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H_2FC

Integrating European Infrastructure to support science and development of Hydrogen- and Fuel Cell Technologies towards European Strategy for Sustainable, Competitive and Secure Energy

Deliverable

D3.4 European Technical School on Hydrogen and Fuel Cells 2012 Programme, content and statistics

Due date of deliverable	**31st May 2013**
Completion date of deliverable	**29th April 2013**
Start date of H2FC project	**1st November 2011**
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Responsible partner for deliverable	**UU**
Contributing partners (short names)	**UU**

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Document History

Issue Date	Version	Changes Made/Comments
26.04.2013	1.0	Sile Brennan

Table of Contents

1 Outline: European Technical School on Hydrogen and Fuel Cells 2012

1.1 Introduction

This document describes the 1st European Technical School on Hydrogen and Fuel Cells organized within the H2FC project. The Technical Schools (TS) are a key networking activity and are organized within WP3. There will be four schools, one per year of the project.

As outlined in the description of work, each TS will be led by UU with input from the School Board. The School Board is composed of at least one representative of each partner and representatives of the Industrial Advisory Board. The list of members was determined in advance of the project kick-off meeting in line with Deliverable D3.2 and they are listed section 1.2. of this document. Partner UU is responsible for dealing with all the organizational, academic and financial issues of the four TS, including contacts with the members of the School Board, participants and keynote speakers, arrangements of the school location, support to a local organization committee, renting of rooms, preparation of delegate pack etc.

This deliverable includes details of the programme, the content feedback on the school and recommendations for subsequent events.

1.2 Members of the school board

Partner	**Representative**
KIT (IKET)	Olaf Jedicke
KIT (INT)	Elisa Gil Bardaji
CEA	Pierre Serre-Combe
UU	Sile Brennan
	Vladimir Molkov
IFE	Magnus Sørby
HSE	Stefan Ledin
JRC	Marek Bielewski
Jülich	Josef Mertens
PSI	Pierre Boillat
NCSRD	Georgia Charalambopoulou
UP	Linda Barelli
ENEA	Angelo Moreno
BAM	U. Schmidtchen
TECNALIA	Inaki Azkarate,
	Jean Baptiste Vorcin
UPI	Marco Carcassi
PS	Andreas Friedrich
NPL	Gareth Hinds
SINTEF	Paul Inge Dahl
VTT	Jari Kiviaho
EMPA	Andreas Züttel
Advisory board representatives	
Volvo	Paul Adams
AL	Sidonie Ruban

1.3 Date and Location of the School

The school was held from the 24th – 29th of September 2012. This timing was to ensure value for money and enabled the group to collaborate rather than conflict with schools organised by other groups. After the summer period allows for better rates on hotel accommodation. However, if it is held too late it may clash with academic terms making it more difficult for some speakers and early stage researchers to travel. This leaves the period of early September – October.

A range of venues were priced throughough Europe. The school was held at the Aquis Hotel Arina Sand, Crete www.aquisresorts.com/aquisresorts/aquis-arina-sand-overview.aspx The basis for choosing this location were as follows:

- Value for money
- Colaboration with training event within TrainHy project http://www.hysafe.org/TrainHyProf This school had a different focus to the H2FC Infrastructure schools. However it enabled participants to attend sessions in both and facilitated networking. The combined numbers also meant improved room rates.
- Proximity to airport
- Availability of frequent charter and scheduled flights
- Accomodation was on an all inclusive basis facilitating financial arrangements

1.3.1 Rates summary

The rates in the Arina Sands for shared occupancy i.e. either an accompanying person or two people attending the school and sharing are given below.

	Arina Sands 24th-29th Sept	
	Double Occupancy	**Single Occupancy**
Board Basis	AI	AI
Accommodation (6 nights)	402.00	630.00
Welcome reception	7.50	7.50
Course dinner	50.00	50.00
Meeting room	12.50	12.50
Total	**472.00**	**700.00**

1.4 Outline structure and content

A detailed programme is given in Section 2. In this section the overall layout of the week is described. The programme for the first TS was designed inline with the specifications outline in the description of work. In line with the DoW it has been suggested to endeavour to keep each day focused on a specific topic and to minimise overlap. This will make it possible for external participants to choose to attend specific days where a full week is not an option.

The suggested structure is as follows:

Monday: **Opening session**
Work-in-progress session where researchers present their recent results and on-going research. Note researchers external to the project who receive funding to attend were asked to present on this day.

Tuesday: **Instrumentation and research methods workshop (Full day)**, partners have the exchange of the state-of-the-art in advanced experimental methods and contemporary measurement techniques. Each each partner providing access to facilities within the H2FC project presented research methods specific to that facility.

Wednesday: **Morning: Instrumentation and research methods workshop (Continued)**
Afternoon: The Computational Fluid Dynamics (CFD) and modelling club

This consisted of three topical sessions facilitated by leaders in the field, alaigned with WP10 and the CYBER laboratory activities. Each session started with a presentation and will include time for a round table discussion.

Thursday: **Topical lectures**, lectures on selected topics of primary interest for the development and exploitation of the H2FCEuropean Infrastructure, delivered by keynote speakers and followed by round table discussions are held.

Friday: **Advanced research workshop** where the top research results generated by scientists during delivery of JRA and TA, as well as by invited researchers are presented and discussed to stimulate the development and efficient use of the H2FCEuropean Infrastructure.

In general the aim was to have a clear focus on the use of H2FCEuropean Infrastructure without being so specific as to exclude external participants.

1.5 Attendees

The aim at each school is to ensure that if possible over 1/2 of attendees are external to the project. At each school there are particpants from partner organisations, external particpants who are funded from the project, and external particpants who are self funded.

Funded participants were selected to enable representation from all sectors, e.g. industry and academia, as well as third countries. To enhance the services provided by the H2FCEuropean Infrastructure and the efficient use of the infrastructure a number of external researchers, including speakers, will participate in the school proceedings.

1.6 Fees

The school was not intended to be a profit making, thus the „fee“ paid by particpants was equal to the Euro700 paid by partner UU per person to cover accomodation, meals and room hire. The cost of delegate packs and USB drives was covered by the UU budget.

Partner UU handled payment of the deposit, interim and final balance to the venue at which the school will be held. Thus UU invoiced each partner and external particpant attending. This invoice was for the sum of the accommodation and course dinner only.

1.7 Promotion of the school

All information related to the school was made available on the project website on a dedicated page (http://h2fc.eu/index.php?option=com_content&id=36) The page was updated as more information became available.

It was requested that all partners circulate promotional materials and the link to the school within their networks.

1.8 Delegate pack

Partner UU prepared the delegate pack, which included a customised H2FC TS binder, H2FC USB with proceedings, pens etc.

1.9 Application forms and selection criteria

UU prepared application forms with input from the school board. Funded applicants were taken from those working in a related field and were required to present their work.

2 Technical School Programme 2012

Arina Sands hotel, Heraklion, Crete, 24-28 September 2012,

Themes: safety, storage, fuel cells

Sunday, 23 September 2012

15:00	Check-in
19:00-20:00	Registration and welcome drink
20:00-22:00	Dinner and get together evening

Monday, 24 September 2012

Work-in-progress sessions

The focus of this session is to encourage collaboration and facilitate networking from the outset.

09:00-10:00	Registration
10:00-10:20	**Opening of the Technical School** Vladimir Molkov, Sile Brennan, Olaf Jedicke
10.20-10:35	**Performance validation of commercially available sensors** Valerio Palmisano, JRC
10:35-10:50	**Improving detection limits of hydrogen purity analysis through the use of a selective permeable membrane device** Arul Murugan, NPL
10:50-11:05	**The influence of experimental data on the regulation "Italian technical rule for hydrogen pipelines"** Marco Carcassi
11:05-11:30	*Coffee*
11:30-11:45	**The use of impedance spectroscopy to gain and understanding of performance in electrochemical hydrogen production** Nicholas Van Dijk, ITM-Power
11:45-12:00	**Modular Storage Solutions with Cheap Materials** Giulia Balducci, University of Glasgow
12:00-12:15	**Novel High Power Density PEM Fuel Cells for Automotive Applications** Ryan Malcolmson, ITM-Power
12:15-12:30	**Hydrogen Storage as a Liquid Organic Hydride** Callum Campbell, Newcastle University & Centre for Process Innovation
12:30-14:00	*Lunch*
14:00-14:15	**Fuel Cell and Battery Technology - Education and Workforce Development at WBZU (Fuel Cell and Education Center Ulm)** Sirko Nell, Weiterbildungszentrum Brennstoffzelle Ulm e.V.
14:15-14:30	**Hydrogen for Flight: New Materials Systems and Approaches** Hazel Reardon, University of Glasgow
14:30-14.45	**Confinement of lithium nitride in porous hosts carbons for hydrogen storage in mobile applications** Marc Segales, University of Glasgow
14:45-15:00	**Potential use of hydrogen fuel cells for secondary power at uncontrolled airport remote tower operations** Shawn Bliss, FAA/Lockheed Martin

