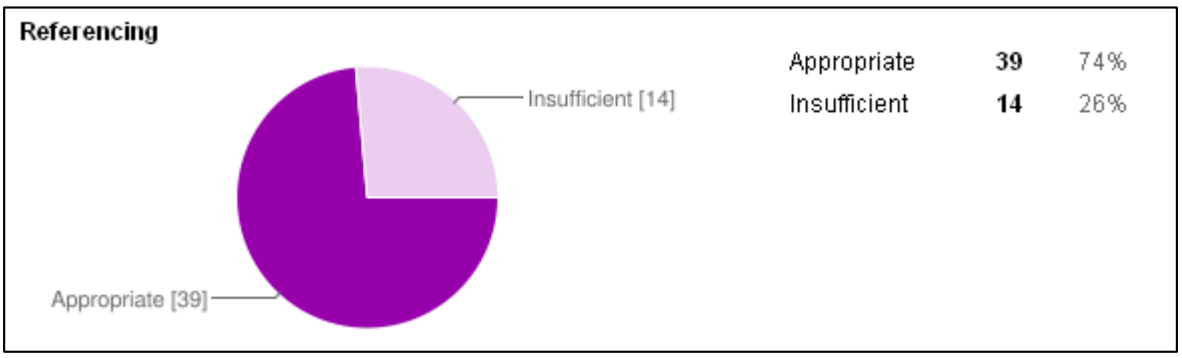
Language:

Given the English is not the first language for the majority of the applications, the reviewers rated almost all bar 2 applications as having an acceptable level of English and being grammatically adequate.



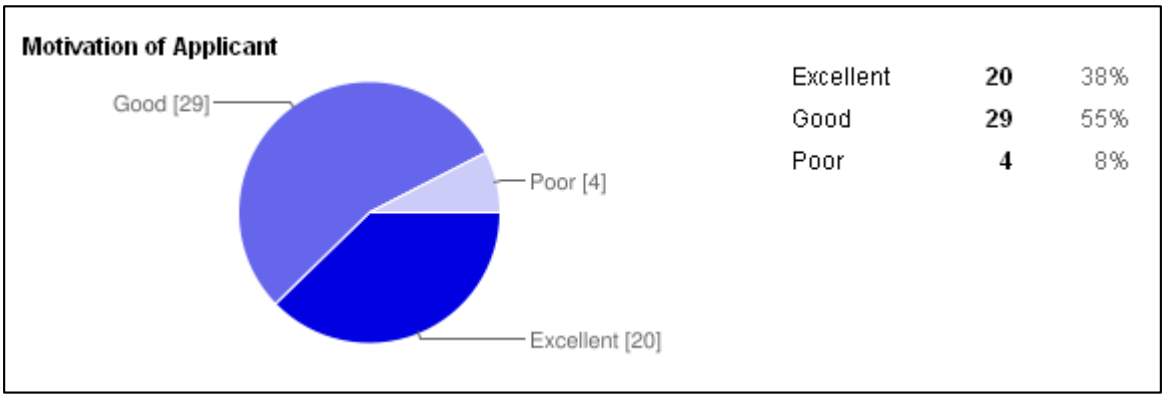
Referencing:

The referencing standard of the applications was a little lower than can be expected, and therefore there was a sizeable number of applications wherein the referencing was considered insufficient.



Motivation of applicant:

The application form had a specific question regarding the motivation and purpose of the applicant's participation in the summer school, and the large majority of applicants clearly outlined their motivation as to how they would benefit from the school, as well as contribute to it.



Selected Participants

The participants were selected on the basis of average score received from both reviewers.

From the 39 applications reviewed, the top 20 applicants were sent invitations to participate in the summer school, with 5 in the priority shortlist in case any applicants were not able to confirm their participation. Eventually, only 19 participated, as one dropped out at a fairly late stage.

The notifications of acceptance were sent out to the students together with the travel grant provided to them. Of the 19, 11 were awarded partial or full travel grants. Travel grants were awarded based on both need and merit.

The travel grants ranged from full travel grants including airfare, train and visa expenses based on need and merit to participants from developing countries, to partial travel grants which covered up to a maximum of 50 % of the total travel cost, based primarily on merit.

The participants were from Europe, Asia, Africa, North America and South America, representing between them 18 countries of origin or place of study.

The list of shortlisted and waitlisted applicants, along with the research paper title and country of application can be found in Annexe 1.

Program

The dates and duration of the Summer School were selected to be from 29th August to 7th September so as to schedule it towards the end of the summer holidays for experts and before the start of the semester for university students.

Based on the feedback from 2009, a 10 day Summer School was considered ideal – giving the participants sufficient opportunity to get to know each other, work together and have a substantial program without being too densely packed, while at the same time not stretching too long as to impact their other projects and activities. The structure of the content was as below - starting with six expert lectures, tapering to three workshops which then culminated into one group work complemented by on-site study tours.

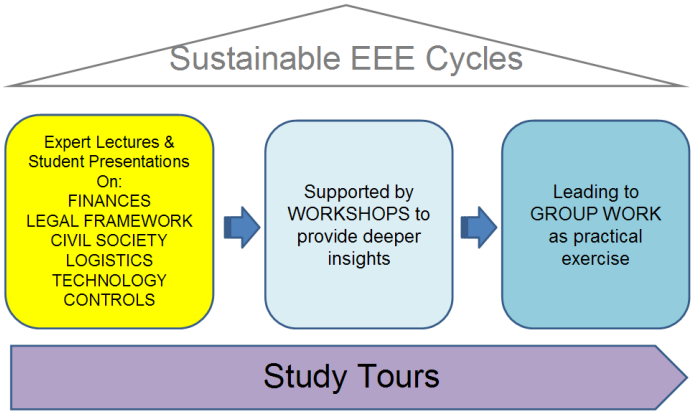


Figure 6: Summer School Program Concept

The expert lectures were focused on “Enablers”, and 6 key enablers were identified as show in the figure below.

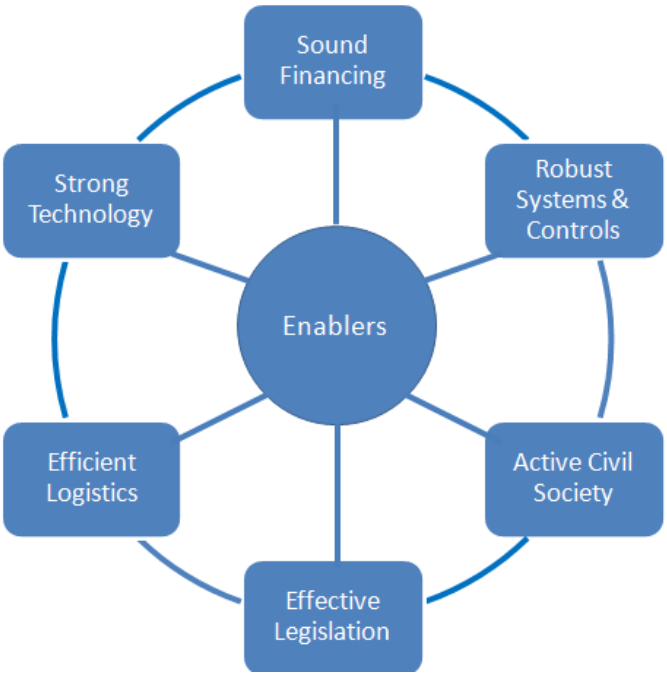


Figure 7: Summer School Program Concept

Expert Lectures and Speakers

The expert speakers brought not only their subject expertise, but also reflected a geographic diversity, coming from Africa, Europe, Asia and North America, as well as representing various stakeholders such as producers, recyclers, regulators and academia. Other stakeholder groups such as NGOs were also invited, but declined due to time and capacity issues.

