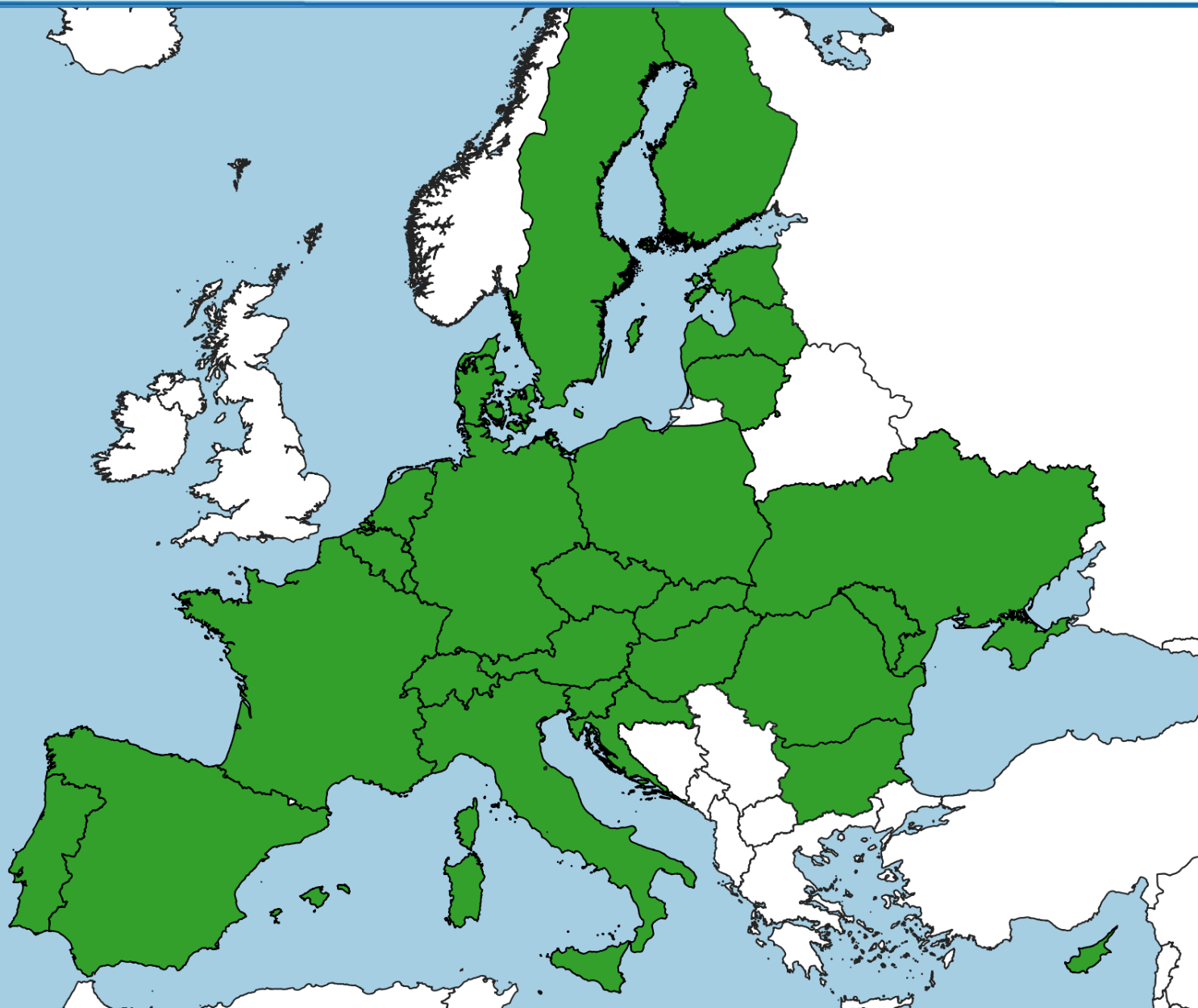




Questionnaire results review

Marcin Grudzień
5th of May 2025, Warsaw

Countries that responded to the questionnaire



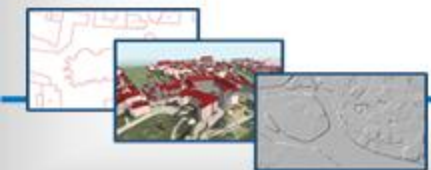
Feedback from
27 countries

Countries that responded to questionnaire



Austria	Federal Office of Metrology and Surveying
Belgium	Federal Public Service Finance Belgium
Bulgaria	Geodesy, Cartography and Cadastre Agency
Croatia	State Geodetic Administration
Cyprus	Department of Lands and Surveys
Czechia	Czech Office for Surveying, Mapping and Cadastre
Denmark	Danish Geodata Agency (Geodatastyrelsen)
Estonia	Estonian Land and Spatial Development Board
Finland	National Land Survey of Finland
France	Public Finances General Directorate
Germany	AdV
	Ministry of Agriculture, Dept. of Land Administration and
Hungary	Geoinformation
Italy	Agenzia delle Entrate

Latvia	THE STATE LAND SERVICE OF LATVIA
Lithuania	SE Center of Register
Luxembourg	Administration du cadastre et de la topographie
Moldova	Agency for Geodesy, Cartography and Cadastre
Netherlands	Kadaster (Netherlands' Cadastre, Land Registry and Mapping Agency)
Poland	The Head Office of Geodesy and Cartography (GUGiK)
Portugal	Directorate General for Territory (DGT)
Romania	National Agency for Cadastre and Land Registration
Slovakia	Geodesy, Cartography and Cadastre Authority of the Slovak Republic (GCCA)
Slovenia	Surveying and Mapping Authority of the Republic of Slovenia
Spain	General Directorate for Cadaster
Sweden	Lantmäteriet
Switzerland	Federal Office of Topography swisstopo - Federal Directorate of Cadastral Surveying
Ukraine	the State Service of Ukraine for Geodesy, Cartography and Cadastre

