ICT TCO Calculation Methodology

for public administration services

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Appendix n. 1 User's Guide

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1. eGC Cloud Calculator User's Guide

1.1 eGC Cloud Calculator and its purpose

The eGC calculator is a tool for calculating and comparing the costs of various solutions (on- premises, cloud, hybrid solutions) of the information system. The calculator can be used especially in the following cases:

- for calculating the total costs of the information system (IS) for a certain period,
- as an attachment to the application for the implementation of the ICT project of the public administration information system sent to the Department of the Chief Architect of the eGovernment,
- when comparing the costs of different variants of IS solutions (on- premises, cloud, hybrid solutions),
- when modelling the economic benefit of different cloud scenarios of IS solutions,
- when comparing the costs of IS implementation and operation at different security levels of a given IS (for example, it is possible to find out how much the costs of the IS will rise if it is reassigned from the "high" security level to the "critical" security level),
- in the detailed analysis of the influence of individual cost items on IS costs,
- when comparing different offerings for the implementation and operation of IS during the tender process.

The eGC calculator is a unified tool for calculating the total cost of ownership (TCO) of an IS, savings or loses during operation of the service in an on- premises, cloud, or hybrid solution model. The following assumptions were taken into account during its creation:

- The calculation assumes a 1-to-5-year TCO period,
- The comparison is between the "on- premises" and "cloud" models. On-premises can be understood as a service, that is "assembled "from purchased components and put into operation through system integration. The cloud can provide analogously the same service as a finished and ready-to-use service, or it is possible to calculate some additional items for the cloud, which are not supplied by the cloud provider (e.g. project management, etc.),
- Cloud service is understood as an IaaS, PaaS, or SaaS variant, referred to as XaaS,
- The calculator can also be used to calculate the TCO of a hybrid solution combining a service in the cloud with an on-premises solution.

he eGC calculator consists of 6 sheets in MS Excel:

- 1. Initial parameters
- 2. Input Data On-Premises
- 3. Input Data for Cloud
- 4. TCO Calculation and Comparison
- 5. TCO Summary
- 6. Glossary

1.2 Principles and Rules

Input values can to the eGC calculator can be entered with, or without VAT. The user chooses the data entry form, which must follow consistently when entering all data. Therefore, if he chooses "in EURO including VAT" in sheet **1-Initial parameters**, all entered data must be completed including VAT. (It is not possible to list the same dates with VAT and some dates without VAT).

Data is entered only into green fields intended for editing. Grey fields are calculated and predefined. In the white fields in the" Comment" column, the user can add all relevant text to the entered values. The user fills in only fields that are relevant to his specific case. The other fields are not filled in(so they are not mandatory).

It is important to add all the costs of the considered solution and to choose the most suitable category for each cost. If the user is not sure, where to enter the load correctly, he selects the item" Other" with a detailed comment.

Example: If it is not known, what type of SW it is, the user only fills in the item "Other software "from the SW category and provides a detailed specification of the given SW in the comment.

When entering the values into the eGC calculator, the user specifies the items and their values related to the calculated project.

Example: If already invested HW / SW resources are shared, the user indicates the proportional part that will be used by the calculated project.

The user of the eGC calculator enters data only in the first three sheets, i.e. Initial parameters common to both on- premises and cloud variants (e.g. project duration, evaluation of human resources- more in chapter 2.1, inputs for the on- premises variant (e.g. price for HW, SW, deployment of ICT services- more in chapter 2.3. and inputs for the cloud variant (fee for the XaaS service- more in chapter 2.4).

Sheet 4. **TCO Calculation and Comparison** is automatically linked to the inputs and calculates the final value of the on- premises variant and the cloud variant displays their comparison. Or the TCO result of the for the selected solution is displayed (for example, only for on- premises or hybrid solutions).

For the reason of a clearer comparison of on- premises and cloud variants in eGC time, the calculator spreads all costs for each year for the duration of the project (i.e. also costs incurred at the beginning as a one- off, e.g. purchase of SW licenses). This procedure can be changed by checking the "YES" box in Sheet 1. **Initial parameters "Show as one - time expense in the first year".** In this case, the load will not be distributed, but will remain displayed as a whole in the first year of the project's duration. This option applies to cost categories A, B, C and Z. The total value of the costs will be preserved in both cases, it is only a matter of displaying costs in individual years of IS operation. This parameter is uniformly linked to the on- premises and cloud solutions.

At the same time, for cost categories F, G and I, it is possible to display costs in the last year of the project or they can be displayed for the entire length of the project. This can be specified by checking the **YES** box in the sheet 1. **Initial parameters "Show as one- time expense** in the **last year".** In this case, the cost will not be distributed, but will remain displayed as a whole in the last year of the project duration. The total value will be preserved in both cases, it is only a display option. This parameter is uniformly linked to the on- premises and cloud solutions. Cost items that apply to the acquisition of property and the service related to this property- in the case of IS, primarily HW / SW license and subsequent annual or multi-year maintenance, are listed separately in this calculator. This means that

the user will state the cost only for the acquisition of HW/ SW licenses in the relevant section and in the following section will state the cost for maintaining the licenses for 1 year. The calculator then calculates the total maintenance price according to the considered duration of the project. **If the eGC calculator is used to compare the costs of on premises and cloud variants of the IS solution, then the same IS security level must be considered in both variants.** This means, that if, for example, the security level of the current IS operation of the on- premises variant is "high" and the newly required IS security level for the cloud variant is "Critical", it is necessary to add the costs of additional security measures to the costs of the on-premises variant, which will ensure the "critical" level even for the on- premises variant.

The detailed structure and division of costs is given in the basic document TCO Methodology of ICT public administration services version 3.10 dated 30 November 2022 (hereinafter referred to as "TCO Methodology"). If there is uncertainty about the relevance and entry of individual cost categories within the TCO comparison of individual variants (on-premises versus cloud), it is necessary to procced in accordance with the recommendations and examples provided in this basic document TCO Methodology. If the TCO Methodology does not specify the entered load, you can use the line "Other" in the eGC calculator for the given load and indicate the note what exactly the load is, but it is always necessary to use the cost category that is relevant for the given case.

1.3 Key features of the eGC Calculator

- eGC calculator is a tool for calculating and comparing the costs of different solution variants, does not check whether a specific item (for example, a server) entering the calculation is purchased cheaply or expensively,
- eGC calculator has a task of mapping and making visible the cost structure of IS operation, which can be hidden under one data, **it points out item that marginally affect TCO**,
- eGC calculator does not check on the website or send entered data outside the calculator, everything stays in one place as part of the calculator,
- **The more accurate data I enter into the calculator, the more accurate the comparison of individual variants is**, with the aim of bringing this comparison closer to the actual situation. The intentional reporting of inaccurate cost items will not distort the final comparison,
- If the input values are not known, it is possible to use approximate values, it can be stated in the calculator that it is an estimate ("Comment column").
- eGC calculator **does not purposefully perform any optimization of input values**, it can serve as a background document for the optimization and development of the information system with regard to its costs.

2. Key sections of the eGC Calculator

2.1 Initial Parameters

Initial parameters are common inputs that influence the calculation of both models through defined individual roles.

All inputs to the TCO Methodology are in EURO. If you have prices available in another foreign currency (Pound sterling), add the price according to the current exchange rate on the day of purchase.

For input data, the user chooses whether to enter input data with, or without VAT. This will be indicated in the sheet **1. Initial Parameters** and must be followed consistently. The user hereby determines whether all entered data is with or without VAT, this parameter in this sheet **1. Initial Parameters** are not used for any VAT recalculation.

The definition of the considered solution support mode is only an informative item. If the user selects the YES parameter, then 24/7 support must be considered for both solutions. If the NO parameter is selected, the user must write the considered support mode for both solutions in the comment (e.g. 8 a.m. on working days).

Defining the mode of working days and hours is used to reliably set the hourly rate for individual roles (employees).

The costs of individual roles are made up of:

- Monthly gross salary, it is stated as a monthly expense,
- Education costs, its reported as an annual expense (training, seminars, conferences, etc.),
- Direct costs (personal equipment- laptop, phone, etc.),

Indirect costs (overhead costs- economic administration, cleaning, energy, heating, etc.), are separately calculated in the category Z 1 Operating overheads and Z 2Administrative overheads, for individual solutions in the sheet no. **2. Input Data On-Premises** and the sheet no. **3. Input data cloud**.

The user of the eGC calculator fills in the individual items according to the specified units (month, year) in the calculator according to the actual costs of their own organization.

The input parameters for HR consider three roles with a graduated wage rate.

The hourly rate of individual IT roles set-up in this way is linked to the comparison result using the selected role category (1, 2, 3) and the number of hours for individual activities.

2.2 How to insert the data

The basis of all input data for on-premises and cloud is the following item parameter, which is the corner stone of the IT service. The user of the eGC calculator only fills in the relevant input data to a specific sheet. The individual categories are in accordance with the TCO Methodology and are divided into eleven groups:

- **A.- Preliminary analysis, assignment, selection and purchase.**

  Costs of introducing an ICT service in on- premises mode (Costs of the purchasing process, costs of external consultation during project preparation).

