

Preliminary information:

This questionnaire was prepared by the “EUREF Study Group on alternatives to ETRS89” (<https://www.euref.eu/governing-board/study-group-alternatives-etr89>).

The purpose of this questionnaire is to investigate user requirements for the European Terrestrial Reference System. The target users include national mapping agencies (NMA) as data providers, GIS users, cadastral professionals, land managers, positioning service providers, industry stakeholders, and any other relevant groups.

Only one response per *authority in charge of reference frame at the national level* is allowed. The authority is accountable for gathering, analysing, and translating user needs into requirements that can inform the development of the European Terrestrial Reference System. Please consult within your organization and with institutional or private partners to provide a representative answer for your country.

Personal information:

- What is your country?
 - Open field
- Are you responsible of the reference frame computation and maintenance in your country?
 - Yes
 - No
- How many public institutions or companies have you consulted? Please provide details if applicable. (Open field)
- Is the following document that describes my national frame up to date?
<https://doi.org/10.71603/NatRefEurope>
 - Yes
 - No
 - If no, what is your up to date national frame? If possible, please provide a link (Open field)

User needs:

- Tick if the following issues are of concern to your country (select one for each: Not a concern, Low, Average, High):
 - National coordinate 1–2-centimeter consistency with respect to neighboring countries for civil engineering projects
 - The differences between our national realization and recent ETRFxx (ETRF2014 and ETRF2020) are too large
 - The difference between national realization and ITRS realizations (ex: ITRF2020) is too large today (~90 cm)
 - National geoid grids used to transform ellipsoid height to gravity-related height (that depends on the national reference frame) cannot be used with both national and ITRF coordinates
 - Lack of reliable velocities for coordinate transformation in deformation zones

- Others (Open field)
- The following needs are important to meet in my country (select one for each: Not a concern, Low, Average, High):
 - Availability of an accurate Pan-European deformation model for horizontal coordinates (< 0.1 mm/yr level)
 - Availability of an accurate Pan-European deformation model for vertical coordinates (< 0.1 mm/yr level)
 - No national coordinate update
 - Stay consistent with previous national reference system despite the INSPIRE directive
 - Keep a static frame despite small deformation
 - Allow users to work in ITRF
 - Minimum deformation at country level
 - Adopting a national dynamic reference frame (= national coordinates can be expressed at any epoch and a deformation model should be used to change coordinate epoch in order to accommodate deformations)
 - Adopting a global dynamic reference frame (ITRF here, = national coordinates can be expressed at any epoch and a deformation model should be used to change coordinate epoch in order to accommodate deformations)
 - Others (Open field)
- What are the needs that are already satisfied today and should also be ensured in the future?
 - Maintaining national realizations with an accurate transformation to ITRF and ETRF
 - Maintaining national realizations with high accuracy consistency with an ETRS89 realization (ex: ETRF2000)
 - A reference system which follows the motion of the Eurasian plate, defined in the stable part of Europe (Central Europe)
 - Easy use of national realizations (cadastral applications)
 - Continue to propose transformations between new frames and old ones
 - Others (Open field)
- What future needs do you expect?
 - Cross-border real-time centimetric positioning (autonomous cars and N-RTK) in ETRS89.
 - PPP results to be accessible in national realizations (and so in the national frame) @ epoch t
 - PPP results to be accessible in national realizations (and so in the national frame) at reference epoch (velocities needed)
 - Due to the limited accuracy of mass-market positioning devices, ITRS/WGS84 and ETRS89 can be considered equivalent today. To have such an approximation valid for 20-cm level positioning in ITRF at epoch t in the future (e.g., the Galileo High Accuracy Service).

- Others (Open field)
- Are you waiting for recommendations from European organisations, e.g. Eurogeographics, UN-GGIM:Europe or EUREF, to handle reference frame metadata in your country?
 - no
 - yes
 - If yes, about what? (Open field)

Impact of national coordinate changes

- What is the maximum change in horizontal coordinates that you would accept if an ETRS89 alternative is chosen?
 - 2 cm
 - 5 cm
 - 10 cm
 - No maximum
- If national coordinates change, do you prefer small or large changes? In other words, would you agree to have change in your national coordinates if there is a benefit for some applications?
 - Yes, up to 10 cm
 - Yes, up to 1 m
 - Yes, between ~10 cm and 1 m
 - No
- What is the minimal acceptable time required between 2 national reference frame updates?
 - 1 year
 - 2-3 years
 - 3-5 years
 - 5-10 years
 - 10-20 years
 - 20-30 years
 - Never (only if absolutely necessary)
 - Don't know
- Open comment

END OF THE QUESTIONNAIRE