

# REQUEST FOR ADDITIONAL RESOURCES IN THE CURRENT YEAR FOR AN EXISTING SPECIAL PROJECT

Please email the completed form to [special\\_projects@ecmwf.int](mailto:special_projects@ecmwf.int).

**MEMBER STATE:** .....Italy.....

**Principal Investigator<sup>1</sup>:** ...Francesco Graziosi.....

**Affiliation:** University of Urbino.....

**Address:** Via Aurelio Saffi 2, 61029 Pesaro Urbino

**Other researchers:** .....

**Project title:** ... European emissions of CO2 and CH4 inferred from model inversion system and their comparison with annual national inventory reports .....

**Project account:** **SPITZGRAZ**

Additional computer resources requested for	2022
High Performance Computing Facility (units)	3,700,000
Data storage capacity (total) (Gbytes)	-

<sup>1</sup> The Principal Investigator is the contact person for this Special Project

*Continue overleaf*

## Technical reasons and scientific justifications why additional resources are needed

To perform our analysis we consumed more resources than we expected. Indeed, in order to find the best setting of the model system we investigated several options, running numerous model simulations and inversion computations. Particular attention was dedicated to simulating the dispersion from receptors located in complex orthography (the mountain stations), where the particles' release altitude depends on the wind field resolutions. These tests implied large consumption of computing resources.

Moreover, adopting the current number of receptors, we obtained a good accuracy (low model uncertainty) in the center-west of the European domain. However, to acquire low uncertainty over the east and north part of the domain, where large carbon dioxide and methane sources are located, we need to add receptors affected by sources located in these areas.

The monitoring stations listed below can be added to our inversion system in order to increase the model sensitivity in the east and north domain.

Diabla Gora / Puszcza Borecka (Poland), Hegyhátsál háttérszennyeztség-mérő állomás (Hungary), Lindenberg (Germany), Křešín u Pacova (Czech Republic), Gartow (Germany), Hyytiälä (Finland), Pallas (Finland). To test this, we require additional computational resources.