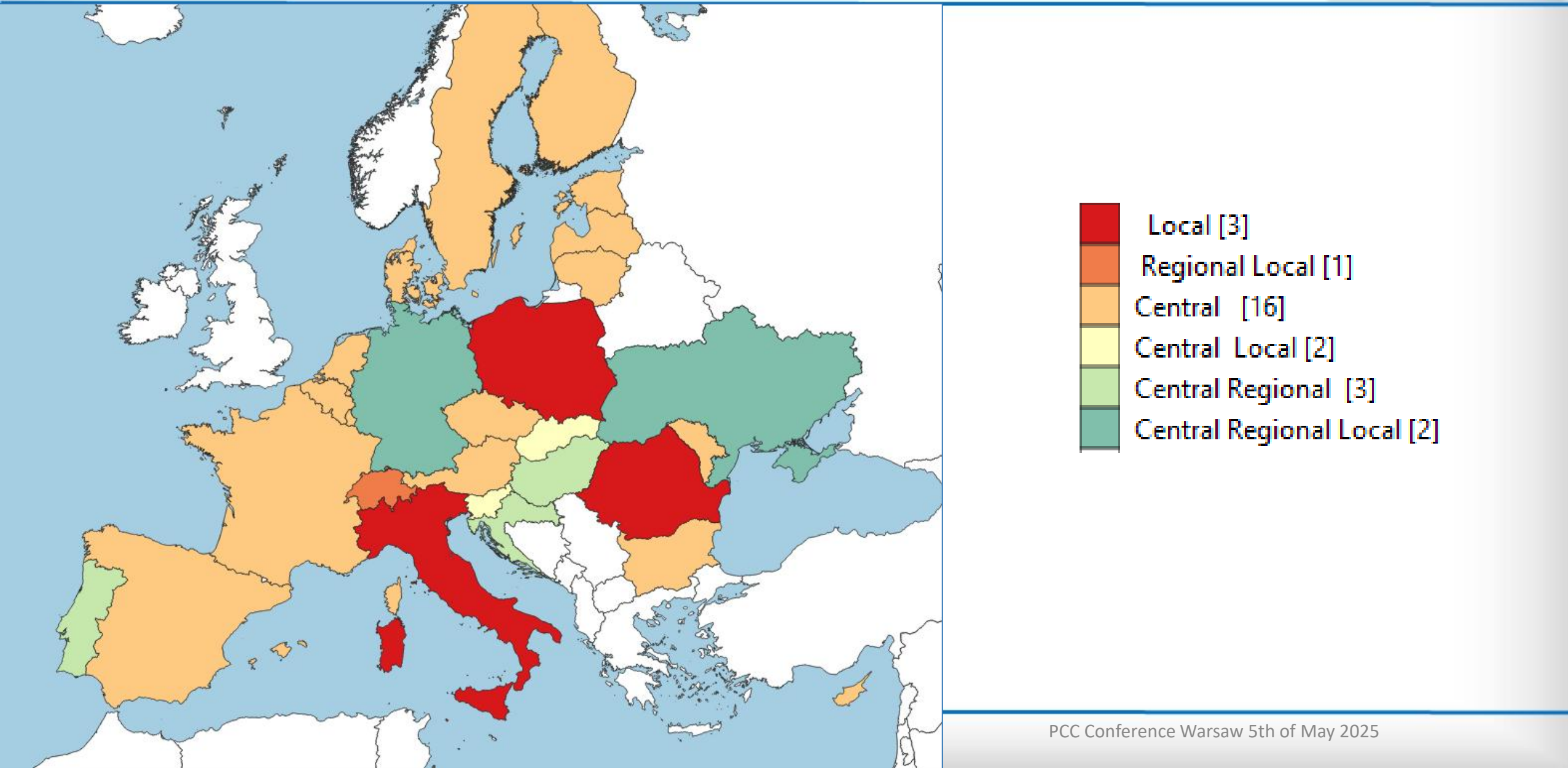


Cadastral Software

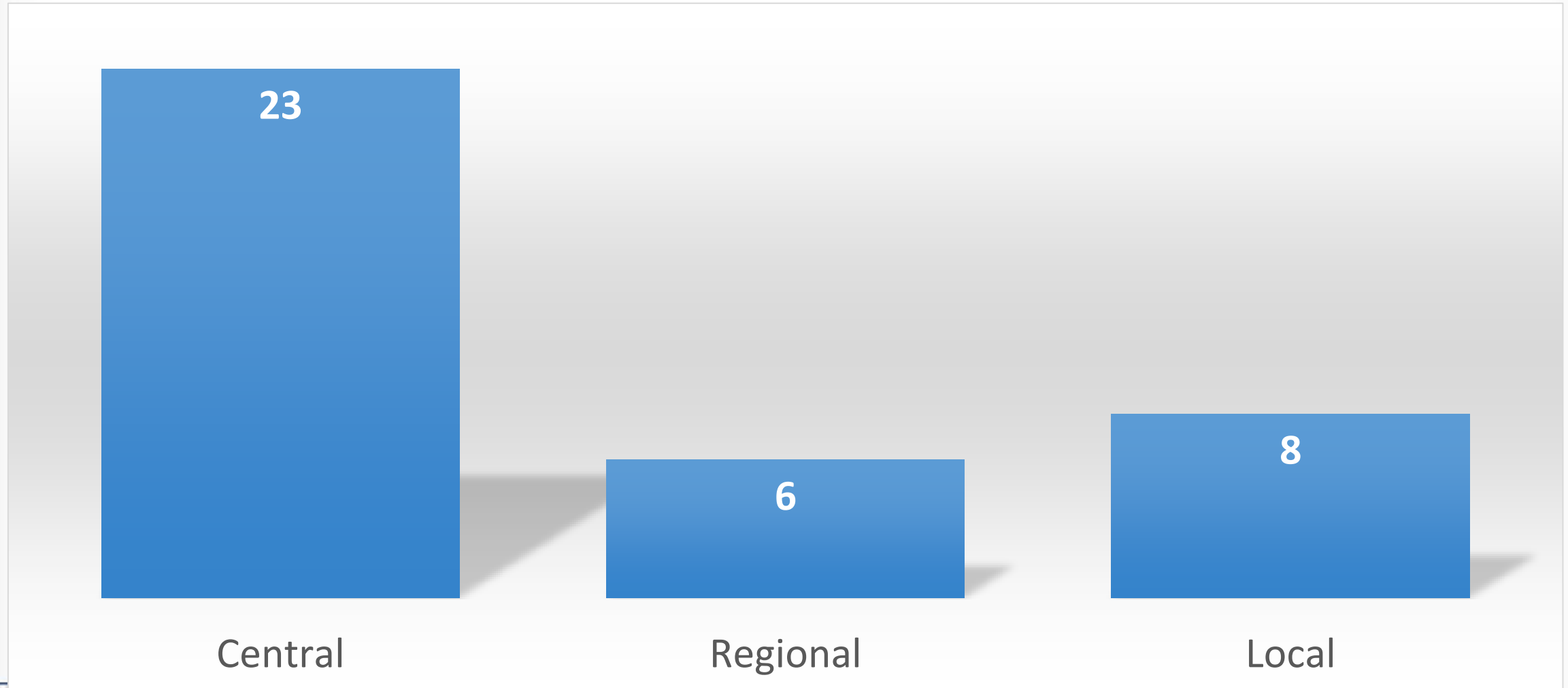
3D & 4D Cadastre

AI in Cadastre

At what level of administrative division is the cadastre maintained?



At what level of administrative division is the cadastre maintained?



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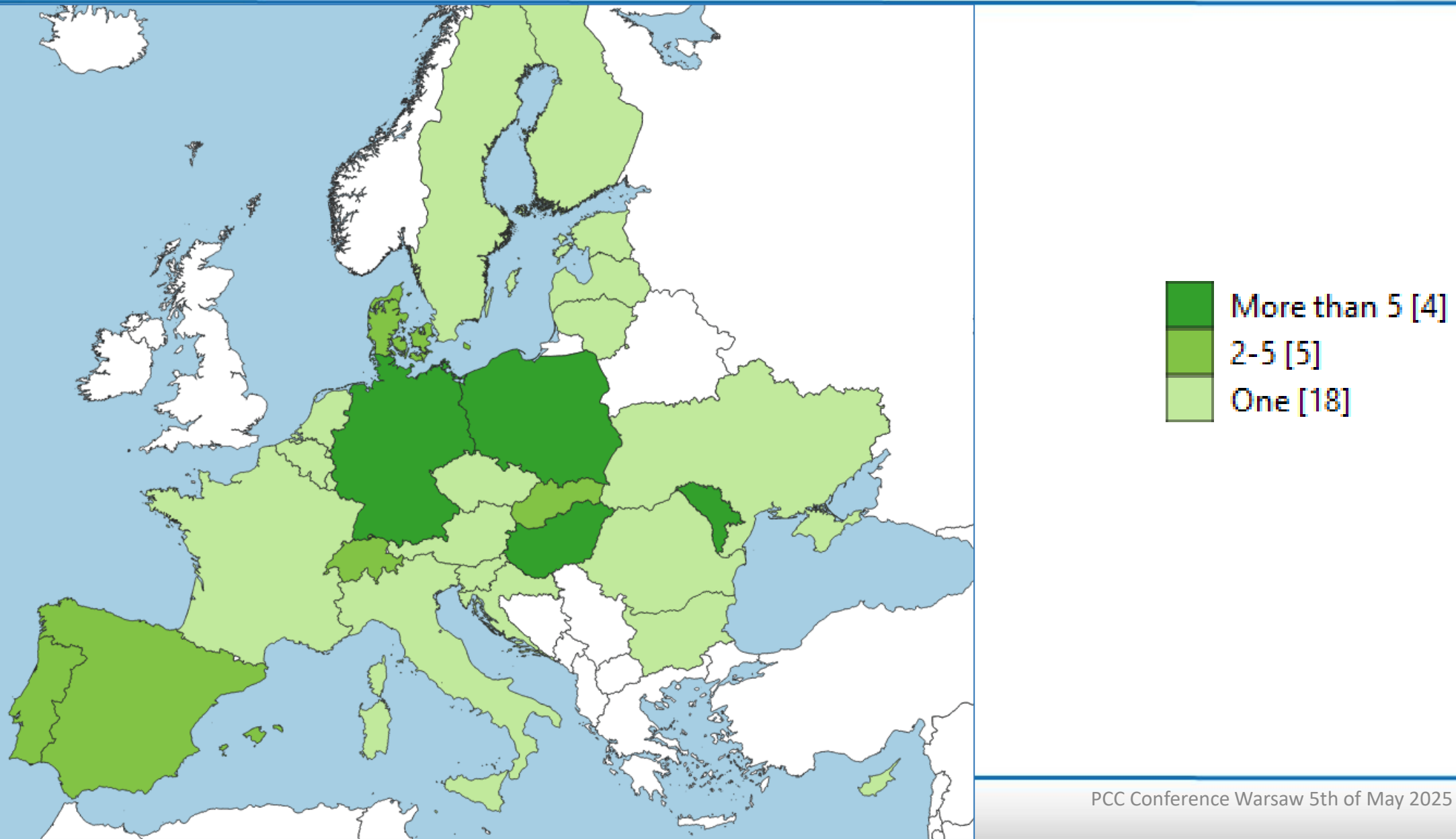
Italy: The organization of the Italian NMCA ("Agenzia delle entrate" i.e. Revenue Agency) is divided, at different levels of government, into 3 Central Divisions and 14 Central Directorates (3 of which directly reporting to the Director of the Agency), 21 Regional Directorates and 101 Provincial Offices "Territorio" (land management offices).

Germany: Cadastre lies within the legal competences of the Laender. According to the cadastral law, cadaster is maintained either on Laender, Regional or Local level. In no case it is maintained on the level of the Federal Republic of Germany.

Belgium: The federal Cadastre is the authentic source for parcels (Cadastral map) in Belgium. However, the regions (Flanders, Brussels and Wallonia) add their own layers to that map, such as the building layer. There is also the National Geographic Institute that shares and exchanges datasets with the national Cadastre and produces its own topographical maps. So the management is central, but the data is made available by different administrative levels.

Spain: The General Directorate for Cadastre of Spain depends on the Ministry of Finance which covers 95% of the national territory, although there are four other regional cadastres of a historical nature, Navarra, Guipuzcoa, Alava y Vizcaya

How many ICT systems for cadastre are maintained in your country?



How many ICT systems for cadastre are maintained in your country?



Romania: One system

- The system in use is named eTerra and is administered by ANCPI.
- eTerra is a unified information system for cadastral records and land registers, used in all counties and administrative-territorial units in Romania. Thus, Romania has a single main cadastre system.

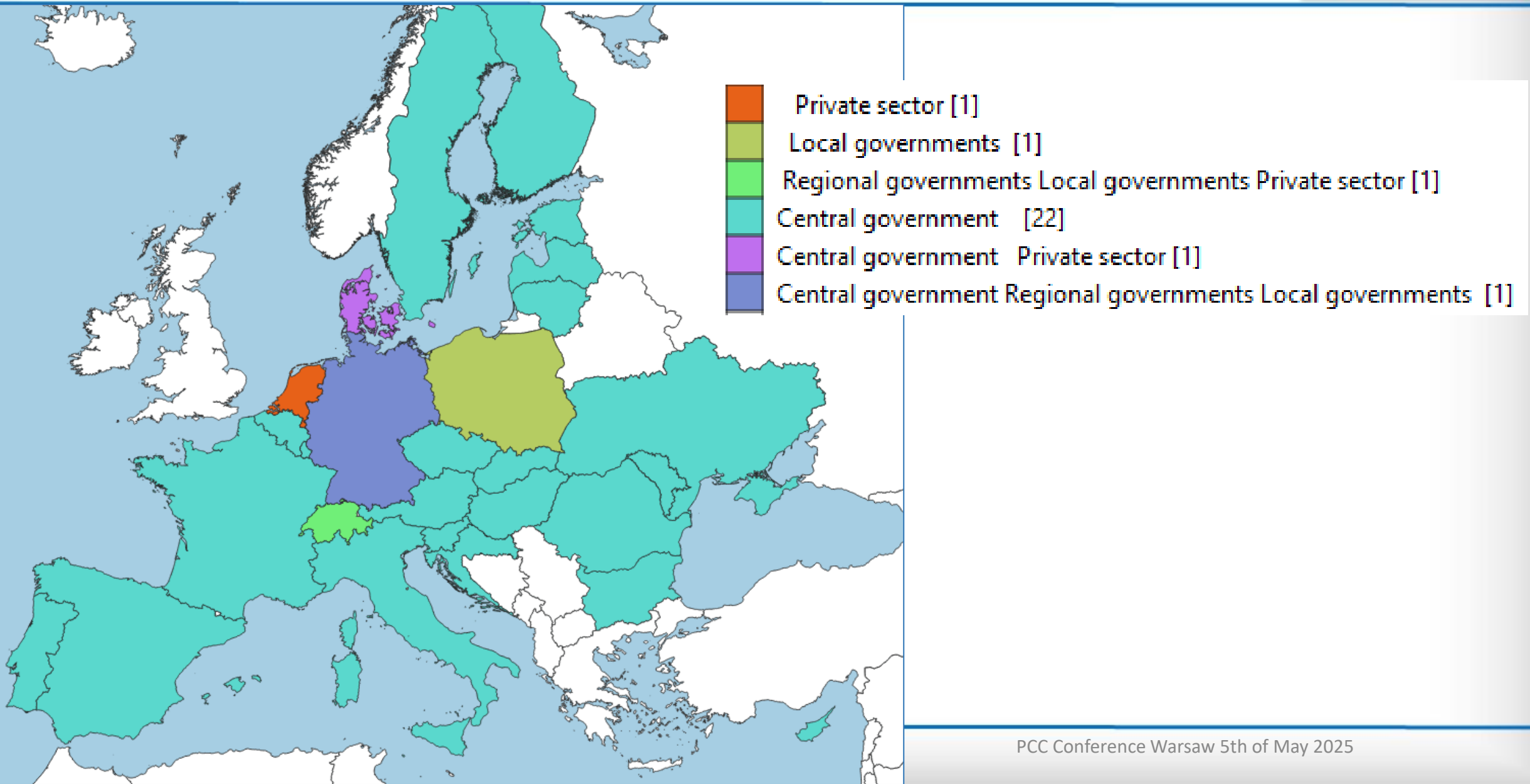
Denmark: here are a few key ICT systems in use, primary “MiniMAKS” (the cadastral register) and the ERPO (associated digital systems used by surveyors and municipalities), but all are managed or coordinated centrally.

