

PROJECT **E2GAS**

**Benchmarking European Gas  
Transmission System Operators  
APPENDIX**

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**swiss economics**

# Cost Reporting Guide (Call C) E2GAS PROJECT

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## Disclaimer

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## Version history

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# Summary

The development of a transmission system cost benchmarking poses several methodological challenges, but the ultimate quality of the outcome stands and falls with the accuracy and comparability of the reported data on costs and asset base. To pursue these aims, the e<sup>2</sup>GAS applies a functional decomposition of gas TSOs activities and costs, which not only implies consistent and transparent allocation of costs from the integrated transmission operators, but also the notion of a common “base level” grid operation and investment level.

The earlier e<sup>3</sup>GRID project for electricity TSOs and the feasibility study pe<sup>2</sup>GAS to this project highlighted a number of critical interfaces between the benchmarked activities and the organizational and accounting reality of the integrated transmission system operators. There is substantial diversity in the way operations are organized, expended and costs allocated, all of which affect the benchmarking. Cost data collection relying directly on actual practices will therefore be arbitrary and incomparable in the separation and allocation of common activities.

This guide addresses this need for an unambiguous cost reporting of the benchmarked activities in construction and maintenance by first defining the transmission service functions such as grid planning and construction. Then, five important principles for the cost reporting are introduced: capitalization, correspondence, separation, verifiability and comparability. The cost-type section of the guide applies the principles to determine the reporting of benchmarked costs in a manner that facilitates reporting, verification and validation. The guide is closed by providing the reporting format used in e<sup>2</sup>GRID.

The deadline for data collection for Call C is four weeks after the issue of V1 of this guide (X refer to drafts).

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# 1. Introduction

## ***Background***

- 1.01 This Cost Reporting Guide is developed to support the e2GAS benchmarking project for gas TSOs.
- 1.02 The aim of the guide is to outline the general principles used and some important choice to be made in the cost reporting. The cost reporting template does not contain the information given in this guide in order to improve the revision management.
- 1.03 As far as appropriate, the guide builds on material and experiences from the e<sup>3</sup>GRID 2012 benchmarking project for electricity TSOs and the feasibility study to this project, pe<sup>2</sup>GAS.

## ***Principles***

- 1.04 The guide concerns the reporting from the TSO accounting system for use in the e<sup>2</sup>GAS benchmark. It does not specifically address cost effects of planned or actual quality in grid operation, subject to other data collection.
- 1.05 Any benchmarking is an imperfect attempt to create comparability across heterogeneous firms with varying investment profile, asset age, technical standards and accounting principles. As such, the results of the exercise cannot be directly used to inform detailed decisions as to the valuation and maintenance of grid assets. Omission of specific costs or functions in the definition of the benchmarked entity does not constitute claim of the past or current possibility to operate the organization with the given resources. This disclaimer is important to highlight when using the final or decomposed results from the e<sup>2</sup>GAS benchmarking in regulation.



**Objectives**

- 1.06 According to the Project Plan, the e<sup>2</sup>GAS involves a number of data calls for information
- 1) *Operating cost, C*  
*Scope and decomposition of costs to be reported in the benchmarking, methodology and definitions.*
  - 2) *Asset data X and output indicators Y*  
*Asset data and technical characteristics, data related to system services performed.*
  - 3) *Operator Specific Conditions Z*  
*Guidelines for submission of cost drivers, costs and asset types that have been omitted in the other calls for some individual operator.*
- 1.07 This guide and its associated reporting template constitute Call C above.

## 2. System description

2.01 The fundamental objective of a transmission system operator is to transport gas to distribution networks and other connected clients.

2.02 By distinguishing activities the autonomy and independency of an operator may be put in a correct context to enable, among other things, performance assessments. The activities are (more detailed description below):

**F**     **Grid ownership**  
**P**     **Grid planning**  
**C**     **Grid construction**  
**M**     **Grid maintenance**  
**T**     **Gas transport and metering**  
**A**     **Administrative support**

*G*     *Gas storage operations (out of scope)*  
*L*     *LNG terminal operations (out of scope)*  
*S*     *System operations (out of scope)*  
*X*     *Market facilitation (out of scope)*  
*O*     *Any other activity (out of scope)*

2.03 Some activities are strategic with long-term impact on system performance. Others such as T are operational with comparatively less long-term system-wide impact. The ownership is normally tightly connected to regulatory and institutional practices. The administration activity is indirect and delivers no specific service to the grid. Some TSOs may have further regulated or non-regulated activities, which can be captured by the residual activity O.

### **F Grid ownership**

2.04 The grid owner ensures the long-term minimal cost financing of the network assets and its cash flows, including debt financing, floating bonds, equity management, general and centralized procurement policies, leasing arrangements for grid and non-grid assets, management of receivables and adequate provision for liabilities (suppliers, pensions, etc). The purely financial part of grid ownership (the cost of external capital) is not benchmarked in this project. To compare the financial costs for the operators, a specific analysis

would be necessary to control for ownership structure, risk ratings and financial leverage with respect to national regulation. The grid owner function is evaluated through a standardized capital expenditure resulting from the original investments, corresponding to a comparable capital cost for the grid assets.

### ***P Grid planning***

- 2.05 The analysis, planning and drafting of gas network expansion and network installations involve the internal and /or external human and technical resources, including access to technical consultants, legal advice, communication advisors and possible interaction with European, governmental and regional agencies for preapproval granting.
- 2.06 Grid planning also covers the general competence acquisition by the TSO to perform system-wide coordination, in line with the IEM directive, the TEN corridors and the associated ENTSOG tasks. Consequently, costs for research, development and testing, both performed in-house and subcontracted, related to functioning of the transmission system, coordination with other grids and stakeholders are reported specified under grid planning P.

### ***C Grid construction***

- 2.07 The grid construction activity is about implementing the plans from the grid planning once all necessary authorizations have been granted. Construction involves tendering for construction and procurement of material, interactions, monitoring and coordination of contractors or own staff performing ground preparation, disassembly of potential incumbent installations, temporary site constructions and installations, installation of equipment and infrastructure, recovery of land and material, test, certification and closure of the construction site.
- 2.08 In particular, all expenses related to site selection and environmental impact analyses are classified as grid construction since such expenses normally are capitalized with the asset investment.
- 2.09 Costs related to the expropriation of land for construction, remodeling or dismantling of grid assets, including direct legal costs for the process and costs potentially paid to claimants as consequences of legal proceedings are to be excluded as country-specific costs out of scope (in sheet "global P&L and out of scope"), see Section 3 below.

### ***M Grid maintenance***

- 2.10 The maintenance of a given grid involves the preventive and reactive service of assets, the staffing of facilities and the incremental replacement of degraded or faulty equipment. Both planned and prompted maintenance are included, as well as the direct costs of time, material and other resources to maintain the grid installations. It includes routine planned and scheduled work to maintain the equipment operating qualities to avoid failures, field assessment and reporting of actual condition of equipment, planning and reporting of work and eventual observations, supervision on equipment condition, planning of operations and data-collection/evaluation, and emergency action.

### ***T Gas transport and metering***

- 2.11 The transport task includes the operation of the injection, transport and delivery of natural gas through the gas transmission system, from defined injection points to connection points interfacing a client, a downstream network, a storage facility or an interconnection to another transmission network. The transport activity is enabled by the operations of compressors, valves and in-line stations. The assets utilized for transport constitute the pipeline system characterizing the TSO. The operational expenses for transport include staffing control centers, inspections, safety and related activities. The volume of energy (gas or electrical) spent in compressors for transport is also comprised in transport. Note that the cost for energy used in transport is standardized to control for structural comparability (Cf. art 5.17)
- 2.12 The TSO operates metering of the flow of gas in segments of the pipelines, at stations and at interconnections to other grids or terminals, including the IT-systems and administrative resources necessary for such services. SCADA and control stations are included in the transport and metering activity, both as investments and operating costs.

### ***G Gas storage***

- 2.13 The operation of gas storage facilities, including their maintenance and internal energy consumption, can be considered as separate service of gas storage, analogous to that of non-TSOs.
- 2.14 Costs concerning gas storage are separable according to the Directive 2009/73/EC Art 23 §1 (principle), Art 30§3 (obligation) and Art 41 §1(f), 6(a) (NRA authority to request data), both in terms of ownership of assets and their operation.

### **L LNG terminals**

- 2.15 The operation and maintenance of LNG terminals and peak-shaving plants, the interfaces with ports and other infrastructure, the administration and specific actions necessary to enable such operations are considered part of a specific service.
- 2.16 Costs concerning LNG terminals are in principle separable according to the Directive 2009/73/EC Art 23 §1 (principle), Art 30§3 (obligation) and Art 41 §1(f), 6(a) (NRA authority to request data), both in terms of ownership of assets and their operation.

### **S System Operations**

- 2.17 Within system operations for gas transmission, ancillary services are retained as defined in 2009/73/EC and congestion management (compliant with the ENTSO-G classification).
- 2.18 Ancillary services include all services related to access to and operation of gas networks, gas storage and LNG installations, including local balancing, blending and injection of inert gases, but exclude “facilities reserved exclusively for transmission system operators carrying out their functions”, 2009/73/EC Art 2(14).
- 2.19 System operations may entail delegating operational balance services to subordinate (regional) gas transmission coordinators with limited decision rights. If this delegation entails a contractual relationship with another grid, these costs are included in system operations to the extent that the services correspond to the services defined above.
- 2.20 ENTSO-G further considers the transparency in data exchange with the purpose of interoperability as a specific point in system operations. In consequence, costs related to this activity per se are to be considered as system operations.
- 2.21 Note that the day-to-day management of the network functionality, including personnel safety (instructions, training), equipment security including relay protection, operation security, coordination with operations management of the interconnected grids, coupling and decoupling in the network and allowances to contractors acting on the live grid are included in the transport activity T. This entails asset used or leased, own and subcontracted staff and other costs.

### **X Market Facilitation**

- 2.22 The classification of ENTSO-G for market facilitation services includes capacity allocation mechanisms, congestion management,

incremental capacity auctioning mechanisms, balancing and tariff structure. For the purposes of this benchmarking, the market facilitation activity is composed uniquely of direct expenses related to the contractual relations excluding transport and storage, including purchase and sales of natural gas, capacity from interfacing networks or reserves offered to clients. The activity has no eligible assets and no staff costs.