The lecture topics and expert speakers for the Summer School 2010 are as below. Each lecture was for 1 hour followed by 15 minutes of Q&A and discussions.

The lecture presentations can be found online at:

http://sites.google.com/site/ewastesummerschool/presentations-sus2010

Sound Finance:

Financing an EPR-based system- Nils de Caluwe, Philips Consumer Lifestyle

Robust Systems & Controls:

E-waste Management within the framework of the Basel Convention: Practical Challenges and Possible Solutions from an African Perspective – Prof. Oladele Osibanjo, BCRC

Active Civil Society:

Take-back and Consumer Return Behaviour in Different Geographies Consumer Awareness and Media Influences – Pia Tanskanen, Nokia

Strong Technology:

UPMR Recycling Technology – Thierry van Kerckhoven & Dr. Christina Meskers

Battery Recycling Technology – Jan Tytgat

Effective Legislation:

Waste as Resource: Comparing legislative frameworks in EU, Japan, US and other Countries – Prof. Naoko Tojo, Lund University

Efficient Logistics:

Reverse Logistics, Reuse and Refurbishment – Willie Cade, PCCR

Robust Controls:

Practical aspects and challenges of ensuring controls on movements of goods – Vera Jansegers, Marc de Strooper, Belgian Port and Customs

Workshops

1. *Sampling, Recycling Rates and Product Design towards Resource Efficiency* – Dr. Antoinette van Schaik, Van Schaik Consulting
2. *Idealised Logistics Chains* – Prof. Josh Lepawsky, Memorial University Newfoundland
3. *Best of Two Worlds Disassembly Session* – Profs. Jaco Huisman & Ab Stevels, UNU/ TU Delft

Group work

The group assignment was led by Rolf Widmer of EMPA, as a case study set in Ghana. The students self-selected themselves into 3 groups, and had to prepare a presentation on the following topics in the context of Ghana. In this, they were supported by experts on Ghana from EMPA (Raphael Fasko, Esther Mueller, Dr. Mathias Schleup) as well as documents and reports from field studies conducted in Ghana.

- Transboundary movements of e-waste,
- The development of a Business Case for better recycling in a developing country, and
- Producing a “Media Story” on e-waste on both topics

The groupwork presentations were broadcast via WebEx, with 15-20 participants joining in from around the world including participants and faculty from the 2009 Summer School, StEP Members as well stakeholders from the Basel Convention Secretariat.

The WebEx seminar can be viewed at the following url:

https://cisco.webex.com/ciscosales/lsr.php?AT=pb&SP=MC&rID=46073912&rKey=65945d9e1aa6b45e

Study Tours

The Summer School visited three sites for study tours, namely:

1. Umicore Precious Metals Refinery, Hoboken, Belgium
2. Port of Antwerp, Antwerp, Belgium
3. Philips Healthcare Refurbished Systems, Eindhoven, Netherlands

Participant Presentations

All participants had a 30 minute slot, with 15 minutes to present their research followed by 15 minutes of questions and discussion. Participant presentations were scheduled between Monday 29th August and Friday 3rd September. The presentations were scheduled so that they complemented with Expert Lectures.

The schedule for the Summer School is as below:

Sun28.08				Welcome Reception
Mon 29.08	**Sound Finance:** *Financing an EPR based system* Nils de Caluwe, Philips Consumer Lifestyle	**Robust Systems:** *E-waste Management within the framework of the Basel Convention: Practical Challenges and Possible Solutions from an African Perspective* Oladele Osibanjo, BCRC	**Student Presentations:** Chris Mcnabb Alex Graziano Somjita Laha Adesewa Adenjiji Li Xiaomin	
Tue 30.08	**Active Civil Society:** *Take-back and Consumer Return Behaviour in Different Geographies Consumer Awareness and Media Influences* Pia Tanskanen, Nokia	**Student Presentations:** Amal Aly Ohakwe Johnson Elizabeth Macharia Nancy Nyenga Mauro Cesar Bernades Irina Oswald Jelle Rademaker Natalia Duque Ciceri		
Wed 1.09	**Strong Technology:** *UPMR Recycling* Thierry van Kerckhoven & Christina Meskers, Umicore	**Strong Technology:** *Battery Recycling* Jan Tytgat, Umicore	**Study Tour** Umicore Precious Metals Refining	
Thu 2.09	**Effective Legislation:** *Waste as Resource: Comparing legislative frameworks in EU, Japan, US and other Countries* Naoko Tojo, Lund University	**Efficient Logistics:** *Reverse Logistics, Reuse and Refurbishment* Willie Cade, PCCR	**Robust Controls:** *Practical aspects and challenges of ensuring controls on movements of goods* Vera Jansegers, Customs Belgium, Marc de Strooper, FEI Belgium	**Student Presentations:** Katarina Tosic Hua Zhong Maurice O'Connell Steven Zhou
Fri 3.09	**Study Tour** Port of Antwerp	**Strong Technology:** *Sampling, Recycling Rates and Product Design towards Resource Efficiency* Antoinette van Schaik, Van Schaik Consulting		**Student Presentations:** Gregory Lewis Huabo Duan
Sat 4.09	Freetime		Groupwork	
Sun 5.09	**Workshop** Idealised Logistics Chains		Groupwork	
Mon 6.09	**Workshop** Best of Two Worlds: Dismantling Session		Groupwork	
Tue 7.09	**Study Tour** Philips Healthcare Refurbished Systems		Groupwork	

Planning & Organisation

Planning Timeline:

The planning for the Summer School 2010 started in January with a proposal to NVMP with a brief concept note. Umicore Precious Metals Refining had shown an interest in exteding their association with the Summer School following last year's involvement as a Study Tour host. Therefore, a formal proposal was made to Umicore after receiving agreement from NVMP and Philips. The call for applications was opened after receiving confirmation of support from all, respectively NVMP, Philips and Umicore of their support for the Summer School. The timeline of the activities, including the planning and preparation of the Summer School can be seen in Annexe 6.

Eindhoven - Venue:

Given highly favourable feedback on High Tech Campus as a suitable venue for the Summer School, the Philips High Tech Campus was once again the venue for the Summer School. In March, a preparatory visit to Eindhoven was made, meeting with Philips to get a confirmation about the availability and reservation of the venue.

