



# ENERQI

*energy efficiency by using daily customers' quality observations to improve public transport*



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[www.enerqi-online.eu](http://www.enerqi-online.eu)

## ENERQI Final Report

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## EXECUTIVE SUMMARY

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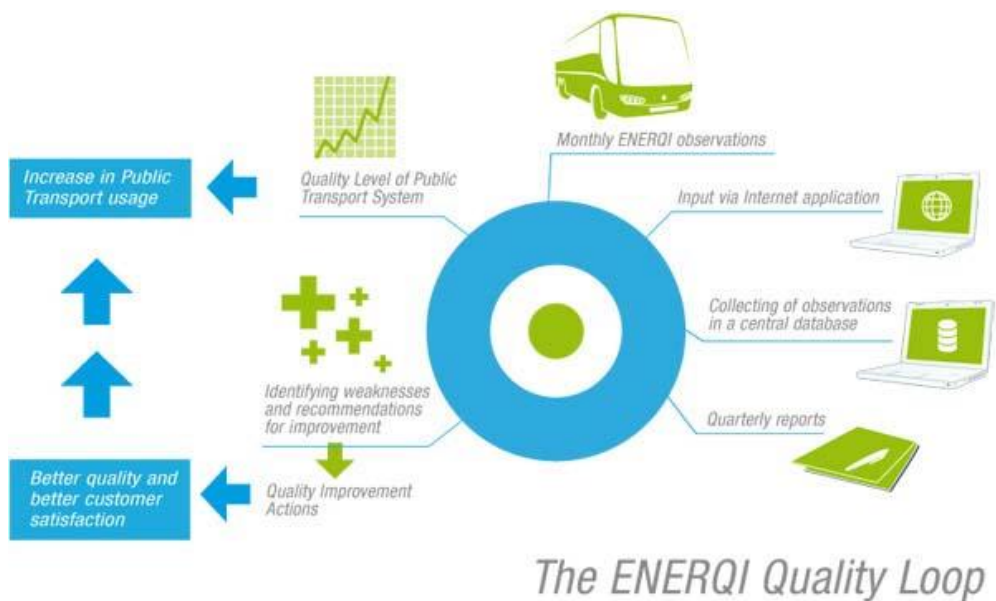
### Objectives of the action

ENERQI implements an innovative quality monitoring system for public transport. Overall, ENERQI aims to increase the quality and attractiveness of collective public transport, so as to affect a modal shift towards these more sustainable modes, with ensuring substantial energy savings, emissions reductions and cost savings. To increase the usage of public transport the project focuses on customer needs. These needs are identified by the customers themselves, through their own (subjective) views. This is done via questionnaires on a wide range of quality related issues regarding the line/service that they are using. It is done on a continuous basis and the results are used to increase the hospitality and quality of the public transport service.

### Quality loop

The ENERQI approach consists of measuring public transport service quality by involving present and potential customers in the observation and reporting of pre-defined quality aspects on a regular basis. It intends to provide a continuous monitoring of public transport quality and to timely identify appropriate measures to improve quality. Additionally, it allows us to closely evaluate the impact on perceived quality of new measures, as well as of communication campaigns.

This process emerges as a “quality loop”.



## Tool

To achieve the quality improvements, the quality loop is followed. To guide the implementation within the project the ENERQI tool is developed as a backbone for the project. The tool is a web based public transport survey application, a tool for both the public transport operators as the observers. The tool includes the following functionalities:

- Registration of observers
- Production and management of questionnaires
- Creation and management of assignments
- Allocation of observers, timing and execution of the survey
- Analysis of data
- Generation of reports

## Results and finding

Within the ENERQI project the approach and tool were tested in 8 European countries. Over 4.000 observers were recruited and actively involved in giving their opinion about the quality of their local public transport. Over 25.000 observations have been made by the observers, which resulted in a good and reliable overview of the perceived quality of the provided services.

In all cities the public transport authorities have actively changed their services for the better. Based on the observations made, the customers rated the quality higher. Successful measures to improve the quality of the service were e.g. driver training, network and timetable changes and giving on route trip information.

