# InGOS – Integrated non-CO2 Observing System

Detailed workplan, appendix to the online application. Request for access to an infrastructure (TNA1-TNA2-TNA3). The plan must not exceed 6 pages in 12 pt single line spacing, applications exceeding this limit will not be evaluated. The following information should be included in order to be evaluated:

1. **Project name (acronym), name and contact information of the researcher(s), duration of the project (dates, number of working days), type and name of the infrastructure requested**

**Project Name:** INGOS NA5 N2O instrument inter-comparison campaign

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**Duration of the project:** June 2 to 28 2013

**Infrastructure request:** Access to Easter Bush supersite (TNA1)

1. **Background**
   1. Significance of the research

The field campaign will allow for side-by-side comparison of fast-response N2O analysers currently available on the market. This will enable us to assess their performance in both concentration and flux mode.

* 1. Previous research relevant to the topic and how the proposed project links to this

UHEL has organized a similar intercomparison campaign in 2011 within the FP7 ICOS project. The campaign of instrumentation for eddy covariance flux measurements of N2O was carried out on a perennial bioenergy crop, reed canary grass (Phalaris arundinaceae, L) plantation. The site was located on the rural area of Maaninka, Eastern Finland. Concentrations and fluxes retrieved from 4 different instruments using laser spectroscopy were compared. The analysis of the results is under progress. The experience gained during this exercise can be used for successfully achieving the goals of the proposed project.

* 1. Links with current research of the applicant

UHEL is currently involved in many international research activities dealing with the standardization of eddy covariance flux measurements of non-CO2 GHGs.

1. **Objectives**
   1. Hypothesis and research objectives

The inter-comparison campaign will allow to assess measurement accuracy and precision, spectral response, systematic and random errors of several N2O laser based analysers currently available for eddy covariance flux measurements.

* 1. Connection with the InGOS objectives and the ‘fitness’ of the use of the requested infrastructure to the objectives

This project is part of NA5 activities in Annex I.

1. **Methods and materials (legal and ethical issues)**

All instruments will be running in parallel for the first few days measuring background conditions, and continue for a three week period following the fertilisation event. All system will be calibrated together with the same gas standards. There will be the opportunity to interface various analysers with a common anemometer / data acquisition system or to test independent complete systems against a reference. Data analysis will be performed individually with own methodology and in parallel following a common protocol.

UHEL will provide the Los Gatos fast N2O/CO/H2O analyser, together with pump, sampling line, inlet, etc.

1. **Implementaton: timetable, budget, distribution of work**
   1. Timetable for the research including personnel efforts, favorably table wise

Ivan Mammarella and Sami Haapanala (UHEL) will visit the Easter Bush site from June 2 to 4 2012 in order to install the N2O analyser.

Sami Haapanala will visit the site for 2 days at the end of the campaign to un-install and pick-up the UHEL equipment.

* 1. Total budget for travel and logistical support as requested

For the campaign setup, the plan is to flight with all the equipments to Edinburgh on the 2nd of June 2013. The estimated costs are of the order of 600 Euro/person for a return trip. We will also require 2 nights’ accommodation near Easter Bush site during the initial setting-up visit and one night at the end of the campaign. The budget requested for this project is: travel costs 3x600 Euro=1800 Euro and subsidence for 2 people for 3 days and 1 people for 2 days: 3x100 + Euro+2x50 Euro =400 Euro.

Total budget 1800+400 = 2200 Euro.

1. **Expected results and possible risks**
   1. Expected scientific impact of the research and applicability and feasibility of the research results

It is expected that the obtained results will provide a reference and standard protocol for N2O flux eddy covariance systems (including measurement setup, calibration, data post-processing) to the whole flux community.

* 1. Publication plan

To be decided.

* 1. Data access plan

Flux data will be submitted to the InGOS Ecosystem database.