Germany: Due to the federal structure of Germany with the competence for cadaster assigned to the Laender, there are basically 16 different implementations. It is the AdV's role to set German-wide standards for the cadaster. According to these standards, all cadastral systems have to follow the AAA-model of the AdV

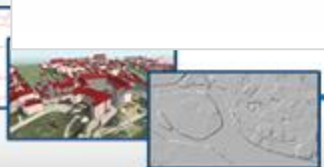
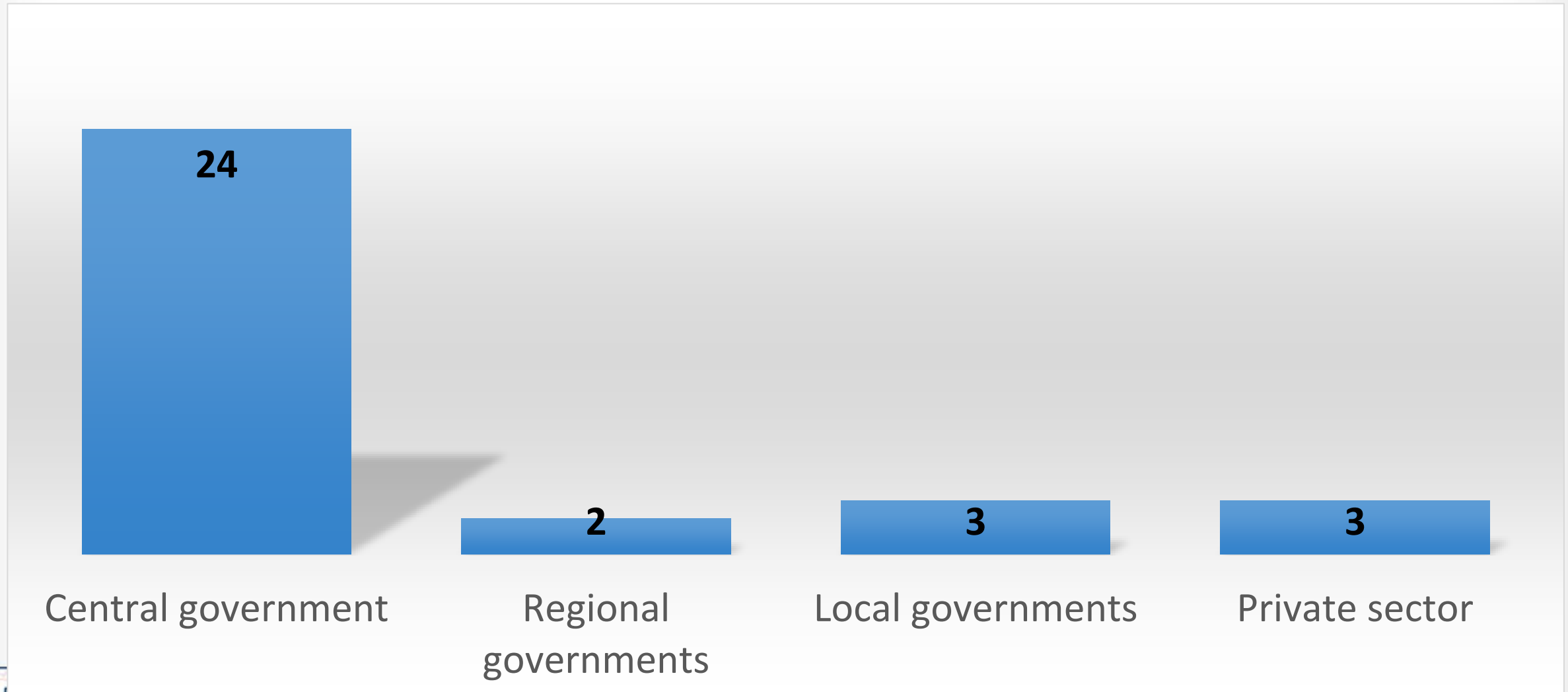
Portugal:

- One : Mainland Portugal
- 2-5 : Regional governments in Azores and Madeira have their own systems

Who funds the maintenance and development of the System(s)?



Who funds the maintenance and development of the System(s)?



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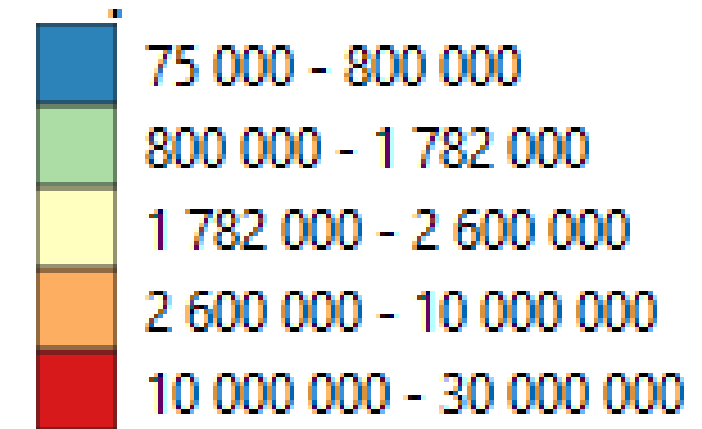
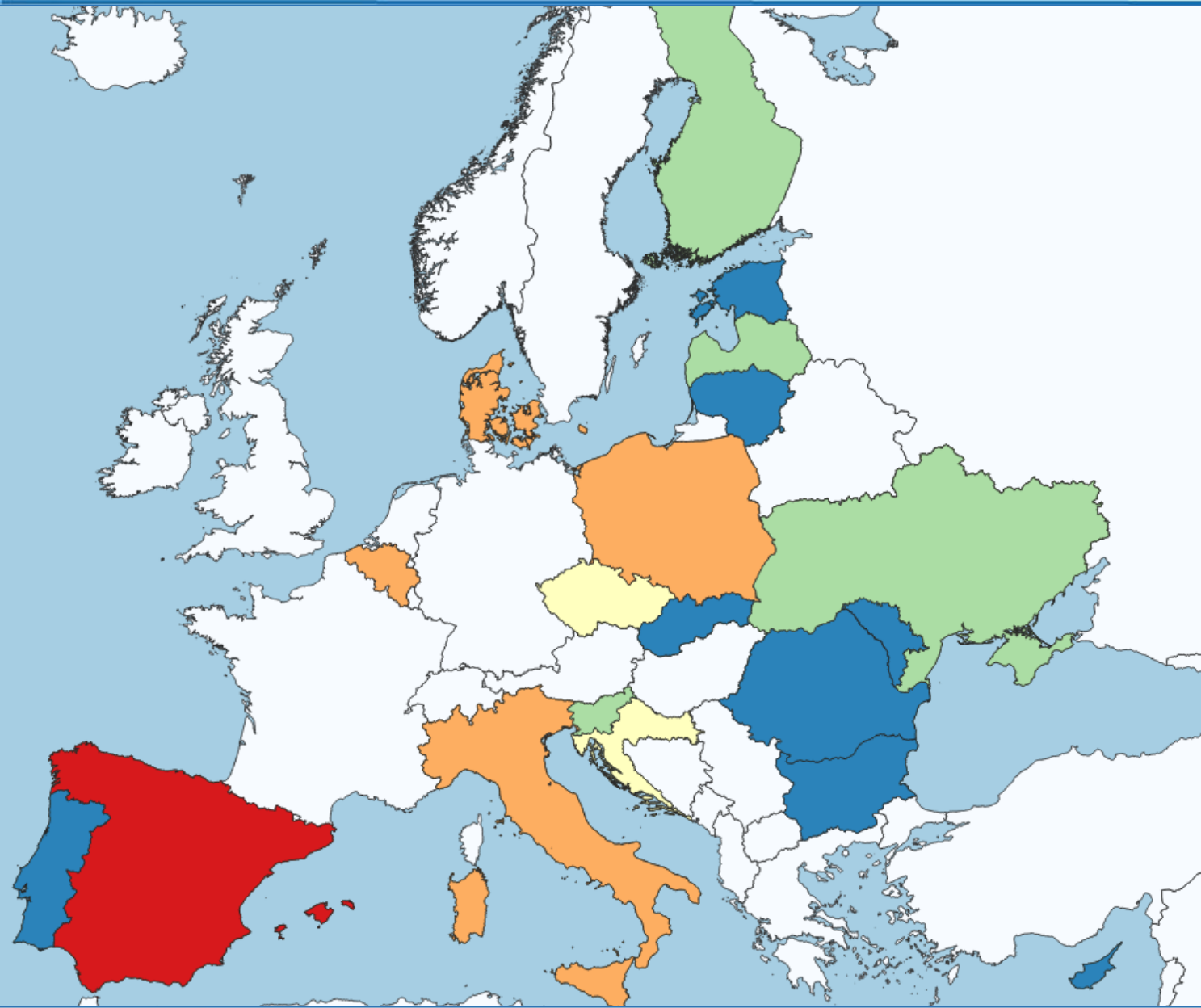
Netherlands: Our cadastre operates on a fee based model in a way that over the years we operate on a cost-recovery business model (including renewal)

Poland: Maintenance of ITC systems is funded directly by local governments. However, the tasks related to the maintenance of the cadastral system are state tasks delegated to the counties. Therefore, counties get funding from the state budget for cadastre maintenance.