- **B.- Procurement of HW and SW.**

SW and HW costs for on- premises solutions. SW (Operating System, System SW, Database SW, Middleware, Application SW), Appliance, HW (Disk storage, Servers, SAN, Networking and network elements, Security, User end devices). Construction, operational and communication infrastructure. Cyber security resources.

- **C.- Development, implementation, modification, integration and test operation.**

  Costs for development, implementation, modifications, integration and test operation of the ICT service in on-premises mode (analysis, architecture, development, implementation and test operation).

- **D.- Solution and operation support.**

  Operation and support of applications, operation and support of IT technologies, operation of the building and data centre technologies, operation and support of cyber security resources.

- **E.- HW/ SW maintenance and ongoing modifications (not in the case of Cloud).**

  Fees for maintenance of HW and network infrastructure elements, fees for maintenance of development, operational and system SW and DB, fees for maintenance of application SW, fees for maintenance of HW/ SW equipment (Appliance), fees for annual standard maintenance of cyber security means, modifications/repairs/ development of HW and network infrastructure elements, applications, HW and SW equipment and cyber security resources (above standard maintenance).

- **F.- Projects of gradual solutions improvements.**

  Functional (process) innovation development projects. Technological development projects. Roll-out projects (extension to other users, organizations). Solution optimization projects (e.g. HW consolidation).

- **G.- Upgrade projects.**

  Application upgrade, system SW upgrade, technology upgrade and infrastructure upgrade projects.

- **H.- Increased cost of use.**

  Costs from lost productivity (training, outages and shutdowns). Costs associated with using the solution.

- **I.- Conservation and termination of solutions.**

  Archiving, preservation and attenuation of solutions, preparation of data for solution migration upon termination, disposal of solution components.

- **X.- Solution as a service.**

  License, SW, HW, operation, support, maintenance, ongoing development. If you use hybrid solution (e.g. backup on- premises, archiving in the cloud), we also list the price for the cloud service here, even if it is input data on - premises. It can also be a purchased service (outsourcing), the user will provide a more detailed description in the comment.

- **Z- Other costs not attributable to the phase of the solution lifecycle.**

  Other operational and administrative overheads.

2.3 Input Data On-Premises

If the user of the eGC calculator plans to calculate on- premises or a hybrid solution, they will also fill in the following part of the calculator in the sheet No. **2. Input Data On-Premises.**

2.3.1 Software

In this section, you enter the costs of the needed SW technologies in individual category. The costs of acquiring all SW are added to the "License line".

The box" Show as a one- time cost" in the first year (YES-displayed in the first year, NO- is displayed for the duration of the project) is only affirmative. The selection of this parameter is reflected from the Sheet **1. Initial parameters** and has an impact on the display in the Sheet **4. TCO Calculation and Comparison**".

Cost	Unit	Comment	Input
Operating system and System SW			
Operating system	EURO	Total cost of acquiring the operating system in EURO, excluding the subsequent (annual maintenance). Pure purchase of all OS licenses for an on-premises solution.	B.3.1 - Server system SW
Operating system - annual maintenance	EURO/year	The costs of ensuring the maintenance of the operating system, the value is given in EURO for 1 year. Pure purchase of maintenance licenses all OSes providing ICT service.	E.2.1 - Fees for annual standard system SW maintenance.
Virtualization / hypervisor	EURO	The costs of acquiring a virtualization tool in EURO, without subsequent (annual maintenance).	B.3.1 - Server system SW
Virtualization / hypervisor - annual maintenance	EURO /year	The costs of ensuring the maintenance of the virtualization tool, the value is given in EURO for 1 year.	E.2.1 - Fees for annual standard maintenance of system SW
Antivirus/antispam license	EURO	Summary of all antiviruses, antispam and similar SW licenses in EURO. Value does not include maintenance fees.	B.3.1 - Server system SW
Antivirus - annual maintenance	EURO/ year	Annual maintenance for the operation of anti/ virus, antispam and similar SW, entered in EURO for 1 year.	E.2.1- Fees for annual standard system SW maintenance.
Backup	EURO	Total cost of purchasing backup SW. The value is	B.3.1 - Server system SW

Cost	Unit	Comment	Input
		given in EURO without annual maintenance.	
Backup SW - annual maintenance	EURO/year	Annual cost of maintaining the backup SW. The value is given in EURO for one year.	E.2.1 - Fees for annual standard system SW maintenance
Monitoring	EURO	Total cost of acquiring monitoring SW. The value is given in EURO without annual maintenance.	B.3.1 - Server system SW
Monitoring - annual maintenance	EURO/year	Annual maintenance costs for monitoring SW. The value is given in EURO for one year.	E.2.1 - Fees for annual standard system SW maintenance.
Other SW	EURO	Determining the total costs for additional system SW that enters the on- premises calculation and is not listed in the previous categories. The value is given in EURO without annual maintenance.	B.3.1 - Server system SW
Other SW - annual maintenance	EURO/year	Determination of annual maintenance costs for additional system SW that is included in the on-premises calculation and is not listed in the previous categories. The value is given in EURO for one year.	E.2.1 - Fees for annual standard system SW maintenance
Database software			
Database SW	EURO	Total cost of acquiring database SW licenses. The value is given in EURO without annual maintenance.	B.3.3 - Database SW
Database- annual maintenance	EURO/year	Annual cost of maintaining the database SW. The value is given EURO per year.	E.2.2 - Fees for annual maintenance. Database.
Development SW			
Development SW	EURO	Total cost of acquiring development SW. The value is given in EURO without annual maintenance.	B.4 - Development SW licence
Fees for annual maintenance of development SW	EURO/year	Determining the annual maintenance costs of development SW. The value is in EURO per year.	E.2.4 - Annual maintenance fees for the development SW
Middleware and integration SW			
Integration SW	EURO	Total cost of acquisition of the Integration SW. The value is given in	B.3.3 - Middleware and Integration SW

Cost	Unit	Comment	Input
		EURO without annual maintenance.	
Integration SW - annual maintenance	EURO/year	EURO/ year annual maintenance costs of the Integration SW. The value is given in EURO per year.	E.2.3 - Fees for annual maintenance Middleware
Other SW	EURO	The total cost of acquiring additional Middleware licenses for the need of the project. The value is given in EURO without annual maintenance.	B.3.3 - Other SW
Other SW - annual maintenance	EURO/year	Annual maintenance costs for middleware SW. The value is given in EURO per year.	E.2.3 - Fees for annual maintenance. Middleware
Modifications/repairs/ development of operational and system SW (above standard maintenance)	Hour/year	Costs for development, operation and system SW (this is not application SW) that are incurred beyond the scope of purchased licenses or beyond the scope of standard maintenance (sw. upgrade projects). This item does not refer to the purchase of SW or its additional functionalities, but to own development, therefore it is given in units of hour/ year.	E.7 - Modifications/repairs/development of operational and system SW, (above standard maintenance)
Modifications /repairs/ development of operational and system SW (above standard maintenance)	EURO/year	Costs for development, operation and system SW (this is not application SW) that are incurred beyond the scope of standard maintenance (sw. upgrade projects). This item does not refer to the purchase of SW or its additional functionalities, but to own development, therefore is given in EURO/ year.	E.7 - Modifications/repairs/development of operational and system SW (above standard maintenance)
Application SW			
Application SW - license	EURO	Total costs for the acquisition of application SW (generic SW, e.g. financial planning, HR management, or SW defined by legislation - File service, etc). The value is set in EURO	B.5.1 - Package solution license

Cost	Unit	Comment	Input
		without annual maintenance.	
Application SWW - annual maintenance	EURO/year	Annual maintenance costs of the application software. The value is given in EURO per year.	E.3 - Fees for the annual standard maintenance of the application SW
Purchase of custom development or in-house development			
Buying custom development	EURO	The costs of developing SW required for the purpose of the project or service, which is not part of the standard license package of the application SW. The purchase of custom development is given in as a total value in EURO.	B.5.2 - Purchasing custom development
Development by own sources	Hour	Development of SW required for the purpose of the project or service, which is not part of the standard application SW. It is not a matter of purchase, but of in-house development, that is why the value is given in hours. The cost is then automatically calculated based on the input parameters according to the entered roles of human resources.	B.5.3 - Development by own sources
HW/SW device (Appliance)			
SW device (Appliance)	EURO	If the SW is supplied pre- installed on the HW, as an inseparable component (SW appliance), then it is listed as one procurement item here. Example: Database appliance. It is stated in EURO without annual maintenance.	B.6.2 - SW appliance
HW device (Appliance)	EURO	If the HW device is supplied as a pre-installed HW (HW Appliance) then the price is listed as one purchase item here. Example: XML Firewall. It is stated in EURO without annual maintenance. .	B.6.1 - HW appliance
HW/SW device (Appliance) - annual maintenance	EURO/year	Annual maintenance for SW/ or HW equipment (Appliance). It is stated in EURO per year.	E.4 - Fees for annual maintenance HW/SW Appliance

Cost	Unit	Comment	Input
Modifications/development of HW/SW device (Appliance, above standard maintenance)	Hour/year	Appliance modifications and development of costs that are incurred beyond the scope of purchased licenses or beyond standard maintenance. This item does not refer to the purchase of SW or its additional functionalities, but to own development, therefore it is given in units of hour/ year.	E.9 - Modifications/repairs/development of HW+SW device (Appliance) (above standard maintenance).
Modifications/development of HW/SW device (Appliance, above standard maintenance)	EURO/year	Appliance modification and development costs that are incurred beyond the scope of standard maintenance (SW upgrade projects). This is a purchase or repurchase of SW, therefore the value is given in EURO/ year	E.9 - Modifications/repairs/development of HW+SW device (Appliance) (above standard maintenance).