15:00-15:15	**Surface modification of Ti - based metal hydride materials by Pd deposition using electrolysis and chemical vapour deposition.** Wafeeq Davids, HySA Systems (University of the Western Cape)
15:15-15:45	*Coffee*
15:45-16:00	**Analytical study of hydrogen release and dispersion in an enclosure with vents** Volodymyr Shentsov, Ulster
16:00-16:15	**Simulation of laser-induced detonation in gas-particle mixtures** Konstantin Volkov, Kingston University of London
16:15-16:30	**Contribution to the study of the hydrogen embrittlement for metallic materials under load** Jean-Baptiste Jorcin, Tecnalia
16:30-16:45	**Numerical Simulation of Deflagration to Detonation Transition in Hydrogen** Ali Heidari, Kingston University of London
16:45 -17:00	**Closing comments**

Tuesday, 25 September 2012
Instrumentation and research methods workshop
This session concentrates on the research techniques and methods applicable for state-of-the-art research. Each partner offering access to experimental facilities within the H2FC project will give a presentation introducing specific techniques and demonstrating how they are applied.

10:00-10:25	Instrumentation and research methods at CEA: **The EDIP experimentation for In-situ and Operando determination of PEMFC membrane water content distribution upon operation** Gérard Gebel
10:25-10:50	Instrumentation and research methods at CEA: **"Instrumented facilities for hydrogen solid storage characterization" around the COMEDHY facility** Olivier Gillia
10:50-11:15	*Coffee*
11:15-11:40	Instrumentation and research methods at IFE: **Neutron scattering instrumentation at IFE** Magnus H. Sørby
11:40-12:05	Instrumentation and research methods at HSL **General Overview of HSL's Research Facilities** Stefan Ledin
12:05-12:30	Instrumentation and research methods at SINTEF **Membrane and Fuel Cell testing at low to high temperatures** Paul Inge Dahl
12:30-14:00	*Lunch*
14:00-14:25	Instrumentation and research methods at University of Pisa **Hydrogen and hydrogen-methane mixture concentration measurements and gas chromatography.** Marco Carcassi
14:25-14:50	Instrumentation and research methods at PSI **Imaging of liquid water in operating polymer electrolyte fuel cells** Pierre Oberholzer.

14:50-15:15	Instrumentation and research methods at NSCRD **Capacity, kinetics, thermodynamics and cycle life measurements of hydrogen storage materials** Theodore Steriotis
15:15-15:45	*Coffee*
15:45-16:10	Instrumentation and research methods at University of Perugia **1. Methods and test rig for HT FC performance analysis** Giovanni Cinti **2. Innovative materials testing for Sorption enhanced steam reforming** Federico Gallorini
16:10-16:35	Instrumentation and research methods at ENEA **Hydrogen, from powders to power** Stephen McPhail
16:35-17:00	Instrumentation and research methods at BAM **A generalist in terms of safety research and technology** Ulrich Schmidtchen
17:00-17:30	Instrumentation and research methods at Juelich **Jülich SOFC Technology Development.** Josef Mertens /Ico Vinke

Wednesday, 26 September 2012
Morning Session: Instrumentation and research methods workshop (continued)

10:00-10:25	Instrumentation and research methods at VTT **The use of on-line hydrogen concentration sensor for studying inert gas effects, nitrogen crossover and purge optimisation in PEMFC system** Timo Keränen
10:25-10:50	Instrumentation and research methods at NPL **Instrumented single cell PEMFC** Edward Brightman
10:50-11:15	*Coffee*
11:15-11:40	Instrumentation and research methods at JRC **1. GasTeF: a facility for the cycling of hydrogen high pressure tanks** **2. SenTeF: testing of sensors under real life conditions** Pietro Moretto
11:40-12:05	Instrumentation and research methods at EMPA **In-situ and in-operando methods for hydrogen related research** Arndt Remhof
12:05-12:30	**Round table discussion/round up of Instrumentation workshop**
12:30-14:00	*Lunch*

Afternoon Session: CFD and modelling sessions

The afternoon sessions bring together experts in modelling to discuss the state-of-the art and issues in the field. There is a session on each of the three themes: safety, storage and fuel cells.

14:00-15:00	**CFD and modelling: Hydrogen safety session** Facilitator Dr Dmitriy Makarov (University of Ulster) including presentation by Dr Stefan Ledin (HSL)
15:00-16:00	**CFD and modelling: Storage session** Facilitator Dr Thanos Stubos (NSCSRD) including presentation by Dr Skarmoutsos (University of Crete)
16:00-16:30	*Coffee*
16:30-17:30	**CFD and modelling: Fuel Cells session** Facilitator Dr Valentina Vetere (CEA)

Thursday: 27 September 2012

Topical lectures

Thursday's sessions incorporate topical lectures on the three themes of the school: safety, storage and fuel cells.

10:00-11:00	**European developments in hydrogen and fuel cells: an EU perspective** Dr. Jean-Luc Delplancke, Programme Head of Unit, Fuel Cells and Hydrogen Joint Undertaking
11:00-11:25	*Coffee and discussion*
11:25-12:25	Hydrogen Safety **Safety issues of hydrogen-powered vehicles** Prof Vladimir Molkov, Director, HySAFER Centre, University of Ulster
12:25-14:00	*Lunch*
14:00-15:00	Fuel Cells **Bringing Fuel Cells to the Market** Prof Robert Steinberger-Wilckens, Chair Hydrogen and Fuel Cell Research, University of Birmingham
15:00-15:30	*Coffee and discussion*
15:30-16:30	Storage **Designing nanoporous materials for hydrogen** Prof George Froudakis, Department of Chemistry, University of Crete
16:30 -17:00	**Round table**

Friday, 28 September 2012

Advanced Research Workshop

This session is conference style. Partners will showcase the latest research in hydrogen safety, storage and fuel cells.

10:00-10:20	Ground breaking research at KIT: **Synthesis and Characterization of Complex Hydrides for Hydrogen Storage** Ulrich Ulmer
10:20-10:40	Ground breaking research at CEA: **Taking into account hydride breathing in an integrated heat exchanger of a hydrogen storage vessel** Olivier Gillia

10:40-11:00	Ground breaking research at IFE: **Structure and property investigations of hydrogen storage materials** Magnus H. Sørby
11:00-11:25	*Coffee*
11:25-11:45	Ground breaking research at HSL **Cryogenic spills: A Tale of the Unexpected** Stefan Ledin
11:45-12:05	Ground breaking research at UU **Plane hydrogen jets** Dmitriy Makarov
12:05-12:25	Ground breaking research at JRC **Temperature evolution during fast filling of a hydrogen tank** Pietro Moretto
12:25-12:45	Ground breaking research at PSI **Neutron imaging combined with helox pulse analysis in fuel cells** Pierre Oberholzer.
12:45-14:00	*Lunch*
14:00-14:20	Ground breaking research at NCSRD **LES modelling of hydrogen dispersion and combustion using the ADREA-HF code** Alexandros Venetsanos
14:20-14:40	Ground breaking research at NPL **Innovations in fuel cell metrology at NPL** Edward Brightman
14:40-15:00	Ground breaking research at BAM **A new safe method for the high pressure storage of hydrogen gas** Ulrich Schmidtchen
15:00 -15:20	*Coffee*
15:20-15:40	Ground breaking research at VTT **Development of integrated fuel cell hybrid power sources for working machine applications** Timo Keränen
15:40-16:00	Ground breaking research at Pro-Science **Hydrogen combustion and detonation in narrow tubes** Joachim Grune
16:00 -16:20	Ground breaking research at EMPA **Controlling the hydrogen release of borohydrides** Arndt Remhof
16:20-16:45	**Round table on existing bottlenecks and knowledge gaps**
16:45-17:00	**Close of the school**
19:00 -22:00	**Gala Dinner**