Eindhoven - Accommodation:

Hotel Eden Crown was also found to be suitable by the participants and faculty in 2009, and given its central location and facilities, was considered the first option. The hotel offered a very competitive rate, especially since the rooms were required over weekends, which are traditionally cheaper at a business hotel. The first meeting with the Group Reservations manager was in March 2010, and once again followed up with a meeting in August 2010, just before the Summer School to finalise all arrangements.

Eindhoven - Catering:

Eden Crown was also found to be a suitable venue for the Welcome Reception. The Welcome Reception took place in the conference room, followed by a buffet dinner.

Lunch was arranged by Philips at the High Tech Campus.

For dinners, several restaurants were explored during the field visit to Eindhoven, especially to check those which offered buffet style meals for groups. As this is not very common for groups under 40-50 persons, most restaurants preferred to offer special group menus with individual service. A shortlist of restaurants was revisited in August, and confirmed, after receiving their menus and costs.

The restaurants selected were:

De Vorruitgang, Le Connaisseur, Ons Eet Café, Javaans Eet Café, Grand Café Berlage.

All the restaurants provided an exceptional service in terms of their speed of service and quality of food.

Eindhoven - Transport:

Given the popularity of cycles, Philips organised to hire cycles for all participants and faculty for the entire duration of the Summer School. Unfortunately, one of the mornings the heavy rain made it impossible to use the cycles, and taxis had to be organised at short notice, which not only was time-consuming, given that taxis were in short supply, but also required a lot more planning and organisation specially regarding payments.

Antwerp/ Hoboken - Venue:

Umicore hosted the Summer School at their headquarters in Hoboken. The recently commissioned new office building has state of the art facilities and has both large meeting room space as well as small amphitheater style room for lectures.

Antwerp/ Hoboken – Accommodation:

Antwerp being a popular tourist and business city, it is very busy at all times of the year. Most hotels in the old city centre cater to tourists, with some business hotels located outside the city centre. A pre-visit was made to Antwerp to have a look at the hotels and their distances and travel connections to Umicore in Hoboken. Among the hotels surveyed, The Theater and the De Keyser offer Umicore company rates. Offers were invited from the Theater Hotel, Park Inn Antwerp and Plaza Hotel, after which The Plaza was shortlisted with the best offer.

Antwerp/ Hoboken – Catering:

Lunch was arranged by Umicore at their offices.

Most restaurants in Antwerp have limited capacity to hold large groups of 20 + persons. Also, as a tourist destination, prices of 3-course meals in Antwerp are above average, and were over the estimated budget. A few possible restaurants were identified in the first visit, and finalised in the pre-school visit in August.

The restaurants selected were:

Stadsherberg, De 7 Schaken, Pakhuis. The first two were in the old city centre, while the Pakhuis was in a more trendy district famous for its restaurants and clubs.

Antwerp/ Hoboken – Transport:

Due to the distance between Antwerp and Hoboken and the time required to travel by public transport which also includes several changes, it was found to be more convenient to use a taxi company to travel to and from the Umicore headquarters in Hoboken to the hotel

in Antwerp. However, this arrangement also caused significant confusion about payment, number of taxis required and timing of taxis.

Visa and Travel Arrangements

As the first point of entry and main destination for participants and most expert faculty was Netherlands, visa invitation letters, if required, were issued by Philips, addressed to the Dutch consulates in the respective countries. UNU prepared all the documentation and remained the point of contact for all student enquiries and requests.

All experts and only students receiving full travel grants had the option to book on their own and get reimbursed or request the UNU to book on their behalf.

The UNU internal travel agency Westtours was requested for quotes for those participants and experts opting for the UNU to book their flights. As the grants were given based on prices available on the internet, they were significantly lower than the quotes from Westtours, and resulted in a significant overspend on travel. However, as administratively, Westtours is the most convenient option for travel bookings from the UNU, it was decided to bear the additional cost, with possible alternatives to be looked at for future Summer Schools.

Participant Feedback

After the Summer School, all participants and expert faculty were sent questionnaires to receive feedback on the Summer School, to use as a basis for continuing the E-waste Summer School series further.

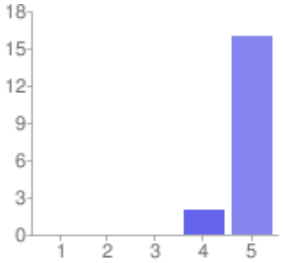
The feedback on the summer school from both the students as well as faculty has been overwhelmingly positive. The feedback on key aspects of the summer school from the student perspective is shown below. The results are based on an online questionnaire[1] completed by 16 of the 17 participants. The questionnaire included both objective and subjective questions, in order to be able to quantitatively rate the various aspects as well as to gather valuable comments and suggestions from participants.

1. Overall experience of the summer school:

The participants overwhelmingly considered the summer school experience as outstanding or very good.

[1] Online questionnaire can be viewed at: http://spreadsheets.google.com/viewform?hl=en&formkey=dEVXUS1qTl9jQkotVzBabTJadEhzMUE6MA..

Q1. How would you rate your overall experience of the summer school?

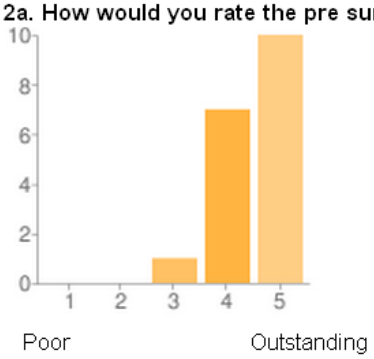


1 -	Poor	0	0%
2		0	0%
3		0	0%
4		2	11%
5 -	Outstanding	16	89%

2. Pre-school support:

The pre-school support was considered generally good, with some comments and suggestions for improvement for the next time.

2a. How would you rate the pre summer school support?



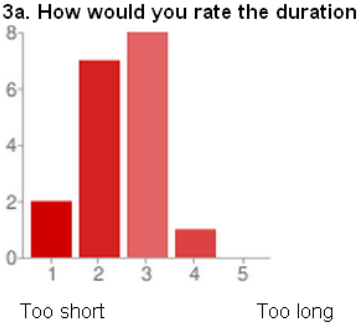
1 -	Poor	0	0%
2		0	0%
3		1	6%
4		7	39%
5 -	Outstanding	10	56%

- ➔ The results were declared much later.
- ➔ Very good support. Email replies were very quick. One suggestion would be to have put the reading for the group work up beforehand, but other than that the support was very good.
- ➔ I think maybe the summer school can deliver the "group task" before the summer school.
- ➔ Notification for participants could a bit earlier may be for 3 or 5 days before making online interviews and also in the case of issuing the traveling grants or to have uniform way of issuing an itinerary
- ➔ As regards the Group work - Groupings should be done and reading materials sent at this stage
- ➔ Give detail schedule in advance

3. Duration of the summer school:

Most participants thought the duration of 10 days for the summer school was about just right, though almost an equal number thought it was probably a little shorter, and might have preferred a slightly longer summer school.

3a. How would you rate the duration of the summer school (29th August - 7th September)?