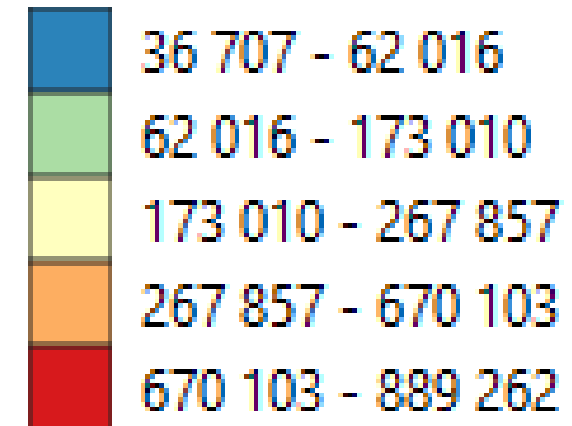
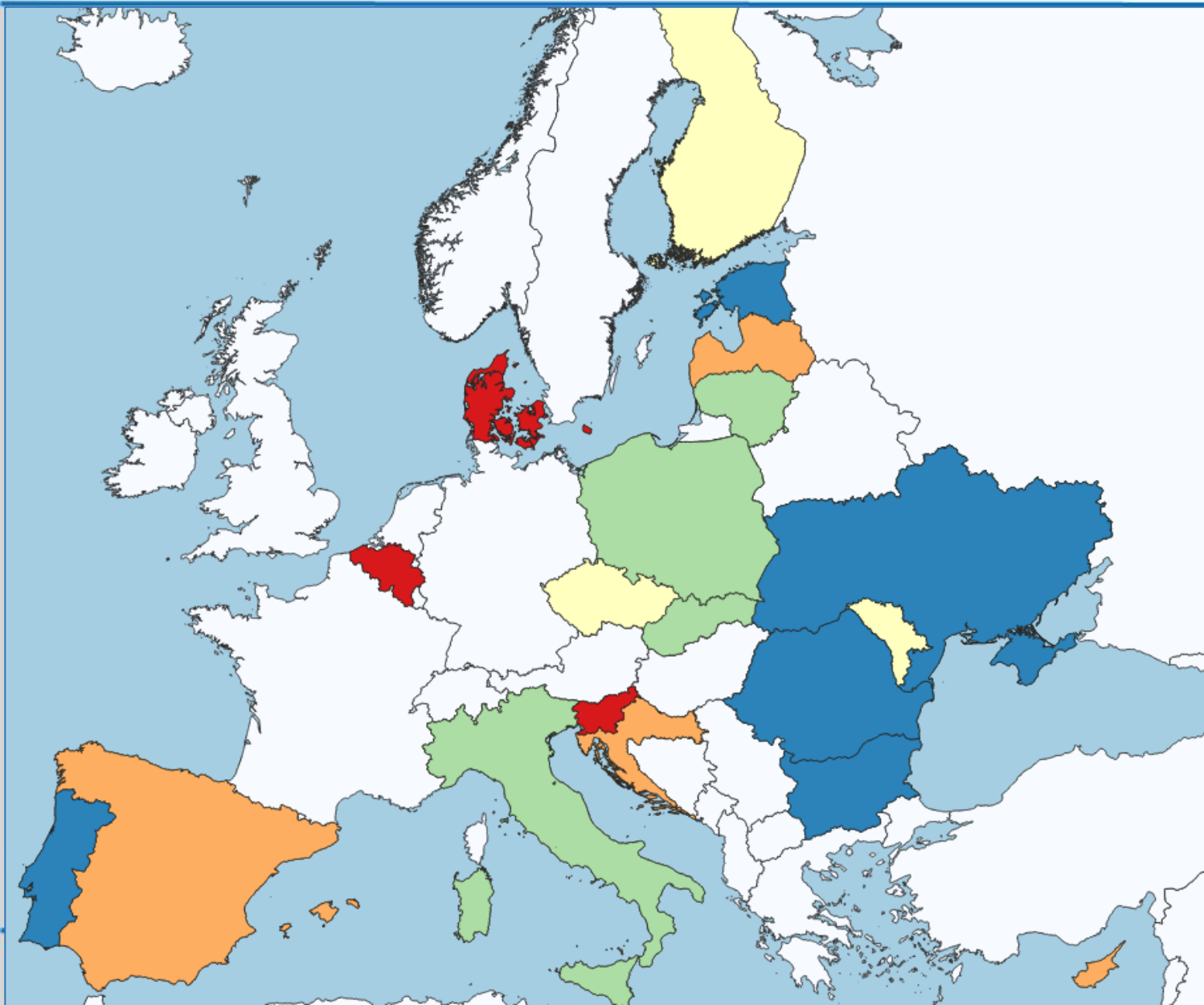
Moldova: The information systems are currently maintained through funding from the state budget, as well as from the revenues of the Public Institution “Real Estate Cadastre” (IP CBI), a self-managed entity whose budget is supplemented by the fees collected for the cadastral services it provides. (..) With the support of the European Union, we aim to develop a new, unified cadastral system that will integrate the existing platforms into a single solution (..).

Switzerland: Each user pays for the system he uses himself.

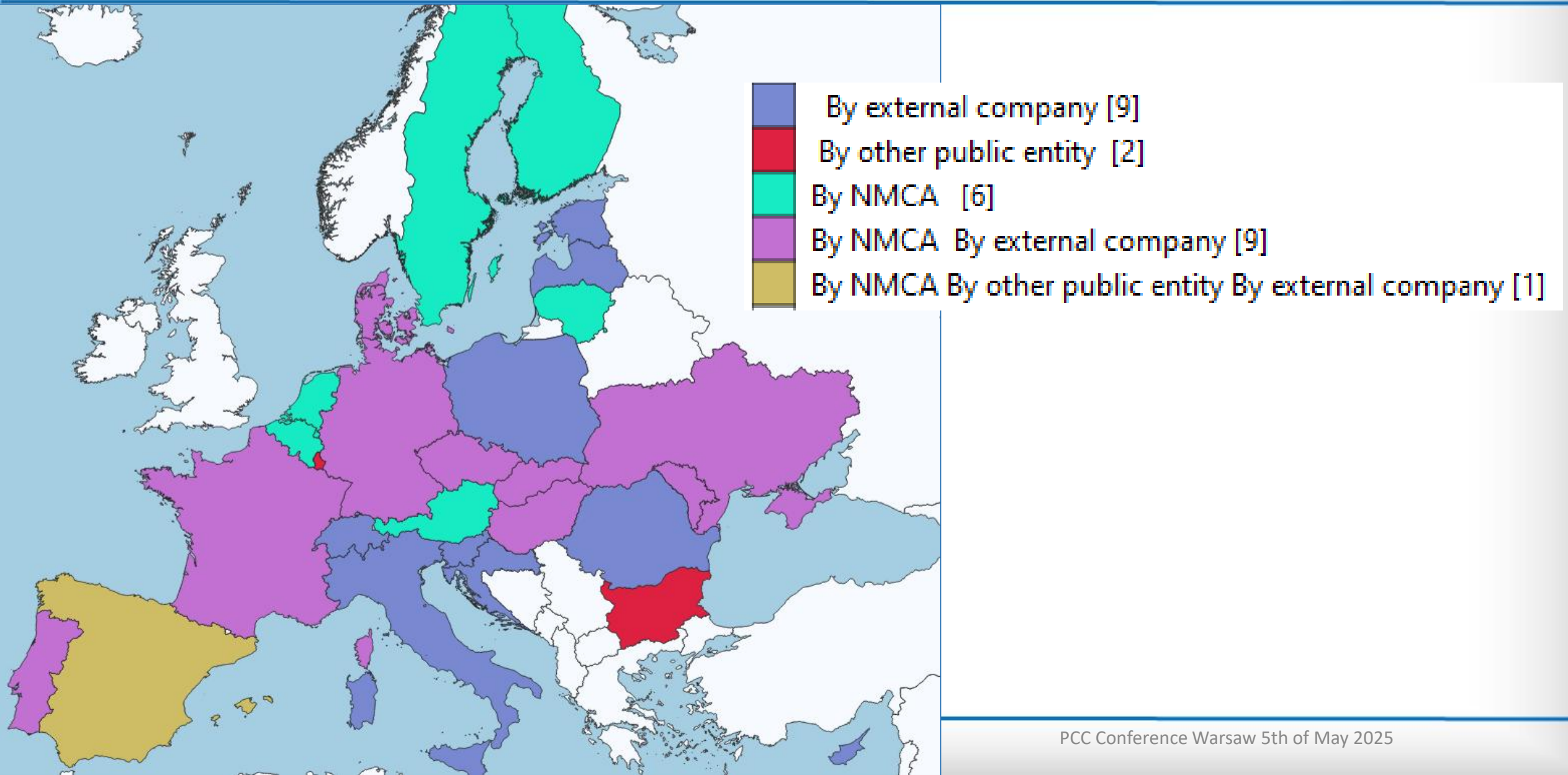
What are the approximate annual maintenance and development costs of the System(s) in Euro?