Saturday, 29 September 2012

12:00	**Latest check-out time for all participants**

3 Participants 2012

3.1 List of participants

	Surname	First Name	Company	Email address	Country
1	Ardelean	Ovidiu	INCDTIM	ovidiu.ardelean@itim-cj.ro	Romania
2	Balducci	Giulia	University of Glasgow	guiliab@chem.gla.ac.uk	Scotland
3	Biesdorf	Johannes	PSI	johannes.biesdorf@psi.ch	Switzerland
4	Blanita	Gabriela	INCDTIM	Gabriela.Blanita@itim-cj.ro	Romania
5	Bliersbach	Andreas	EMPA	andreas.bliersbach@empa.ch	Switzerland
6	Bliss	Shawn	FAA/Lockheed Martin	Shawn.CTR.Bliss@faa.gov	USA
7	Brennan	Sile	UU	sl.brennan@ulster.ac.uk	Northern Ireland
8	Brightman	Edward	NPL	edward.brightman@npl.co.uk	England
9	Campbell	Callum	Newcastle University	c.r.campbell@ncl.ac.uk	England
10	Carcassi	Marco	UNIPI	carcassi@ing.unipi.it	Italy
11	Charalambopoulou	Georgia	NCSRD	gchar@ipta.demokritos.gr	Greece
12	Cinti	Giovanni	Perugia	fclab@unipg.it	Italy
13	Davids	Wafeeq	HySA Systems (University of the Western Cape)	2235735@uwc.ac.za	South Africa
14	Delplancke	Jean-Luc	FCH-JU	JeanLuc.Delplancke@fch.europa.eu	Belgium
15	Dupuis	Cedric	McPhy Energy	cedric.dupuis@mcphy.com	France
16	Friedrich	Andreas	Pro-Science	friedrich@pro-science.de	Germany
17	Froudakis	George	University of Crete	frudakis@chemistry.uoc.gr	Greece
18	Gallorini	Federico	Perugia	federico.gallorini@alice.it	Italy
19	Gebel	Gérard	CEA	gerard.gebel@cea.fr	France
20	Gillia	Olivier	CEA	olivier.gillia@cea.fr	France
21	Grune	Joachim	Pro-Science	grune@pro-science.de	Germany
22	Hall	Jonathan	HSL	jonathan.hall@hsl.govluk	England
23	Heidari	Ali	Kingston University	A.Heidari@kingston.ac.uk	England

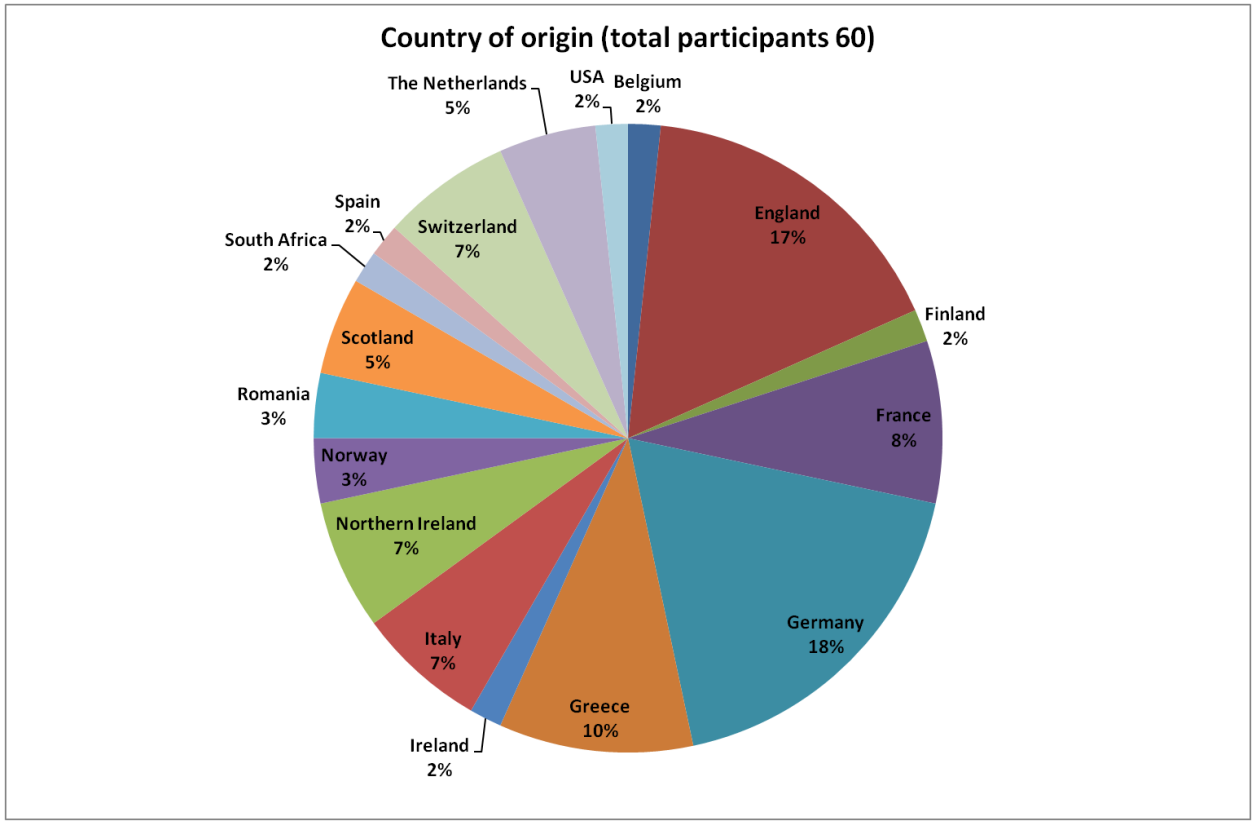
24	Inge Dahl	Paul	SINTEF	paul.inge.dahl@sintef.no	Norway
25	Jedicke	Olaf	KIT	olaf.jedicke@kit.edu	Germany
26	Jorcin	Jean-Baptiste	Tecnalia	jbaptiste.jorcin@tecnalia.com	Spain
27	Keränen	Timo	VTT	Timo.Keranen@vtt.fi	Finland
28	Ledin	Stefan	HSL	stefan.ledin@hsl.gov.uk	England
29	Lefebvre-Joud	Florence	CEA	florence.lefebvre-joud@cea.fr	France
30	Malcolmson	Ryan	ITM	rm@itm-power.com	England
31	McPhail	Stephen	ENEA	stephen.mcphail@enea.it	Italy
32	Mertens	Josef	Juelich	jo.mertens@fz-juelich.de	Germany
33	Molkov	Vladimir	UU	v.molkov@ulster.ac.uk	Northern Ireland
34	Moretto	Pietro	JRC	pietro.moretto@ec.europa.eu	The Netherlands
35	Murugan	Arul	NPL	arul.murugan@npl.co.uk	England
36	Nell	Sirko	Weiterbildungszentrum Brennstofzelle Ulm e.V.	sirko.nell@wbzu.de	Germany
37	Oberholzer	Pierre	PSI	pierre.oberholzer@psi.ch	Switzerland
38	Ortiz-Cebolla	Rafael	JRC	Rafael.ORTIZ-CEBOLLA@ec.europa.eu	The Netherlands
39	Palmisano	Valerio	JRC	Valerio.PALMISANO@ec.europa.eu	The Netherlands
40	Patrick	Patton		patrickjpatton@gmail.com	Ireland
41	Reardon	Hazel	University of Glasgow	hazelr@chem.gla.ac.uk	Scotland
42	Remhof	Arndt	EMPA	arndt.remhof@empa.ch	Switzerland
43	Schmidtchen	Ulrich	BAM	ulrich.schmidtchen@bam.de	Germany
44	Segales	Marc	University of Glasgow	marseg@chem.gla.ac.uk	Scotland
45	Shentsov	Volodymyr	UU	shentsov-v@email.ulster.ac.uk	Northern Ireland
46	Skarmoutsos	Ioannis	University of Crete		Greece
47	Sorby	Magnus	IFE	magnuss@ife.no	Norway
48	Steinberger-	Robert	University of	R.SteinbergerWilckens@bham.ac.uk	England