### **A Administrative Support**

- 2.23 With administration, we refer all costs related to the general management of the undertaking, the support functions (legal, human resources, regulatory affairs, IT, facilities services etc.) that are not directly assigned to an activity above. Central management, including CEO, Board of directors and equivalent is also explicitly included.
- 2.24 In principle, the residual assets for a gas transmission system operator (e.g. office buildings, general infrastructure) could be considered as assets for Administration. However, to the extent that this entails the incorporation of land, land installations and non-grid buildings in the analysis, all of which are susceptible to be country specific investments, such elements are listed in section 2c) of out of scope costs and are hence excluded from the benchmarking.

### **O Other activities**

- 2.25 Exceptionally, a TSO may have marginal activities that are not covered by the classification above, such as external operator training, field testing for manufacturers, leasing of land and assets for non-transport use. These activities should be listed, the costs and assets should be specified and excluded from the benchmarking.

### **Summary**

- 2.26 The benchmarking scope includes the main transport function for a gas transmission operator, the assets and costs necessary to maintain a going concern. Whenever relevant, the costs may be standardized to assure comparability, e.g. for labor and energy purchased.
- 2.27 Activities that are not commonly performed (gas storage and LNG terminals) are excluded.
- 2.28 Costs in system operations and market facilitation that result from country-specific, time-specific or structurally incomparable processes (ancillary services, capacity reservation contracts, reserves etc) are also excluded from the benchmarking.

- 2.29 The remainder of this guide provides an example of how to recreate this basis of comparison from an arbitrary organizational model under separated accounts as governed in EC directive 2009/73/EC.

### 3. Out-of-scope items

- 3.01 As the objective of the e2GAS study is to compare the relative performance of TSOs in Europe, it requires a set of structurally comparable units. Although corrections can be made for many specific conditions, such as labor cost differences, equipment specifications and service requirements, certain costs are intrinsically related to national cost levels and legislations. Including such costs in the benchmarking, even after some partial adjustments, would potentially create misleading targets and decrease the applicability of the results. Also, the benchmarking is done on the level of operating costs and financial elements of the P&L. Therefore, all costs and revenues linked to extraordinary elements are out of scope.
- 3.02 Starting from audited profit and loss accounts (1), certain costs are to be specified and excluded in their entirety from the study. This also means that their amount will have to be audited by an NRA, auditor or equivalent.
- 3.03 Three types of costs are out of scope:
- 1) *Extraordinary costs (2a)*
  - 2) *Out-of scope activities, i.e. G, L, X, S, O (2b)*
  - 3) *Non-controllable cost types as listed below (2c)*

#### **Extraordinary costs**

- 3.04 Costs that are classified as extraordinary in the annual accounts should be specified and excluded, subject to the validation of the NRA.

#### **Out of scope activities**

- 3.05 As discussed in the previous Chapter, the assets and costs for out-of-scope activities are to be specified prior to exclusion. The specification is made to enable validation and control, the corresponding costs and investments are not included in the benchmarking.

#### **Specific non-controllable costs**

- 3.06 The following cost types (2c) are out of scope: all costs related to material and immaterial assets related to land or buildings, all types



of taxes and levies on properties and activities. More specifically, this concerns:

- 1) *Land-owner compensation*
- 2) *Right-of-way and easement fees*
- 3) *Taxes on property and operation*
- 4) *Depreciation on land, buildings and improvements*
- 5) *Rents and leases of land and buildings*

### ***Land-owner compensation***

3.07 Non-capitalized payments to property owners as a result of a legal process (e.g. expropriation or compensation agreement), procurement or negotiation, related to the damage or injury of land, and /or the right to use land for the activities of the TSO. The direct costs for judicial assistance, court fees etc for legal processes (terminated or non-terminated) related to the use, damage or injury of land for the activities of the TSO are also out of scope.

3.08 Motivation: land-owner compensation is inherently country-specific, they depend on the value of the land used, the national rules for compensation and the national regulation for infrastructure construction.

### ***Right-of-way and easement fees***

3.09 Non-capitalized payments to third parties as a result of a legal process (e.g. expropriation or compensation agreement) or negotiation related to the use of specific land or installations (roads, waterways) for the activities of the TSO.

3.10 Motivation: compensations to third parties are inherently country-specific, they depend on the legal framework for collateral damage, the national rules for compensation and the national regulation for infrastructure construction.

### ***Taxes and levies***

3.11 Non-capitalized state, municipal and regional taxes, levies and public fees paid for the ownership of specific assets (e.g. property taxes, packaging), to use of specific processes (e.g. environmental levies), for investments and procurement (stamp taxes, legal fees, customs), for non-claimed value-added taxes (foreign VAT), and taxes paid on declared annual profits. Note that taxes, charges or fees related to salaries, pensions and other payroll items are considered in scope.

- 3.12 Motivation: taxes and fees are inherently country-specific, and exogenous.

***Depreciation on land, buildings and improvements***

- 3.13 Depreciations on all land (if applicable), buildings, building improvements, land/site improvements, and building infrastructure are part of the out of scope. However, depreciation related to vehicles, furniture and equipment related to joint or non-grid use, including communication and computer equipment are in scope of the study.
- 3.14 Motivation: depreciation is a country-specific accounting allowance for the wear and tear of an asset. Buildings (offices) and land used by a TSO are by definition country-specific and reflecting the value of real estate in the specific country. The depreciation is not structurally comparable.

***Rent of land, buildings and infrastructure***

- 3.15 Rents and leasing fees paid for the right to use land, buildings, building improvements and/or land/building infrastructure are excluded. However, rents that include other assets or equipment, such as vehicles, communication and computer equipment are in scope.
- 3.16 Motivation: for neutrality with respect to owned or leased assets in the category buildings and land rent and leasing fees are excluded just as depreciation above.

## 4. Principles

- 4.01 The functional decomposition of costs for the reporting in E2GAS is based on the five predetermined principles capitalization [CAP], correspondence [COR], separation [SEP], verifiability [VER] and comparability [COM]. These are described below and referred to thereafter in the document.

### ***CAP. Capitalization principle***

- 4.02 Capital expenditure means the cost of the asset including the cost to put it in place. Capital expenditure for equipment means the net invoice price of the equipment, including the cost of any initial modifications, attachments, accessories, or auxiliary apparatus necessary to make it useable for the purpose for which it was acquired. It also includes the cost of incoming transportation incurred on shipments from external suppliers. Equipment means a grid asset of non-expendable, tangible, property which stands alone, is complete in itself, does not lose its identity, and has a useful life of more than one year. The Capitalization principle [CAP below] is applied as threshold and is a supplementary information for the other rules that are applied.
- 4.03 Enhancement parts with an acquisition cost of at least 6,500 Euro, which permanently increase the value of an item of minor equipment to 50,000 Euro or greater and are acquired within 120 days of the acquisition date of the item of minor equipment will have their cost added to the cost of the item of minor equipment being enhanced and both the enhancement part(s) and the item of minor equipment will be capitalized; otherwise, they will be expensed.
- 4.04 By definition, any asset that benefits more than one fiscal period potentially could be classified as a capital asset. As a practical matter, however, their only higher cost assets capitalized. That is, TSOs specify a *capitalization threshold* that assets must exceed if they are to be capitalized. The TSO are free to select different capitalization thresholds for different capital asset classes, just as they are free to apply different depreciation methods to different capital asset classes. To maintain comparability [COM] while assuring a feasible reporting, we accept the investment data with specification of the capitalization threshold per asset category. The capitalization threshold per asset category has to be specified in the Cost Reporting template.

## ***COR. Correspondence principle***

- 4.05 The accounting objects of the investment stream data should correspond to the grid assets reported in the asset reporting sheets. This does not apply to associated assets such as SCADA and inline stations. Thus, any asset included in the asset data base should have its correspondence in terms of investment data in the investment stream reporting. Analogously, investments in assets excluded from the asset data base should normally not be included in the investment stream (see specifications in chapter 5).

## ***SEP. Separation principle***

- 4.06 Primarily, the functional separation into the benchmarked range of activities (in particular construction and maintenance) is used to define the costs and assets. For specific activities, the separation has been explained above. However, for joint costs a specific principle applies, see VER below, see also chapter 2.
- 4.07 The separation principle implies that the benchmarked entity is a *viable* organization, which means that it in principle should be comparable to the overall cost from a subcontracting offer for the corresponding services. This means that the entity does carry the necessary human and technical management resources to cover its operational planning and management functions, as well as the cost of the technical know how necessary to define the tasks of the subcontractor.

## ***VER. Verifiability principle***

- 4.08 According to the verifiability principle, joint assets or costs should not be disaggregated beyond the point of a verifiable reference. This means, e.g., that an arbitrary allocation of fixed costs to an activity is inferior to one of three alternatives: complete exclusion of costs, complete inclusion of costs and inclusion of net effect of costs and revenues. The last application would imply that a potentially non-regulated activity (revenue source) is contributing to the operating efficiency of the firm. For joint costs related to administration, a pragmatic cost allocation key may be chosen to curb the incentives to reassign dedicated resources to joint units.
- 4.09 Whenever the verifiability regarding the allocation of a cost or asset is subject to ambiguity, it is the responsibility of the reporting entity to provide documentation regarding (i) used principles for its allocation and (ii) the motivations for the principles applied. In absence of satisfactory documentation, SUMICSID and Swiss

Economics may reassign costs and/or assets to benchmarked costs as the default option.

## **COM. Comparability principle**

- 4.10 Although respecting the separation principle, a given cost item may be unique, inevitable or uncontrollable. Certain costs of this type, such as land owner compensations, right-of-way rents, property taxes, are excluded from the benchmarked cost since they distort the comparability of the data without adding any useful information about the individual performance. Exclusions of this type are explicitly declared, either in this guide or through communication on specific country specific costs (Call Z) in response to motivated TSO requests.

## **Reporting formats**

- 4.11 Although the level at which the e<sup>2</sup>GAS project is situated is the activity level as in Chapter 2, the reporting may optionally be based on subactivities, summing to the defined activities. This subdivision is voluntary and not subject to validation in the project.
- 4.12 The advantage of this is to offer flexibility to the reporting TSOs while at the same time enabling the construction of a multiplicity of cost measures using a building block approach to be used in different parts of the benchmarking. This reporting format also facilitates the standardization of included costs elements and the verification of the reporting against public accounts.
- 4.13 The details of what to report is given in the Excel cost reporting template and summarized in Appendix A to this guide.