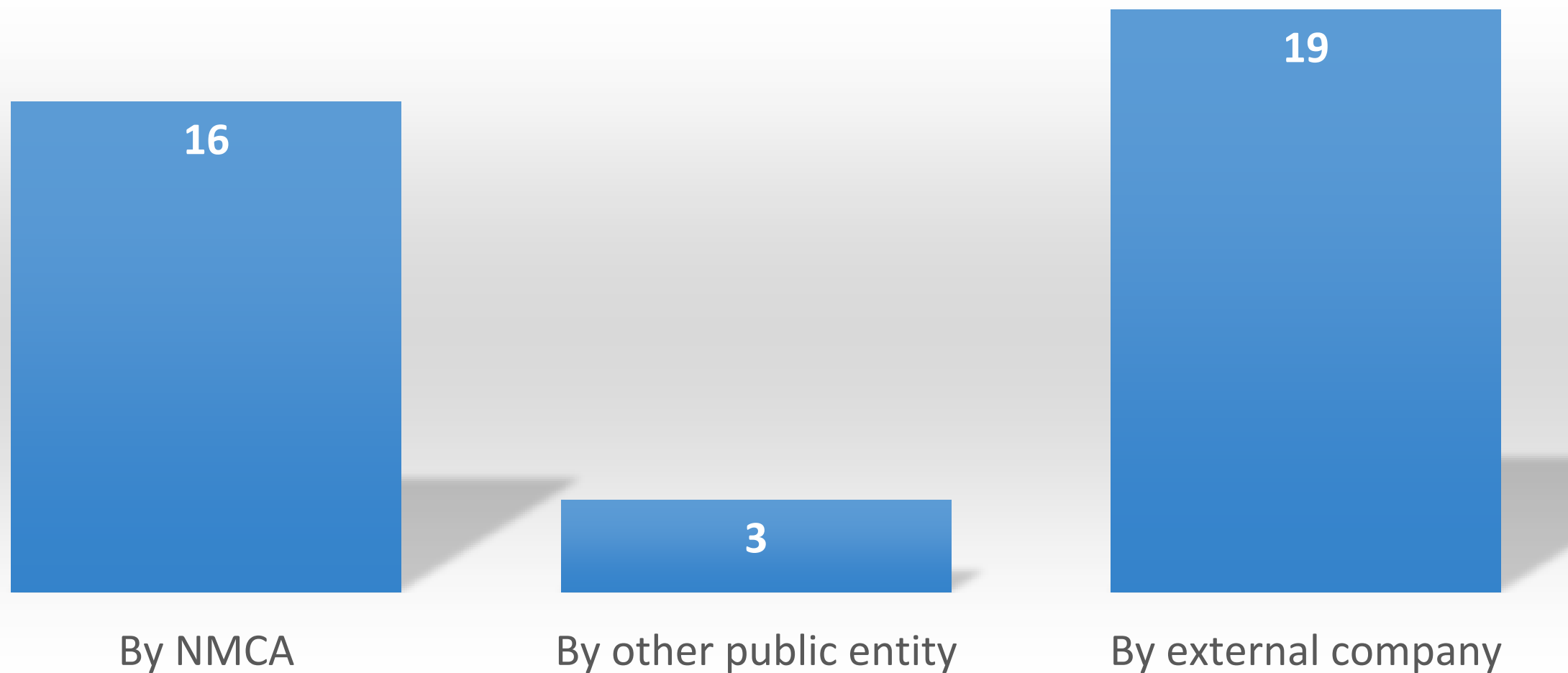
What are the approximate annual maintenance and development costs of the System(s) in Euro per 1 milion citizens?



Is the System(s) developed directly by NMCA or is the task of development and maintenance outsourced to an outside company?



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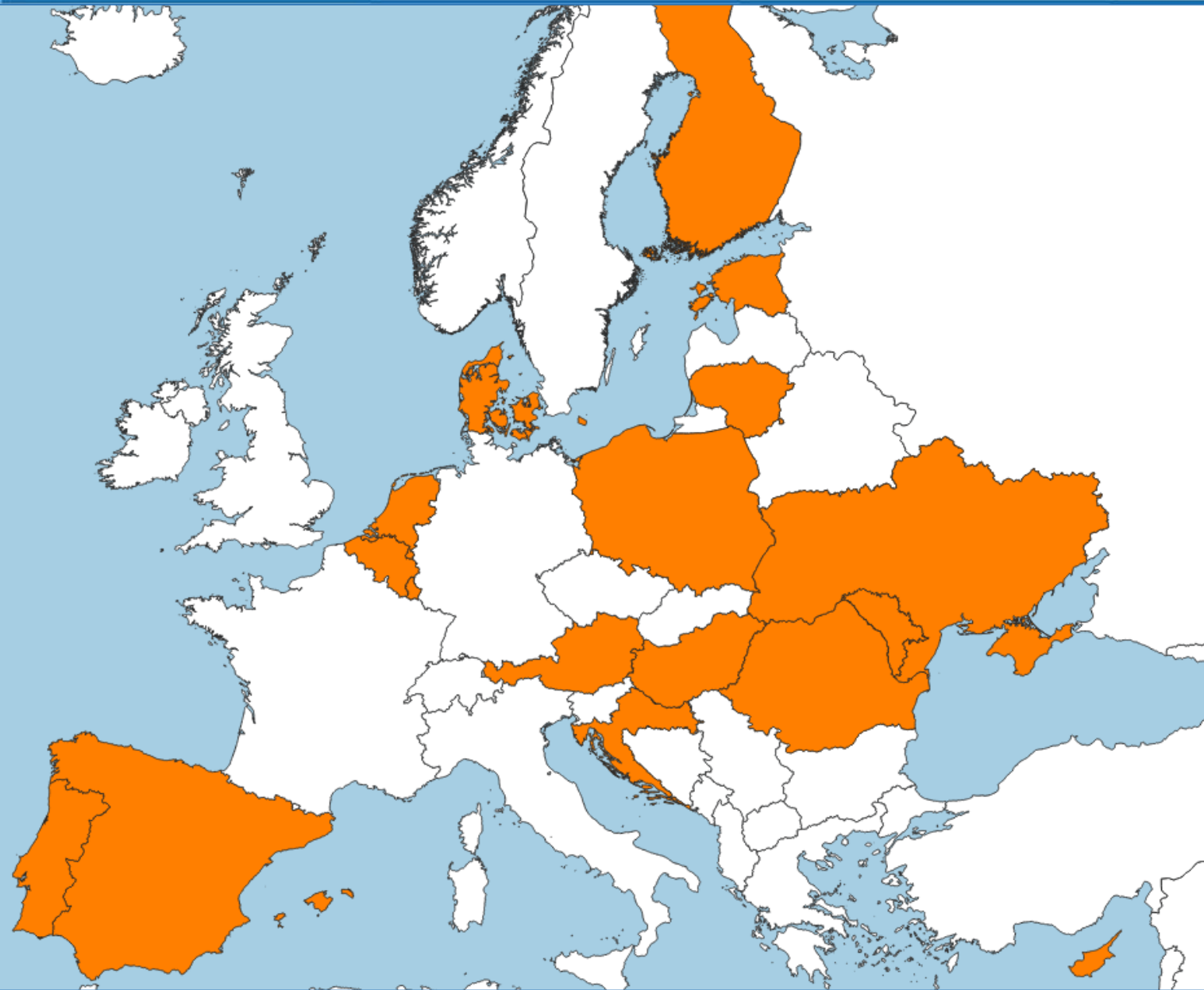
Czechia: By NMCA and by external company
Some components are outsourced based on public tenders

Ukraine: By NMCA and by external company
The holder of the State Land Cadastre is the State Service of Ukraine for Geodesy, Cartography and Cadastre. The Administrator of the State Land Cadastre is the State Enterprise "State Land Cadastre Centre", which is subject to the State Service of Ukraine for Geodesy, Cartography and Cadastre.

Switzerland: By external company
Each software producer develops its own system. When changing the data model, we organize sessions with all the software producers to explain the changes and discuss any implementation problems with them.

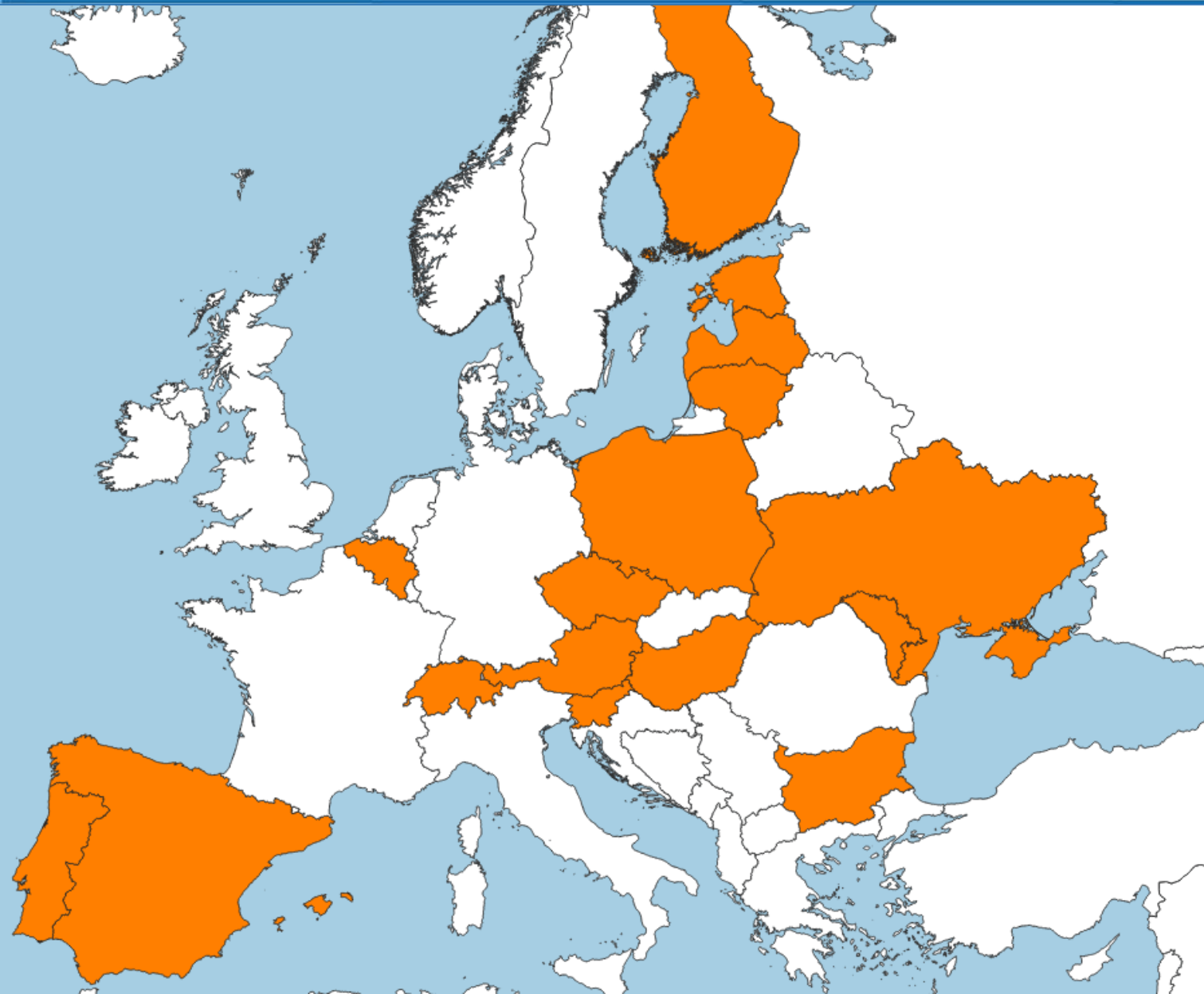
Luxembourg: By other public entity
Centre des Technologies de l'Information de l'Etat

What are the biggest challenges/problems in maintaining and developing the System(s)?