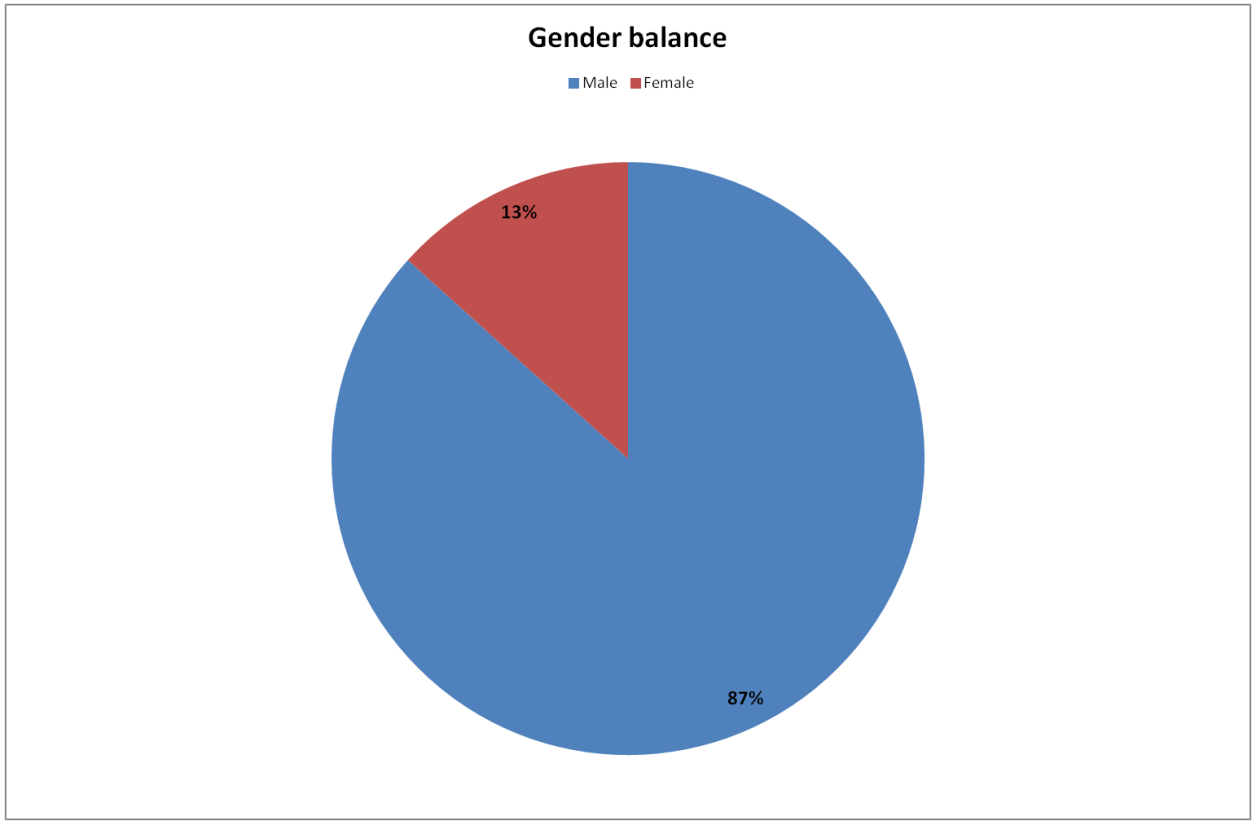
	Wilckens		Birmingham		
49	Stengel	Torsten	Airbus	torsten.stengel@airbus.com	Germany
50	Steriotis	Theodore	NCSRD	tster@chem.demokritos.gr	Greece
51	Stubos	Athanassios	NCSRD	stubos@ipta.demokritos.gr	Greece
52	Ulmer	Ulrich	KIT	ulrich.ulmer@kit.edu	Germany
53	Van Dijk	Nicholas	ITM	nvd@itm-power.com	England
54	Venetsanos	Alexandros	NCSRD	venets@ipta.demokritos.gr	Greece
55	Vetera	Valentina	CEA	valentina.vetere@cea.fr	France
56	Vinke	Ico	Juelich	i.c.vinke@fz-juelich.de	Germany
57	Volkov	Konstantin	Kingston University	K.Volkov@kingston.ac.uk	England
58	Wilhelm	Gerd	Ingenieurbüro Wilhelm GmbH	wilhelm@ibwilhelm-gmbh.de	Germany
59	Wollrab	Uwe	Airbus	uwe.wollrab@airbus.com	Germany