## Benchmark

In all countries observations were done based on the same questionnaire. This made it possible to benchmark between the different countries/public transport providers. Overall, the most important aspect was punctuality, followed by frequency, price, reliability, safety and security, comfort, level of crowding and condition of the vehicles. There are clearly similar patterns on how people value the importance of these aspects in different countries. Still, there are relevant differences in what the customers value the most. Some of the most stringent ones are:

- Price is among the top five of most important aspects in all sites except Alba Iulia. Lisbon is the place where price has a higher relative importance, which is very likely related to the recent drastic fare increases in this site;
- The conditions of the vehicles are clearly more valued in Alba Iulia, Plovdiv and Lancashire than in other places;
- Punctuality is within the top three aspects in all sites, except for Alba Iulia (where there is a very high frequency of the services).

Most important quality aspects for costumers (percentage of responses)

	Price (value for money)	Level of crowding	Safety and security	Condition of the stops	Condition of the vehicles	Punctuality	Reliability	Frequency	Comfort	Behaviour of the driver	Information provision	Handling of incidents and disruptions	Pre- and after trip customer service
NB, NL	13%	12%	5%	0%	4%	18%	13%	16%	6%	7%	3%	1%	2%
TL, FR	18%	6%	9%	2%	4%	17%	12%	21%	2%	2%	3%	4%	0%
LS, PT	15%	10%	8%	2%	5%	20%	8%	11%	15%	4%	2%	0%	0%
GZ, AT	15%	6%	7%	3%	5%	20%	17%	13%	4%	6%	2%	1%	1%
AT, GR	12%	12%	3%	4%	5%	22%	17%	15%	3%	2%	3%	1%	0%
LA, UK	12%	5%	6%	1%	11%	14%	19%	16%	8%	6%	0%	1%	1%
AI, RO	13%	9%	10%	8%	13%	9%	3%	12%	12%	3%	4%	2%	2%
PL, BG	17%	9%	14%	6%	13%	13%	7%	8%	7%	3%	2%	0%	2%
total	15%	8%	9%	4%	7%	17%	10%	14%	8%	4%	3%	1%	1%

## Conclusions and recommendations

The choice of a transport mode is based on a lot of aspects but quality continues to become even more important. The quality of public transport is influenced by transport aspects (frequency, accuracy, speed), service aspects (friendliness of the driver, information, quality of the vehicle, costs) and others (cleanliness of the stop, public transport image, feeling of safety and security).

The ENERQI local sites proved that optimal perceived quality leads to satisfied travellers and in the end a better product with even more customers – travellers. Targeting the recognised quality aspects allows an operator to be more cost effective and steer its investments wisely.

The ENERQI methodology and tool allows operators to better listen to their customers; and to improve the quality of public transport based on their observations. In line with the European Standard EN 13816-2002 for public service quality ENERQI helps the operator to obtain this knowledge. The ENERQI Quality Loop helps public transport management take the right actions to improve the quality of the public transport services and to increase usage. The driver behind the quality improvements are observations made by regular travellers, the so-called observers. They get at least one assignment a month to fill in a questionnaire about a daily trip. With the help of a carefully constituted group of volunteer observers it is possible to get a reliable and sound overview of the perceived quality of the delivered public transport service and the effects of improvements.

## 1 BACKGROUND AND OBJECTIVES

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### 1.1 Need for better focused public transport investments

To increase the use of public transport a lot of effort is put in the renewal of the public transport systems mostly resulting in new bus, tram or metro lines, new vehicles, changes in schedules and so on. The present economic crisis has forced more targeted investments and these should focus on what the public transport customer really values as important. More and more public transport users are non-captive users and will only make use of the services if they offer true customer quality.

Not always are the needs and expectations of the customers fully taken into account. To cope with this shortcoming, quality monitoring systems are being developed and implemented throughout Europe. Most of these quality monitoring systems capture only indirectly or with large intervals the perceived customer quality. Quality expectations and needs of non-users are in general not considered. The extracted management information for decision making in relation to public transport quality improvements is poor.

Surprisingly the use of new technologies like internet, monitoring software, databases and new customer involvement techniques is hardly taking place in public transport. These new but already proven technologies allow us to take into account the real perceived customer quality on an almost continuous basis.