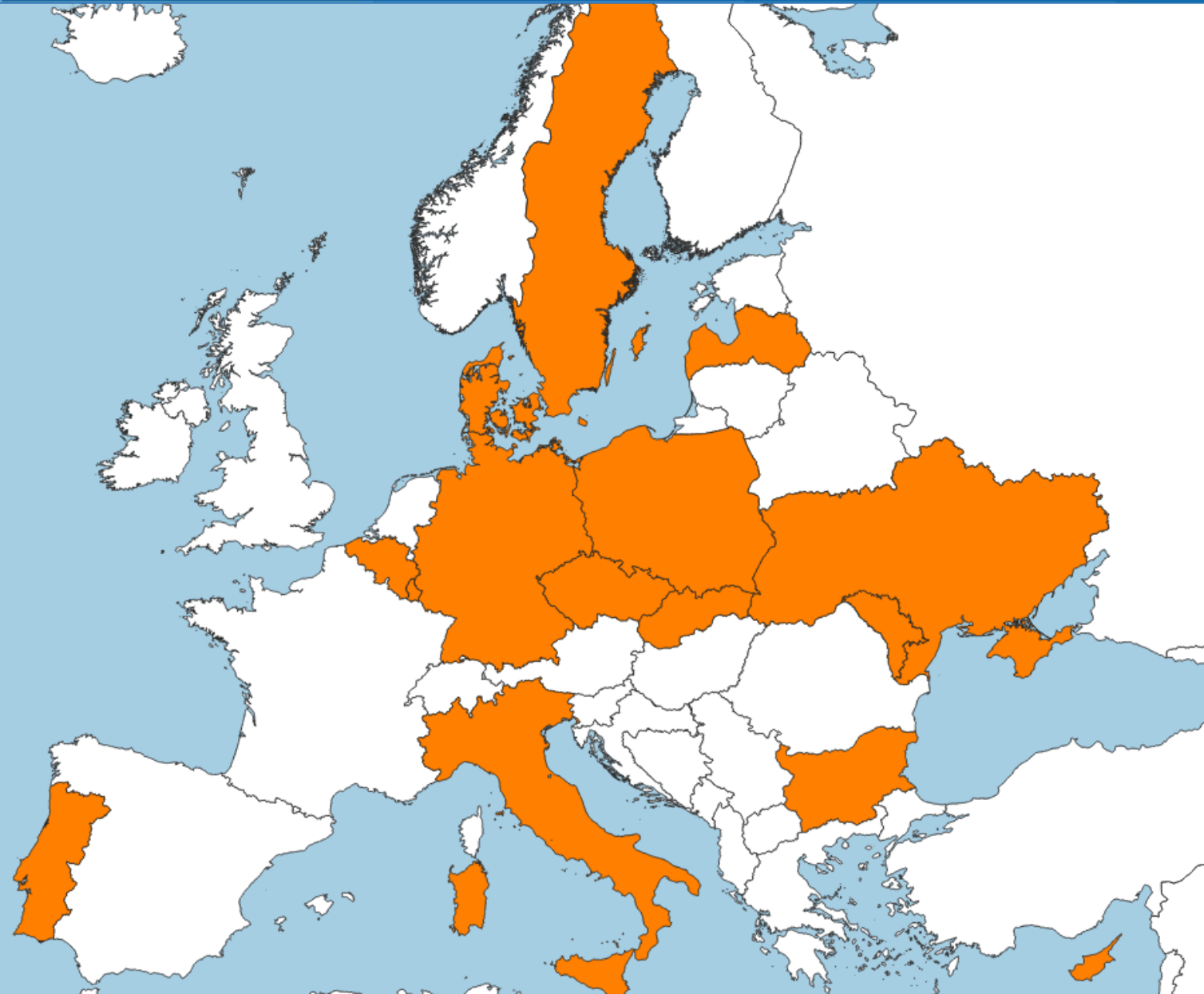
Understaffing

What are the biggest challenges/problems in maintaining and developing the System(s)?



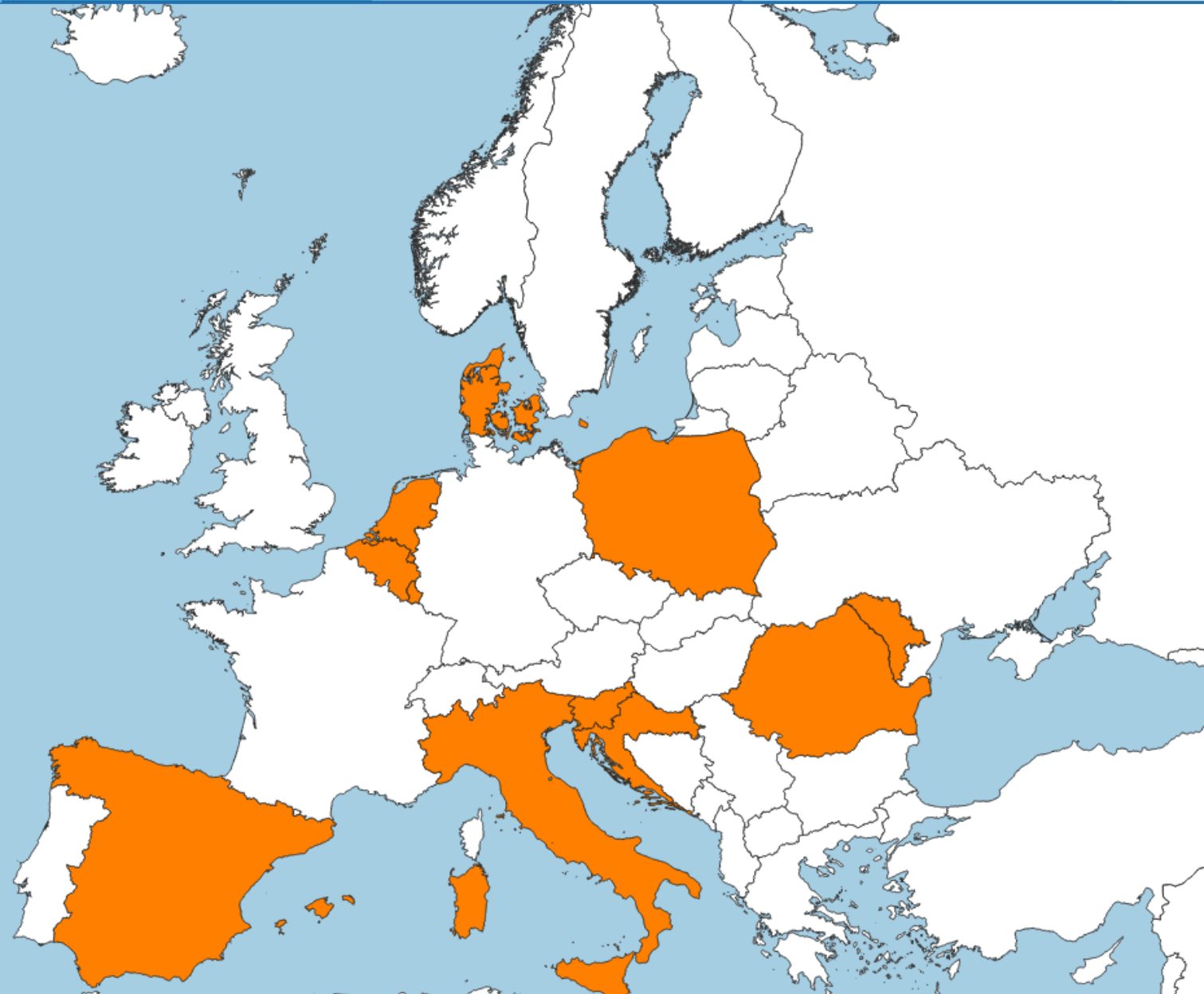
Underfunding

What are the biggest challenges/problems in maintaining and developing the System(s)?



Rapid progress of
technology

What are the biggest challenges/problems in maintaining and developing the System(s)?



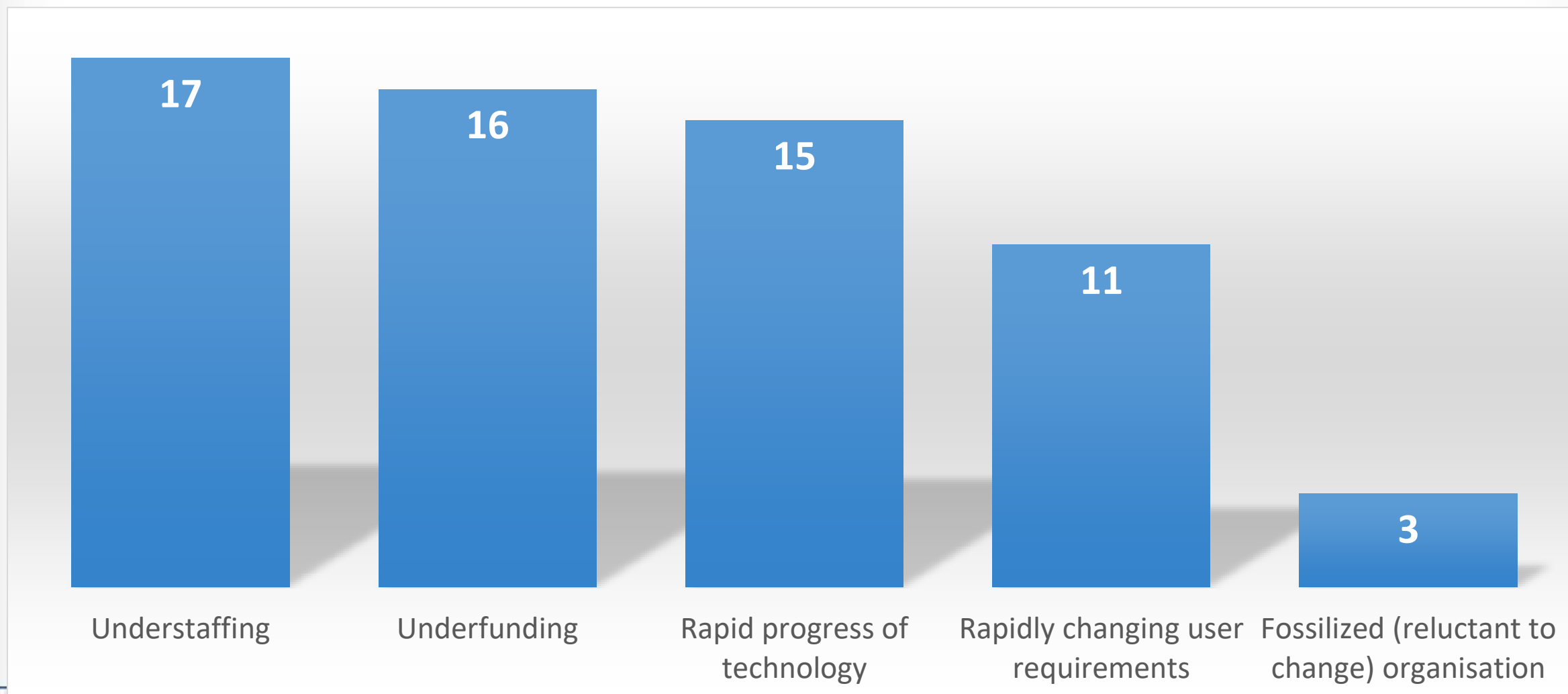
Rapidly changing
user requirements

What are the biggest challenges/problems in maintaining and developing the System(s)?