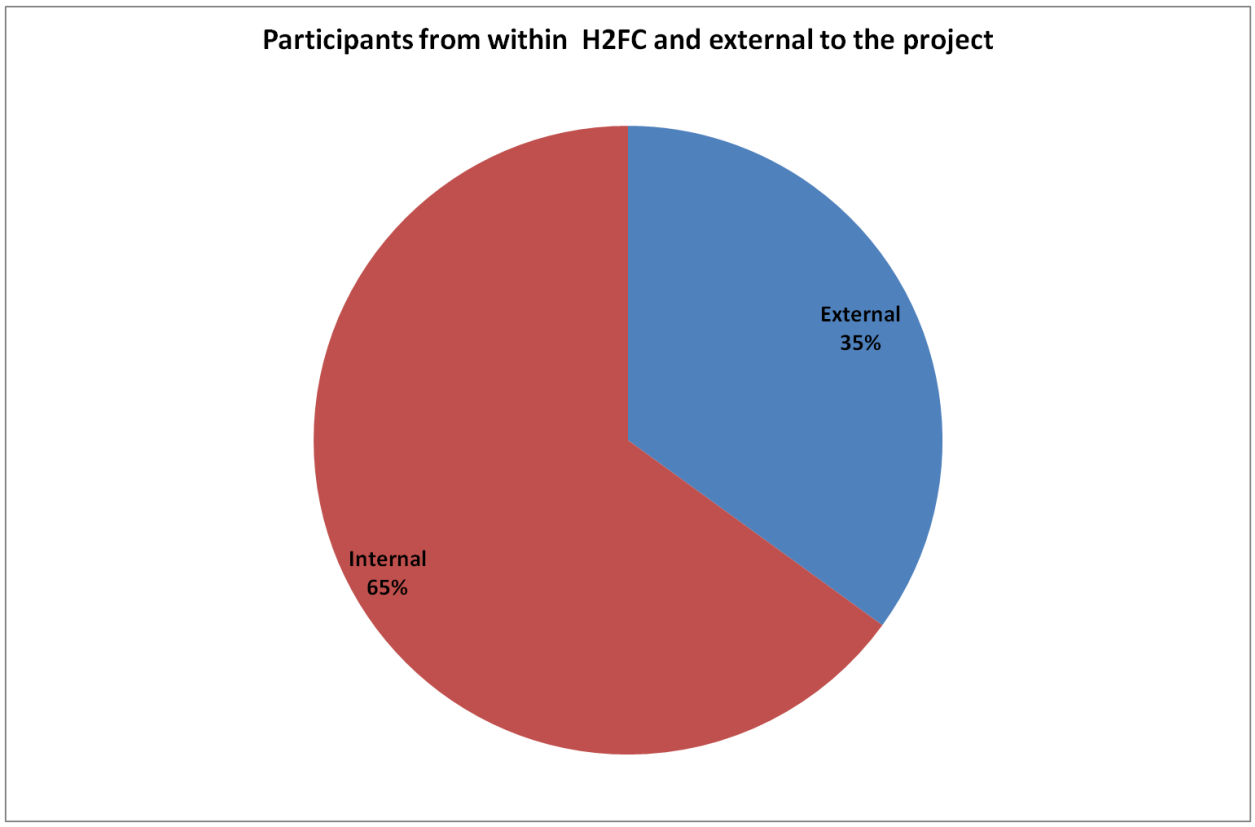
3.2 Analysis of participants

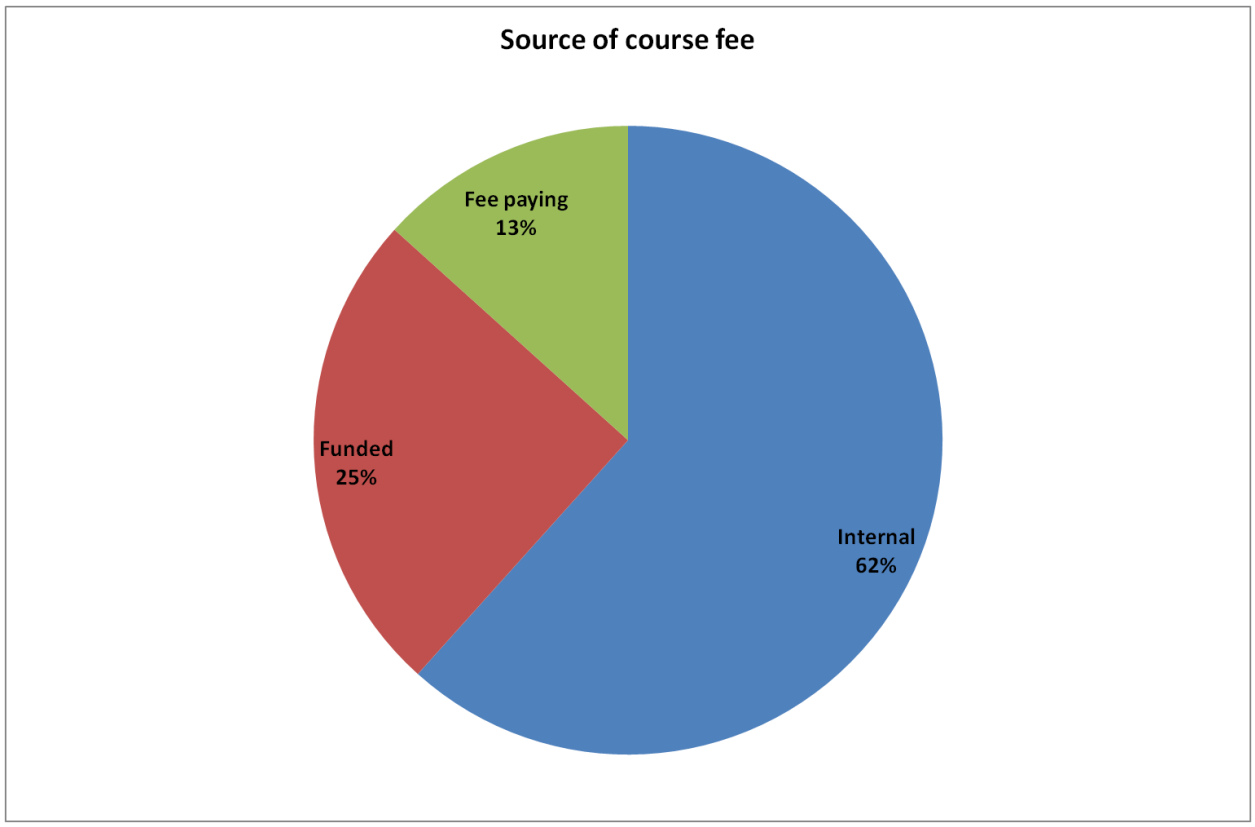
17 countries were represented. In addition to the individuals listed in the previous section, some participants attending the paralell school joined the H2FC event when sessions did not clash. The vast majority of participants were from European countries with 4% from third countries.

The attendees were 13% female. It is hoped that this precentage will be increased for the 2013 Technical school. Over 1/3 of participants were external to the project. The organisers will endeavour to increase this percentage for the 2013 school.


Country of origin (total participants 60)
The Netherlands 5%
USA 2%
Belgium 2%
England 17%
Finland 2%
France 8%
Germany 18%
Greece 10%
Ireland 2%
Italy 7%
Northern Ireland 7%
Norway 3%
Romania 3%
Scotland 5%
South Africa 2%
Spain 2%
Switzerland 7%


Gender balance
Male
Female
13%
87%



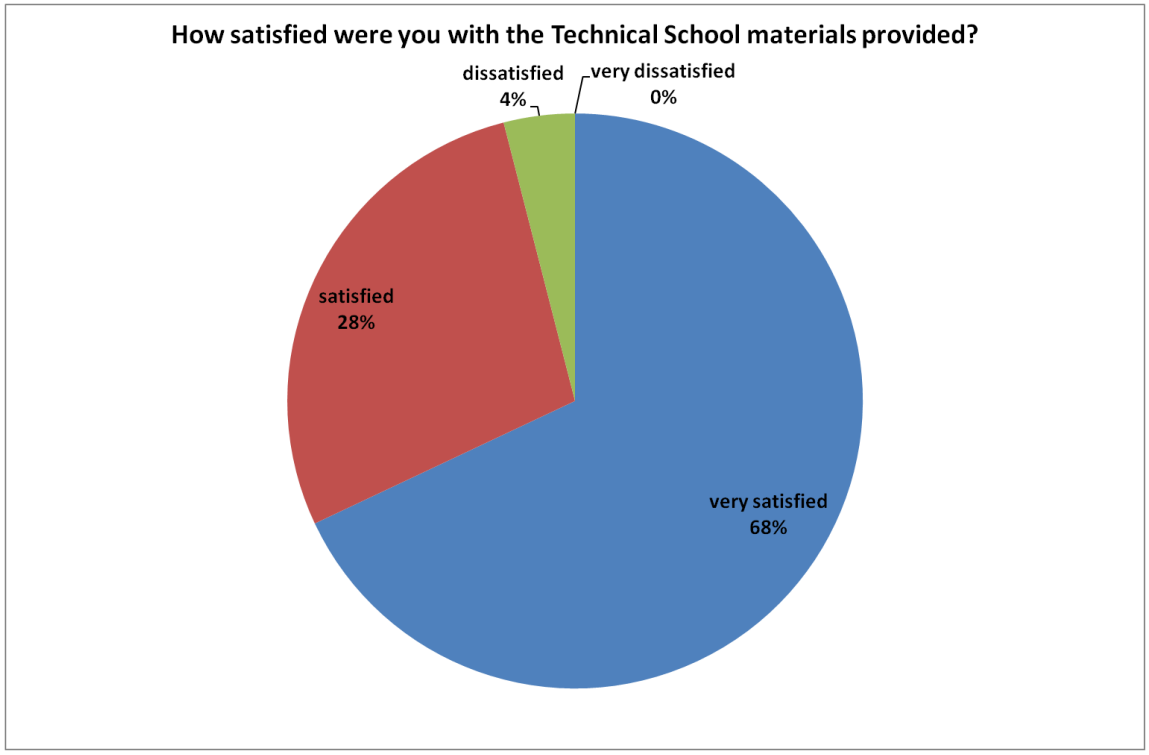


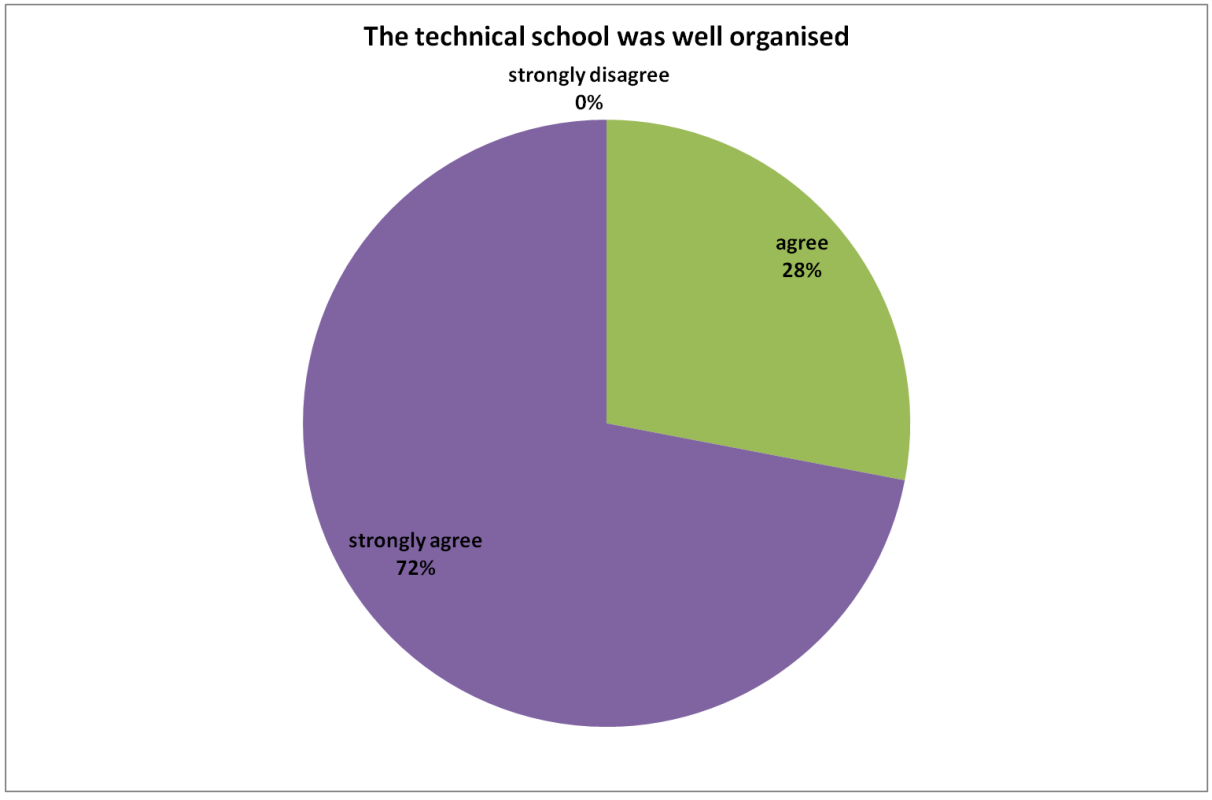
Please note in the above figure – internal describes project partners who attended and paid the fee from their project budget.