2.3.2 Hardware

In this section, you enter the costs of acquiring HW technologies according to the individual categories. Here we enter the costs of servers, SAN storage (Block/File/Object Storage), network elements and security elements (firewalls, etc.). If the solution also includes HW for end users (readers, scanners, tablets, etc.), we also list them in this section. SW and HW Appliance are included in the previous, i.e. SW section. Therefore, we do not list them here. The box "Show a one-time cost in the first year "(YES - displayed in the first year, NO - displayed for the duration of the project) is only informative. The selection of this parameter is reflected from the sheet **1. Initial parameters** and has an impact on the display in the sheet. **4. TCO Calculation and Comparison**.

Cost	Unit	Comment	Input
Server			
Lifetime of servers	Year	The lifetime of servers is tied to the length of the project, according to the OHA methodology. Input from Sheet 1 Introductory parameters, project duration	Without direct link to the end calculation.
Purchase price of servers	EURO/Servers	Here you need to enter the total acquisition value for all servers. In the note, it is necessary to indicate the number and type of servers, including configurations, for a correct comparison with the cloud service.	B.2.1 - Computing HW

Annual server maintenance costs	EURO/year	Maintenance is for all servers of the required solution.	E.1.1 - Fees for annual standard maintenance of HW and infrastructure elements.
Modifications/development of HW and network infrastructure elements (beyond standard maintenance)	Hour/ year	If, during the project, the solution needs to be developed or adjusted from the point of view of implementation.	E.6 - Modifications/repairs/development of HW and network infrastructure elements.
Modifications/development of HW and network infrastructure elements (beyond standard maintenance)	EURO /year	If, during the project, the solution needs to be developed or modified from the point of view of other HW elements (RAM upgrade, additional processor, new network card)	E.6 - Modifications/repairs/development of HW and network infrastructure elements.
Disk storage			
Disk storage - Total storage size	TB	The initial storage size is entered, not the total.	This parameter enters the calculation Results of the comparison: "Development of the size of the solution", specifically in the line "disk storage size" and serves as informative data.
Disk storage- Annual increase in disk storage size	%	A qualified estimate of the increase in % over the duration of the project. % increase in the given year is always calculated from the previous year.	B.2.1 - Computing HW, cost growth over time according to the size of disk storage growth is reflected in the sheet 4. TCO calculation and comparison.
SAN			
SAN - Acquisition price of finding to the result of the SAN storage	EURO	SAN disk storage designed for data storage.	Annual depreciation of SAN storage
SAN - Annual depreciation of SAN storage	EURO/year	The annual depreciation is linked to the length of the project and the purchase price.	B.2.1 - Computing HW
SAN - One SAN contains a number of disks	Pieces	This is an informative value: binding to the result of the comparison per row: the number of units in the rack occupied by the storage.	Solution size evolution: Number of rack units occupied by storage.

SAN - One SAN occupies the number of drives in the rack.	Pieces	This is an informative value: binding to the result of comparison per row: the number of units in the rack occupied by the storage.	Solution size evolution: Number of rack units occupied by storage.
SAN - Disk size	TB	Informative value: binding to the result of the comparison per row: number of disks.	Solution size evolution: Number of disks.
SAN - Secured capacity	%	Informative value for usable SAN capacity: binding to the result of the comparison per row: number of disks.	Solution size evolution: Number of disks.
SAN - Purchase price of HW data backup	EURO	It is HW designed for data backup. If the same SAN storage is used for backup, the value will be zero.	Annual depreciation of HW backup
SAN - Annual depreciation of HW for backup.	EURO/year	The annual depreciation is linked to the length of the project and the purchase price.	B.2.1 - Computing HW
Networking and network elements			
Router	EURO/ Routers	Total value for all routers.	B.2.2 - Internal networking HW - Networking and network elements.
Load Balancer	EURO/ Balancers	Total value for all load balancers.	B.2.2 - Internal networking HW - Networking and network elements.
Switch	EURO/ Switches	Total value for all switches	
Another element	EURO / elements	Total value for all other element (for example Gateway, Network appliance, etc.)	

Internal connectivity - support	EURO/year	Charges for internal connectivity within the data centre (including connectivity between data centres).	
External connectivity	EURO/year	Internet connectivity, KIVS (LAN Ports)	
SW and HW security			
Security - Firewall	EURO	The purchase price of the Firewall or its part, if it is relevant for the project.	
HW for cybersecurity	EURO	Purchase price of a new security element not listed above (network Appliance, for example. Q-RADAR)	
SW for cybersecurity	EURO	Purchase price of a new security element not listed above (network Appliance, for example. Q-RADAR)	
Another HW elements	EURO	There are, for example cabling, optical elements, etc. Enter the number and type of elements in the comment in the EGC calculator.	
SW for security	EURO	SW for key management, SW for encryption, certificates, etc.	
SW for security - annual maintenance	EURO/year	Annual maintenance - SW security	
Firewall - annual maintenance	EURO/year	Annual firewall maintenance	
HW/SW for cybersecurity- annual maintenance	EURO/year	Annual maintenance of HW/SW for cybersecurity.	

Another element - annual maintenance	EURO/year	Annual maintenance for other network elements (network Appliance, cabling, optical elements.)	
Modifications/repairs/development of cybersecurity resources (beyond standard maintenance)	Hour/year	Works and services, that are necessary for the project implementation. (E.g. Identification of security weaknesses and the need to fix them, e.g. weaknesses of viruses, malware, phishing, DOS, etc.)	
Modifications/repairs/development of cybersecurity resources (beyond standard maintenance)	EURO/year	Security technologies, that are necessary for the project implementation (fixes, SW products, SW/ HW upgrade, etc.).	E.10 - Modifications/repairs/development of cybersecurity resources (beyond standard maintenance)
User end devices			
User end devices	EURO	Total terminal cost for all users, not just one user. Equipment designed for a specific solution, e.g. file service, etc .is calculated here and includes a PC, laptop, scanner, tablet, etc. It does not apply to equipment that has already been included in the direct costs of individual roles. (see chapter 2.1 initial parameters)	B.2.3 - User end devices
System SW for end users	EURO	E.g. operation system Windows (Total cost for all users). It is system (not application SW) necessary for the operation of the terminal equipment, that is the subject of the license and is a cost item.	B.3.2 - System SW for end users
Terminal maintenance fees	EURO /year	Includes maintenance fees associated with the operation of end device	E.1.3. - Terminal maintenance fees

2.3.3 Data Center location costs

Building, operational and communication infrastructure is indicated if the construction, acquisition or reconstruction of a server room or data centre is involved. Where the service being calculated does not require any costs associated with the modification or construction of a data centre or server room, the items below are zero.

A mandatory item is the energy necessary for the operation of the data centre, including electricity, including the energy needed for heating, cooling the server room or data centre.

Mandatory items also include the cost of the communications infrastructure, including necessary backups (redundant network lines for Internet connections, etc.).

The "Show as a one-off cost in the first year" field (YES - shown in the first year; NO - shown for the duration of the project) is for information only. The selection of this parameter is reflected from the sheet "**1. Initial Parameters**" and has an impact on the display in the sheet "**4. TCO Calculation and Comparison**".

Circulation	Unit	Comment	Entry for
Building, operational and communication infrastructure			
Building infrastructure	EURO	Costs for construction work related to the construction (reconstruction) of a server room or data centre in connection with the required solution	Element B.1.1 -- Building infrastructure
Operating technology	EURO	Non-IT technology for datacentre operations related to the required solution and includes e.g. cooling, power, security, substations, etc.	B.1.2 - Operating technology
Connection to external communication networks	EURO	Cabling and one-time preparation for connecting the server room or data centre to the provider. This includes e.g. setting up an optical network, VDSL, etc.	B.1.3 - Connection to external communication networks
Cost of Racks + accessories	EURO	Purchase of new Racks for placement of SAN Storage servers, Firewalls, etc.	B.1.2 - Cost of Racks + accessories
Cost of placing the Racks in the datacentre	EURO/year	Cost of space (m^2) in the datacentre. In case a new rack is not purchased, the amount including the cost of an adequate part of the rack is given.	Element D.3.1 - Operation and support of DC technology
Electricity			
Price of backup power per 1 kWh and cooling	EURO/kWh	Price for electricity for the server room/data centre including the price for backup cooling.	Input value in EURO for calculation D.3.3.1 to D.3.3.4

Circulation	Unit	Comment	Entry for
Energy for DC operation	EURO/year	If it is not possible to quantify the energy consumption for the individual elements in categories D.3.3.2 to D.3.3.4, provide here the aggregated energy consumption value.	D.3.3.1 - Energy for DC operation
Electricity consumption for all servers per year	EURO/year	Estimated real power consumption of all servers / this is not a power label.	D.3.3.2 - Electricity - direct consumption other
Electricity consumption for all storage sites year	EURO/year	Estimated real power consumption of all storage devices / this is not the label power consumption.	D.3.3.3 - Electricity - direct storage consumption
Electricity consumption - other HW per year	EURO/year	Estimated real power consumption of other HW / this is not the label power consumption.	D.3.3.4 - Electricity - direct consumption other

2.3.4 Cost of operating ICT services - human resources

ICT service costs represent the operational costs associated with the need to run the ICT service. This section includes both in-house and external human resource costs. Human resources costs include 3 sub-cost groups: User Support Costs, Operational Costs and Project Management Costs (including Cyber Security Costs). For all human resource costs, a unit of hours per year is used.