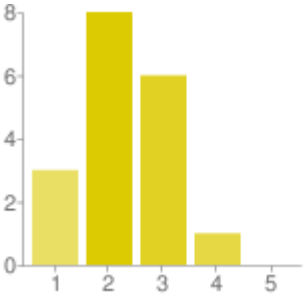
1 -	Too short	2	11%
2		7	39%
3		8	44%
4		1	6%
5 -	Too long	0	0%

- ➔ An additional day after the final presentation would have been useful, as "debriefing" time, after the pressure was off the participants. There could be some good discussion on that day!
- ➔ Duration was just about right, although of course there is always time shortage and you always want to put more stuff into the program.
- ➔ I which the summer school should be extended to a month or three weeks because a lot can still be learnt, incorporated into the programme and more tours that are relevant are also important.
- ➔ More time should be given for group discussion especially for that group exercise of E-Waste Management case of Ghana.
- ➔ The summer school could be even longer by 2 or 3 days, in my opinion, so that the days a bit less heavy.
- ➔ A little extension needs to be made on the duration, so as to relax the tightness of the programme a little bit.
- ➔ 9,5 days was absolutely perfect as it really gave us a chance to sink into the topic and get to know each other quite well.

4. Summer School Schedule:

The participants indicated that the schedule was perhaps slightly fuller than they either expected, or would have liked. This was also reflected in their comments which mention that they would have preferred to have some more free time, also perhaps time to relax in the evening specially before dinner. However, the free morning in Antwerp was appreciated.

Summer school schedule:

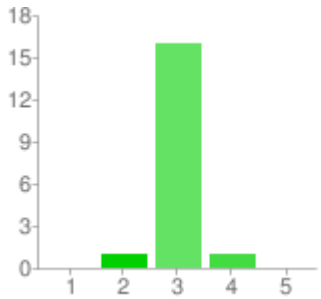


1 -	Too full	3	17%
2		8	44%
3		6	33%
4		1	6%
5 -	Too empty	0	0%

- ➔ The fact that the schedule was very full was a good thing, but maybe just a little bit more resting time would have been welcome. Another 30 minutes before dinner :)
- ➔ Content-wise it was full enough. Because of the social aspect of the summer school, the schedule doesn't end at 6PM, but at 11 PM when dinner is done. so it was intensive enough in my opinion. having a free morning in antwerp is enough to relax and to enjoy some sightseeing.
- ➔ Could have done with a little more free time.
- ➔ The summer school schedule is good the way it was programmed, but the time for dinner should be shortened so that more time can be devoted for resting and reading.
- ➔ Maybe have a complete free day somewhere in between?
- ➔ There is need to have a 1 hour relaxation period between the a day's activities and dinner time.
- ➔ It's kind of a little busy. But i hope we can be busier during daytime, since with tight schedule, we can learn more, accept more and have high efficiency.
- ➔ I think that the 'work' portion of the schedule was good. My suggestion would be to offer an evening or two where the dinner was optional to attend.
- ➔ I thought, the schedule was intense, but in a good way. It's a summer school, right - not a summer camp. I even think one could consider to have 10 or 10,5 days and keep the schedule - but give one free afternoon after 5 days or so. I think (another) half day off after 5 days is worth considering because it would give the students the possibility to let everything they have learned settled a little bit.

5. Class size:

Almost all participants (89%) thought that the class size of 19 persons was just right. A class size between 16 – 20 was also considered optimal for organisational a budgetary reasons.

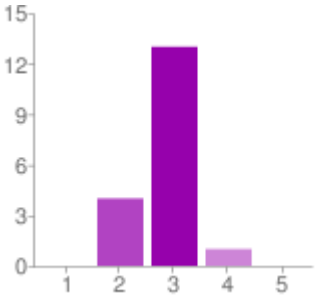


1 -Too few students - would have preferred a larger class	**0**	0%
2	**1**	6%
3	**16**	89%
4	**1**	6%
5 -Too many students - would have preferred a smaller class	**0**	0%

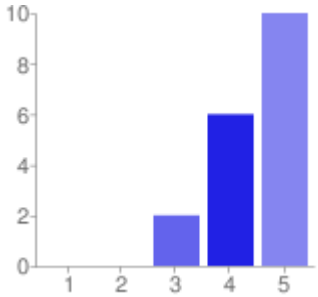
6. Faculty input:

The faculty input was evaluated on both the 'number' of faculty lectures as well as the quality of the lecturers. The number of faculty lectures was considered just about right by most of the participants, though some would have preferred fewer lectures.

In terms of the quality of faculty input, most students considered the quality outstanding or very good, with a few comments and suggestions for improvements for next time in terms of the lectures they might be more interested in.



1 -Insufficient faculty input - would have liked more faculty lectures	**0**	0%
2	**4**	22%
3	**13**	72%
4	**1**	6%
5 -Too much faculty input - would have liked fewer faculty lectures	**0**	0%



1 - Poor	**0**	0%
2	**0**	0%
3	**2**	11%
4	**6**	33%
5 - Outstanding	**10**	56%

Financials

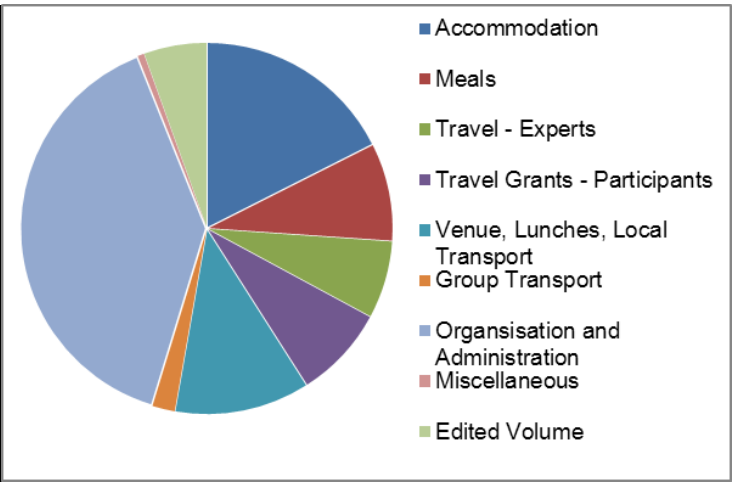
NVMP, as the sponsor of the Summer School contributed the most, with additional contributions from Philips and Umicore. While Philips managed their own budget, Umicore preferred to contribute on invoice. In addition, each student paid fees of €400. Thus the total budget [2] for the Summer School was € 90,812.48.

Overall, the Summer School 2010 was conducted within the estimated budget. The highest variance was in the travel costs (notably higher cost of flights for students awarded travel grants) and local transport. On the other hand, it was possible to negotiate a good rate with the hotel, thereby also allowing for more flexibility in the budget.

The category-wise spend is shown below.

[2] Total budget estimated as Philips paid for venue, meals and transport sponsored by them directly.