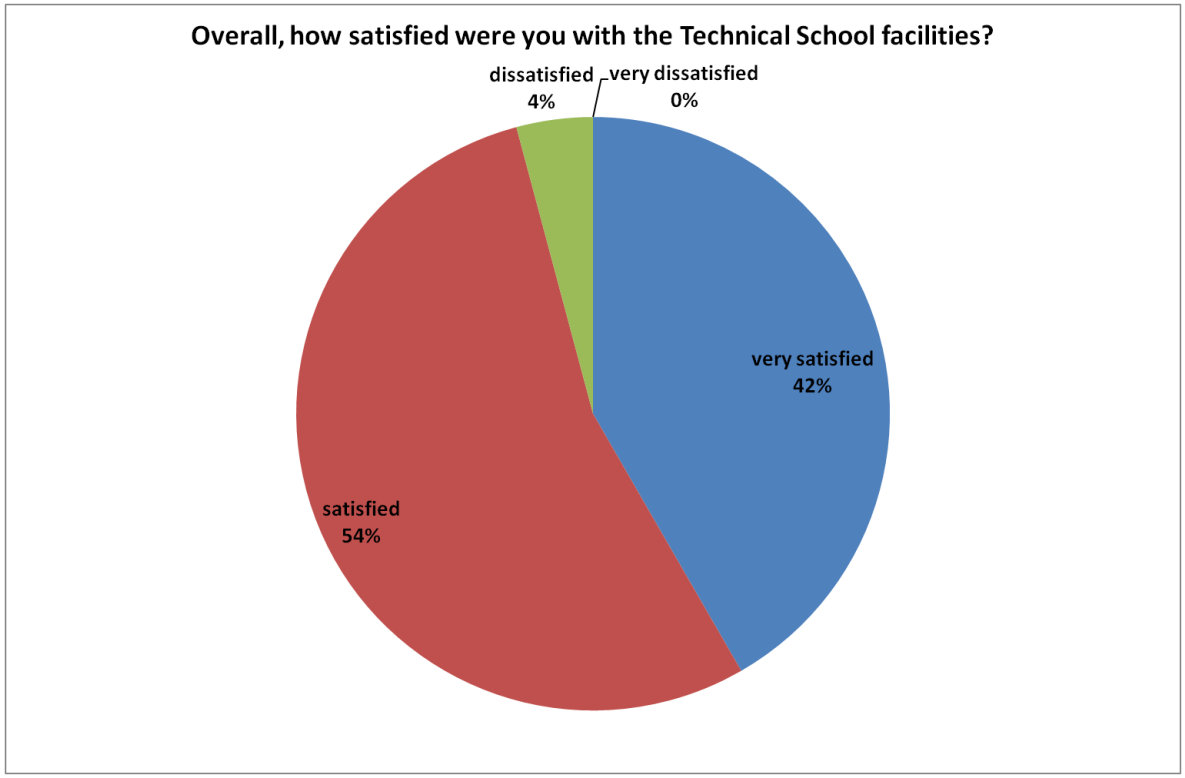
4 Feedback

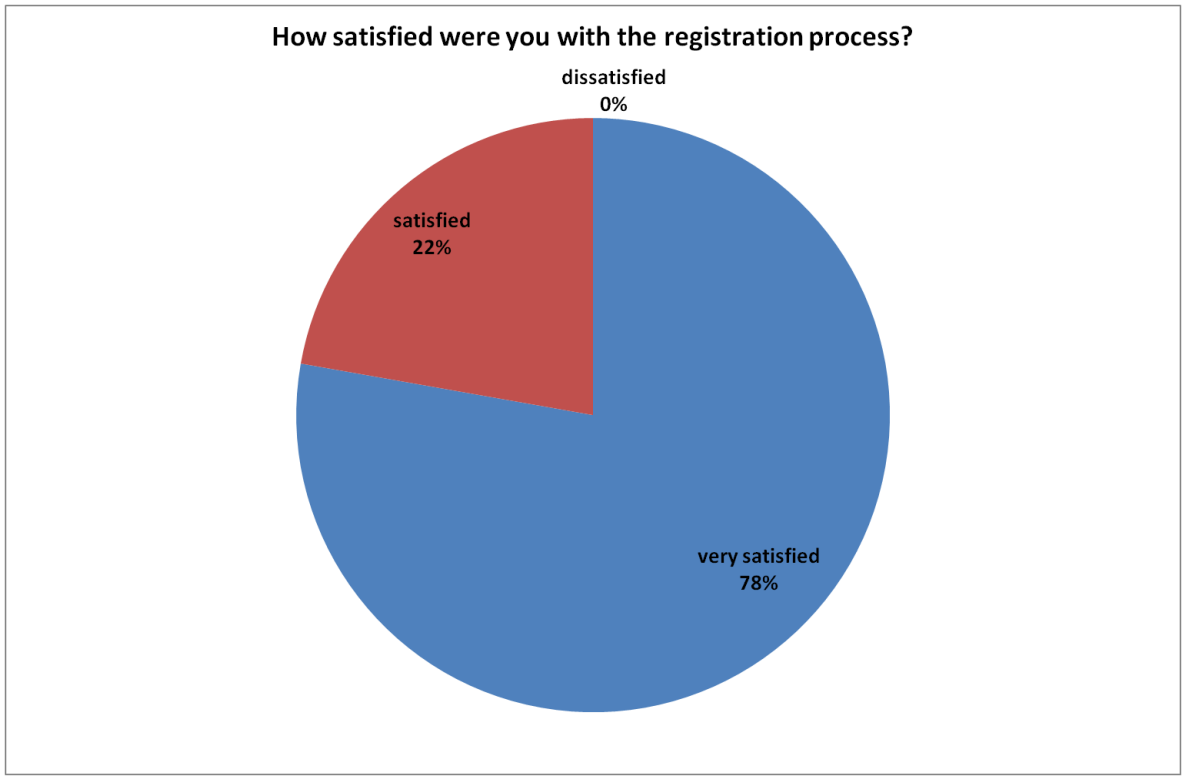
Just over 50% of participants completed forms at the school and this was subsequently followed up with an online form to increase the response rate. Generally very positive feedback was received. The location and timing received extremely high reviews and whilst the programme was well received some changes to structure have been suggested.