2.3.4.1 Support for users

This sub-cost group represents the system and application support for users necessary for the operation of the ICT service, quantified in number of hours per year. If the support is purchased externally, it is stated in EURO per year.

Circulation	Unit	Comment	Entry for
Support: user administration (add, change, remove)	Hour/year	In-house support	D.1.5 - Application Service Desk and Incident Management
Support: incident management	Hour/year	In-house support	D.1.5 - Application Service Desk and Incident Management
Support: other relevant activities	Hour/year	In-house support	D.1.5 - Application Service Desk and Incident Management
Support: external support service	EURO/year	Purchase of an external service for user support	D.1.5 - Application Service Desk and Incident Management

2.3.4.2 Operation

The operation of the ICT service itself is expressed in operating costs broken down into individual items and expressed in hours per year. If in doubt about the location of a cost item, choose the one closest to the actual cost, indicate in the notes which item is closer and avoid double entry. Again, if the support is purchased externally, it should be stated in EURO per year.

Circulation	Unit	Comment	Entry for
Operation: system monitoring	Hour/year	Includes network, HW and SW layer monitoring up to the operating system level including	D.2.1 - System Monitoring

Circulation	Unit	Comment	Entry for
Operation: Application monitoring	Hour/year	Includes monitoring of the application and application components (database, application server)	D.1.1 - Application monitoring
Operation: System administration	Hour/year	Total time required for interventions and changes in the system	D.2.2 - System administration
Operation: Application Administration	Hour/year	Total time required to manage applications	D.1.2 - Application administration
Operation: solving system problems	Hour/year	Total number of hours allocated to solving system and infrastructure problems	D.2.3 - Problem management system
Operation: solving application problems	Hour/year	Total number of hours for problem solving at the application level	D.1.3 - Application management problem
Operations: change management for systems	Hour/year	Changes at system and infrastructure level (HW upgrade, OS upgrade)	D.2.4 - Software Change Management
Operation: change management for applications	Hour/year	Application changes (upgrades to newer versions), configuration changes, etc.	D.1.4 - Application change management software
Operation: system service desk and incident management	Hour/year	Number of hours allocated to the service desk (call centre) for infrastructure support	D.2.5 - System Service Desk and Incident Management
Operation: backup (application and system)	Hour/year	Number of hours allocated for backup	D.1.2 - Application administration
Operations: other relevant activities for applications	Hour/year	All activities not included above. It is necessary to indicate which activities the time pool has been allocated to for the number of hours indicated.	D.1.6 - General and administrative costs for running applications
Operations: other relevant activities for IT technologies	Hour/year	Costs associated with IT operations that cannot be categorised. You must specify in the note which cost it is.	D.2.6 - General and administrative costs for the operation of the system
Operation: operational safety	Hour/year	Number of hours allocated to operational security, including audits and inspections.	D.5.2 - Operational security (penetration tests, external audits, consultancy)
Application modifications/development (above standard maintenance)	Hour/year	Number of hours devoted to application modifications and development, e.g. analysis of new functions, optimization (tuning) of the application, etc.	E.8 - Application modifications/repairs/development (beyond standard maintenance) - ongoing (internal, line-managed)
Application modifications/development (above standard maintenance)	EURO/year	If the application requires a change (for legislative or other reasons), we report the cost of the adjustment in this category.	E.8 - Application modifications/repairs/development (beyond standard maintenance) - ongoing (internal, line-managed)

Circulation	Unit	Comment	Entry for
Operation: security surveillance	Hour/year	Costs associated with cybersecurity, including monitoring, in-house.	D.5.1 - Cyber security and security intelligence
Operation: external application operation service	EURO/year	If the operation of the applications is outsourced, the price of the annual contract must be stated here.	D.1.6 - General and administrative costs for running applications
Operation: external IT technology operation service	EURO/year	If the IT infrastructure is operated by an external supplier, including outsourcing, or as a specific service for the customer (managed service).	D.2.6 - General and administrative costs for the operation of the system

2.3.4.3 Cyber security

Cybersecurity includes operational costs related to cybersecurity. Do not list technology here! Required inputs are expressed in time items (hour/year), only external costs provided by external entities are expressed in EURO/year.

Circulation	Unit	Comment	Entry for
Management: cyber security project management	Hour/year	Number of hours of project/security manager with a link to cyber security	D.4 - Operation and support of cyber security assets
Management: other relevant activities cyber security	Hour/year	Total number of hours allocated to cyber security activities not listed under 'Management: cyber security	D.4 - Operation and support of cyber security assets
Management: cyber security	Hour/year	Number of hours allocated to cybersecurity; includes security audits, tests, reports, and mandated security documents.	D.4 - Operation and support of cyber security assets
External costs of cybersecurity assurance	EURO/year	If cyber security services are provided by a contractor, they are stated in EURO/year according to the contractor's contract.	D.5.1 - Cyber security and security intelligence
External costs cyber security	EURO/year	Penetration tests, external audits, consultations	D.5.2 - Operational security (penetration tests, external audits, consultancy)

2.3.5 Cost of introducing and changing an ICT service

2.3.5.1 Cost of the purchasing process related to the acquisition of the on-premises model

These are one-off costs of the purchasing process, either in-house or the cost of supplier advice and consultancy.

The "Show as one-off cost in the first year" field (YES - shown in the first year; NO - shown for the duration of the project) is for information only. The selection of this parameter is reflected from the sheet "**1. Initial Parameters**" and has an impact on the display in the sheet "**4. TCO Calculation and Comparison**".

Circulation	Unit	Comment	Entry for
Project plan - TCO analysis	The Hour	TCO analysis performed in-house	A.1 - Project plan and inception study
Cost of external consultancy for project preparation	EURO	Costs of external consultancy contractors for project preparation	A.1 - Project plan and inception study
Cost of selecting a supplier - public contract	The Hour	Preparation of a public contract by own forces	A.2 - Procurement and selection of supplier
Cost of external consultancy - public contract	EURO	Cost of external law firm in preparation of the tender	A.2 - Procurement and selection of supplier

2.3.5.2 Analysis, development, implementation and test operation

These costs are one-off in the first year or before the project starts.

The "Show as one-off cost in the first year" field (YES - shown in the first year; NO - shown for the duration of the project) is for information only. The selection of this parameter is reflected from the sheet "**1. Initial Parameters**" and has an impact on the display in the sheet "**4. TCO Calculation and Comparison**".

Circulation	Unit	Comment	Entry for
Project management of development and implementation on the VS side	The Hour	Total number of hours of project manager's time on project management.	C.1 - Development and implementation project management
Project management of development and implementation on the VS side	EURO	Cost of project management if provided by or purchased from an external company.	C.1 - Development and implementation project management
Solution architecture	The Hour	Total number of hours associated with system/service design (including documentation).	C.2 - Solution architecture, including changed processes
Solution architecture	EURO	The cost of the system/service architecture design (including documentation) purchased from an external company.	C.2 - Solution architecture, including changed processes
ICT service analysis costs	The Hour	Total number of hours allocated to the analysis of the service to be implemented.	C.3 - Organisational and process changes (OCM, BPM)
ICT service analysis costs	EURO	External cost of the analysis of the service to be implemented.	C.3 - Organisational and process changes (OCM, BPM)
Costs of changes caused by the introduction of an ICT service	The Hour	The introduction of a new service may have an impact on the operation of existing systems. Please indicate the number of hours associated with changes to existing systems to allow for the implementation of the new service.	C.3 - Organisational and process changes (OCM, BPM)
Costs of changes caused by the introduction of an ICT service	EURO	External costs associated with changes to existing systems to implement the new service.	C.3 - Organisational and process changes (OCM, BPM)