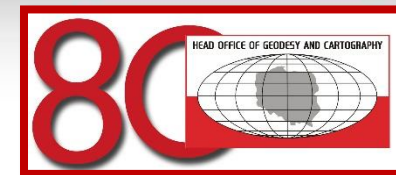


Fossilized (reluctant
to change)
organisation

What are the biggest challenges/problems in maintaining and developing the System(s)?



What are the biggest challenges/problems in maintaining and developing the System(s)?



France	Our largest obstacle is the obsolescence of our current System (PCI-Vecteur), which prevent us from meeting some specific users' needs.
Denmark	Maintaining up-to-date systems and meeting stakeholder demands for digital services are key challenges.
Belgium	One of the additional difficulties in Belgium is a divided responsibility between the federal Cadastre and the regions and an outdated valuation system.
Latvia	Discussions with developers
Netherlands	1. It is not that we are understaffed, but having sufficient knowledgeable and skilled personnel is a challenge. 2. What we experience is an increasing demand for (information) secure systems, access protocols and connecting various data sources. 3. As far as technology is concerned we rather see this as an opportunity than a challenge.
Sweden	Increasing requirements eg. in the area of security, cyber security and crime prevention.
Switzerland	The Swiss market is a very small market and software producers are sometimes reluctant to make changes for so few customers.
Poland	Dispersed cadastral databases.

Is there a 3D (2D + height) cadastre implemented?



Examples of 3D cadastre utilisation or plans for utilisation.

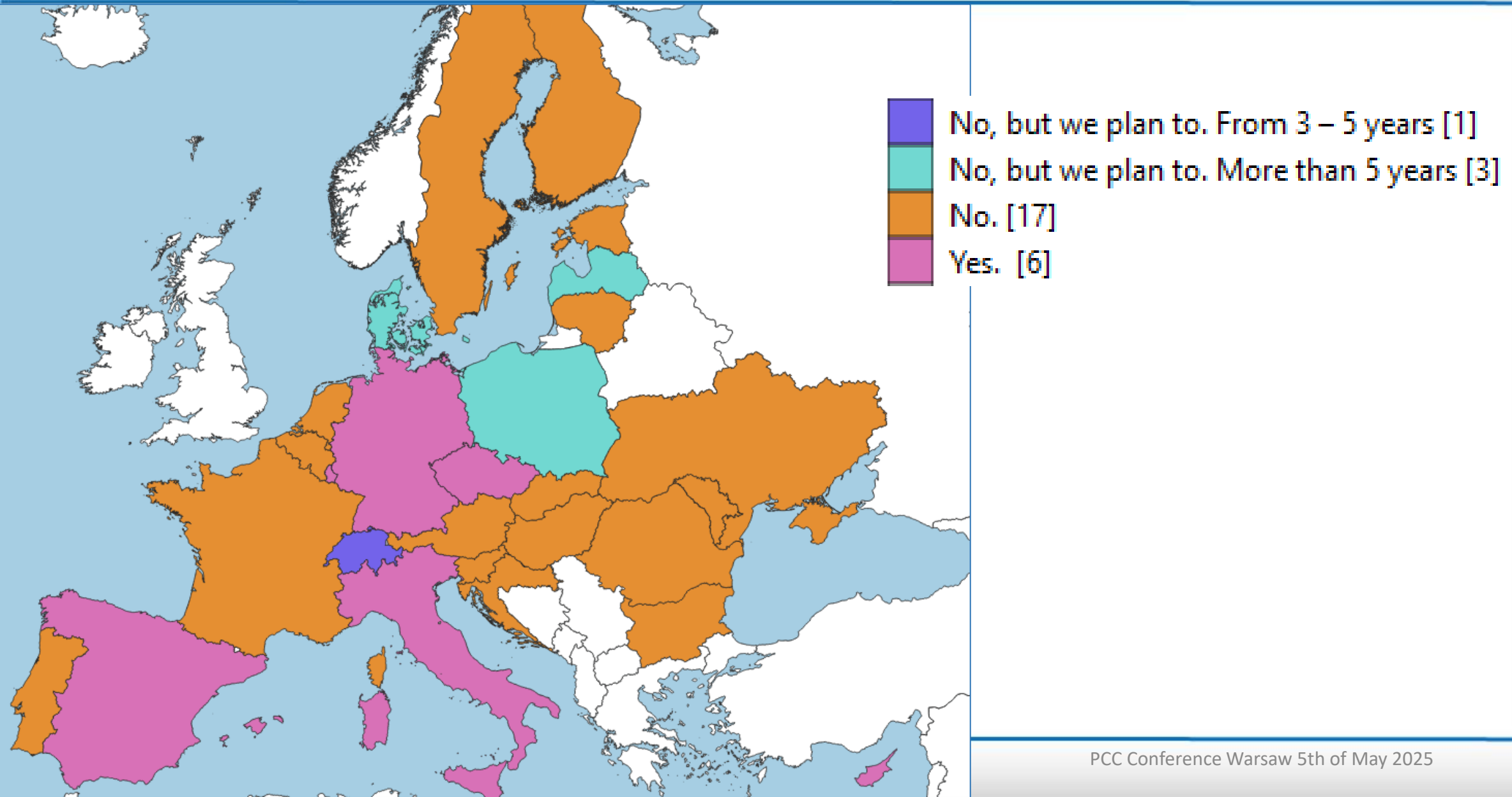
Spain: Buildings with its different volumes (parts with different heights). There are also blueprints by floor with delimitation of apartments (no information about internal distribution of the apartment), commercial premises, storerooms, common areas, etc. that helps to create the 3D model of the building. The reason is to have individualised the different properties that can exist within a building.

Cyprus: DLS is planning to collect the height for buildings in order the geoinformation of the buildings to be completed. Also, this information would be helpful for the Cartography Section

Netherlands: We start with apartment rights, where we plan to register spatial rights derived from BIM-models

Switzerland: the buildings in order to be able to document the properties per floor in 3D

Is there a 4D (2D + time or 3D + time) cadastre implemented?



Examples of 4D cadastre utilisation or plans for utilisation.

Denmark: The GDA wants to be able to show the cadastral map that was in force at any time - after 1999 when the cadastral map became digital. At present it is only possible to see the cadastral map from 2018 onwards.

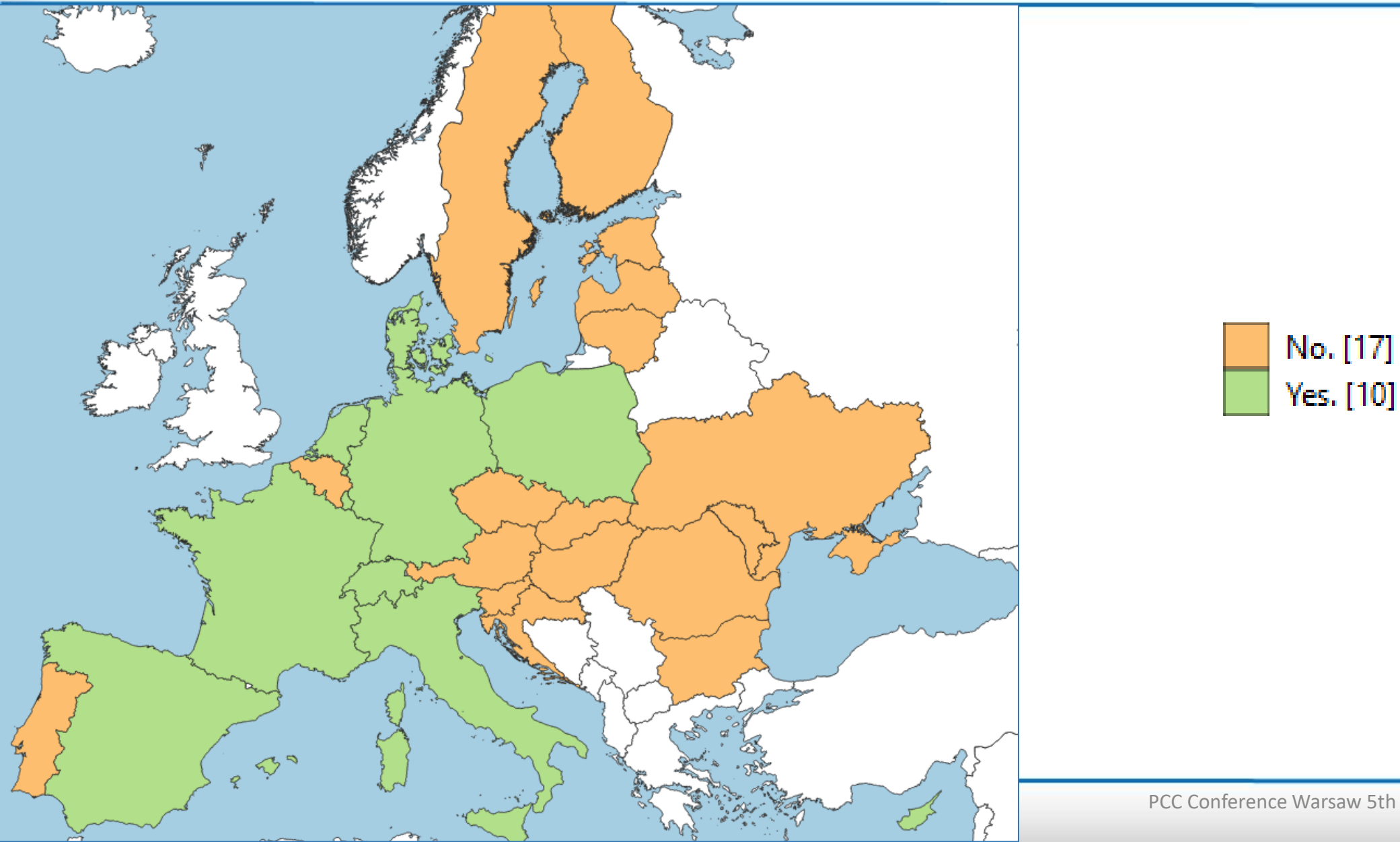
Cyprus: The new GIS has implemented based on the ESRI's Parcel Fabric. This means that:

- I. Parcels (digitized)
- II. Buildings (digitized)
- III. Leases (digitized)
- IV. Easements (digitized)
- V. Administrative Units are being aligned with every spatiotemporal update of neighboured parcels.