4.1 Organisation

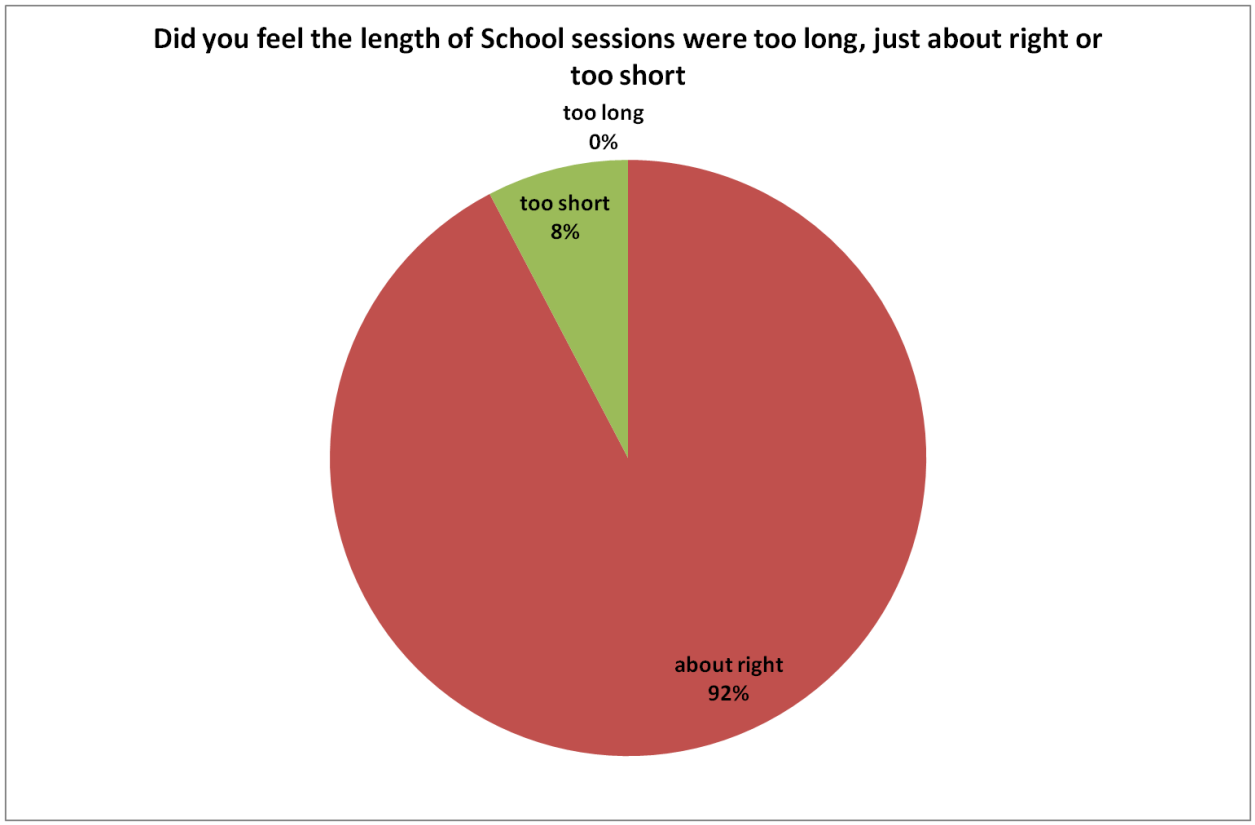


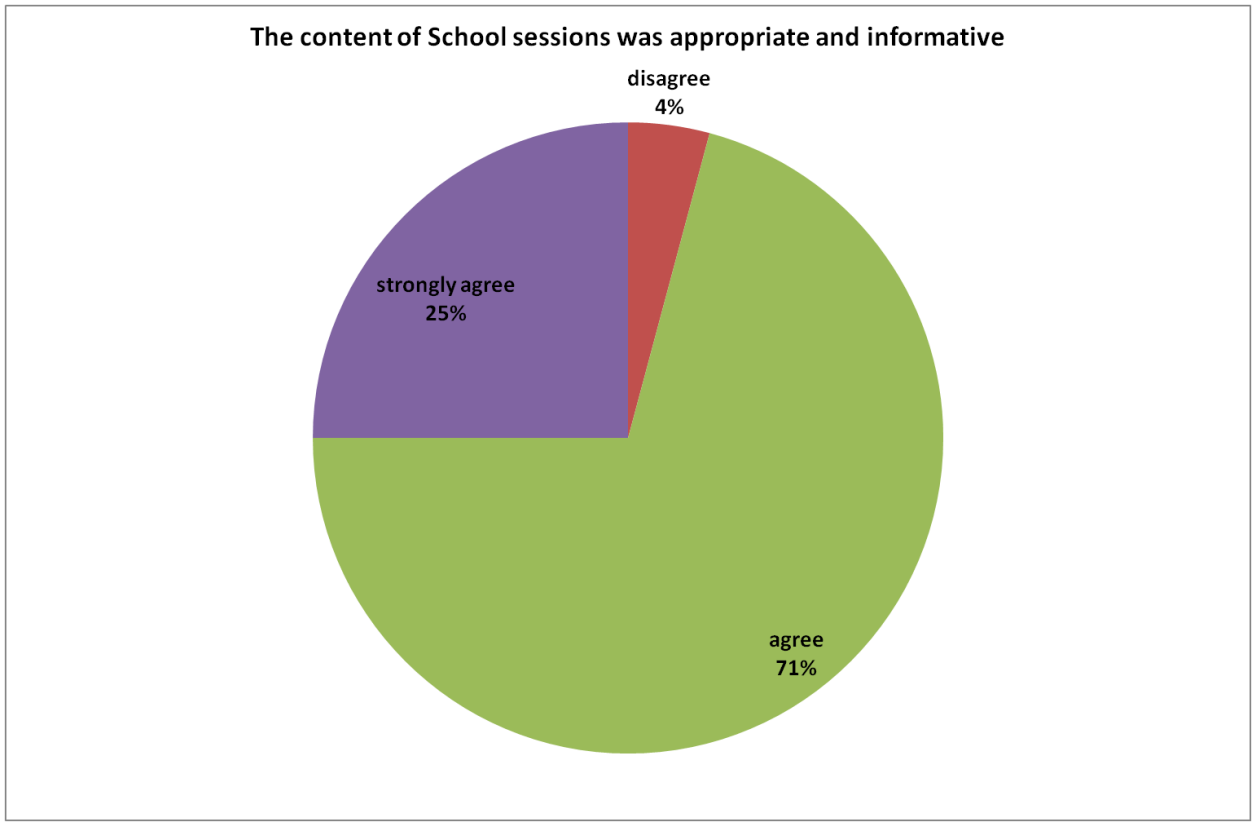


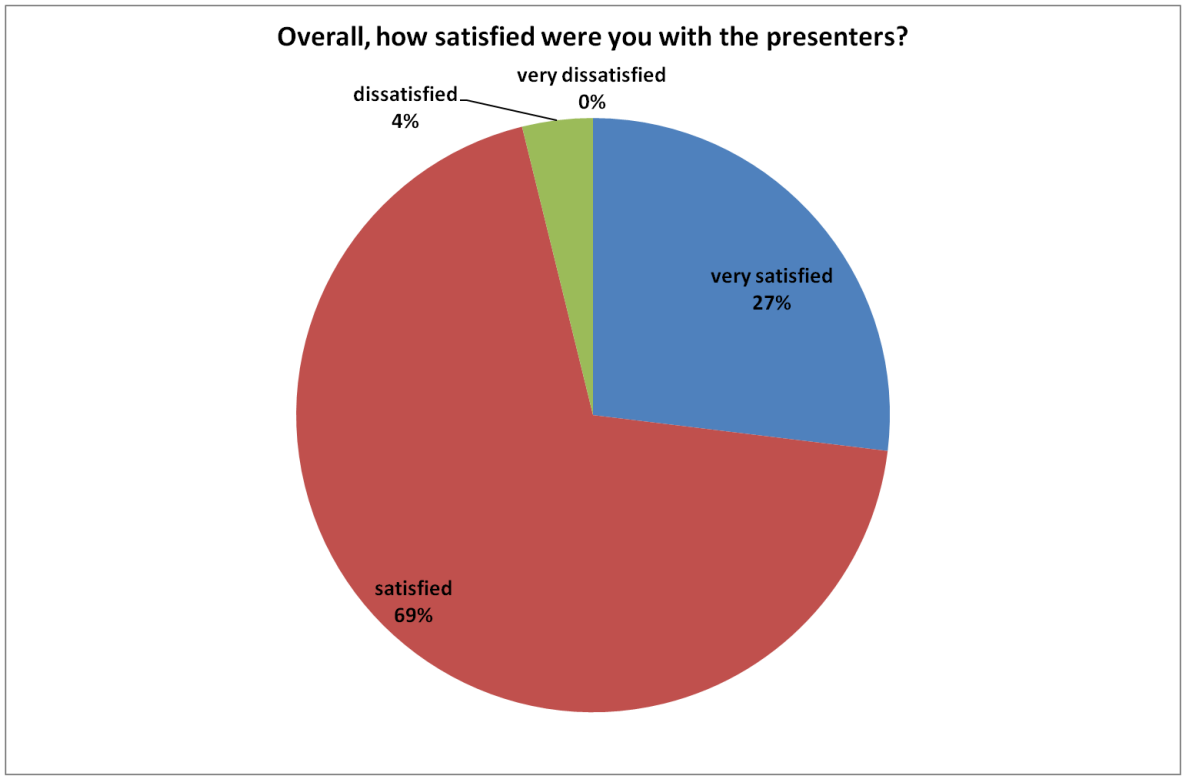

Overall, how satisfied were you with the Technical School facilities?
dissatisfied
4%
very dissatisfied
0%
very satisfied
42%
satisfied
54%


How satisfied were you with the registration process?
dissatisfied
0%
satisfied
22%
very satisfied
78%

4.2 Sessions


Did you feel the length of School sessions were too long, just about right or too short
too long
0%
too short
8%
about right
92%


The content of School sessions was appropriate and informative
disagree
4%
strongly agree
25%
agree
71%