## **Cost elements**

- 4.14 Each activity in which a function is decomposed must be described in terms of the following cost elements:
- 1) *the labor cost of the direct personnel, i.e. staff directly involved in the activity or service that is concerned.*
  - 2) *the cost of services purchased externally to perform the activity or service concerned, such as maintenance, administration (billing, HR), construction; here a distinction is made between:*
    - services that are not capitalized on the books, but that are expensed in the profit and loss accounts of the year in which they were purchased
    - services that are capitalized in the books, and whose cost is then split over several years through the depreciation cost. Here, a further distinction is made between :
      - depreciation cost of grid related assets (software development)

- depreciation cost of other assets (e.g. ICT equipment, patents)
- 3) *the cost of goods used to perform the activity or offer the service concerned; here a distinction is made between:*
  - goods (excluding energy) that are not capitalized in the books, but that are expensed in the profit and loss accounts of the year in which they were purchased; to this type of cost is added, the cost of services purchased externally in order to perform the activities or be able to offer the own services
  - cost for energy (gas, electricity, ...)
  - goods that are capitalized in the books, and whose cost is then split over several years through the depreciation cost. Here, a further distinction is made between :
    - depreciation cost of grid related assets (e.g. compressors)
    - depreciation cost of other assets (e.g. ICT equipment, cars)
  - goods that are leased, in which case the leasing fees have to be reported
- 4) *indirect costs of management and support services that are situated at the level of the function*
- 5) *other costs that are, by definition, not included in any of the categories mentioned above*
- 6) *from this total will be deducted:*
  - capitalized work that was performed for own account (only applicable to the function C – Grid Construction)
  - revenues that are generated by the sale of products or services that are not part of the benchmarked outputs, e.g. working hours by internal staff sold to other companies.

4.15 Default reporting for a cost element is unspecified services (5), direct expense.

4.16 The decomposition is identical for all activities although certain fields may be empty in normal operations (e.g. cost of energy under P).

**Grid assets**

- 4.17 The reporting of grid assets is defined in a separate guide (XY). For the purposes of this description, we offer a non-exhausting list as example.
- 4.18 Grid assets for transport are those directly pertaining to the pipeline system; pipelines, compressors, pressure regulators, controllers, in-lines stations (block valves and pig traps), fire protection equipment, metering stations, as well as control rooms and SCADA. The buildings and ground preparations (e.g. access roads) shielding or providing access to the above assets are also defined as grid assets.
- 4.19 Non-grid assets are typically land and buildings for offices and other uses, computers, cars, office equipment and various supplies.

## 5. Detailed guidelines

5.01 Below, we give an overview of specific costs and their treatment in the e<sup>2</sup>GAS reporting. For each cost, explicit reference is given to the principle(s) applied to determine its inclusion or exclusion in brackets [ETC], cf. above. As mentioned above, the guide below is primarily of use for the decomposition method to exclude certain costs, cf. Appendix A.

5.02 For any given cost item in the unbundled accounts, allocation should be made to an activity (e.g. P) as either a direct cost (by identification of type or source), by indirect cost, or by default. Joint costs, such as joint general expenses related to administration and support are assigned to activities based on an allocation key.

### ***Allocation key***

5.03 The allocation key for joint administration and support expenses in E2GAS is defined by project management and applied to all operators. There is no need to define or calculate individual allocation keys.

5.04 The default allocation key used in similar projects is staff intensity in full time equivalents (FTE). The rationale is based on its verifiability and generality as a cost driver for administrative costs, expenses and services. Thus, separate reports should be made of the number of staff (in FTE) assigned to each function. [SEP]

5.05 Fulltime equivalent staff (FTE) is calculated as the ratio of total number of hours effectuated by TSO (not subcontracted) staff divided by total annual working hours.

5.06 In the absence of staff data and/or in presence of strong dominance of subcontracting for the benchmarked activities, the project team may define an alternative allocation key, e.g. direct expense per activity.

5.07 Direct functional assignment is based on hierarchical arguments (to whom the staff is reporting to) and/or task consistency (staff responsible for activities included in the functional description). Two examples in a non-conforming organization: (i) An IT-engineer works with service and development of software in a department headed by the responsible for maintenance. By hierarchy, the engineer is assigned as staff in function M. (ii) A staff member in a support unit is uniquely charged with monitoring and closure of supplier relations within existing construction contracts. By virtue of



the task consistency, the staff member is assigned to function C. The assignment follows the principles internally accepted in each TSO, no specific documentation is necessary.

- 5.08 Default allocation of joint administration and support costs is to T in case of missing information on staff count.

## ***Sales and revenues***

- 5.09 The regulated revenues for core functions are not included in the reporting. The only revenues that may be relevant are fees and rents collected for the use of in-house staff for external services and use of assets by other operators. [COR]

## ***Operating expenses***

### ***Payroll costs: Functional staff***

- 5.10 The cost for staff includes all mandatory charges, pension allowances etc constituting the gross manpower compensation. [SEP]

### ***Payroll costs: Joint staff***

- 5.11 Payroll costs of the Board of Directors, Advisory Boards (similar) and Chief Executive Officer are considered central management and directly assigned to A. [COM, VER]
- 5.12 Payroll costs (including fringe benefits, pensions, employers' contributions and direct levies on salaries) for administrative (legal, accounting, controlling, communication, human resources) and support (security, information systems, office and equipment maintenance) that are not directly assigned to any function by virtue of 5.16 are considered *joint payroll costs* and consequently allocated to A. [SEP]
- 5.13 Possible settlements, compensations or pension costs directly related to previous engagements for staff that may be considered stranded social costs and are out of scope and be reported under (2c), subject to NRA validation.

### ***Purchase of services and goods***

- 5.14 Capitalized costs for grid assets should be reported as investments in the investment stream data. All extension investments and replacement investments above the activation threshold reported in 4.03 are included on the balance sheet; Replacements below the limit are included as cost of goods under activity T.

- 5.15 Purchases for non-outsourced maintenance are included in M. [CAP]
- 5.16 Purchase of energy for resale are direct costs for X. [SEP]
- 5.17 Purchase of energy for covering network losses and consumption in compressors for transport and regulation are allocated to T.

**General expenses: Functional**

- 5.18 Expenses related to supplies, minor tools, repairs, oil etc. that are directly related to grid installations, operations and maintenance are reported under respective function. [VER, COM]

**General expenses: Joint**

- 5.19 The non-specified operating expenses cover costs like office supplies, rental charges, insurance, traveling expenses, repairs, marketing, illumination, heat, etc. We also find costs for maintenance of non-grid assets (buildings, etc.) in this category. These costs are considered *joint general expenses* in A. [VER, COM, SEP]

**Services: Functional**

- 5.20 Costs related to legal processes (not related to such proceedings as described in 3.09), communication and third-party valuation, including feasibility and impact studies, are assigned to P. [COM]

**Services: Administration/overhead**

- 5.21 External services that are not functionally assigned by any of the articles above, or by virtue of 4.07, such as joint administrative and support services, costs for housing and facility services, are considered *joint external services*. [COM, VER].

**Services: Telecommunication costs**

- 5.22 Operational telecommunication costs related to the metering, control and supervision of the network are to be reported under T. This also includes costs for operating and maintaining SCADA, control rooms and monitoring equipment on pipelines, compressors and regulators. [VER]
- 5.23 Costs for telecommunication related to non-grid use (leased to other operators or to telecom operators, e.g. optical fibers) are to be specified to S, along with the corresponding revenues (if any).

**Services: Ground preparation**

- 5.24 Costs for ground preparation are to be reported under cost of services under C (construction), unless capitalized with an associated investment. [SEP]

**Services: Research and development**

- 5.25 The overall costs for research and development, both in-house and external services, are to be allocated to P. [COR, SEP, VER]

**Other operating expenses: Insurances**

- 5.26 Insurance premiums can be either directly assigned to functions or indirectly as joint insurance cover. Property and liability insurances premiums for construction or maintenance operations, including civil responsibility for third party damages related to grid assets, are assigned to M. If applicable, insurances related to the economic liability of market information, timeliness and/or financial operations are directly assigned to X. As *joint insurance expenses* in A are considered contracts for fire, property and liability on joint assets such as office buildings, cars, office equipment and staff. [COR]

**Other operating expenses: Leasing fees**

- 5.27 Leasing fees for assets (excluding buildings and land) in benchmarked activities are reported at the corresponding line.
- 5.28 Leasing fees for buildings and land are out of scope and excluded (Cf 3.15).
- 5.29 If leased components refer to grid assets that are not in scope (e.g. control equipment for an LNG terminal), then the corresponding leasing fee is out of scope and excluded. [COR]

**Depreciation**

- 5.30 As mentioned above (2.04) the actual capital costs and depreciation on grid assets are not used in calculations of the benchmarking, as they are based on nominal values, vary between countries and have a fiscal connotation. The reporting in the sheet is for validation purposes, consolidating with the accounting book value.
- 5.31 Depreciation of non-grid assets (equipment, vehicles and furniture are considered as joint costs under A unless they are attributed to specific function. [COM]

- 5.32 Depreciations for building and installations are out of scope and excluded (Cf. 3.13).

### ***Investment stream***

- 5.33 The investment stream data is reported when it occurred, not when the underlying assets are put into operation. [VER]. Appendix B of this guide describes the reporting template in detail.

### ***Upgraded grid assets***

- 5.34 Consider two cases: upgrading leading to asset category change (e.g. higher pressure class) and an upgrade to prolong the asset life time. In the first case, the investment is offset by a higher asset base. In the second case, we need to offset the upgrade by changing the CAPEX for the concerned asset to reflect the prolongation of the life time.
- 5.35 First, grid assets that are upgraded at a later time and that are in service during all or part of the benchmarked period are listed in the Asset Data Base in their upgraded quality at the year of upgrading, the same year the original asset is deleted from in the Asset Data Base (cf. Call XY). The corresponding upgrading investment is added to the investment column by asset class (pipelines, compressors, SCADA, other), respectively.
- 5.36 Second, grid assets that are subject to a life-time prolonging renovation at a later time and that are in service during all or part of the benchmarked period are listed in their initial category. The corresponding upgrading investment is added to the column "investments in upgrades (life time , not class)" in the sheet. The initial investment by asset class (pipelines, compressors, SCADA, other) is specified in the year of initial investment.

### ***Scrapped grid assets***

- 5.37 Grid assets that are used part of the benchmarked period and then scrapped are included in the investment stream at the year of original investment. The year of service withdrawal, the asset is deducted from the Asset Data Base. The cost of decommissioning net of any proceeds from the salvage of the item is reported under expenses in T, if not capitalized, or as "investment: other equipment", if capitalized.