Circulation	Unit	Comment	Entry for
HW and technology implementation	The Hour	HW recovery, installation and configuration.	C.4 - Revitalizing the HW and technology of the development and implementation environment
HW and technology implementation	EURO	Recovery, installation and configuration of HW in the form of external purchase of service.	C.4 - Revitalizing the HW and technology of the development and implementation environment
Infrastructure SW implementation	The Hour	Installation of operating system including patches and software/add-ons to the operating system for future application/service.	C.4 - Revitalizing the HW and technology of the development and implementation environment
Infrastructure SW implementation	EURO	Installation of the operating system including patches and software/add-ons to the operating system for a future application/service, in the form of an external service purchase.	C.4 - Revitalizing the HW and technology of the development and implementation environment
Application development and programming modifications	The Hour	Installation, configuration and commissioning of the application, system or service.	C.5 - Application development and programming modifications
Application development and programming modifications	EURO	Installation, configuration and commissioning of an application, system or service, in the form of an external purchase of a service.	C.5 - Application development and programming modifications
Customization of solutions/ICT services	The Hour	Modification of the solution beyond the basic installation, configuration (e.g. tuning, optimization of operating parameters, etc.)	C.6 - Customization (setting parameters) of the application
Customization of solutions/ICT services	EURO	Modification of the solution beyond the basic installation, configuration (e.g. tuning, optimization of operating parameters, etc.), in the form of external purchase of services.	C.6 - Customization (setting parameters) of the application
Integration of the solution/ICT service to other applications/systems	The Hour	Integration to other system(s).	C.7 - Application integration to other applications
Integration of the solution/ICT service to other applications/systems	EURO	Integration to other system(s), by external purchase of service.	C.7 - Application integration to other applications
Data acquisition, data migration	The Hour	Number of hours to import, manual data entry or data migration.	C.8 - Data acquisition, data migration
Data acquisition, data migration	EURO	External purchase of import service, manual data entry or data migration.	C.8 - Data acquisition, data migration
Testing	The Hour	Includes functional, stress (performance), penetration testing.	C.9 - Testing
Testing	EURO	Functional, stress (performance), penetration testing, in the form of external purchase of services.	C.9 - Testing
User training	The Hour	Number of hours for user training	C.10 - User training

Circulation	Unit	Comment	Entry for
User training	EURO	Training of users, in the form of external purchase of the service.	C.10 - User training
Acceptance and verification operation	The Hour	Number of hours per run, solution commissioning	C.11 - Acceptance and verification operation
Acceptance and verification operation	EURO	Start-up and commissioning of the solution, in the form of external purchase of the service.	C.11 - Acceptance and verification operation
Cybersecurity preparation	The Hour	Number of hours to set up, configure, and document the setup of the solution to meet security requirements (e.g., authentication, authorization, data security during transmission and storage).	C.12 - HW and SW implementation for KB, security implementation, audit
Security project, audit	EURO	Costs associated with an audit performed by an external company may include a security project.	C.12 - HW and SW implementation for KB, security implementation, audit
Other	The Hour	Time estimate of activities that are carried out internally and that cannot be included in the above activity descriptions.	C.13 - Other direct costs of the solution
Other	EURO	If some activities are provided by contractors and cannot be included in the above headings, the costs according to the contractor's contract in EURO are given here. Cost of external consultancy/advice.	C.13 - Other direct costs of the solution

2.3.6 Gradual Solution Improvement Projects, Upgrade, Preservation and Closure Projects, Increased Cost of Use

Category F, G and I costs are one-off costs in the **last year of the project** or after its completion.

The "Show as a one-off cost in the last year" field (YES - shown in the last year; NO - shown up to the length of the project) is for information only. The selection of this parameter is reflected from the sheet "**1. Initial Parameters**" and has an impact on the display in the sheet "**4. TCO Calculation and Comparison**".

2.3.6.1 Gradual improvement projects

Circulation	Unit	Comment	Entry for
Gradual improvement projects			
Functional (process) innovation development projects	The Hour	Costs for process and solution functionality adjustments, costs for internal roles.	F.1 - Functional (process) innovation development projects
Functional (process) innovation development projects	EURO	Costs for process and functionality modification of the solution, costs for an external supplier.	F.1 - Functional (process) innovation development projects

Circulation	Unit	Comment	Entry for
Gradual improvement projects			
Technological development projects	The Hour	Cost of additional technical updates to the solution, cost of internal roles.	F.2 - Technology development projects
Technological development projects	EURO	Cost of additional technical update of the solution, cost of external supplier.	F.2 - Technology development projects
Roll-out projects	The Hour	Costs associated with deploying the solution into operation, costs for internal roles.	F.3 - Roll-out projects (extension to other users, organisations)
Roll-out projects	EURO	Costs associated with the deployment of the solution into operation, costs of an external supplier.	F.3 - Roll-out projects (extension to other users, organisations)
Solution (cost) optimization projects	The Hour	Solution cost optimization (e.g. HW consolidation), internal role costs.	F.4 - Solution optimization projects
Solution (cost) optimization projects	EURO	Cost optimization of the solution, cost of external supplier.	F.4 - Solution optimization projects

2.3.6.2 Upgrade projects

Circulation	Unit	Comment	Entry for
Upgrade projects			
Application upgrade projects	The Hour	Application layer upgrade costs, internal role costs.	G.1 - Application upgrade projects
Application upgrade projects	EURO	Costs associated with application layer upgrades, external supplier costs.	G.1 - Application upgrade projects
System software upgrade projects	The Hour	Costs for system software updates (includes OS, system software, DB, middleware, integration software), costs for internal roles.	G.2 - System software upgrade projects
System software upgrade projects	EURO	Costs for system software updates (includes OS, system software, DB, middleware, integration software), costs for external supplier.	G.2 - System software upgrade projects
Technology upgrade projects	The Hour	Technology upgrade costs, internal role costs.	G.3 - Technology upgrade projects
Technology upgrade projects	EURO	Technology upgrade costs, external supplier costs.	G.3 - Technology upgrade projects
Infrastructure upgrade	The Hour	Infrastructure upgrade costs, internal role costs.	G.4 - Infrastructure upgrade projects
Infrastructure upgrade	EURO	Infrastructure upgrade costs, external supplier costs.	G.4 - Infrastructure upgrade projects

2.3.6.3 Preservation and termination of the solution

Circulation	Unit	Comment	Entry for
Preservation and termination of the solution			
Archiving, preservation and attenuation solutions	The Hour	Cost of internal roles.	I.1 - Archiving, preservation and solution attenuation

Circulation	Unit	Comment	Entry for
Preservation and termination of the solution			
Archiving, preservation and attenuation solutions	EURO	Cost of external supplier.	I.1 - Archiving, preservation and solution attenuation
Preparing data for migration from the solution on termination	The Hour	Cost of internal roles.	I.2 - Preparation of data for migration from the termination solution
Preparing data for migration from the solution on termination	EURO	Cost of external supplier.	I.2 - Preparation of data for migration from the termination solution
Disposal of solution components	The Hour	Cost of internal roles.	I.3 - Disposal of solution components
Disposal of solution components	EURO	Cost of external supplier.	I.3 - Disposal of solution components

2.3.6.4 Increased costs of use

Cost category H. Increased usage costs are ongoing. These are costs that could not be predicted at the time the project was commissioned. They include extra costs related to training, training, unplanned outages and downtime, or other unforeseen events (increase in the number of users, change in legislation, geopolitical situation).

Circulation	Unit	Comment	Entry for
Increased costs of use			
Cost of lost productivity - Training	Hour/year	Cost of internal roles.	H.1.1 - Training
Cost of lost productivity - Training	EURO/year	Cost of external supplier.	H.1.1 - Training
Cost of lost productivity - Downtime and outages	Hour/year	Cost of internal roles.	H.1.2 - Outages and disruptions
Cost of lost productivity - Downtime and outages	EURO/year	Cost of external supplier.	H.1.2 - Outages and disruptions
Costs associated with using the solution	Hour/year	Cost of internal roles.	H.2 - Costs associated with the use of the solution
Costs associated with using the solution	EURO/year	Cost of external supplier.	H.2 - Costs associated with the use of the solution

2.3.7 Cloud service fee

Category X costs. Cloud service fees are only added for on-premises solutions if the on-premises solution is supplemented or extended with this type of service, i.e. it is a hybrid solution.

> *Example 1: If the backup is on-premises and at the same time you are backing up the data to the cloud, the cost of the cloud backup is listed here in the IaaS section.*

Example 2: If an office software license has been purchased to run in a hybrid mode, i.e., both cloud and on-premises, split these costs (if possible) and include the cost of the cloud operation of this office software (editor, calculator, presentation tool) in the SaaS category.

Circulation	Unit	Comment	Entry for
Cloud service fee			
IaaS	EURO/infrastructure/year	IaaS service costs.	X.1 - Charge for cloud services (IaaS, PaaS, SaaS)
PaaS	EURO/platform/year	PaaS costs.	X.1 - Charge for cloud services (IaaS, PaaS, SaaS)
SaaS	EURO/software/year	Cost of SaaS service.	X.1 - Charge for cloud services (IaaS, PaaS, SaaS)

2.3.8 Other costs not attributable to the life cycle phase of the solution

Circulation	Unit	Comment	Entry for
Other costs not attributable to the life cycle phase of the solution			
Operating overhead	EURO/year	Annual costs in relation to assets (building, equipment, HW+SW, furniture, etc.)	Z.1 - Other operating overheads
Operating overhead	EURO/ lump sum	One-off costs in relation to assets (building, equipment, HW+SW, furniture, etc.)	Z.1 - Other operating overheads
Administrative overhead	EURO/year	Annual costs in relation to employees who are not costed into the project within roles (managers, directors).	Z.2 - Other administrative overheads
Administrative overhead	EURO/ lump sum	One-off costs in relation to employees who are not costed into the project as part of their roles (managers, directors).	Z.2 - Other administrative overheads

These are costs that cannot be allocated to another category.

