TC for Metrology in Chemistry:

Highlights and challenges

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Outline

- TC-MC projects: ongoing Regional and Supplementary comparisons
- Project example: JRP ENG09 "Biofuels – Metrology for biofuels"

EURAMET Projects:
Ongoing Regional and Supplementary comparisons

Health

- EURAMET.QM-K12 “Creatinine in human serum”
- EURAMET.QM-S7 “Electrolytic conductivity at pure water level”

Energy

- EURAMET.QM-K16 “Comparison on natural gas”
- EURAMET-QM-S6 “Liquefied hydrocarbon mixtures in constant pressure (piston) cylinders”

Environment

- EURAMET.QM-K26a “Reactive gases: NO in N_2”
- EURAMET-QM-S5 “CO_2 in N_2”

EMRP
European Metrology Research Programme
Programme of EURAMET
The EMRP is jointly funded by the EMRP participating countries within EURAMET and the European Union
EURAMET
European Association of National Metrology Institutes

ENG09 BIOFUELS
Metrology for biofuels

From 01/06/2010

JRP-Coordinator
Paola Fisicaro
LNE

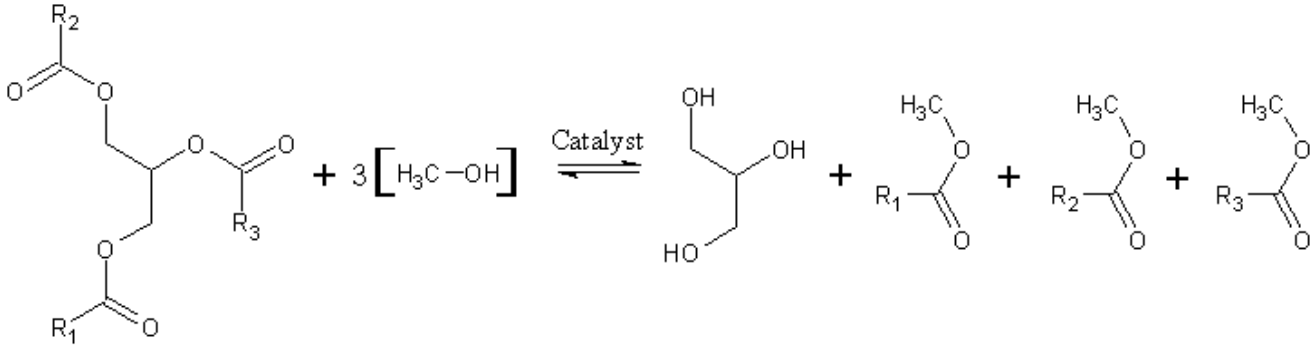
The first-generation liquid biofuels are generally produced from sugars, grains or seeds

Bioethanol: by fermentation of sugar extracted from crop plants and starch contained in corn, sugar cane and sugar beet.

Bioethanol fuels can substitute gasoline in spark-ignition engines.

Biodiesel (FAME, FAEE): produced from vegetable oils of oleaginous plants (rapeseed, soybean, sunflower) by transesterification processes.

Biodiesel is suitable for use in compression-ignition engines.