***Spare parts***

- 5.38 The overall cost/investment in spare parts related to grid assets is to be included in either the investment stream (if capitalized) or the operating costs under M (if expensed) , c.f. 5.14. [SEP]

***Grid assets not in data base***

- 5.39 Asset-related buildings and land installations are considered implicitly included in the standard values for the grid assets (e.g. compressor station). Thus, costs for maintenance or repair of such installations are to be included in benchmarked costs (M) to the extent that they are not capitalized and included in the reported investment stream.
- 5.40 For specific grid assets of considerable value, see Call Z.

***Construction interest***

- 5.41 Interest during construction (bridging finance) is out of scope as a capital cost and not reported. Capitalized construction interest (or other financial costs) is reported in the investment stream and then removed.

***Taxes***

- 5.42 Direct costs for taxes are excluded by 3.11. In the case of capitalized (embedded) taxes in the investment stream data, report in the sheet.

## 6. Appendix A: Cost reporting sheet

### **Introduction**

- 6.01 The activities whose cost and efficiency levels will be benchmarked, can be split into three types :
- the purely operational activities, sometimes also called the vertical functions, which comprise grid planning (P), grid construction (C), grid maintenance (M) and transport & metering (T)
  - the joint support function (A), also called the horizontal function, whose cost is composed of the cost of the board + the general management, the central staff and other central services
  - the grid ownership (F), basically the cost of investment.
- 6.02 The activities templates are subdivided into several possible sub-activities. The reason for this is double :
- it is reasonable to suppose that most TSO use some form or another of Activity Based Costing, at a granularity level that suits their needs.
  - it is also reasonable to suppose that not all TSO use the same definitions in the description of the different activities. In this case, a note can be made regarding these differences, noting that the important distinction is between in-scope (T, P, C, M, A, F) and out of scope (S, X, O), not within the two categories.
- 6.03 Concerning the types of costs that are needed for the benchmark, the following ones are considered
- the labor cost of the direct personnel, i.e. the people directly involved in the activity or service that is described. Note that this information is the basis for labor cost adjustments.
  - the cost of services purchased externally in order to perform the activities or be able to offer the own services, and the cost of expensed goods, i.e. the cost of goods used to perform the activity or offer the service concerned. For both categories, a distinction is made between the following cases:
    - purchased services/goods that are not capitalized in the books, but that are expensed in the profit and loss accounts of the year in which they were purchased

- purchased services/goods that are capitalized in the books, and whose cost is then split over several years through the depreciation cost. Here, a further distinction is made between:
  - depreciation cost of grid related assets
  - depreciation cost of other assets (e.g. ICT equipment, cars)
- For goods, purchased energy is specified separately
- For goods, leasing fees (excluding buildings and land) are separated.
- indirect costs of management and support services that are situated at the level of the function (and thus not part of the joint support that is to be reported under function A)
- other costs that are, by definition, not included in any of the categories mentioned above
- from this total will be deducted:
  - the capitalized work that was performed for own account (only applicable to the function C – Grid Construction)
  - the revenues that are generated by the sale of the products or services that form the output of the activities considered, such as the sales of working hours to other companies or income related to commercial non-benchmarked services.

6.04 The amount thus obtained can be considered as the net cost of the activity or service, exclusive of the cost of joint services (see further). This is, in principle, also the cost as it should appear in the Activity Based Costing system, be it that, in the e<sup>2</sup>GAS project, some costs are «out of scope» since they are irrelevant as far as the (international efficiency) benchmarking is concerned. Cf section 3 of this guide.

6.05 When adding up the net costs of each function plus their shares in the joint services, we should obtain the same figures as published in the annual P&L accounts, provided the following adjustments are made :

- direct costs for out of scope activities
- taxes and fees
- the actual capital costs for debt
- the actual depreciations.

6.06 Provided these adjustments are correctly made, a validation of the data reported in the templates, through a comparison with the P&L

accounts that were published, is possible. Obviously, the contents and the costs of the «out of scope» elements will have to be certified either by the NRA or by a third party before they can be left out.

***Benchmarked TOTEX***

- 6.07 Benchmarked TOTEX is calculated as the sum of direct costs for the benchmarked activities, less the defined deductions and adjustments, adding the administration and joint costs according to the allocation key (see 5.03 ff) and the standardized capital expenditure (CAPEX) for the in-scope grid assets from the investment stream.



## 7. Appendix B: Investment stream sheet

### ***Introduction***

- 7.01 The investment sheet contains data for the in-scope assets
- the nominal investments per asset class
  - the investment values for upgraded
  - possible corrections for capitalized labor, taxes and planning costs

### ***Year of initial balance***

- 7.02 In the case of an opening balance, state the year, if not state earliest year for existing investments (later or equal to 1975).

### ***Activation policy***

- 7.03 State any difference in policy with respect to the assumptions in 4.02 and below.

### ***Currency***

- 7.04 State currency abbreviation at the year (row).

### ***Total investment (gross)***

- 7.05 This value is calculated as the sum of the following columns where the gross investment, excluding any corrections, depreciation and taxes should be reported:
- Investment: pipelines
  - Investment: controllers, meter stations, compressors
  - Investment: SCADA, telecom
  - Investment: other equipment
- 7.06 The differentiation in investment is subject to different techno-economic life times, i.e. the standard real annuities constituting CAPEX.
- 7.07 The default category is “Investment: other equipment”. The default techno-economic life time for investments in this category is the weighted life time for the assets added to the Asset Data Base in the specific year.

***Total upgraded assets (life time, not class)***

- 7.08 This value is calculated as the sum of the following columns where the gross investment for assets that are upgraded with respect to life time is reported:
- Upgraded: pipelines
  - Upgraded: controllers, meter stations, compressors
  - Upgraded: SCADA, telecom
  - Upgraded: other equipment
- 7.09 The default category is “Upgraded: other equipment”. The upgraded value cannot exceed the nominal investment per class in the same year. The prolonged life time parameters will be presented for consultation prior to the run.
- 7.10 The following columns are voluntary except 7.16. The data are used for various corrections of the investment stream. For all columns below, the default reporting is zero. The columns are summed, thus the same amount cannot figure in two different columns.

***Capitalized labor cost (internal and external)***

- 7.11 State the total amount a given year of capitalized labor costs (internal staff and outsourced).

***Capitalized planning costs (excluding labor as above)***

- 7.12 State the total amount of capitalized planning costs (excluding labor above).

***Capitalized costs for out-of-scope assets***

- 7.13 State the amount of out-of-scope assets (gross of any other exclusion; labor, interest etc).

***Capitalized financial costs (construction interest etc.)***

- 7.14 State the amount of capitalized financial costs (construction interest etc).

***Capitalized taxes, fees and levies***

- 7.15 State the amount of capitalized taxes etc.

***Construction labor as direct expense, direct subsidies and exceptional depreciation***

- 7.16 State the amount for the investments the given year that concerns direct labor costs (reported as cost of labor), direct subsidies (revenues from state or EU), and exceptional depreciation (write-down due to specific regulation). Note that this position will imply a readjustment between OPEX and CAPEX in the benchmarked cost.





**swiss economics**

# Asset and Output Reporting Guide (Call XY)

**E2GAS PROJECT**

**SUMICSID  
Swiss Economics**

**2015-12-1 / ver V1.2**

## Disclaimer

This is a cost reporting guide for the E<sup>2</sup>GAS project for benchmarking of gas transmission system operators, delivered by the authors, SUMICSID and Swiss Economics. The latest version of this document is always obtainable at the Worksmart platform.

The content has not been subject to any formal review, nor endorsement from authorities and does not imply future consideration of any submitted factor in regulatory proceedings.

The submitting TSOs or NRAs are the sole responsible for the correctness of their claims under their national regulation. Technical and economic questions can be posed to the team through the TSO Helpdesk at the Worksmart platform.

## Version history

Version	Date	Status	Concerns
X0.1	2015-10-23	Draft	NRA and TSO review release
X0.2	2015-11-06	Draft	Internal review
V1.0	2015-11-11	Release	
V1.1	2015-11-18	Release	Clarifications
V1.2	2015-12-1	Release	Minor changes, highlighted in blue

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# 1. Introduction

## *Background*

- 1.01 This Asset and Output Reporting Guide is developed to support the e<sup>2</sup>GAS benchmarking for gas TSOs.
- 1.02 As far as appropriate, the guide builds on material and experience from the e<sup>3</sup>GRID 2012 benchmarking project for electricity TSOs, the German benchmarking of gas TSOs from 2010 onwards, and the feasibility study to this project, pe<sup>2</sup>GAS from 2014.

## *Overview*

- 1.03 According to the Project Plan, e<sup>2</sup>GAS involves a number of data calls for information
- 1) Operating cost, C  
Scope and decomposition of costs to be reported in the benchmarking, methodology and definitions.
  - 2) Asset data X and output indicators Y  
Asset data and technical characteristics, data related to system services performed.
  - 3) Operator Specific Conditions Z  
Guidelines for submission of cost drivers, costs and asset types that have been omitted in the other calls for some individual operator.
- 1.04 This guide and its associated reporting template constitute Call XY above as part of the deliverable G2 (final release of data collection material).
- 1.05 A guide in draft format is labelled X. When released, the revision number is labelled V. The data collection starts at the final release of V1.0. Any revisions of this document and/or data templates will be uploaded to the Worksmart platform and a notification will be issued to registered participants.

## *Principles*

- 1.06 The asset guide X (Sections 3-5) concerns the reporting of the grid assets from the TSO asset registers for use in the e<sup>2</sup>GAS benchmark. It does not specifically address planned or actual quality in grid operation.
- 1.07 The output guide Y (Section 6) concerns the listing of output indicators that come from two sources: (i) TSO output data reported by the TSOs and (ii) a number of country-related indicators collected from open

sources. The output parameters inform the selection of output variables for the efficiency model. Some output parameters may also be used in sensitivity analysis after the run. Public parameters used in the calculations will be referenced and reproduced in subsequent reports. This version does not contain variables collected for the correction of specific cost parameters nor output specifications for out-of scope activities, e.g. indexes related to labor cost corrections.

## 2. System description

2.00 The following section gives a brief overview over the system description for the asset base of a gas TSO.

### *Transmission system*

2.01 The fundamental objective of a transmission system operator is to transport gas to distribution networks and other connected clients.

2.02 The gas transmission system is composed of different network parts characterized by the type of gas transmitted. There are two types of natural gas:

- 1) a low calorific value ("L gas") with a High Heating Value (HHV) between 9.5 and 10.5 kWh/m<sub>n</sub><sup>3</sup> and,
- 2) a high calorific value ("H gas") with a High Heating Value (HHV) between 10.7 and 12.8 kWh/m<sub>n</sub><sup>3</sup>.