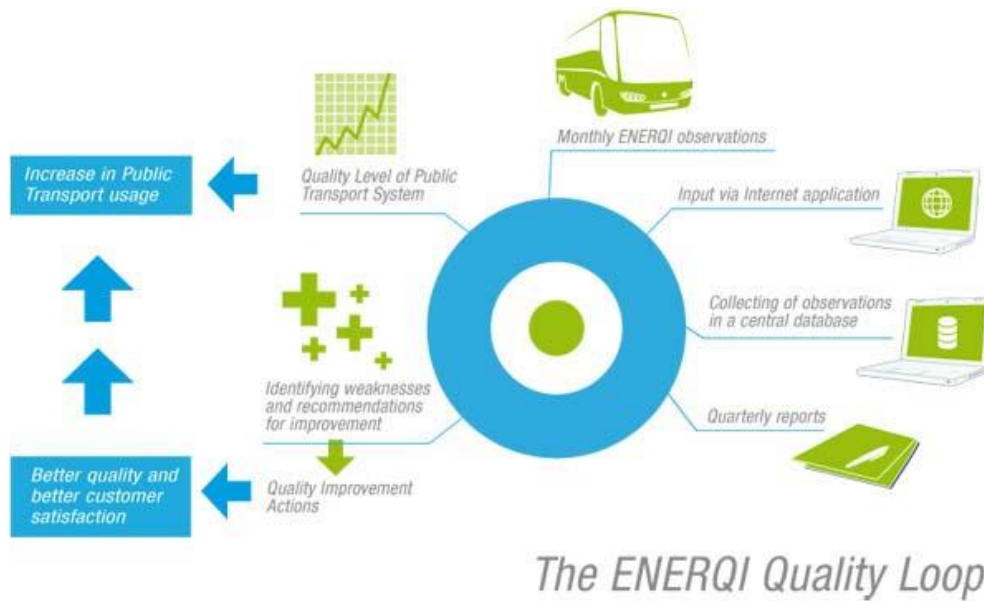
The main goal of the ENERQI project was to allow a learning by doing and learning by exchanging experiences about the customers' needs and expectations between public transport operators, authorities, passenger organisations and energy agencies in Europe. Exchanges between, within and beyond the ENERQI consortium should be a gateway to improve the quality monitoring by all local urban public transport stakeholders in Europe.

### 1.2 ENERQI, an ambitious quality monitoring method

The ENERQI approach consists of measuring public transport service quality by involving present and potential customers in the observation and reporting of pre-defined quality aspects on a regular basis. It intends to provide a continuous monitoring of public transport quality and to timely identify appropriate measures to improve quality. Additionally, it allows us to closely evaluate the impact on perceived quality of new measures, as well as of communication campaigns.

This process emerges as a “quality loop”, giving direct input to the management of the public transport operator and authority. A close customer relation management is made possible. In the end, the “real time” availability and use of quality monitoring information will lead to an increased use of public transport and lower consumption of energy, environmental emissions and congestion through less private car use.





**Figure 1.2 – The ENERQI Quality Loop**

This ambitious approach consists of comparing the quality perceived by the users against each specific public transport network. The definition of a common European approach allows comparing results across sites and in that way obtaining additional learning both on implementation issues and on analysis of results. Any definition of a common methodology must take into account the diversity of the internal and external components in each network. Establishing the points of convergence and divergence and appropriate criteria has based the development of this methodology.

The structure and the organisation of the public transport networks are key elements in the development and deployment of the methodology. In addition, European standards have also defined measurement indicators for public transport quality of service, which were used as a reference in the development of the ENERQI methodology.

Lastly, the definition of this common methodology required the creation of a common frame of reference, from the definition of the terms, to the scales of measurement that are used.

To conclude, the main advantages of the ENERQI methodology may be summarised are:

- ENERQI allows the measurement of the perceived quality of service of public transport by the customers themselves,
- ENERQI applies with quantitative and qualitative indicators,
- ENERQI can be used locally for the needs of each network or operator and more widely for benchmarking purposes.

