



# Gas Analysis Working Group (GAW) - Status and perspectives -

York Neubauer, TU Berlin; Serge Biollaz, PSI

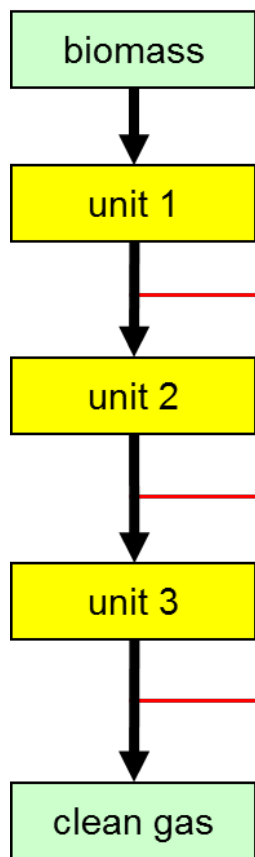
IEA Bioenergy, Task 33 Workshop

"Gas measurement and analysis in thermal gasification systems"

26. October 2016, Lucerne, Switzerland



## Process



## Analytical Tool Box for Gas Analysis

### Sampling Points

#1

#2

#3

### Sampling Systems

GQ

LQ

LQ

GQ

PQ

TC

### On-line Analysis

SID

 $\mu$ GC, NDIRUV-VIS,  $\rho$ 

ICP/MS

 $\mu$ GC, NDIR

FTIR

ICP/MS

MS

GC/SCD

UV-VIS

### Sample Preparation & Off-line Analysis (Liquid Samples)

Sample post treatment

fraction collector

fraction collector

KF

UV-VIS

GC/MS

GC/FID

GC/SCD

ICP/MS

ICP/OES

GC-ICP/MS

Sampling principles of sampling systems:

LQ: Liquid Quench

GQ: Gas Quench

PG: Pressure Quench

TC: Temperature Control

Sample stream:

→ Gas warm

→ Gas cold

→ Solvent



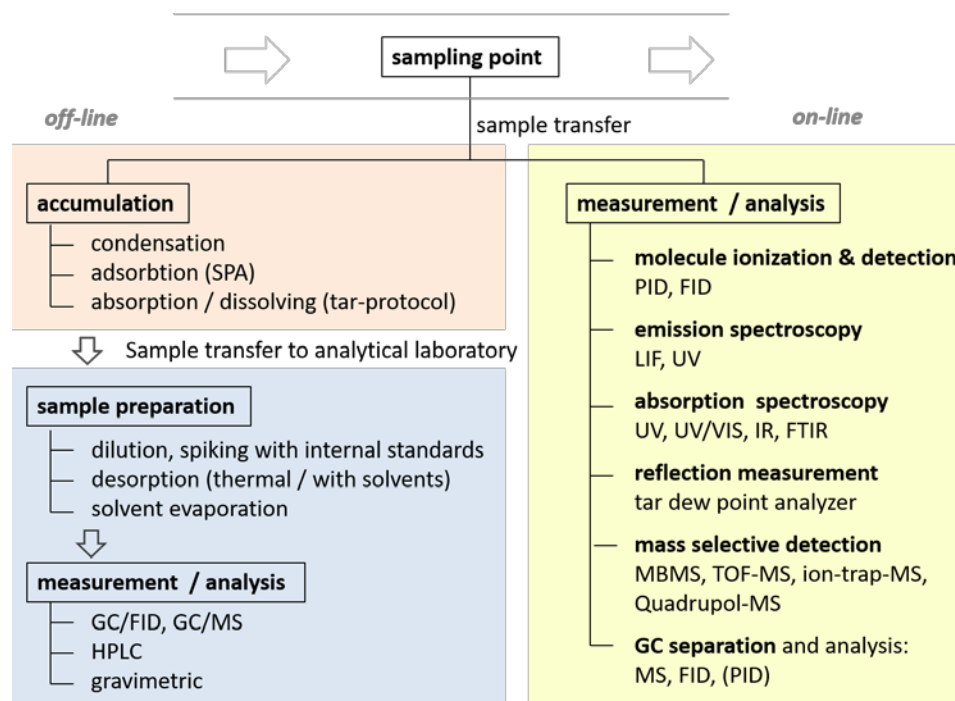
First workshop on “tar measurement” in 2010 in Berlin was driven by consulting a research project which aimed at comparing gasifiers (“Bundesmessprogramm”) coordinated from DBFZ, Leipzig, Germany @ TU Berlin  
TU Berlin, Fraunhofer IFF, Fraunhofer Umsicht,

## **Conclusions:**

- Different interpretations of the ‘standard’ tar protocol
- No overview about the status of other known concepts for measuring
- Would be nice to have an international workshop.