### *Services and scope*

2.03 Gas transmission systems can cover for both qualities the following ranges of services:

- 1) Domestic gas **transport** for redelivery at a delivery point in the country;
- 2) International gas **transit** services without domestic gas distribution or supply along a route from a transit entry point to a transit exit point;
- 3) **System services**;
- 4) **Gas storage** services;
- 5) **LNG** services.

2.04 Associated activities are described in the Cost guide C.

2.05 In this benchmarking only the services 1) and 2) are considered. Both assets and costs for other services are excluded from the calculation of cost efficiency measures.

### *Assets and outputs*

2.06 Assets relevant for this benchmarking include components that are relevant to transport and distribute gas, essentially a pipeline network with its control system as described in more detail in Section 3 below.

2.07 The associated outputs are described in Section 6.

### 3. Asset description

#### *Overview*

- 3.01 To describe a pipeline network, locations, pipes, controllers/compressors and connection points can be distinguished, as illustrated in Figure 1. There is one sheet for each category in the template.
- 3.02 A **location** is a geographical location, for example the location of a connection point.
- 3.03 A **pipe** (gas pipeline) connects two locations.
- 3.04 A **controller/compressor** is located at location between two locations of different nominal pressure or at a connection point.
- 3.05 A **connection point** marks entry or exit of gas from network, e.g. injection from upstream suppliers or delivery to downstream networks.

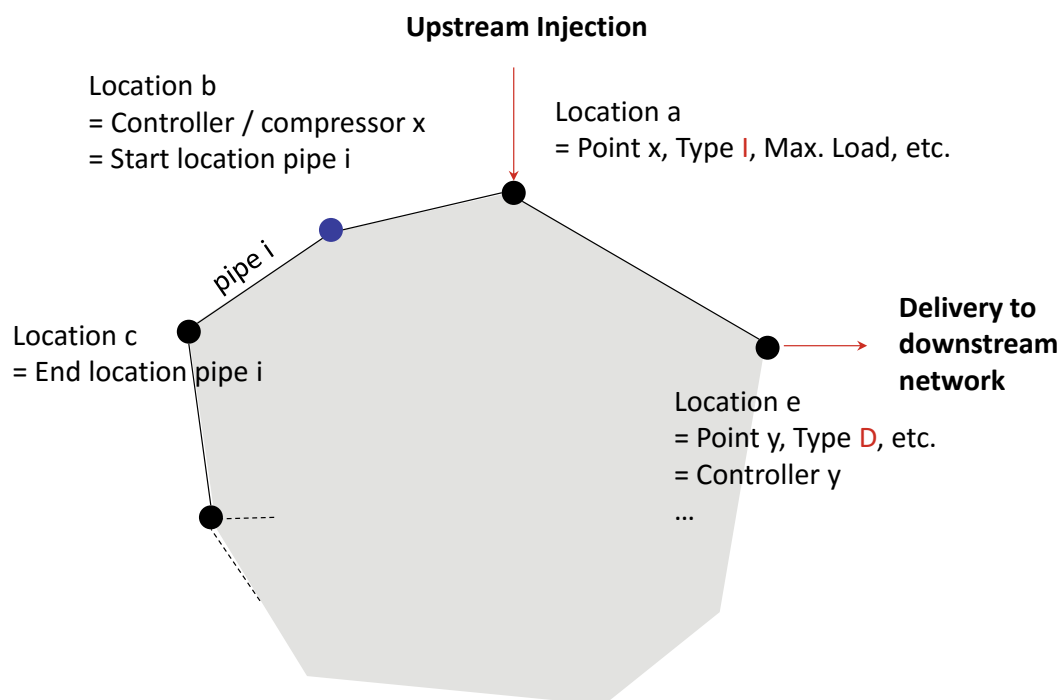


Figure 1 Scope and functions.

### ***Pipes***

- 3.06 The pipeline network transmits gas from the receiving points located at the borders of neighbouring TSOs and/or from LNG either to customers directly or through DSOs or for gas transit purposes to or from neighbouring TSO.
- 3.07 Pipelines / pipes are elementary sections of the pipelines system that are for example characterized by a nominal diameter or a specific Maximum Operating Pressure (MAOP). The network parts used for transport to (domestic) customers versus transit offtake often have different dimensioning. The pipeline is protected against external corrosion by an external coating and a cathodic protection system, alternatively through the use of other materials.
- 3.08 In-line stations (block valves and pig traps) are installed at regular intervals along the pipelines for safety and operational purposes. As they are correlated with network length, pressure levels and other factors for which data is collected for, such data are not collected in this call. Should local regulations be a cost driver in this regard (e.g. prescription of maximal distances between sectionalizing valves stations), this can be specified in Call Z.

### ***Pressure regulators/controllers and compressors***

- 3.09 Compressor stations are installed along the pipeline route in order to compensate pressure drops as the network develops. The pressure regulators are installations serving to regulate the gas flow in the system. There could also be metering stations with equipment for measuring, but not regulating, the flow through a given pipeline section.
- 3.10 Such assets are located at locations between two nodes of different nominal pressure or at a connection point where pressure is changed (e.g. in a delivery station where pressure is reduced).

### ***Connection points***

- 3.11 Connection points are entry and exit points where gas enters or leaves the network.
- 3.12 At connection points, metering stations are often located, e.g. at border metering stations used for commercial and fiscal purposes and at internal delivery stations located at the output of the transport system to measure the gas delivered and to reduce its pressure to the needs of the downstream distribution system.

- 3.13 When pressure is reduced for delivery, the exit point is also a controller/compressor location and to be listed twice in the asset database, once as an exit point and once as a controller/compressor.
- 3.14 The following types of connection points are distinguished:
- I: Injection from upstream net/production/injection from biogas plant
  - D: Delivery to downstream network
  - C: Delivery to customers, direct withdrawal
  - N: Delivery to neighbouring networks
  - S: Gas storage

## 4. Reporting Structure

4.01 Below, we give an overview of the item database structure and the common reporting categories. Whenever applicable, the default reporting option is stated and indicated with grey shading in tables.

4.02 For each category, the classes are defined with unit of measurement, definition of measure and limits  $(a,b)$  of the type  $a < x \leq b$ , i.e., the lower limit is exclusive.

### *Principles*

4.03 All values should be provided to normal temperature and pressure ( $T = 0^{\circ}\text{C}$ ,  $P = 1.01325 \text{ bar}$ ).

4.04 Data that are not available are to be calculated or estimated as exactly as possible. The determination of such data is to be documented and provided to the NRA together with the data.

4.05 Unless stated, the reporting here only concerns the state of assets in use Dec 31, 2014.

4.06 The data collection is separated for H gas (high calorific gas) and L gas (low calorific gas).

4.07 A more differentiated classification may be applied, maintaining the above ranges, see green fields on the left.

### *Geographical data*

4.08 The provision of geographical data for the used location IDs including names is voluntary and serves for validation purposes only, unless all operators provide geographically coded data.

4.09 If geographical coordinates are not supplied, you may attribute unique location IDs to denote assets for validation purposes.

### *Pressure range*

4.10 Assets such as pipes are to be attributed to pressure ranges. The attribution of assets to pressure ranges should be based on the assets nominal pressure.

4.11 There are six types of standard pressure ranges in Table 4-1:

Table 4-1 Pressure ranges.

P	Limit L	Limit H	UoM	Definition
LP	-	= 0.1	Bar	nominal
MP	>.1	= 1	Bar	nominal
HP1	>1	=5	Bar	nominal
HP2	>5	=16	Bar	nominal
HP3	>16	=70	Bar	nominal
HP4	>70	-	Bar	nominal

4.12 In case of missing, incomplete or incorrect report of the category, the lowest category is assumed by default.

4.13 Note: These pressure ranges relate also to DSOs, and the high pressure ranges may need a higher differentiation. You may further detail HP3 and HP4 in the templates, make sure to be consistent with the above ranges to ensure comparability.

### ***Code keys***

4.14 Code keys, fully identifying the type of asset are automatically generated and serve for internal purposes only.



## 5. Asset Category Definitions

- 5.01 Below, we introduce the asset categories in order, drawing if applicable on the previously defined classes of pressure range (P). The main attention is paid to the asset specific positions. Some comments are given to guide the reporting.

### *Pipeline system*

- 5.02 An item in pipes category (sheet "X pipes") is a pipe section that is appropriately described by the following characteristics.

- 5.03 **Pipe section length:** Length of pipe section (without house connections) in kilometers that is already in use for the transport of gas or the delivery of gas to clients. Also to be reflected are pipelines that have been put out of service short-, middle- or longterm. Not to be reflected are pipelines that are dismantled or that are now used for other services than gas transport. Pipeline kilometers that are shared with external parties are to be included and marked separately (see below).

- 5.04 **Pipe section volume:** Inner spatial volume  $V$  of pipe section  $i$  in  $m^3$ , to be calculated based on section length  $L$  and inner diameter of the pipe section  $D_{inner}$ . Spatial volume is therefore independent of the pressure level and calculates as follows:

$$V_i = \pi \cdot \left( \frac{D_{inner,i}}{2} \right)^2 \cdot L_i$$

Pipeline volumes that are shared with external parties are to be included and marked separately (see below).

- 5.05 **Share of external use of pipe kilometers or volumes in co-ownership:** The share of external use is the respective amount in km of pipelines in co-ownership that is used by other network operators (without house connections). The shares are determined based on capacities granted on a contractual basis, not on property shares.

### Example:

*Shared network length without house connections: 100km*

*Shared network volume without house connections: 100m<sup>3</sup>*

*Third-party share of capacity usage: 20%*

*=> 100km\*20% = 20km share of external use*

*=> 100m<sup>3</sup>\*20% = 20m<sup>3</sup> share of external use*

- 5.06 **Gas quality:** Indication whether the pipe operates for H gas (high calorific gas) or L gas (low calorific gas).

5.07 **Pressure range:** Options cf. art 4.10.

5.08 **Material class:** Steel pipes are protected against external corrosion by an external coating and a cathodic protection system, alternatively through the use of other materials. Options are as follows:

Table 5-1 Pipelines: material classes.

M	Definition
SteelPE-CC	Steel pipeline with PE (polypropylene) and cathodic corrosion protection
SteelPE	Steel pipeline with PE (polypropylene)
SteelB	Steel pipeline bituminous-treated
Iron	Cast iron pipeline
PE	Polypropylene pipeline
PVC	PVC pipeline

5.09 **Diameter class:** Distinction of pipelines according to the nominal diameter. Steel and iron pipes: DN for the inner diameter of the pipe. For PE pipes: DN for the outer diameter of the pipe. Pipes have to be separated according to the following classes A to G (PE from D on only).