2.4 Input Data Cloud

If the user of the eGC calculator plans to calculate a cloud or hybrid solution, he/she will further fill in the following part of the calculator in sheet **3 Cloud Input Data**.

The base consists of the cloud service fee and additional services not included in the basic cloud service (add on services).

Running an on-premises service involves higher administrative costs than a cloud service. If the cloud provider includes administrative services in the base price, then the time consumption expressed in MD in the cloud is much lower.

In the case of the cloud service, no modifications to the building infrastructure, the data centre or the purchase and modification of operational technologies are expected.

Depending on the nature of the cloud service to be purchased, the following options are possible:

a) all cost categories listed below are part of the cloud service fee; the user only fills in the cost of the cloud service, in which case there will be zero entries in all other lines of the eGC calculator;

b) some of the cost categories listed below are included in the cloud service fee, the user just indicates these costs in a note but the cost will be zero, the non-covered items in the cloud service need to be filled in the relevant categories below.

Decisions about which cost categories are zero and are part of the cloud service, and conversely which need to be quantified, are based on the specific architectural solution and the user specifies the categories to avoid duplicate cost category entries.

Example: local support beyond the cloud service in case additional support provided by the local service provider is expected (e.g. cloud service support in Czech, monitoring).

Sheet 3. Input data cloud" can also be used to calculate the TCO of a hybrid solution, where the hybrid service is based on a cloud service supplemented by some elements of an on-premises solution.

2.4.1 Operating costs for the cloud service

Cost of service provision by focus: infrastructure, platform, software. The cost of the service as a whole is shown here. If infrastructure as a service is supplied, then the charge for all servers, storage, firewalls is given in total per year. It is necessary to indicate in the note what is included in the service.

Circulation	Unit	Comment	Entry for
Cloud service fee			
IaaS	EURO/infrastructure/year	IaaS service costs.	X.1 - Charge for cloud services (IaaS, PaaS, SaaS)
PaaS	EURO/platform/year	PaaS costs.	X.1 - Charge for cloud services (IaaS, PaaS, SaaS)
SaaS	EURO/software/year	Cost of SaaS service.	X.1 - Charge for cloud services (IaaS, PaaS, SaaS)

2.4.2 Cost of operating ICT services - human resources

Additional costs necessary to fully use the cloud service, depending on its nature. To be filled in only if they are not part of the cloud service fee but are unavoidable for the operation of the service.

2.4.2.1 Support for users

If support for users is not part of the cloud service, then this sub-cost group is also filled in, which represents system and application support for users necessary for the operation of the ICT service quantified in number of hours per year. If the support is purchased externally, it shall be stated in EURO per year.

Circulation	Unit	Comment	Entry for
Support: user administration (add, change, remove)	Hour/year	In-house support when you need to perform an administrative intervention in the cloud service that is not part of the cloud service.	D.1.5 - Application Service Desk and Incident Management
Support: incident management	Hour/year	In-house support, any user support incidents beyond cloud support.	D.1.5 - Application Service Desk and Incident Management
Support: other relevant activities	Hour/year	In-house support, unspecified user support activities.	D.1.5 - Application Service Desk and Incident Management

Circulation	Unit	Comment	Entry for
Support: external support service	EURO/year	Purchase of an external service for user support if user support is outsourced.	D.1.5 - Application Service Desk and Incident Management

2.4.2.2 Operation

The operation of the ICT service itself is expressed in operating costs broken down into individual items and expressed in hours per year. If in doubt about the location of a cost item, choose the one closest to the actual cost, indicate in the notes which item is closer and avoid double entry. Again, if the support is purchased externally, it should be stated in EURO per year.

Circulation	**Unit**	**Comment**	**Entry for**
Operation: system monitoring	Hour/year	It includes monitoring of the network, HW and SW layers up to and including the operating system level, beyond the cloud service.	D.2.1 - System Monitoring
Operation: Application monitoring	Hour/year	It includes monitoring of the application and application components (database, application server), beyond the cloud service.	D.1.1 - Application monitoring
Operation: System administration	Hour/year	Total time required for interventions and changes to the system, beyond the cloud service.	D.2.2 - System administration
Operation: Application Administration	Hour/year	Total time required to manage applications, beyond the cloud service.	D.1.2 - Application administration
Operation: solving system problems	Hour/year	Total number of hours allocated to solving system and infrastructure problems, beyond the cloud service.	D.2.3 - Problem management system
Operation: solving application problems	Hour/year	Total hours for application-level troubleshooting, beyond the cloud service.	D.1.3 - Application management problem
Operations: change management for systems	Hour/year	Changes at system and infrastructure level (HW upgrade, OS upgrade), beyond the cloud service.	D.2.4 - Software Change Management
Operation: change management for applications	Hour/year	Application changes (upgrades to newer versions), configuration changes, etc., beyond the cloud service.	D.1.4 - Sofware Change management applications
Operation: system service desk and incident management	Hour/year	Number of hours allocated to the Service Desk (call centre) for infrastructure support, beyond the cloud service.	D.2.5 - System Service Desk and Incident Management
Operation: backup (application and system)	Hour/year	The number of hours allocated for backup, beyond the cloud service.	D.1.2 - Application administration
Operations: other relevant activities for applications	Hour/year	All activities not included above. For the numbers of hours listed, it is necessary to indicate which activities the	D.1.6 - General and administrative costs for running applications

Circulation	Unit	Comment	Entry for
		time pool was allocated to, beyond the cloud service.	
Operations: other relevant activities for IT technologies	Hour/year	Costs associated with IT operations that cannot be categorised. You must indicate in the notes what the cost is, beyond the cloud service.	D.2.6 - General and administrative costs for the operation of the system
Operation: operational safety	Hour/year	Number of hours allocated to operational security, including auditing and controls, beyond the cloud service.	D.5.2 - Operational security (penetration tests, external audits, consultancy)
Operation: security surveillance	Hour/year	Costs associated with cybersecurity, including monitoring, beyond the cloud service, in-house.	D.5.1 - Cyber security and security intelligence
Operation: external application operation service	EURO/year	If the operation of the applications is provided by an external entity, the price of the contract for a one-year period, beyond the cloud service, must be indicated here.	D.1.6 - General and administrative costs for running applications
Operation: external IT technology operation service	EURO/year	If the operation of the IT infrastructure is operated by an external supplier, including outsourcing or as a specific service for the customer (managed service), beyond the cloud service.	D.2.6 - General and administrative costs for the operation of the system

2.4.2.3 Cyber security

Cybersecurity includes the operational costs associated with cybersecurity in the cloud. Required inputs are expressed in time items (hour/year), only external costs provided by external entities are expressed in EURO/year. These items are only to be filled in if they are not part of the cloud service.

Circulation	Unit	Comment	Entry for
Management: cyber security project management	Hour/year	Number of hours of project/security manager with a link to cybersecurity in the cloud.	D.4 - Operation and support of cyber security assets
Management: other relevant activities cyber security	Hour/year	Total number of hours allocated to cybersecurity activities in the cloud not listed in the "Management: cybersecurity.	D.4 - Operation and support of cyber security assets
Management: cyber security	Hour/year	Number of hours allocated to cybersecurity; includes security audits, tests, reports, and mandated security documents.	D.4 - Operation and support of cyber security assets
External costs of cyber security	EURO/year	If cyber security services are provided by a contractor, they are stated in EURO/year according to the contractor's contract.	D.5.1 - Cyber security and security intelligence
External costs cyber security	EURO/year	Penetration tests, external audits, consultations.	D.5.2 - Operational security (penetration tests, external audits, consultancy)

2.4.3 Software

If the application is not provided as a SaaS service, it is possible to purchase the application software licenses separately and transfer them to the cloud. Thus, only IaaS or PaaS can be rented from the cloud provider and the application software licenses can be installed in the cloud. If the entire application is provided as SaaS, then the item below is not populated.