Expenditure		
Accommodation	€	15,942.50
Meals	€	7,751.68
Travel - Experts	€	6,164.92
Travel Grants - Participants	€	7,340.84
Venue, Lunches, Local Transport	€	10,714.30
Group Transport	€	1,800.00
Organsisation and Administration	€	35,578.99
Miscellaneous	€	519.25
Edited Volume	€	5,000.00
Total	**€**	**90,812.48**



Summer School 2010 – Category-wise spend

Notes:

- The costs for accommodation, meal, venues and local transport are for both Eindhoven and Antwerp.
- The travel for experts includes flight costs, terminal expenses as well as a token honorarium, of €100, given to each expert.
- Travel grants were awarded to 10 of the 19 students, some of which 7 were full travel grants, and 3 were part travel grants.
- Group transport was for return travel from Eindhoven to Antwerp, as well as the bus for the visit to the port of Antwerp.
- Organsiation and administration covers personnel costs, costs of travel and pre-visits, as well as administrative costs (eg. phone calls, postage, printing etc).
- Miscellaneous costs incurred were for costs such as the fee for the port visit, bike storage costs, as well as other items such as photos, stationery supplies etc. required during the summer school.
- The cost for the edited volume is spilt equally between the two summer schools. This is based on an estimated budget, as the final costs for the edited volume will be known only later, after the finalisation of the publication.

Recommendations

Though the Summer School has received very positive feedback, there are a few recommendations and suggestions for future Summer Schools.

Participant selection: Comparing the participants of the two Summer Schools, there was a noticeable difference in the knowledge and stage of research between participants from the two Summer Schools. The majority of participants in 2009 were more advanced researchers

sufficiently progressed in their doctoral research, while the class of 2010 had more recent entrants to e-waste research. As the Summer School can be immensly helpful for researchers just starting on their masters or doctoral theses, they should be encouraged and a select few invited, however, it is recommended that future Summer Schools lay a greater emphasis on more advanced e-waste researchers who are able to fully engage in the discussions and benefit most from the interaction.

Format: The Summer School format is suitable for academic researchers, however not so suitable for other stakeholders such as policy makers and regulators involved in e-waste, which is also a need that has been identified by the StEP network. Therefore, it may be a recommendation for StEP members and sponsors to consider other formats which share the intensive knowledge exchange and interaction of the Summer School, albeit in a shorter duration, perhaps as an E-waste Academy more suited to non-academics.

Target Group: The applications for participation in the Summer School 2010 reflected a great deal of interest from professionals, specially working in e-waste management companies. It is a suggestion to develop more suitable platforms for professionals, similar to the Summer School in keeping the international and interdisciplinary nature of the School, but with objective more suited to professionals.

Location: Eindhoven, as also Antwerp and Davos have been highly appreciated locations, receiving excellent feedback for their venues, accommodations and meals. Nevertheless, it would be a recommendation to take the Summer School to a different location, preferably in a developing country. While this brings with it operational and organisational risks, it would be an opportunity for researchers to see on the ground problems of e-waste in developing countries.

Timing and Planning: The organisation of the Summer School should ideally start 10-12 months in advance, with the calls for applications launched at least 7-8 months in advance so as to give sufficient time for applicants to submit their completed forms and papers. It is also important to plan adequate time for reviews as well as contingencies, specially in case of delays in receiving back reviews.

Conclusions

The Summer School 2010 has once again proved to be a success, not only for the students and sponsors, but also for the entire StEP network. It has developed into the foremost, and only interdisciplinary platform for young e-waste researchers to come together and connect, and the Summer School alumni will continue to be a strong asset and resource base for the StEP network

Annexe 1: Call for Applications

NVMP – StEP E-waste Summer School 2010
Enabling Sustainable EEE Cycles

StEP
SOLVING THE E-WASTE PROBLEM

What is it about?

The E-waste Summer School is a pioneering concept in the research and education on e-waste management, looking at the e-waste issue in its entirety, rather than through the lens of a specific academic discipline.

The vision is to provide the foremost platform to young scientists involved in e-waste related research to share their knowledge, interact with experts and develop collaborative partnerships fostering high quality cutting edge scientific research on all areas related to e-waste - from policy to technology to economics to social & societal aspects.

Who is it for?

The Summer School is open to doctoral students and final year master students as well as post-doctoral early-career researchers currently working on e-waste related topics. Researchers must be associated to a university or scientific institution and possess a good knowledge of English.

Why should you apply?

The Summer School incorporates both academic work and visits to organisations active in e-waste. Participants will have a chance to:

- Gain a broader perspective on e-waste by having an insight into different aspects of e-waste research beyond their disciplinary focus
- Get rigorous feedback on their research by having a chance to share their research with highly regarded domain experts from academia and industry and also peers familiar with the e-waste issue
- Develop valuable research skills such as collaborative project management, peer reviewing etc.
- Visit facilities along the entire life cycle of electronics – from design and manufacturing to smelting and material recovery
- Develop interdisciplinary research collaborations with an international group of peers

When & where does it take place?

The Summer School will be held from 29th **August – 8th September, 2010** at the Philips High-Tech Campus in Eindhoven, the Netherlands, and at Umicore Precious Metals Refining in Hoboken, Belgium.

How much will it cost?

Thanks to the generous support of our sponsors NVMP, Philips and Umicore Precious Metals Refining, the participation fee for the Summer School is € 400 per participant. This includes the full tuition, accommodation, meals and study tours for the entire duration of the Summer School!

Does it get any better?

Yes! There is financial support (although limited) available as travel grants to some participants, based on merit and need.

Sponsored & Organised by:

NVMP PHILIPS umicore UNITED NATIONS UNIVERSITY EMPA IWF

How do you apply?

Applicants should submit:

- A completed application form (found on our website)
- A CV including list of publications, presentations at conferences etc.
- A research paper of 3-5 pages– excluding references (using the Summer School template).

Please note that by participating in the summer school, you consent to your paper being published in the proposed Edited Volume, a compilation all the participant papers.

To download the application form and template for the paper, visit www.step-initiative.org/summerschool.

We are especially interested in interdisciplinary research on e-waste, looking at the issue from a holistic perspective. Papers from researchers in developing and emerging economies and / or exploring the challenges and solutions of e-waste management in these countries are particularly encouraged to apply.

Topic areas include, but are not limited to:

- International/ country specific legislation
- Financing models for e-waste disposal
- Producer responsibility
- Life Cycle Analysis (LCA)/ Material Flow Analysis (MFA)
- Design for Re-use and Recycling (DfR) / Eco-design
- Corporate Social Responsibility (CSR)
- Take-back and collection system models
- Reverse logistics
- Consumer recycling / disposal behaviour
- Re-use and recycling of e-waste
- Formal and informal sectors in e-waste management
- Material recovery and disposal technologies
- Modelling and forecasting product and waste trends

How is the selection process organised?

The 20 participants will be selected on the basis of their paper as well as their application form. The evaluators are interested in the motivation of the applicant for participating in the Summer School, the broader research environment of the applicant's institution, support from peers and professors, and other interdisciplinary and geographic linkages.

Is there a deadline for applications?