Table 5-2 Pipeline: diameter classes.

D	Definition
A	Pipelines of nominal diameter DN $x \geq 1000$ .
B	Pipelines of nominal diameter DN $700 \leq x < 1000$ .
C	Pipelines of nominal diameter DN $500 \leq x < 700$ .
D	Pipelines of nominal diameter DN $350 \leq x < 500$ rsp. Da $355 \leq x < 500$ .
E	Pipelines of nominal diameter DN $200 \leq x < 350$ rsp. Da $225 \leq x < 355$ .
F	Pipelines of nominal diameter DN $100 \leq x < 200$ rsp. Da $110 \leq x < 225$ .
G	Pipelines of nominal diameter DN $x < 100$ rsp. Da $x < 110$ .

5.10 **Pipe section name and location of start and end:** Voluntary information.

***Pipe section environmental conditions:***

5.11 Considering that most TSOs will not be able to provide geographical information for specific assets and the access to comparable data sources for all countries involved, the Call X already includes a collection of environmental condition parameters for the pipeline system. In the case of proportions of a specific condition, e.g. 20% of a specific pipeline runs through a natural reserve, then the corresponding length (20% x total length) should be reported as a separate asset line in the sheet.

- 5.12 **Land use:** urban; rural (unproductive, =default); industrial; agricultural; environmental protected area
- 5.13 **Soil subsurface:** Loose or soft soils (=default); stony soils; rocky soils.
- 5.14 **Topographical:** Flat (=default); undulating (0 % < slope < 5 %); hilly (5 % < slope < 30 %); mountainous (30 % < slope). For slopes exceeding 40 % please add a comment.
- 5.15 **Soil humidity:** dry; occasionally wet (=default); permanently wet.
- 5.16 **Comment:** If the above categories do not appropriately describe the specific pipe laying difficulty conditions, please describe.

***Pressure regulator/controller stations and compressor stations***

- 5.17 A pressure controller or a compressor is either located at a location ID between two locations of different nominal pressure or at a connection point.
- 5.18 There is no need to report metering stations that are connection points as well, as it can be assumed that such connection points have a metering functionality depending of the nature of the connection point (I, D, C, N, S). If you consider that metering stations along the pipeline system that are not located at connection points are an important cost driver independent of pipeline length and other factors already asked for, you can list such metering stations in "x controllers and compressors" and urge in call Z why their reflection is necessary. The template will in this case not produce a controller/regulator ID (as these are not pressure controlled).
- 5.19 **Nominal pressure level** of pipelines connected to this location or that could be connected to this location in bar. If pipelines of different nominal pressure level are connected, the highest pressure level applies. Note that the nominal pressure level is not the effective pressure yielding from a load flow calculation.
- 5.20 **Pressure controlled:** Operating pressure in bar if held at a constant value (otherwise keep void).
- 5.21 **Upstream pressure:** Maximum operating pressure upstream (inlet) in bar.
- 5.22 **Downstream pressure:** Maximum operating pressure downstream (outlet) in bar.

- 5.23 **Flow rate:** Hourly nominal output in  $m_n^3/h$ . For stations, report nominal flow rate for an entire compressor station (i.e. not individual compressors within compressor station).
- 5.24 **Mechanical efficiency:** Overall mechanical efficiency in % (voluntary).
- 5.25 **Share of external usage:** Share of external usage is the respective share [%] of use of a third party of the controller or compressor in co-ownership. The shares are to be determined based on capacities granted on a contractual basis, not on property shares. It is the share in % of the pressure controller or compressor whose capacities are shared between one or more network operator and over whom the network operator can dispose only partially besides third parties.

### *Connection points*

- 5.26 Connection points are points in the system where gas enters or leaves the network. Use for every connection point a new line in sheet "X connection points". Pressure controllers that inject to downstream networks are seen as connection points as well (list here and under "X controllers and compressors").
- 5.27 **Location ID:** May provide location ID for connection point.
- 5.28 **Point also regulator?:** If the connection point is also a pressure regulator/controller/compressor, select the corresponding station ID (II.7 of sheet "X controllers and regulators").
- 5.29 **Pressure level:** Pressure level to which the connection point is connected to in bar.
- 5.30 **Type of connection point:** Type of injection or extraction/delivery:

Table 5-3 Pipelines: type of connection points.

T	Description
I	Injection from upstream net/production/injection from biogas plant/LNG terminals
D	Delivery to downstream network
C	Delivery to customers, direct withdrawal
N	Delivery to neighboring networks
S	Gas storage

If a connection point has both injection and delivery functionality, use two rows and provide specific values for each direction. Thereby,

change for the second entry the formula in II.13 (Connection point ID) by linking it to the first entry, so that both rows have the same connection point ID.

- 5.31 **Gas quality:** Gas quality of injection or delivery. H for H-gas and L for L-gas.
- 5.32 **Commercial settlement:** Commercial settlement of processing at the connection point:  
 1) Bookable or orderable  
 2) Nor
- 5.33 **Unique or shared use:** Indication whether the connection point is in unique (reporting TSO only) or shared (reporting TSO with other party) operation.
- 5.34 **Ownership of connection point:**  
 1) Fully owned  
 2) Partial ownership (joint venture)  
 3) Rental (unique rental contractor)  
 4) Shared rental (joint rental contract)
- 5.35 **Renter:** if applicable, renter of the connection point
- 5.36 **Pressure.max:** maximal pressure in bar that has to be reached at this connection point technically resp. contractually (Type D, C, N, S) or, respectively, that the upstream supplier is allowed to set (I). Applicable is the higher value.
- 5.37 **Pressure.min:** minimal pressure in bar that has to be reached at this connection point technically resp. contractually (Type D, C, N, S) or, respectively, that the upstream supplier is allowed to set (I). Applicable is the higher value.
- 5.38 **Capacity.injection.peak:** Highest measured hourly concurrent sum of capacities of all physical upstream injections at this connection point of the network operator that has occurred during the relevant year in  $\text{nm}^3/\text{h}$  ("concurrent peak load of the year").
- 5.39 **Capacity.delivery.peak:** Highest measured hourly concurrent sum of capacities of all physical downstream deliveries/withdrawals at this connection point of the network operator that has occurred during the relevant year in  $\text{nm}^3/\text{h}$  ("concurrent peak load of the year").
- 5.40 **Connection point or zonal value:** Indication, whether the following values are provided for the connection point (standard) or for the zone as a sum of the individual connection points.

- 5.41 **Capacity.injection.bookable/orderable:** Maximal hourly injection capacity bookable resp. orderable at the connection point resp. the zone in the relevant year in  $\text{nm}^3/\text{h}$ .
- 5.42 **Capacity.delivery.bookable/orderable:** Maximal hourly delivery/withdrawal capacity bookable resp. orderable at the connection point resp. the zone in the relevant year in  $\text{nm}^3/\text{h}$ .
- 5.43 **Capacity.injection.booked/ordered:** Yearly average hourly injection capacity booked resp. ordered at the connection point resp. the zone in the relevant year in  $\text{nm}^3/\text{h}$ .
- 5.44 **Capacity.delivery.booked/ordered:** Yearly average hourly delivery capacity booked resp. ordered at the connection point resp. the zone in the relevant year in  $\text{nm}^3/\text{h}$ .

## 6. Outputs

6.01 This data call for output indicators (Call Y) is developed to support the e<sup>2</sup>GAS benchmarking round for TSOs.

### 6.1 TSO-collected indicators

6.02 **Energy injected** is the sum of energy injected into the gas grid during the relevant year, to be provided in Normal cubic meters (nm<sup>3</sup>) and kilowatt hours (kWh).

Energy injected is required furthermore on a decomposed level as follows:

- 1) thereof from storage

6.03 **Energy delivered** is the sum of energy delivered / withdrawn from the gas grid during the relevant year, to be provided in Normal cubic meters (nm<sup>3</sup>) and kilowatt hours (kWh). To be included are also clients with individually negotiated terms. Self-consumption does not include linepack maintenance.

Energy delivered is required furthermore on a decomposed level as follows:

- 1) thereof to distributors
- 2) thereof to final customers (including industrial customers)
- 3) thereof to neighbouring market areas (TSO inside country)
- 4) thereof to neighbouring countries (TSOs outside country)
- 5) thereof to storage
- 6) thereof own consumption
- 7) thereof network losses

6.04 **Peak load of injections** is the highest sum of loads of simultaneous/concurrent injections into the gas grid, it occurs therefore in one particular moment during the year. Peak load is to be provided as hourly values measured in Normal cubic meters (nm<sup>3</sup>) and kilowatt hours (kWh). To be included are also clients with individually negotiated terms.<sup>1</sup> Values should be based on measurements.

6.05 **Peak load of deliveries** is the highest sum of loads of concurrent (simultaneous) deliveries (withdrawals) from the gas grid, it occurs

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<sup>1</sup> I.e. clients that obtain special conditions based on individual negotiations.

therefore in one particular moment during the year. Peak load is to be provided as hourly values measured in Normal cubic meters (nm<sup>3</sup>) and kilowatt hours (kWh). To be included are also clients with individually negotiated terms. Values should be based on measurements.

- 6.06      **yCompressors.num**: Total number of installed compressors
- 6.07      **yCompressors.power.sum**: Sum of power of installed compressors
- 6.08      **yCompressors.energy.used.sum**: Sum of energy used by compressors installed
- 6.09      Based on the asset data provided, a series of unweighted indicators are computed in the reporting sheet: **Total size of network** (unweighted) and the unweighted **sum of connection points**.

## 6.2      Public parameters

- 6.10      Call Y also includes two categories of data, which are summed up in 4 groups (A, B, C, D):
  - **Transportation service (A)**
  - **Physical environment (B)** – these data will be used to identify further cost drivers and/or indicators from the physical environment having an impact on the cost level.
  - **Economic environment (C)**
  - **Macro-economics environment (D)** – these indicators can be useful for the standardization of the investment stream and labour cost corrections.
- 6.11      Whenever possible, only original indicators are listed, not composed ones such as “population per km<sup>2</sup>” etc.
- 6.12      Unless indicated otherwise, indicators are defined for the country as a proxy for service area. For the case of multiple operations in the same country, equivalent data are to be collected by region or corresponding.
- 6.13      Unless indicated otherwise, the indicators refer to annual values for the latest available data (2014).
- 6.14      The geographical variables are defined using an averaging technique that depends on available data. If only national data are available, such will be used. For regions, the same technique as for countries will be used.