Circulation	Unit	Comment	Entry for
Application software (beyond XaaS)			
Application software - BYOL licence	EURO	Total cost of acquisition of application software (generic software e.g. financial planning, human resources management or software defined by legislation - filing service etc.). The value is given in EURO without annual maintenance. It is assumed that licenses are purchased outside the cloud service and transferred to the cloud (Bring-Your-Own-License).	B.5.1 - Package Solution License
Application software - annual maintenance in the form of BYOL	EURO/year	Annual maintenance costs of the application software. The value is given in EURO per year. Maintenance of licenses transferred to the cloud.	E.3 - Annual standard maintenance fees for application software
Middleware - BYOL licence	EURO	E.g. databases, integration software, key management, application servers	B.5.1 - Package Solution License
Middleware - annual BYOL maintenance	EURO/year	Annual maintenance costs	E.2.3 - Middleware maintenance fees
Infrastructure software - BYOL licence	EURO	Own operating system, monitoring, backup	B.5.1 - Package Solution License
Infrastructure SW - annual maintenance in the form of BYOL	EURO/year	Annual maintenance costs	E.2.1 - System software maintenance fees
Purchase of customized development or in-house development			
Purchase of tailor-made developments	EURO	The cost of developing software required for the purpose of the project or service that is not part of the standard application software licence package. The purchase of custom development is given as a total value in EURO.	B.5.2 - Purchase of customised developments
Development on your own	The Hour	Development of software required for the purpose of the project or service that is not part of the standard application software. It is not a purchase but an in-house development, therefore the value is given in hours. The cost is then automatically calculated based on the input parameters according to the specified human resource roles.	B.5.3 – In-house development

Circulation	Unit	Comment	Entry for
Development Software Maintenance Fees	EURO/year	Definition of the annual maintenance costs of the development software. The value is in EURO per year.	E.2.4 - Development Software Maintenance Fees

2.4.4 Networking

Circulation	Unit	Comment	Entry for
Networking			
External Connectivity to the Cloud	EURO/year	Only if it is no longer part of the XaaS service. Connection to the cloud solution, KIVS.	D.3.2 - Operation of communication infrastructure

2.4.5 User end devices

Circulation	Unit	Comment	Entry for
User end devices			
User end devices	EURO	A cloud solution typically does not provide endpoint devices if they are a prerequisite for an on-premises-like solution.	B.2.3 - User end devices
System software for end devices	EURO	If the end device requires special software that is not included in the end device, the price for this software is listed here.	B.3.2 - System software for end devices
Maintenance fees for terminal equipment	EURO/year	Includes fees associated with the operation of endpoint devices only if it is no longer part of the XaaS service.	E.1.3 - Maintenance fees for terminal equipment

2.4.6 Cost of introducing and changing an ICT service

Additional costs necessary to fully use the cloud service, depending on its nature. To be filled in only if they are not part of the cloud service fee but are unavoidable in the preparation, modification and implementation of the service.

2.4.6.1 Cost of the purchasing process

These costs are one-off in the first year or before the project starts. For clarity, they can also be shown spread over the length of the project. The box "Show as one-off cost in the first year" (YES - shown in the first year; NO - shown over the length of the project) is for information only. The selection of this parameter is reflected from the sheet "**1. Initial Parameters**" and has an impact on the display in the sheet "**4. TCO Calculation and Comparison**".

Circulation	Unit	Comment	Entry for
Project plan - TCO analysis	The Hour	In-house TCO analysis for cloud solutions.	A.1 - Project plan and inception study
Cost of external consultancy for project preparation	EURO	Cost of external consultancy supplier in the preparation of the project for the cloud solution.	A.1 - Project plan and inception study
Cost of selecting a supplier - public contract	The Hour	Preparation of a procurement for a cloud solution, carried out in-house.	A.2 - Procurement and selection of supplier

Circulation	Unit	Comment	Entry for
Cost of external consultancy - public contract	EURO	Cost of external law firm in preparation of the procurement for the cloud solution.	A.2 - Procurement and selection of supplier

2.4.6.2 Development, implementation, customization, integration and test run

These costs are one-off in the first year or before the project starts. For clarity, they can also be shown spread over the length of the project. The box "Show as one-off cost in the first year" (YES - shown in the first year; NO - shown over the length of the project) is for information only. The selection of this parameter is reflected from the sheet "**1. Initial Parameters**" and has an impact on the display in the sheet "**4. TCO Calculation and Comparison**".

Circulation	Unit	Comment	Entry for
Project management of development and implementation on the VS side	The Hour	Total number of hours of project manager's time to lead a project in the cloud.	C.1 - Development and implementation project management
Project management of development and implementation on the VS side	EURO	External cost of running a project in the cloud.	C.1 - Development and implementation project management
Solution architecture	The Hour	Total number of hours associated with the design of the system/service to the cloud (including documentation).	C.2 - Solution architecture, including changed processes
Solution architecture	EURO	External cost of purchasing the system/service design into the cloud (including documentation).	C.2 - Solution architecture, including changed processes
ICT service analysis costs	The Hour	Total number of hours allocated to the analysis of the service to be implemented in the cloud.	C.3 - Organisational and process changes (OCM, BPM)
ICT service analysis costs	EURO	External cost for the purchase of the analysis service to be implemented in the cloud.	C.3 - Organisational and process changes (OCM, BPM)
Costs of changes caused by the introduction of an ICT service	The Hour	The introduction of a new service may have an impact on the operation of existing systems. Please indicate the number of hours associated with changes to existing systems to allow the new service to be implemented in the cloud.	C.3 - Organisational and process changes (OCM, BPM)
Costs of changes caused by the introduction of an ICT service	EURO	The introduction of a new service may have an impact on the operation of existing systems. External costs associated with changes to existing systems to implement a new service in the cloud.	C.3 - Organisational and process changes (OCM, BPM)
HW and technology implementation	The Hour	HW recovery, installation and configuration. Not relevant for cloud solutions by default. Only if not part of XaaS. E.g. it can be used for recovery of user's HW (tablet, phone).	C.4 - Revitalizing the HW and technology of the development and implementation environment
HW and technology implementation	EURO	External cost for recovery, installation and configuration of HW. Not relevant for cloud solutions by default. Only if it is not part of an XaaS service. E.g. can be used for recovery of user's HW (tablet, phone).	C.4 - Revitalizing the HW and technology of the development and implementation environment

Circulation	Unit	Comment	Entry for
Infrastructure SW implementation	The Hour	Installation of operating system including patches and software/add-ons to the operating system for future application/service. Not relevant for cloud solutions by default. Only if not part of an XaaS service. E.g. can be used for phone or tablet OS installs or specific OS patches/add-ons etc.	C.4 - Revitalizing the HW and technology of the development and implementation environment
Infrastructure SW implementation	EURO	Installation of operating system including patches and software/add-ons to the operating system for future application/service. Not relevant for cloud solutions by default. Only if not part of an XaaS service. E.g. can be used for phone or tablet OS installs or specific OS patches/add-ons etc. In case it is provided by an external purchase of the service.	C.4 - Revitalizing the HW and technology of the development and implementation environment
Application development and programming modifications	The Hour	Installation, configuration and commissioning of an application (BYOL type or user-developed), system or service. Only if it is not part of the XaaS service.	C.5 - Application development and programming modifications
Application development and programming modifications	EURO	Installation, configuration and commissioning of an application (BYOL type or user-developed), system or service. Only if it is not part of the XaaS service and is provided by an external purchase of the service.	C.5 - Application development and programming modifications
Customization of solutions/ICT services	The Hour	Modifying the solution beyond the basic installation, configuration (e.g. tuning, optimizing operational parameters, etc.) Only if it is not part of the XaaS service.	C.6 - Customization (setting parameters) of the application
Customization of solutions/ICT services	EURO	Modification of the solution beyond the basic installation, configuration (e.g. tuning, optimization of operational parameters, etc.) Only if it is not part of the XaaS service and is provided by an external purchase of the service.	C.6 - Customization (setting parameters) of the application
Integration of the solution/ICT service to other applications/systems	The Hour	Integration to other system(s).	C.7 - Application integration to other applications
Integration of the solution/ICT service to other applications/systems	EURO	Integration to other system(s) if provided by external purchase of service.	C.7 - Application integration to other applications
Data acquisition, data migration	The Hour	Number of hours to import, manual data entry or data migration.	C.8 - Data acquisition, data migration
Data acquisition, data migration	EURO	External purchase of a service to provide import, manual entry or data migration if not part of the XaaS service.	C.8 - Data acquisition, data migration
Testing	The Hour	Includes functional, stress (performance), penetration testing.	C.9 - Testing

Circulation	Unit	Comment	Entry for
Testing	EURO	It includes functional, stress (performance), penetration testing, in the form of external purchase of services.	C.9 - Testing
User training	The Hour	Number of hours for user training.	C.10 - User training
User training	EURO	Training of users through external purchase.	C.10 - User training
Acceptance and verification operation	The Hour	Number of hours per run, commissioning of the solution in the cloud.	C.11 - Acceptance and verification operation
Acceptance and verification operation	EURO	Start-up, operationalization of the solution in the cloud, by external purchase and if it is not already part of the XaaS service.	C.11 - Acceptance and verification operation
Cybersecurity preparation	The Hour	Setup, configuration, documentation of the solution setup to meet security requirements (e.g. authentication, authorization, data security during transmission and storage.	C.12 - HW and SW implementation for KB, security implementation, audit
Security project, audit	EURO	Costs associated with an audit performed by an external company may include a security project.	C.12 - HW and SW implementation for KB, security implementation, audit
Other	The Hour	Time estimate of activities that are carried out internally and that cannot be included in the above activity descriptions.	C.13 - Other direct costs of the solution
Other	EURO	If some activities are provided by contractors and cannot be included in the above headings, the costs according to the contractor's contract in EURO are given here. Cost of external consultancy/advice.	C.13 - Other direct costs of the solution

2.4.7 Incremental Solution Improvement Projects, Upgrade and Preservation Projects, Solution Termination, and Increased Cost of Use.

Category F, G and I costs are one-off costs in the **last year of the project** or after its completion.

The "Show as a one-off cost in the last year" field (YES - shown in the last year; NO - shown up to the length of the project) is for information only. The selection of this parameter is reflected from the sheet "**1. Initial Parameters**" and has an impact on the display in the sheet "**4. TCO Calculation and Comparison**".