The call for applications closes on 30th **April, 2010**. We'll notify the accepted participants by 7th June, and require registrations and payments by 2nd July to confirm participation.

Where can I get more information?

The website www.step-initiative.org/summerschool

Or send an email to the Summer School Team:
summerschool@step-initiative.org

Annexe 2: Application Form

NVMP – StEP E-waste Summer School 2010
Enabling Sustainable EEE Cycles

APPLICATION FORM – Personal Details

Title (Mr, Mrs, Ms):	**First Name:**
Surname:	
Email Address:	
Postal Address: Street	
City and Postal Code	
Country	
Contact Phone Number (with country code):	

Current University/ Institution:
Current Degree:
Last Completed Degree, Year:
University/ Institution:

Summary of Thesis or Research Area (if different from paper) (max 100 words)	

Supervisor / Referee Name:
Supervisor's/ Referee's Email Address:
Co – Supervisor/ Referee Name:
Co – Supervisor's/ Referee's Email Address:

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APPLICATION FORM – Statement of Purpose

Why do you want to attend the E-waste Summer School, what benefits are you seeking and how would your attendance add value to the summer school? (Maximum 500 words)

Would you like to apply for the travel grants? If yes, please list below the breakdown of the approximate travel cost to Eindhoven, Netherlands in economy/ standard class. Please note that there are limited grants available, and though all selected applicants will be considered for travel grants, not all may receive it.

Please send this completed form with a **copy of your CV** (including any publications/ conference presentations) and **Research Paper** by **Friday 30th April 2010** to summerschool@step-initiative.org.

Sponsored & Organised by:

Annexe 3: Paper Template

Paper Title – A Sample Paper

FirstAuthorName Surname[1], CoAuthorname Surname[2]

[1] University/ Institution Name, City, Country
[2] University/ Institution Name, City, Country

Firstauthor.email@institution.org
Coauthor.email@institution.org

Abstract

The Summer School applicant should be the first author of the paper. Please leave a blank line between authors and affiliations. Please mention the affiliation of all authors as a numbered list, including city, and country. After a blank line, please include the email addresses of all authors. The abstract should contain about 100 words.

1 Author instructions

For your convenience, you can just replace the contents of this document with your own. *Please do not change page margins or columns*. When you copy/paste own contents into this document, please do so *preserving the style of this document (paste as unformatted text)*.

Your paper should comprise a ***maximum of 3 pages A4*** using the layout of this document. The base font for all text is Arial. Body text is 10pts, line spacing 1.5 lines. For headings and sections, you may use the style provided in this sample paper.

The format of the list of references is shown in section 4. When citing in text, just use the number of the reference in brackets like this [1]. The list may be sorted in order appearance in the paper or also alphabetically.

Please try to ensure illustrations, tables and figures appear within the designated margins, however are still able to be read with ease.

Please send your paper saved as a PDF file.

2 Further examples using document styles

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3.1 This is a 2nd Order Heading (12 pt boldface)

3.1.1 This is a 3rd Order Heading (11 pt boldface)

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4 Literature

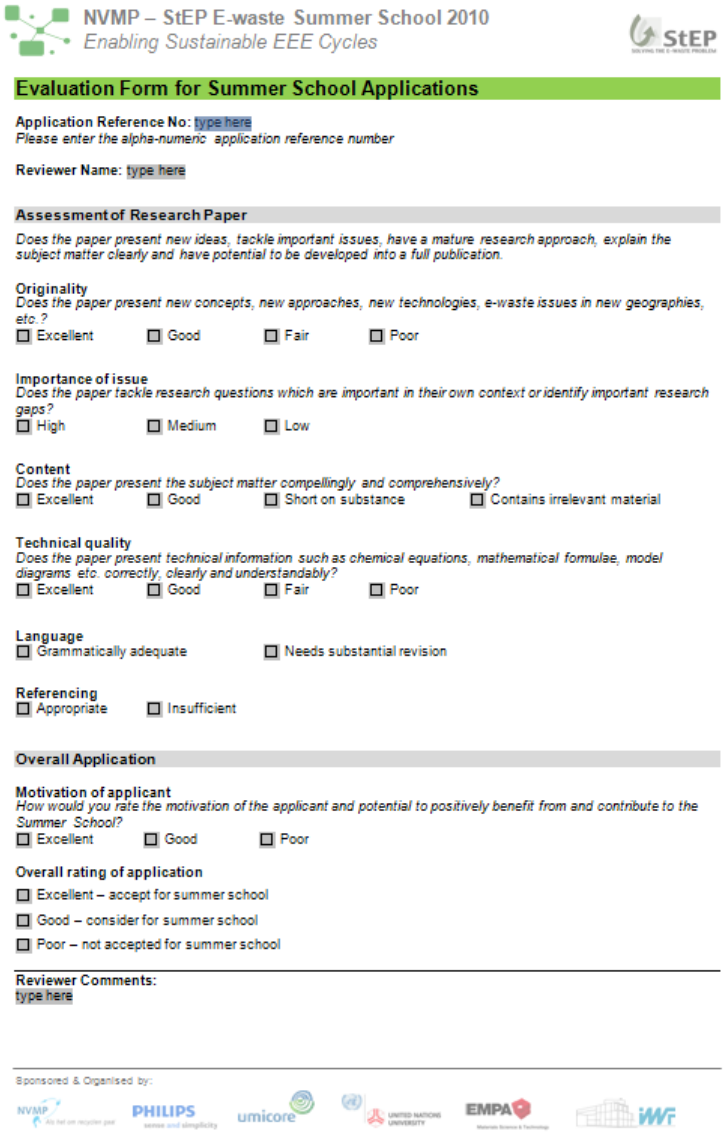
[1] R. Kuehr and E. Williams, *Computers and the Environment: Understanding and Managing Their Impacts*, Kluwer Academic Publishers, 2003.

[2] A.L.N. Stevels, A.A.P. Ram, and E. Deckers, "Take-back of discarded consumer electronic products from the perspective of the producer," *Journal of Cleaner Production*, vol. 7, 1999, pp. 383-389.

[3] R. Widmer, H. Oswald-Krapf, D. Sinha-Khetriwal, M. Schnellmann, and H. Böni, "Global perspectives on e-waste," *Environmental Impact Assessment Review*, vol. 25, 2005, pp. 436-458.

[4] J. Huisman, A. Stevels, T. Marinelli, and F. Magalini, "Where did WEEE go wrong in Europe? Practical and academic lessons for the US," *Electronics and the Environment, 2006. Proceedings of the 2006 IEEE International Symposium on*, 2006, pp. 83-88.

Annexe 4: Evaluation Form



NVMP – StEP E-waste Summer School 2010
Enabling Sustainable EEE Cycles

StEP

Evaluation Form for Summer School Applications

Application Reference No: type here
Please enter the alpha-numeric application reference number

Reviewer Name: type here

Assessment of Research Paper

Does the paper present new ideas, tackle important issues, have a mature research approach, explain the subject matter clearly and have potential to be developed into a full publication.