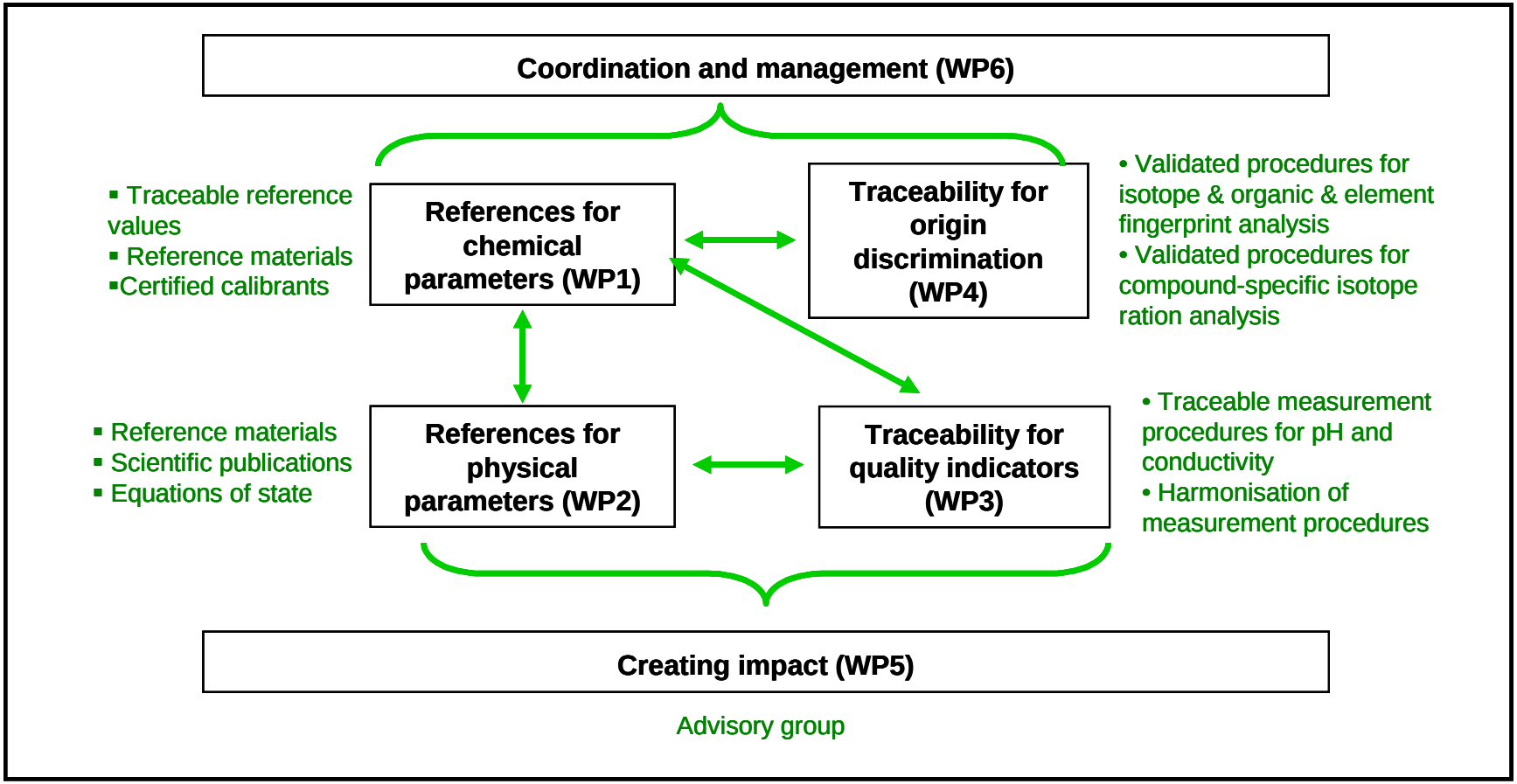
Aims of the project

To provide validated and reliable methods with **clear traceability** of the measurement results for physical and chemical parameters of liquid biofuels, focusing on first generation materials.

To develop **reference materials** to be used as tools for method **validation** and instrument **calibration**, covering both chemical parameters and physical transport properties.

To promote the **harmonization of measurement and written standards** across borders, essential for confidence in international quality assurance, needed to facilitate global trade.

Structure of the project



Conclusions and highlights

A **reference method** to quantify **methanol** content at the specification limit of 0.2 % *m*/*m* of the EN 14214 standard is finished (an improvement of existing the EN14110 standard method).

A **reference method** has been developed for characterisation of **free glycerol** in rapeseed based biofuel; it would be applicable as an IDMS based reference procedure, suitable for the characterisation of a CRM.

Transport properties' measurements at normal pressure (density, viscosity) and calorific value measurements were concluded showing good agreement between the JRP-Partners involved in the task.

A **pHe comparison** of phosphate buffer in a water-ethanol mixture (50% *w*/*w*) between LNE, PTB, INMETRO and NMIJ has been completed. A CCQM Pilot study on the topic has been agreed.

A method for reliable multi-screening/elemental ratio monitoring of raw materials was put in place, suggesting that selected elemental ratios can be considered suitable tools for the discrimination between **different raw materials of different biological origin**.

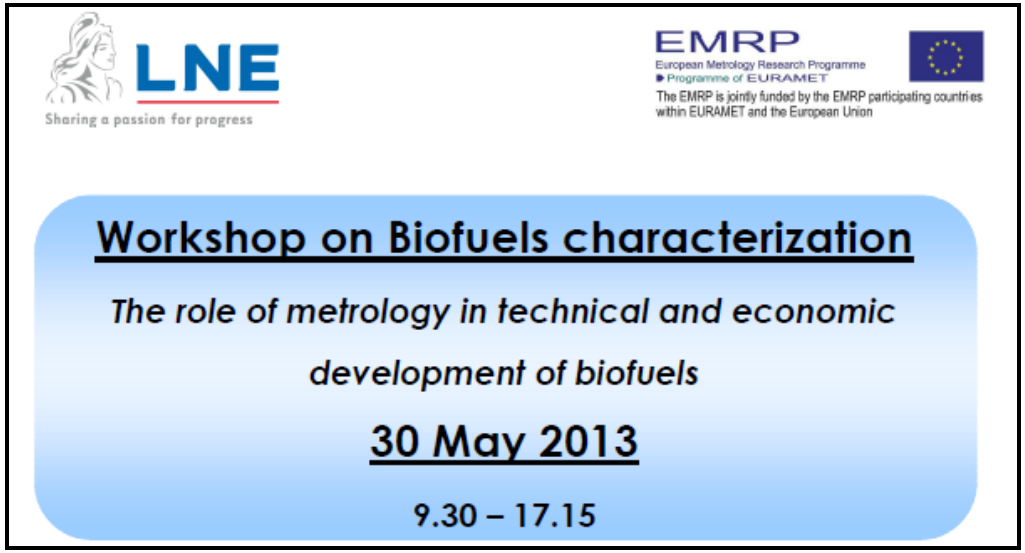
Conclusions and highlights

The project will end in May 2013

Fruitful collaboration between the partners ➔ good outcomes of the project:

•Results obtained in WP2 on density measurements will partially be used to draft a **French standard** (FD M 08-037).

• 5 **scientific papers** have been already published in peer-reviewed journals, 3 will be submitted by the end of the projet, and 12 presentations were given in **International conferences**.



PTB

Thank you for your attention!