## June 2011 @ 19<sup>th</sup> EUBCE in Berlin: International Workshop: Measurement, Analysis and Monitoring of Condensable Gas Components (**especially Tar**) in Product- Gases from Biomass Gasification and Pyrolysis



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## **EVUR** After workshop Berlin 2011

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**Idea discussed at end of Berlin workshop:**

- Create review paper/Report/wiki for determining the current status of analytical techniques and for its dissemination
- have another workshop

**Idea brought up by M. Kleinhapfl to form international working group:**

*“Setup of a working group to optimize the basis of knowledge about sampling, analysis and evaluation of impurities in product gases from thermochemical gasification, pyrolysis gases and conditioned synthesis gases”*



## Motivation for the Gas Analysis Working Group (GAW)

- **Workshops** and internet based **Webinars** on all issues regarding gas analysis and more generally analytical tasks in gas producing processes
- Exchange of information on recent methodologies in product gas sampling and analysis
- Sharing knowledge and experiences
- **Working together** to learn, improve and to gain and deepen personal contacts (**host site**)
- Provide information on current status of analytical technologies in this field via **Website** and **Wikis**.



## Gas Analysis Workshops: Since 2010

Gas Analysis Workshop 2016 Amsterdam

[Amsterdam 2016](#)

Gas Analysis Workshop 2015 Vienna

[Vienna 2015](#)

Gas Analysis Workshop 2014 Hamburg - Challenge event: Chemical Analysis in Biomass Conversion Processes

[Hamburg 2014 \(EUBCE\)](#)

Gas Analysis Workshop 2014 Berlin

[Berlin 2014](#)

Gas Analysis Workshop 2013 - tar & sulphur sampling and analysis

[Copenhagen 2013 \(EUBCE\)](#)

Workshop on Sampling, Detection and Quantification of Impurities in Gases from Thermochemical Biomass Conversion Processes - "Gas Analysis Workshop"

[Milan 2012 \(EUBCE\)](#)

Measurement, Analysis and Monitoring of Condensable Gas Components (especially Tar) in Product-Gases from Biomass Gasification and Pyrolysis

[Berlin 2011 \(EUBCE\)](#)

Workshop zum Messen von Teer - Teermessung an Holzvergasungs-Motor-BHKW

[Berlin 2010 - Invitation](#)

More information here:

<http://www.gas-analysis-webinars.org/?q=node/9>



## Gas Analysis Working Group: Since 2016

Here we are looking for your input. We want to concentrate on relevant issues. Therefore we will ask you to choose what is relevant for yourself or for your group. This feedback enables us to steer the activities in the best possible way.

**Your participation in topical groups, Status of interest on:**

### **Tar online measurement systems**

- Tar online measurement systems
- Laser based/optical measurements of BTX+PAC

### **Sulphur measurement (technique and equipment)**

- GC-X sulphur measurement (FPD, PFPD, SCD)
- Sulphur measurement with Micro-GC
- Low cost total sulphur measurement

### **FTIR**

- FTIR measurement (technique & equipment)

### **Particle sampling and analysis**

- On-line particle measurements

### **Supporting devices for gas sampling**

- Design & operation of gas dilution systems

### **ELN & LIMS - electronic laboratory notebook & laboratory information management system**

- ELN & LIMS

More information here:

<http://www.gas-analysis-webinars.org/?q=node/26>

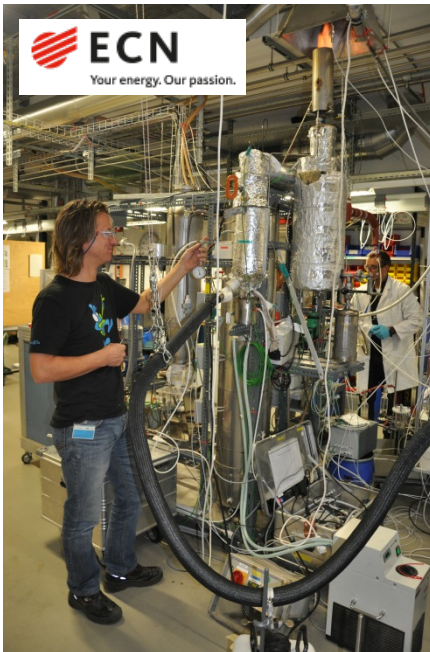




## Learnings

- Interaction via internet makes collaborative working in virtual teams possible!
- Find other groups with very similar interests
- Try to understand the common motivation
- Perform round robin tests with real teams: Example PSI November 2013

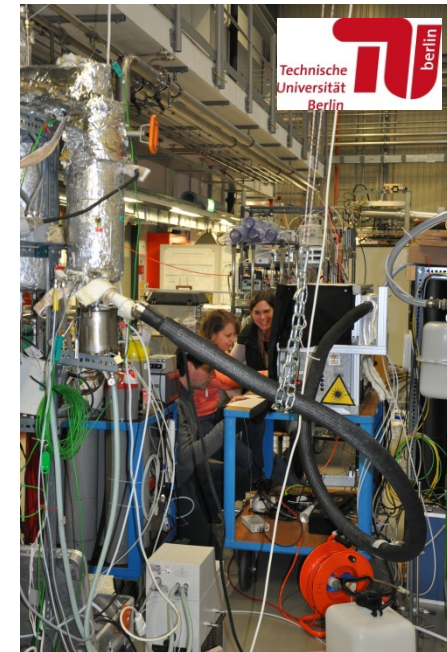
**SPA**



**ETP**

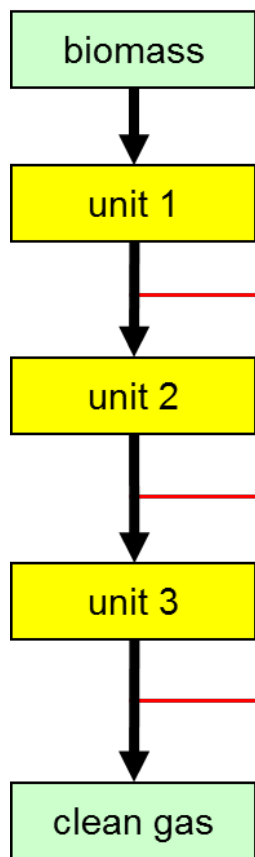


**LIF**





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**Coming together is a beginning;  
keeping together is progress;  
working together is success.**

Henry Ford (1863-1947)

**We invite you to join!**



Home

Webinars

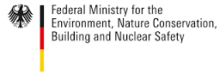
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# Gas Analysis Webinars

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<http://www.gas-analysis-webinars.org>

The screenshot shows the homepage of the Gas Analysis Webinars website. The header is red with the site logo and name. Below the header is a navigation menu with links for Home, Webinars, Wiki, Working Group, and Workshops. The main content area features a sidebar with navigation options and a list of workshops. The first workshop listed is 'Gas Analysis Workshop 2016 Amsterdam', submitted by Jan Van den Broek on Feb 19, 2016. The description for this workshop states: 'By Friday, June 10th 2016, we will have over 100 attendees for the Analysis Workshop. The support of ECDC, ECHA Research and ICCS is most valued to make sure to have this meeting without additional costs for the participants. If you have not yet registered please do so by returning the 'Gas Analysis at 2016' form to: [jan.vandenbroek@ecdc.europa.eu](mailto:jan.vandenbroek@ecdc.europa.eu). We will have the latest information on the workshop and the program.' Below this, there is another entry for 'Gas Analysis Workshop 2016 Amsterdam' submitted by Jan Van den Broek on Feb 19, 2016, with a description: 'The next Analysis Workshop is planned to take place in Amsterdam on Friday, June 10th 2016. If you plan to attend the meeting please email us at: [jan.vandenbroek@ecdc.europa.eu](mailto:jan.vandenbroek@ecdc.europa.eu). Further information about the workshop topics will follow soon on this website.' The third entry is 'Gas Analysis Workshop 2015 Vienna' submitted by Jan Van den Broek on Feb 19, 2015.

<http://wiki.gas-analysis.info>

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