The cost categories below are only filled in if they are above and beyond the cloud service, i.e. if they are not included in the price of the cloud service. Otherwise, the user does not fill in these cost categories.

2.4.7.1 Gradual improvement projects

If the solution is extended (or narrowed), cost category F can be used to calculate TCO.

> *Examples include expanding application functionality (for SaaS), increasing the number of users or upgrading the technology infrastructure and solution architecture. Or implementation of artificial intelligence and enhanced security features.*

Circulation	Unit	Comment	Entry for
Gradual improvement projects			
Functional (process) innovation development projects	The Hour	Costs for process and solution functionality adjustments, costs for internal roles.	F.1 - Functional (process) innovation development projects
Functional (process) innovation development projects	EURO	Costs for process and functionality modification of the solution, costs for an external supplier.	F.1 - Functional (process) innovation development projects
Technological development projects	The Hour	Cost of additional technical updates to the solution, cost of internal roles.	F.2 - Technology development projects
Technological development projects	EURO	Costs for additional technical updates of the solution, costs for an external supplier.	F.2 - Technology development projects
Roll-out projects	The Hour	Costs associated with deploying the solution into operation, costs for internal roles.	F.3 - Roll-out projects (extension to other users, organisations)
Roll-out projects	EURO	Costs associated with the deployment of the solution into operation, costs of external supplier.	F.3 - Roll-out projects (extension to other users, organisations)
Solution (cost) optimization projects	The Hour	Solution cost optimization (e.g. HW consolidation), internal role costs.	F.4 - Solution optimization projects
Solution (cost) optimization projects	EURO	Cost optimization of the solution, cost of external supplier.	F.4 - Solution optimization projects

2.4.7.2 Upgrade projects

Costs associated with upgrading application software in the form of BYOL.

Circulation	Unit	Comment	Entry for
Upgrade projects			
Application upgrade projects	The Hour	Application layer upgrade costs, internal role costs.	G.1 - Application upgrade projects
Application upgrade projects	EURO	Costs associated with application layer upgrades, external supplier costs.	G.1 - Application upgrade projects

2.4.7.3 Preservation and termination of the solution

Category I costs. Preservation and termination of the solution shall be used by the user to calculate the cost for an exit strategy to terminate the service in the cloud and move to another cloud solution or to on-premises.

Circulation	Unit	Comment	Entry for
Preservation and termination of the solution			
Archiving, preservation and attenuation solutions	The Hour	Cost of internal roles.	I.1 - Archiving, preservation and solution attenuation
Archiving, preservation and attenuation solutions	EURO	Cost of external supplier.	I.1 - Archiving, preservation and solution attenuation
Preparing data for migration from the solution on termination	The Hour	Cost of internal roles.	I.2 - Preparation of data for migration from the termination solution
Preparing data for migration from the solution on termination	EURO	Cost of external supplier.	I.2 - Preparation of data for migration from the termination solution
Disposal of solution components	The Hour	Cost of internal roles.	I.3 - Disposal of solution components
Disposal of solution components	EURO	Cost of external supplier.	I.3 - Disposal of solution components

2.4.7.4 Increased costs of use

Cost category H. Increased usage costs are ongoing. These are costs that could not be predicted at the time the project was commissioned. They include extra costs related to training, training, unplanned outages and downtime, or other unforeseen events (increase in the number of users, change in legislation, geopolitical situation).

Circulation	Unit	Comment	Entry for
Increased costs of use			
Cost of lost productivity - Training	Hour/year	Cost of internal roles.	H.1.1 - Training
Cost of lost productivity - Training	EURO/year	Cost of external supplier.	H.1.1 - Training
Cost of lost productivity - Downtime and outages	Hour/year	Cost of internal roles.	H.1.2 - Outages and disruptions
Cost of lost productivity - Downtime and outages	EURO/year	Cost of external supplier.	H.1.2 - Outages and disruptions
Costs associated with using the solution	Hour/year	Cost of internal roles.	H.2 - Costs associated with the use of the solution
Costs associated with using the solution	EURO/year	Cost of external supplier.	H.2 - Costs associated with the use of the solution

2.4.8 Other costs not attributable to the life cycle phase of the solution

In general, the costs of the Operating and Administrative overhead categories are not considered for a cloud service because the introduction of a cloud service does not usually impact the user's overhead.

An example is filling a director position that will have the same overhead costs in both on-premises and cloud solutions, it is not anticipated that overhead employees would be laid off when moving to a cloud service. Should such a situation arise, the user will reflect this in this cost category. The operational activities of each role are addressed in cost category D. Operation and support of the solution where no overhead staff is involved.

Circulation	Unit	Comment	Entry for
Other costs not attributable to the life cycle phase of the solution			
Operating overhead	EURO/year	Annual costs in relation to assets (building, equipment, HW+SW, furniture, etc.)	Z.1 - Other operating overheads
Operating overhead	EURO/ lump sum	One-off costs in relation to assets (building, equipment, HW+SW, furniture, etc.)	Z.1 - Other operating overheads
Administrative overhead	EURO/year	Annual costs in relation to employees who are not costed into the project within roles (managers, directors).	Z.2 - Other administrative overheads
Administrative overhead	EURO/ lump sum	One-off costs in relation to employees who are not costed into the project as part of their roles (managers, directors).	Z.2 - Other administrative overheads

2.5 TCO Calculation and Comparison

In Sheet **4 TCO Calculation and Comparison,** the eGC Calculator user sees summary results that are automatically populated and calculated from the input values entered in Sheet **1 Initial Parameters**, Sheet **2 On-premises Input Data**, and Sheet **3 Cloud Input Data**.

Warning:

Non-payers of** VAT always evaluate the price **in EURO including VAT.

VAT payers** always evaluate the price **in EURO without VAT.

These results in Sheet **4 TCO Calculation and Comparison** can be used for:

- TCO calculation for individual information system
- TCO calculation for on-premises and cloud separately
- TCO calculation for hybrid solutions
- the results of the comparison of different versions of TCO (on-premises solution versus cloud solution, or comparison of hybrid solution with one of the previous solutions).

Sheet **4 TCO Calculation and Comparison** provides information on:

- the difference in cost between on-premises and cloud (or hybrid) solution
- the difference in cost per user (if the number of users is relevant for the service under consideration and this is specified in sheet **1 Initial parameters**)
- the difference in the number of MD (man-days) required for the individual solutions compared.

For a clearer orientation, the output data in Sheet **4 TCO Calculation and Comparison** is supported by a graphical display:

- TCO for the entire duration of the project
- TCO per user for the entire duration of the project
- decomposition of total costs by year
- decomposition of the total cost per user in each year.

The detailed output information in Sheet **4 TCO Calculation and Comparison** is displayed by cost category for the on-premises version, the cloud version or the hybrid solution. Costs are broken down by year, based on the duration of the project.

If the user has selected to display costs in category A when entering input data in sheet **1 Initial parameters.** Preliminary analysis, procurement, selection and purchase, B. Hardware and Software Acquisition, or C. Development, Implementation, Integration, and Testing in the first year only, this decomposition of costs over time is locked and will only appear in the cells for the first year of the project.

If the user has selected to display costs in category F. Phased Improvement Projects, G. Upgrade Projects, or I. Solution Preservation and Closure Projects only in the last year, this decomposition of costs over time is locked and will only appear in the cells for the last year of the project.

The other cost categories are always entered as annual and are linked to the length of the project.

2.6 Financial comparison summary

In Sheet **5 Financial Comparison Summary,** the eGC Calculator user sees summary results that are automatically populated from the resulting values in Sheet **4 TCO Calculation and Comparison**. These results are used to quickly compare the specified solution options. A simple evaluation of the individual solution options entered and a comparison of the comparability of the solutions is shown, where the financial difference for each solution of 2% is considered as a comparable solution.

2.7 Abbreviations and terms used

Abbreviation/concept	Explanation
Appliance	A device combining hardware, software or firmware designed for a specific need (database appliance, appliance combining router and firewall functions, etc.)
BYOL	Bring your own license - option to transfer purchased licenses to the cloud
DB	Database
DC	Data Center
eGC	eGovernment cloud
eGC calculator	Excel spreadsheet for calculating TCO
Hybrid solutions	Solution combines on-premises and Cloud
IaaS	Infrastructure as a Service
KB	cyber security
Managed service	Complete management of a selected IT area by an external supplier (servers, networks, applications, cyber security)
MD	Man day, man day
OHA	Department of the Chief Architect
On-premises	Own infrastructure operated in its own datacentre or server room
Outsourcing	Complete or partial takeover of IT and operations by an external supplier
OVM	Public authority
PaaS	Platform as a Service
SaaS	Software as a Service
SAN	Storage Area Network
TCO	Total Cost of Ownership. A method of assessing the total cost of ownership of a product or service. TCO is used to express the complete cost of an investment and its operation, taking into account not only the purchase price but also the expenses incurred by owning the goods being evaluated. For the case of eGC, the TCO evaluates the cost of running the service in the government or commercial part of the cloud.
XaaS	General designation for IaaS, PaaS, SaaS services