- 6.15 The sources for general parameters are primarily EUROSTAT, ENTSO-G, national statistical bureaus and OECD. In the final release of the parameter values to each participant, the sources for all parameters will be indicated. Certain indicators may be composites (e.g. material price indexes), in such cases the original sources will be indicated as well as the exact calculation of such parameters.

### ***A - Transportation services***

Table 6-1 Indicators Transportation services

	Total Import of gas
	Total Export of gas
	Total gas consumption

- 6.16 The aggregate data are complements to the basis of validation for the TSO-reported data.

### ***B - Physical environment***

- 6.17 The physical environment may have an impact on the cost level, either for maintenance or investment. The list below tries to cover the main indicators to reflect the physical environment of a TSO from an aggregate (country) level.

Table 6-2 Indicators Physical environment

	Surface area (total)	km <sup>2</sup>
	Surface area (habitable)	km <sup>2</sup>
	Area for lakes, mashland and swamps	km <sup>2</sup>
	Forest area	km <sup>2</sup>
	Agricultural area	km <sup>2</sup>
	Area for road and rail infrastructure	km <sup>2</sup>
	Urban area (including city)	km <sup>2</sup>
	City area	km <sup>2</sup>
	Surface area above forestation level	km <sup>2</sup>
	Surface area above forestation level	km <sup>2</sup>

- 6.18 The aggregate data are complements to the basis of validation for the TSO-reported data.

### ***C - Economic environment***

- 6.19 Indicators of the economic environment can be useful for the standardization of the investment stream and/or corrections of labour costs.

Table 6-3 Indicators Economic environment

Labour productivity per hour worked	EUR
Labour productivity per person employed	EUR
Comparative price levels (EUROSTAT def)	-
Purchasing Power Parity	-
Market Integration – Trade integration of goods	-
Market Integration – Trade integration of services	-
Energy intensity of the economy (EUROSTAT def)	-
Hourly compensation costs for production workers manuf.	EUR
Social insurance expenditure and other taxes as % of salary	%

***D - Macro-economic environment***

6.20 Indicators of the macro-economic environment are candidates for use in the standardization of the investment stream and for deeper analyses of labour cost corrections.

Table 6-4 Indicators Macro-economic environment

Price convergence between EU member states	
Producer price index	
Consumer price index	
Retail price index	
Steel price index	
GDP per capita	EUR
Real GDP growth rate	%





swiss economics

# Operator Specific Conditions (Call Z)

E<sup>2</sup>GAS PROJECT

SUMICSID  
Swiss Economics

2015-12-16

Version V1.0

## Version history

Version	Date	Status	Concerns
X0.1	2015-11-02	Draft	For NRA and TSO review
V1.0	2015-12-16	Release	Post review NRA, TSO and W2

## Disclaimer

This is a reporting guide for operator specific conditions in the E<sup>2</sup>GAS project for benchmarking of gas transmission system operators, delivered by the authors, SUMICSID and Swiss Economics. The latest version of this document is always obtainable at the Worksmart platform.

The content has not been subject to any formal review, nor endorsement from authorities and does not imply future consideration of any submitted factor in regulatory proceedings.

The submitting TSOs are the sole responsible for the correctness of their claims under their national regulation. Technical and economic questions can be posed to the team through the TSO Helpdesk at the Worksmart platform.

Operator Specific Conditions,  
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## Summary

*This guide defines and illustrates the idea of operator specific conditions, i.e. conditions that are exogenous to the TSO, and are likely to have a significant impact on benchmarked cost. To qualify, the condition should ideally be durable as well. Complications that have a temporary nature, e.g. a complicated repair, will in general not qualify as an operator specific condition if it could have been avoided by reasonable insurance cost or similar.*

*The operator specific conditions are intended to identify the most important factors that are unique to one or a few operators, that the benchmarking approach does not correct for via the standardization of assets, investments and operating costs, and which cannot be captured by the general quality and output indicators.*

*All TSOs will be entitled to an opportunity to submit information for approved claims, this implies a potential second round of data collection.*

*To make claims about complicating factors, the TSO is encouraged to fill out standardized forms, "Form for Specific Claims" that allow us to process the claims and to make a timely evaluation in a collaboration between the technical and economic experts.*

*The deadlines and procedures for submission of claims in this data call are defined in the e<sup>2</sup>GAS Project Plan and stated on the project platform.*

# 1. Introduction

- 1.01 This Guide on operator specific conditions is developed to support the e<sup>2</sup>GAS benchmarking for gas TSOs.
- 1.02 As far as appropriate, the guide builds on material and experience from the e<sup>3</sup>GRID 2012 benchmarking project for electricity TSOs, the German benchmarking of gas TSOs from 2010 onwards, and the feasibility study to this project, pe<sup>2</sup>GAS from 2014.

## **Overview**

- 1.03 According to the Project Plan, e<sup>2</sup>GAS involves a number of data calls for information
- 1) Operating cost, C  
Scope and decomposition of costs to be reported in the benchmarking, methodology and definitions.
  - 2) Asset data X and output indicators Y  
Asset data and technical characteristics, data related to system services performed.
  - 3) Operator Specific Conditions Z  
Guidelines for submission of cost drivers, costs and asset types that have been omitted in the other calls for some individual operator.
- 1.04 This guide and its associated reporting form constitute Call Z above as part of the deliverable G3 (draft release of data collection material).
- 1.05 A reporting instruction in draft format is labelled X. When released, the revision number is labelled V. The data collection starts at the final release of V1.0. Any revisions of this document and/or data templates will be uploaded to the Worksmart platform and a notification will be issued to registered participants.

## **Principles**

- 1.06 The purpose of the process is to inform the benchmarking of specific conditions that may affect the performance of an individual operator (or a group) and that are exogenous, durable and significant.
- 1.07 The submission of data corresponding to this call is voluntary.



- 1.08 Benchmarking is an informative exercise to reveal differences and to facilitate the accountability of operators towards regulators. Benchmarking, econometric modeling and any other comparative analysis is not a substitute for regulation. Thus, the invitation to submit operator specific conditions (Call Z) is neither a part of a regulatory review, nor a process that will necessarily explain all cost differences in a given comparison. It should primarily be seen as a way to improve the informativeness of the method, by extending the asset database or by refining the assessment of specific conditions, not as a rate review. Nevertheless, in order to guarantee transparency and systematic review of the submitted information, a minimum of structure is required to respect the specifics of an international benchmarking using confidential data.

## 2. Operator specific conditions

### **Background**

- 2.01 To allow fair comparisons and relevant modeling, we need to account for a range of complicating factors, i.e. factors that the TSOs do not control and which may have significant impact on their ability to perform cost-efficient services. The complicating factors could for example reflect:
- climate and other operating conditions which might render the construction, operation and maintenance more difficult and costly
  - environmental restrictions which may severely limit the firms' choice of technical solutions
  - universal service obligations that are imposed on the different companies
- 2.02 To allow fair comparisons and relevant modeling, we also need to account for a range of complicating properties, i.e. properties that the companies may affect but which are neither inputs nor outputs in the usual sense. Rather, the complicating properties capture different properties of the inputs or outputs. The complicating properties for an gas TSO may for example include:
- Differences in quality and safety regulation
  - Differences in customer satisfaction

### **Criteria**

- 2.03 Given the number of TSOs in any detailed study and the informational asymmetry inherent in the benchmarking of national monopolies, all individual conditions that are, or have been, applicable to the service cannot be covered in the general model. Instead, participating TSOs are invited to submit a statement of alleged complicating factors. To qualify for inclusion in the study as an operator-specific allowance, the cost driver has to have exogenous, durable and sizeable impact on benchmarked cost.

**Eligibility**

- 2.04 A submission under Call Z has to concern a specific identified cost, asset or valuation included in the benchmark and be accompanied by an estimate of its impact on the operator in terms of cost and/or performance dimensions relevant to the study. Submissions that do not concern any specific data, that concern the scope of the study or that are not accompanied with adequate documentation are declared ineligible and dismissed without further review.

**Expert review: Criteria**

- 2.05 The purpose of the entire Z process is to inform the benchmarking of specific conditions that may affect the performance of an individual operator (or a group) that are
- 1) exogenous
  - 2) significant
  - 3) durable

**1. Exogeneity**

- 2.06 Claims that refer to conditions, equipment and /or operating standards that may have impact on CAPEX and/or OPEX but that are the result of an internal decision making process in the firm (e.g. substation design, rail access, investment policies) are considered endogenous rather than exogenously imposed. Crucial for the determination of the exogeneity is the existence of a legal or regulatory obligation to perform a non-standard task/cover the cost *in spite* of an explicit interest on behalf of the operator to adopt a different policy.
- 2.07 An example of endogenous claim could be an equipment choice that might not be cost-optimal (today) but that did not result from any exogenous involvement. The prerogative of interpretation of exogeneity is given to the NRAs.

**2. Significance**

- 2.08 Claims that indeed are exogenous have to exceed a materiality criterion not to burden the data collection with minor issues. The recommended criterion is 3% of benchmarked cost by claim (not cumulated). Benchmarking is a comparative process that is intrinsically associated with averaging conditions and simplifying to pick up the important differences in relative performance. Deviations (up and down) are naturally part of any collection of asset or cost-

service observations. A selective reporting of positive small deviations would of course lead to a biased estimate of the true costs for both the operator and the sector. In addition, the materiality criterion serves as an indicator of the level of deviations for which the external team might be more effective than the NRA in judging against international average and best practice. Smaller differences, if indeed relevant when all effects are factored in, may and should be addressed by the NRAs within its applicable regulatory framework.

- 2.09 The experts screen the claims for materiality.

### **3. Duration**

- 2.10 Claims that refer to restructuration, accidents, refurbishing, upgrading of assets etc. are often related to sporadic events. In terms of insurable events, no correction is made since insurance premiums are included in the benchmarked cost. For non-insurable events above the materiality threshold, the result is to be interpreted by the NRA that is likely better informed about the cause and the impact of the results than the consultants. The criterion serves as to direct the process towards stationary operator specific conditions, not out-of-scope or exceptional events for which other procedures exist.

- 2.11 The durability is determined by the experts, if necessary after NRA validation.