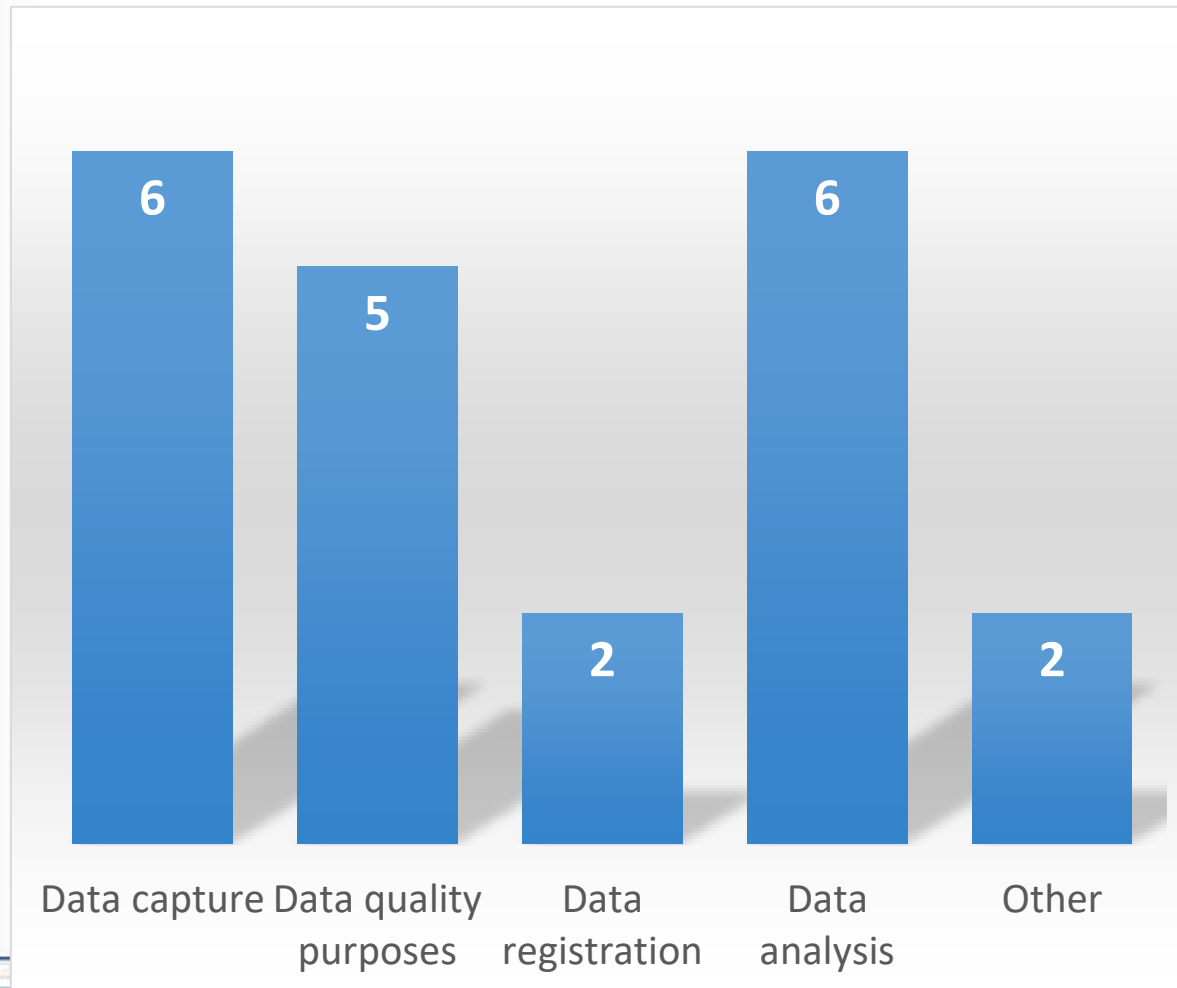
Czechia: Since 2001 all cadastral information (boundaries, mode of use, type of land, ownership relations) has a time dimension in the form of the time stamp and so the history of changes can be depicted back to 2001

Germany: Cadastral information includes a time stamp indicating the time of its validity. But this is currently not used in practice for visualisation of changes over time

Are you using AI in cadastre?



For what purpose you use AI?



Italy: Other. identification of not declared properties.

Sweden: Other. Lantmäteriet has a chatbot for questions.

Examples of AI utilisation.

Poland:

- Parsing of notarial deeds.
- Raster to vector data transformation e.g. labels recognition.
- Classification of objects on aerial and satellite imagery including detection of buildings and detection of land use changes.
- Anonymisation of cadastral data or other related documents as a result of the GDPR.
- Implementation of chatbots supporting cadastral data users.
- Intelligent labels placement on maps.

Germany: AI is used
i.e. for change
detection concerning
building and land use.
It gives hints for
changes.

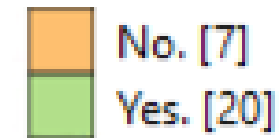
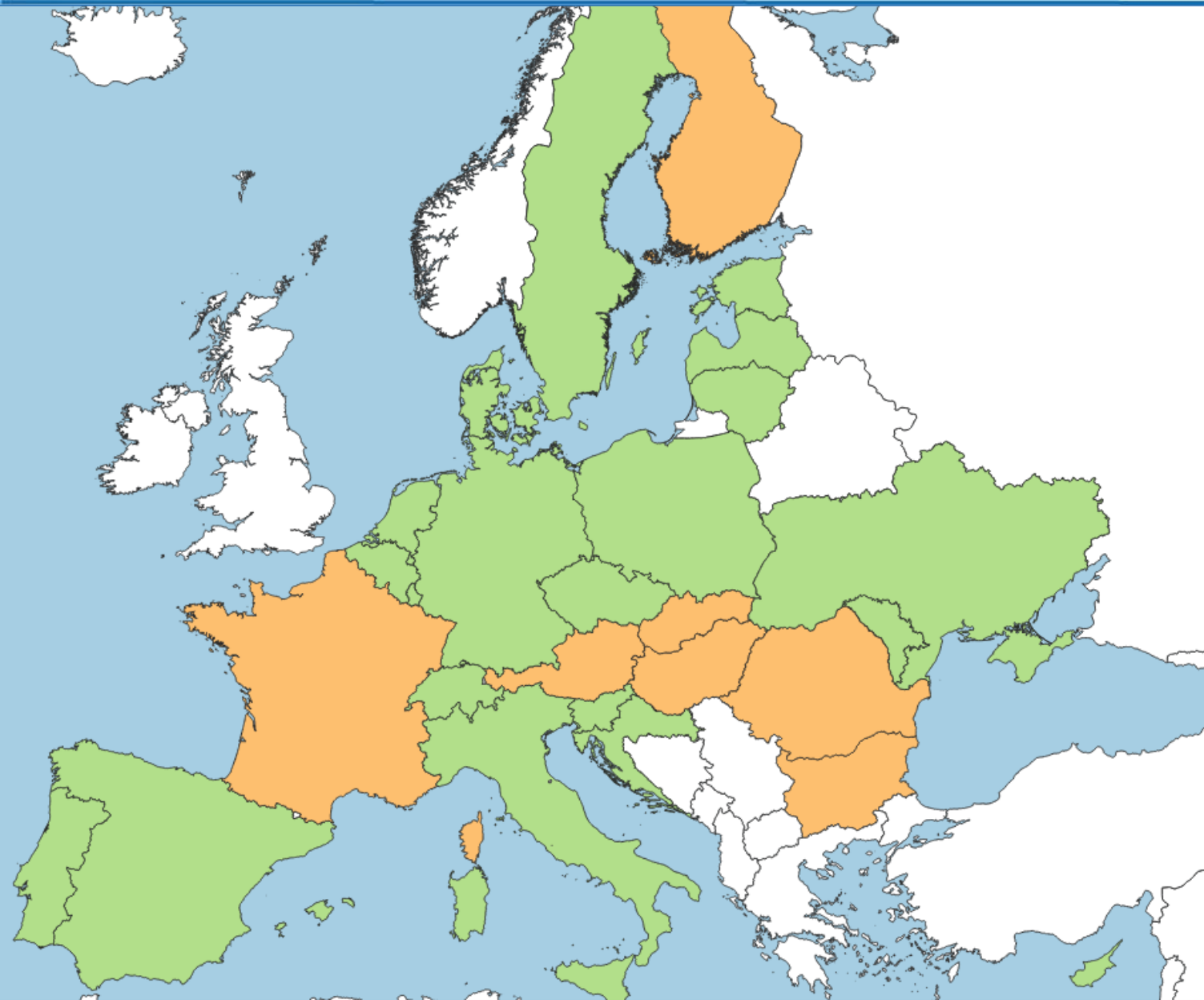
Spain:

1. We are renewing our cadastral map by using the original (measurement) information from the original field sheets. Reading and structuring the information from field sheets is based on AI-technology.
2. We are in the process in extracting legal information from the Land Register (e.g. easement) in automatically updating our cadastral registration.
3. We are quite advanced in using AI for object recognition, but this is focussed on our topographic mapping.

Luxembourg: AI for detecting new
buildings on cadastral parcels and
AI for OCR



Are you planning to implement and/or upgrade AI in your cadastral system in the future?



Examples of planned AI utilisation.

Cyprus: The Department of Lands and Surveys (DLS) is already using AI during Data Capture and Data Analysis for buildings, via aerial imagery. Also, DLS is planning to implement AI chatbot in the Department's Portal.

Italy: The results of the ongoing tests will lead to possible choices regarding the use of artificial intelligence to periodically support the identification activities regarding the real estate that, although existing, is not declared to the Cadastre.

Portugal:

1. In automatic recognition of submitted documents to support maintenance operations
2. Help in answer to citizens questions about procedures according to law, related to cadastre execution and cadastre maintenance operations

Belgium: Mathematical valuation of properties, identification of cadastral data on the map or in notarial deeds, support to users.

Thank you for your attention
mapy.geoportal.gov.pl

Marcin Grudzień