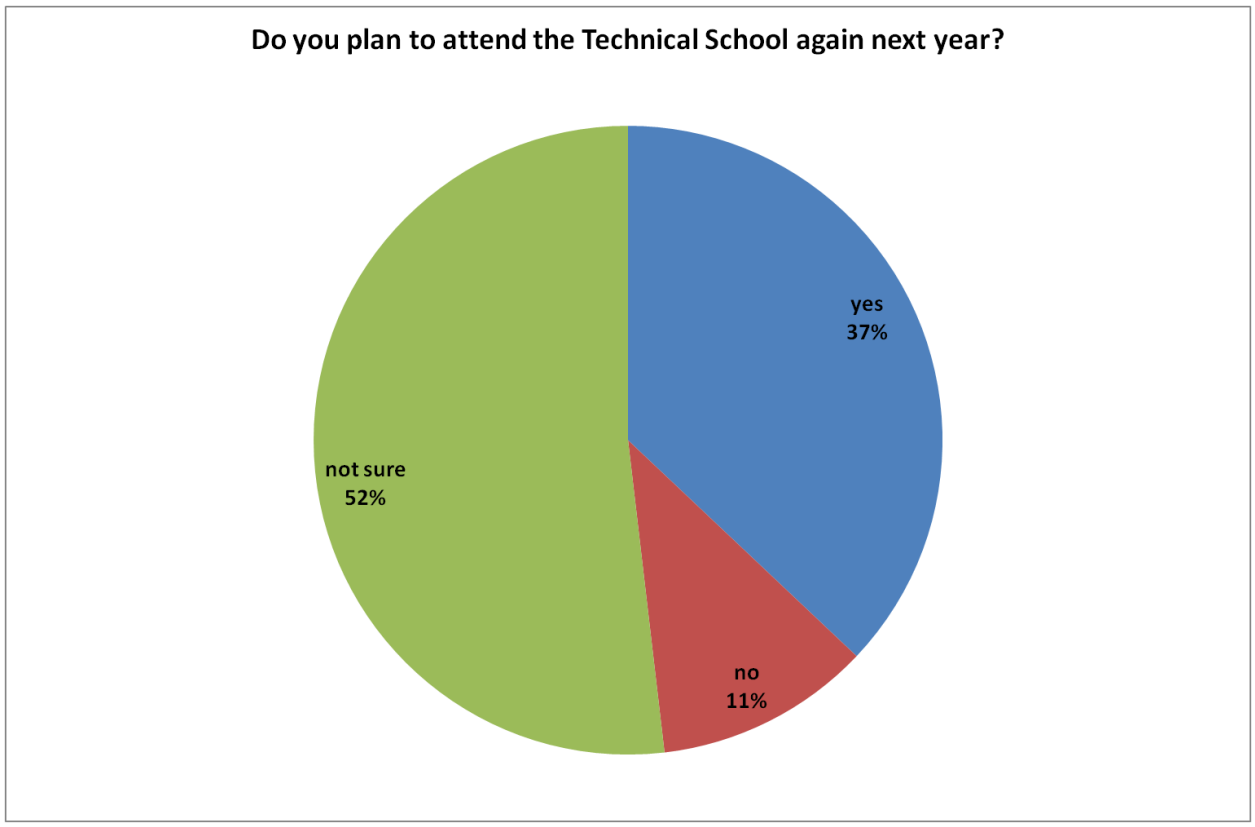


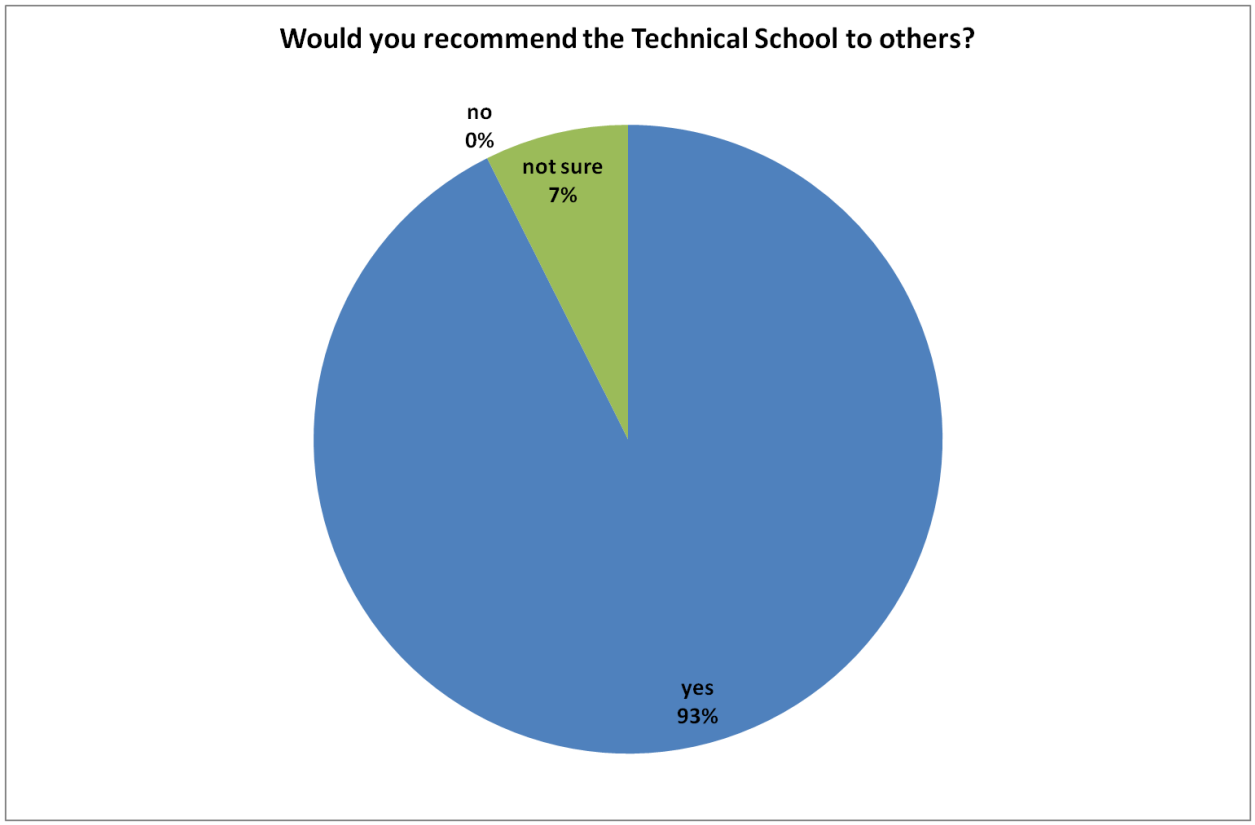
Attendees were asked for specific topical suggestions the following sessions were requested noted:

- Introductory sessions [mentioned numerous times]
- More hydrogen safety discussions [mentioned 5 times]
- Discussions on known standards and targets e.g. DoE or EU [mentioned 3 times]
- Include non-solid storage [mentioned 2 times]
- Full chain (production, distribution etc.)
- Keynote lecture on CFD
- H2 production, including efficiencies from production to end use
- More engineering and applied research
- Tutorial on experimental techniques

4.3 Future attendance

It can be seen that the majority of attendees would definitely recommend the school to others. Whilst not all would attand again, discussions with attendees indicated that they would advise colleagues to go or that they would attend themselves if the content was not repeated. It shoudl be noted that the University of Ulster has recieved several email enquiries from 2012 attendees for the 2013 school.


Do you plan to attend the Technical School again next year?
yes
37%
no
11%
not sure
52%


Would you recommend the Technical School to others?
no
0%
not sure
7%
yes
93%

4.4 Positives and negatives

Participants were asked what the appreciated most and what they would improve in order to facilitate planning for next year.

Room for improvement:

- Internet connection – Whilst WiFi was available some particpants noted the connection was slow. The organisers will try to ensure a better connection in 2013
- No microphone – AV equipment will be used in 2013
- No excursion – this will be added
- Start earlier and have longer lunch/keep programme the same – the organisers have made some changes to the 2013 programme in an attempt to comprimise.
- Lack of overview/topical lectures should be earlier – these will be moved to Monday
- The variable content in the work in progress sessions was critisised, it has been suggested to replace this with a poster session in 2013.

Positives:

Same comments on majority of forms

- Location
- Quality of presentations
- Length of sessions
- Environment for networking and exchange
- Different format every day location
- Session timing
- Learning about facilities
- Atmosphere
- Networking discussions
- Topical lectures

5 Lessons learnt and recommendations for next year

Generally there was very positive feedback on the first Technical School but there is room for improvement!

The location, organization and timing recieved almost universal positive feedback thus a similar approach will be taken in 2013.

The structure will be adapted somewhat inline with feeback for example:

- Include excursion and/or more structured social programme
- More introduction session
- Microphone for speakers
- Internet connections
- Include photos and bio for participants
- Greater balance between subject areas needs to be maintained

The interaction between the school and advisory board needs to be discussed