Originality
Does the paper present new concepts, new approaches, new technologies, e-waste issues in new geographies, etc.?
☐ Excellent ☐ Good ☐ Fair ☐ Poor

Importance of issue
Does the paper tackle research questions which are important in their own context or identify important research gaps?
☐ High ☐ Medium ☐ Low

Content
Does the paper present the subject matter compellingly and comprehensively?
☐ Excellent ☐ Good ☐ Short on substance ☐ Contains irrelevant material

Technical quality
Does the paper present technical information such as chemical equations, mathematical formulae, model diagrams etc. correctly, clearly and understandably?
☐ Excellent ☐ Good ☐ Fair ☐ Poor

Language
☐ Grammatically adequate ☐ Needs substantial revision

Referencing
☐ Appropriate ☐ Insufficient

Overall Application

Motivation of applicant
How would you rate the motivation of the applicant and potential to positively benefit from and contribute to the Summer School?
☐ Excellent ☐ Good ☐ Poor

Overall rating of application
☐ Excellent – accept for summer school
☐ Good – consider for summer school
☐ Poor – not accepted for summer school

Reviewer Comments:
type here

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Annexe 5: Selected and Waitlisted Applicant

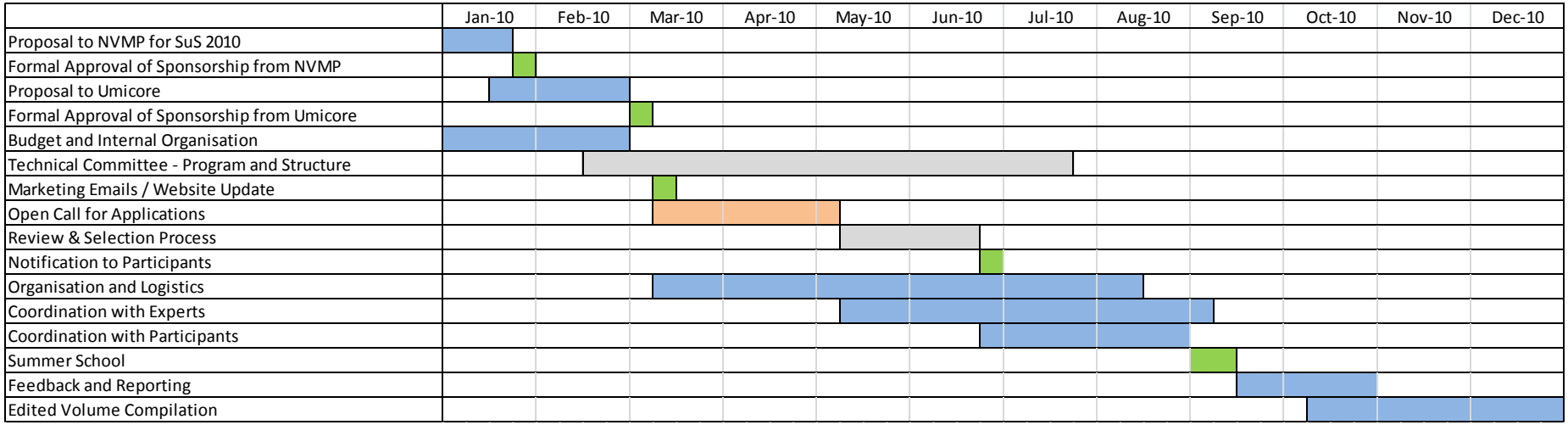
Summer School 2010 - Short List

	Summer School ID	First Name	Surname	University / Institution	Country	Paper Title
1	AANG45	Adeniji	Arafat	Department of Chemistry, University Of Ibadan	NG	Heavy metals in electronic games in Nigeria
2	AFEG37	Amal	Fahmy	University of Alexandria, High Institute of Public Health	EG	Mobile Phone waste as an electronic waste problem in Egypt
3	AGUK55	Alexandra	Graziano	Cardiff University	UK	With the increase of e-waste and its exportation to developing countries, to what extent can we say that the West is exploiting Africa and disregarding Africa's right to a clean environment?
4	CMCA57	Chris	McNabb	MUN	CA	No way out? Electronic waste management and materiality
5	EMKY32	Elizabeth	Muoria	Department of Environmental Science Egerton University	KY	E-WASTE: DISPOSAL BEHAVOUR OF CONSUMERS IN NAKURU MUNICIPALITY KENYA
6	GLBE46	Gregory	Lewis	University of Liege - Mineral Processing and Recycling	BE	Microbiological aspects of polymetallic wastes bioleaching
7	HDCN28	Huabo	Duan	Tsinghua University	CN	Recycling of Waste Printed Circuit Board Subjected to Thermal Preprocessing and Its Influencing Mechanism
8	HZUS42	Hua	Zhong	Beijing Institute of Technology/ Visiting scholar in University of Califonia, Berkeley	US	Building a Third-party Recycling Platform for E-waste Recycling through an Extended Producer Responsibility Framework
9	JRNL20	Jelle	Rademaker	Delft University of Technology + Leiden University	NL	An Industrial Ecology approach to the recovery of metals in e-waste
10	KTRS31	Katarina	Tosic	University of Belgrade, Serbia	RS	Needs in Development of Serbian National Legislation on E-Waste Management for Regulation of Small- and Medium-Enterprises in Computer Recycling from the Informal Sector
11	MBBR52	Mauro	Cesar Bernardes	University of Sao Paulo/Eletronic Computer Center, São Paulo, Brazil	BR	Design and Implementation of a Center for Discarding and Re-cycling Informatics Residuals in a Developing Country
12	MOIE10	Maurice	O'Connell	University of Limerick	IE	Investigating Reuse of B2C WEEE in Ireland
13	NCIT13	Natalia Duque	Ciceri	Politecnico di Milano	IT	Methodology to Estimate Products Embodied Energy and Potential Recovery in Recycling: Italy and US cases
14	NNTZ23	Nancy	Nyenga	National Environmental Management Council, Directorate of Environmental Compliance and Enforcement	TZ	A PREDICTABLE E-WASTE MATERIAL FLOW MODEL FOR TANZANIA
15	OJNG36	Ohakwe	Johnson	Department of Industrial Chemistry, Abia State University, Uturu, Abia State, Nigeria	NG	SIGNIFICANT PREDICTORS OF WILLINGNESS OF RESIDENTS TO PARTICIPATE IN ELECTRONIC WASTE RECYCLING IN SOUTHEASTERN NIGERIA – A CASE STUDY OF MOBILE PHONE RECYCLING
16	SLUK40	Somjita	Laha	Institute of Development Policy and Management, University of Manchester	UK	Rise of Informalisation in Global Capitalism: Exploring Environmental Sustainability
17	SSBE38	Sheron	Shamuilia	Departement of Metallurgy and Materials Engineering, KULeuven	BE	The 3P-scan: a method to trace innovative and sustainable product development
18	SZSE6	Steven	Zhou	LUMES	SE	Reducing E-waste by Lowering the Rate of OS Upgrades
19	XLCN8	Xiaomin	Li	Chinese Academy of Sciences	CN	Pilot Study on PCBs, PBDEs and PXDD/Fs Contamination Status in an E-waste Dismantling Area in Southeast China