### ***Already included factors***

- 2.12 Also, factors that are already accounted for via the standardization of costs and assets (Calls C and X) are excluded. Examples of this could be right away fees (which may depend on operator specific land prices).
- 2.13 *Likewise, there is no reason to make claims of operator specific cost properties that are already accounted for via the environmental factors, quality or performance indicators in Call XY. Examples of factors that may be excluded for this reason are construction costs due to specific subsoil properties or high population density.*
- 2.14 To sum up, the operator specific conditions are intended as a residual in which factors with exogenous, durable and sizeable impact are elicited that are not covered by the other calls (XY, C).

**Process**

- 2.15 We realize of course that this process is complicated by the fact that no single TSO knows the conditions faced by other TSOs that it is likely to be compared with in full details. The general data collection is indeed designed to assess sufficient information to explain relevant cost differences from external conditions. The Z-process should then be seen, not as a mandatory step to justify any cost increase compared to average, but as a way to suggest additional parameters that could be relevant to understand the specific operator characteristics.
- 2.16 Be careful to support the report with documentation, statistics and other data that show the incidence and the cost impact of the condition. State whether the claim adheres to all controllable operating costs, to operating costs for specific asset groups or asset items, or to investment costs for asset items or groups. The technical validation team will review any submitted claim, assess the documentation and return with a motivated response to how the conditions is to be considered in the benchmarking.

### 3. Submission process

- 3.01 The purpose of Call Z is to complement a comparison between operators. The submission of operator specific conditions and assets (Z) starts after the submission of DS1 (standard data with main environmental conditions). Given that the quest for Z-factors is opened, it is also difficult for a TSO to ensure a comprehensive review in relation to the results, meaning that some specific factors submitted in Z might actually be shared or even generalized among the TSOs. Hence, the process allows all TSOs in e<sup>2</sup>GAS to complement the data submitted with additional information that has been judged eligible for correction by the e<sup>2</sup>GAS project.

#### **First submission of operator specific information (Z)**

- 3.02 The detailed submission and validation process for Call Z follows various steps which are shown in Figure 1 below:

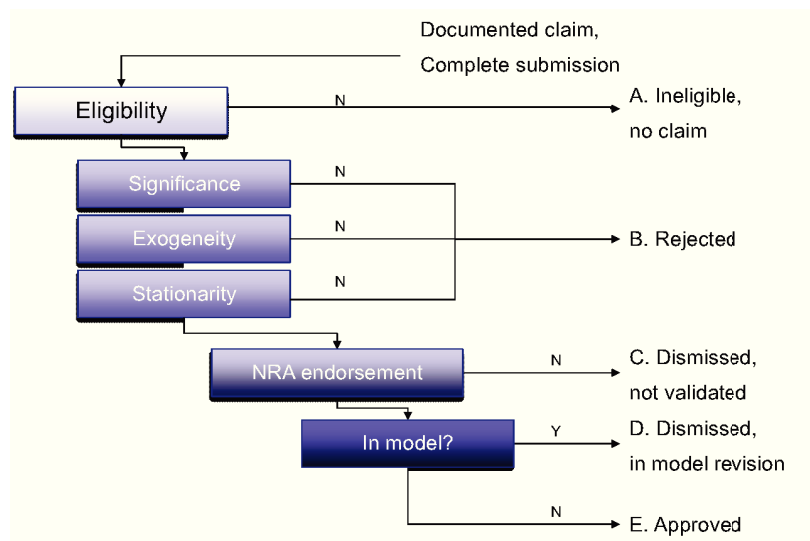


Figure 1 Review process for operator-specific claims (Call Z).

- 3.03 Any operator may submit information corresponding to Call Z as a part of the voluntary data set DS2. The information is structured as Claims, each accompanied by a form (Appendix A). In the form, a summary is made of the condition that is submitted for review, the

category of assets and/or costs that it affects, an estimation of its importance and references to sources to support the Claim. All content of the Claim, except the upper identification part of the Claims form, is considered confidential and covered by the project confidentiality agreement. The documentation must not be transmitted electronically, but if cited it must be made available for review at request from NRA or the e<sup>2</sup>GAS team.

- 3.04 The submission of Claims in DS2 passes through the TSO folder on the project platform. This means that the associated NRA has full information about the Claim and all accompanying information. All Claims pass to the NRA for preliminary review prior to submission to e<sup>2</sup>GAS over the project platform. *Note that the existence of a Claim and its type is not considered confidential information, only the identity of the claiming TSO and the content.*

***NRA review of operator specific information: Z***

- 3.05 Each corresponding NRA is charged to make a preliminary evaluation concerning the eligibility of the Claims. In particular, this concerns Claims that evoke regulatory rulings, public demand and legal provisions as the exogeneity required in the Claim. The NRA should also filter Claims that clearly relate to sporadic random events that are more adequately addressed outside of the benchmarking project as a part of normal due diligence in regulation.

***External review of operator specific information: Z***

- 3.06 After the closing of the submission window, the experts of e<sup>2</sup>GAS will investigate the submitted Claims to (i) determine whether the criteria for eligibility are fulfilled and, if so, (ii) decide upon appropriate consequences for the asset database, the capital and operating cost estimates and/or corrections to specific cost items. If necessary, the team will review any information submitted from the TSO and may request to see the additional information from the NRA. If applicable, the NRA may then request the information from the TSO, who is obliged to provide the quoted information in a timely manner. Failure to provide information or poorly documented Claims will be dismissed.

- 3.07 The detailed outcome from the review process (G4) is disseminated at a given date (see the project plan and the platform) to the corresponding NRA over the project platform. Decisions leading to introduction of corrections and/or amendments of the database will be disseminated to all NRAs. In these decisions, the basis for corrections and, if applicable, the definitions of new or redefined assets will be provided in a transparent manner.

***Final submission of operator specific information (Z)***

- 3.08 Any TSO in e<sup>2</sup>GAS, upon receiving the list of approved operator specific conditions and assets, may submit corresponding information to be evaluated at an equal basis. This submission (data set DS3) is voluntary and may be cancelled if no Claims are approved.
- 3.09 Any adjustments made for operator specific factors will be specified in the final individual report (R2) and the type of adjustments made will be listed in the final open report (R1).

***Confidentiality***

- 3.10 All data (except the existence of a claim and its potential approval) submitted in this process (DS2 and DS3) are strictly confidential and will not be shared with any third party.



## 4. Examples for pipelaying costs

### ***Preamble***

- 4.01 As indicated in the PE2GAS final report with Appendixes, one of the primary cost factors in gas transmission is found in the pipelaying. The conditions for the pipeline system are correlated to the environmental conditions for other relevant assets (compressors, stations), they also correspond to a large part of the assets and drive a large part of the maintenance costs, directly or through correlated operations. Although the Data Call XY collects the most important differentiating environmental conditions (land use, subsurface features, topology, humidity), it is natural here to discuss the complementary conditions that are relevant to pipelaying.
- 4.02 The purpose with this section is to propose dimensions for additional reporting, if the conditions in these dimensions are particularly difficult for a large part of the network. However, note that the section is not binding: a TSO may also propose and document other relevant dimensions, for other assets than pipelines with associated installations, as well as for operating cost increases related to other tasks than capacity provision.
- 4.03 Pipelaying operations are always broken down into normal (or standard) pipelaying operations (those that can be achieved by conventional spreads) and special pipelaying operations (corresponding to important obstacle crossings). In fact, in pipelaying, everything is connected to the means used (personnel and equipment). The description of pipeline route can be broken down into difficulties as mentioned hereafter.

### **Surface Features**

#### ***Land use***

- 4.04 The conditions for land use are collected in Call XY (V1.0, art 5.11).

#### ***Subsurface features***

- 4.05 The subsoil features are included in Call XY (V1.0, art 5.12).

**Topology**

- 4.06 The topology conditions are included in Call XY (V1.0, art 5.13).

**Soil humidity**

- 4.07 The humidity conditions are included in Call XY (V1.0, art 5.14).
- 4.08 For the last three items, depending on the crossing length, special construction procedures and equipment may be required and such crossings shall be classified as special areas (see below § 3). By some aspects, soil moisture should be classified among sub-soil properties; we have however preferred to classify soil moisture separately because corresponding construction procedures are different from those related to subsoil geo-mechanical properties.

**Vegetation**

- 4.09 The pipeline route can be classified as follows in order of difficulty:
- 1) Grassland or short growings
  - 2) Bushes
  - 3) Shrubs
  - 4) Woods
  - 5) Forests.

**Minor crossings**

- 4.10 Minor crossings (or singular points) concern the small obstacles encountered along the pipeline route and assigned to construction spreads as they does not require important construction resources. The following obstacles are distinguished:
- 1) Small or secondary roads
  - 2) Small and narrow railways,
  - 3) Streams,
  - 4) Small watercourses,
  - 5) Small ponds
  - 6) Drains
- 4.11 It is difficult to list all obstacles that can be encountered by a land pipeline. The obstacles mentioned above are those most frequently occurring.

## **Construction track and access to construction tracks**

### **Construction track**

4.12 The pipeline route can be classified as follows in order of difficulty:

- 1) Clearing and grading easy
- 2) Grading locally difficult due to existence of rock outcrops
- 3) Grading locally difficult due to transverse slopes
- 4) Grading difficult due to rocky soils requiring blasting

### **Access**

4.13 From a maintenance perspective (lowered OPEX) and from investment costs (higher installation cost), the number and type of accesses to the pipelines may be of interest. The access conditions for a pipeline route can be classified as follows:

- 1) numerous access points in good condition
- 2) numerous access points in fair condition
- 3) numerous access points poor condition
- 4) only 1 access point per km
- 5) only 1 access point per 5 km
- 6) only 1 access point per 10 km
- 7) only access through construction track

### **Special installations**

4.14 For important roads, highways, wide railway tracks, large rivers, subsea crossings, if any, etc. where the obstacle to be crossed exceeds the construction spread possibilities and requires special means, the corresponding work is, as mentioned before, classified as a special point or special area and is assessed separately from specific cost drivers or more generally from similar previous works. Thus, it is not useful to define general parameters for data collection for such installations that are to be evaluated in Call Z on an individual basis.

4.15 The incidence of in-line stations (pigging stations, sectioning or block valves) has been evoked as a differentiating factor. Reporting the number of inline stations as an operator-specific factor will trigger an investigation on the conditions for this implicit asset type.

**Specific activities: odorization**

- 4.16 Whereas most DSOs in Europe use odorization as a public safety measure, only certain TSOs perform this on the transmission network. Given that the activity entails both specific assets that are not listed in the asset database and associated variable costs, the activity is eligible for a specific analysis, if included in the assets and operating costs.