Priority Waitlist

	Summer School ID	First Name	Surname	University / Institution	Country	Paper Title
1	IODE48	Irina	Oswald	University of Augsburg	DE	E-waste Management – a Preventative Approach
2	TAAE24	Tarek	Abdallah	Masdar Institute of Science and Technology, UAE	AE	Carbon Sensitive Closed-Loop Supply Chain Design with Green Procurement
3	ESTW33	Edward	Sanneh	National Taipei University of Technology, Institute of Environmental Engineering and Management	TW	Is the donation of ICT products to developing countries a good corporate social responsibility
4	GCCA1	Gideon	Christian	University of Ottawa/Université d'Ottawa	CA	Sustainable Legal Framework for Transboundary Movement of Electronic Waste to Developing Countries
5	ADUK26	Azadeh	Dindarian	University of Manchester	UK	Electronic waste: A proposed study to find out what happens to discarded Microwave ovens

Annexe 6: Timeline of Project Activities



Annexe 7: Press Release
Young researchers meet in Eindhoven and Hoboken to look at the future of e-waste

Eindhoven/ Hoboken: Philips and Umicore hosted an international group of young researchers looking at the growing problem of waste electronic and electrical equipment, more commonly known as e-waste. Sponsored by the NVMP Foundation, the Dutch Association for the Disposal of Metal and Electrical Products, the E-waste Summer School was organised by the United Nations University under the aegis of the StEP Initiative and took place from 29th August – 7th September.

"Building research capacity on e-waste management is a key objective of NVMP. Hence, the Summer School is a wonderful platform for this", said André Habets, in charge of Research and Development at NVMP.

Nineteen students from all continents participated in this second NVMP-StEP E-waste Summer School. Between them, they represented 18 countries of origin or place of study. The issues discussed during the ten days ranged from environmental justice to consumer behaviour to recycling technology.

The theme of this year's Summer School was 'Enabling Sustainable EEE Cycles'. Claudia Luepschen of UNU said, "It was our intention to provide young e-waste researchers with an opportunity to look at e-waste in a holistic perspective. E-waste is not only an environmental issue. It is closely interlinked with technical, legal, social, logistic and economic issues too and often researchers working in one field are not aware of the other related aspects".

Nils de Caluwe from Philips, also a co-sponsor, is very supportive of the aims and objectives of the Summer School. He said, "It is important for young researchers to interact with experts from industry as well as academia and government as also to share their knowledge and expertise amongst their peers. The Summer School was a unique opportunity for Philips and also for me personally to get fresh ideas and know more about the questions and solutions being discussed around the management of e-waste worldwide".

One of the international experts invited to the Summer School was Prof. Oladele Osibanjo, the Executive Director of the Basel Convention Coordinating Centre for the African Region in Nigeria. He added: "This is such a laudable initiative. The future of e-waste management is in the hands of our young researchers and scientists. I was immensely impressed by the level of knowledge and the lively discussions we had in the sessions".

One of the participants, Huabo Duan from China explains, "E-waste is a hot topic around the world. Less developed countries like China or India have been experiencing great challenges in managing their e-waste due to growing domestic generation as well as uncontrolled imports. The Summer School provided a platform for me to learn about e-waste management systems in countries like the Netherlands, Belgium or Germany, which have integrated recycling systems and advanced technology in place and many years of experience in e-waste management."

The programme of the summer school included expert lectures, student presentations as well as on-site study tours and even a hands-on dismantling session. The group also visited co-sponsor Umicore Precious Metals Refining in Hoboken, Belgium, where precious metals like gold, silver and even special metals like indium are recovered from e-waste. Christina Meskers from Umicore adds: "The involvement in the Summer School is a further continuation of our interaction with StEP. It provides the students insights in the workings of a high-tech metallurgical and chemical plant, illustrates the complexity of recycling chains and the role that each stakeholder plays in it".

Mauro from Brazil summed up the experience of the students "This is a brilliant initiative and not only beneficial for me, but for my university and my country. I received so much input on just the first day alone so as to compensate for my travel from Brazil. I had come to get some answers regarding

e-waste. After ten days, not only do I know lots of answers and possible solutions, but have even more enthusiasm to work towards an e-waste solution for Brazil."

StEP, Germany
Solving the E-Waste Problem is a partnership of several UN organizations, prominent industry, government and international organizations, NGOs and the science sector. StEP initiates and facilitates a sustainable e-waste management worldwide through analysis, planning and pilot projects. The StEP initiative is hosted by United Nations Universities Institute for Sustainability and Peace (UNU-ISP SCYLE). The NVMP – StEP E-waste Summer School is organized under the Capacity Building task force of StEP.**www.step-initiative.org**
For more information on the Summer School see: www.step-initiative.org/summerschool
Contact Person:
For Summer School: Claudia Luepschen, UNU-ISP SCYCLE, luepschen@unu.edu, Tel.: +49-288-815-0214

United Nations University, Japan
UNU is a major think-tank for the United Nations System. With research and capacity-building, UNU helps to resolve most burning global problems. The University comprises UNU headquarters in Tokyo, Japan (since 1975) and a worldwide network of more than a dozen Research and Training Centres and Programmes. www.unu.edu, www.isp.unu.edu

NVMP, Netherlands
The NVMP Foundation (the Dutch Foundation for the Disposal of Metal and Electrical Products) has been commissioned by producers and importers to set up an efficient and effective collection and recycling system for discarded electrical and electronic equipment and appliances in The Netherlands. NVMP is sponsoring E-waste Summer School. www.nvmp.nl

Philips, Netherlands
Royal Philips Electronics of the Netherlands is a global leader in healthcare, lifestyle and technology, delivering products, services and solutions through the brand promise of "sense and simplicity". Sustainability is an integral part of the way Philips does business focused on improving people's lives through timely innovations. Philips is hosting the E-Waste Summer School at Hightech Campus in Eindhoven. www.philips.com

Umicore, Belgium
Umicore is a materials technology group. It focuses on application areas where it knows its expertise in materials science, chemistry and metallurgy can make a real difference. Umicore generates approximately 50% of its revenues and spends approximately 80% of its R&D budget in the area of clean technology, such as emission control catalysts, materials for rechargeable batteries and photovoltaics, fuel cells, and precious metals recycling. Umicore's overriding goal of sustainable value creation is based on this ambition to develop, produce and recycle materials in a way that fulfils its mission: materials for a better life.
The Umicore Group has industrial operations on all continents and serves a global customer base; it generated a turnover of € 6.9 billion (€ 1.7 billion excluding metal) in 2009 and currently employs some 14,300 people. www.umicore.com

EMPA, Switzerland
EMPA is the research institute for material science and technology of the Swiss Federal Institute of Technology (ETH) domain. It is a pioneer in monitoring and controlling for e-waste management systems and setting recycling and disposal standards. Additionally, it manages the online e-waste guide (www.ewasteguide.info). Empa is co-organizer of the Summer School. www.empa.ch