### 1.3 ENERQI reinforcing the European standard EN 13816:2002

The customer based continuous quality monitoring methodology provides the ability for the transport operator or other entity to receive detailed up-to-date feedback on the perceived quality of public transport services.

According to the European Standard EN 13816:2002<sup>1</sup>, and related national standards there are four sub categories of “quality of service”: a) the desired quality of service; b) the delivered quality of service; c) the perceived quality of service; d) the expected quality of service.



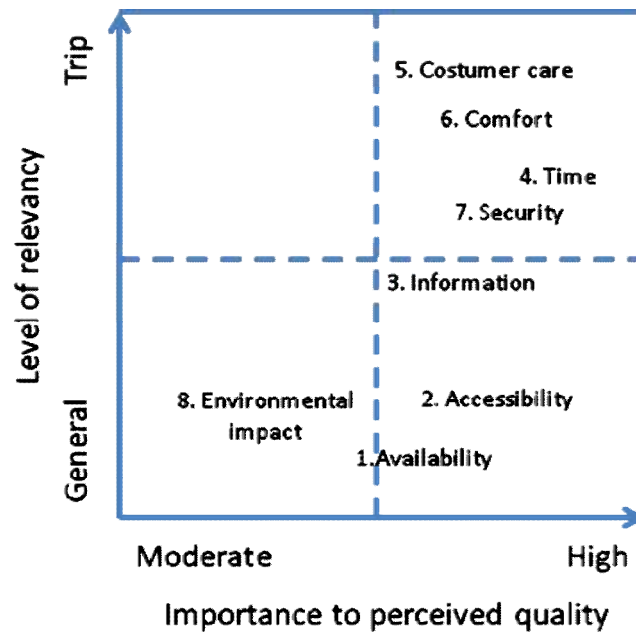
Fig. 1.3.1 Different forms of quality

Where as most public transport networks focus on the delivered quality, it is the perceived quality of service that is related to true customer satisfaction and the willingness to use public transport. The ENERQI methodology concentrates more closely than any other methodology (e.g. production quality, mystery guest, annual customer satisfactory survey) on measuring the quality of service perceived by the daily users. By measuring the perceived quality it is possible for the public transport operator to direct its investments to what is really important for the users.

EN 13816:2002 proposed a list of eight groups of standard indicators<sup>2</sup>. It includes eight groups of indicators: Availability, Accessibility, Information, Time, Costumer care, Comfort, Security, and Environmental impact. The following figure presents a subjective view of their general positioning concerning relevance towards trip specific performance and perceived quality of service. In face of this classification, it can be concluded that groups of indicators 3. to 7. are comparatively more relevant for a continuous observer based quality monitoring approach such as ENERQI.

<sup>1</sup> EN 13816 – Transportation – logistics and services – Public passenger transport – Service quality definition, targeting and measurement

<sup>2</sup> For an overview see ENERQI Deliverable 2.1 State of the Art



**Figure 1.3.2 – Classification of groups of indicators proposed by EN 13816:2002 according to their importance towards specific trip performance and customer perceived quality**

The relevancy of each indicator may vary from place to place, and depend on the groups of customers according to their expectations and preferences. For example, some user groups may be more focused on status concerns – projected by comfort – as in a different place customers may be more economically rational.

The ENERQI approach integrates the customer view with the aim of providing public transport services which match the customers' needs and expectations as closely as possible. ENERQI is a key tool to improve the quality of public transport, since it focuses better than other quality monitoring approaches on what is really important for the customer.

## 2 APPLIED APPROACH AND METHODOLOGY

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### 2.1 A common methodology adaptable to the local context

The ENERQI methodology is flexible enough to be adapted to each local setting of a public transport network. It serves all modes of public transport (i.e. bus; tram, light rail, metro, train) and it can be used both in urban and regional networks; the number of lines involved, number of observers, type of local partner that runs the tool (public authority, operator, energy agency, external consultant), regularity of questioning, type of filling, spread of questionnaires, collection of observations, length of questionnaire per observation, additional questions, free questionnaires, all can be adapted to the local context and needs. In order to come to a successful monitoring of perceived quality a number of topics have to be taken into accounts which are:

1. Building resources – it is necessary to join the different resources to assure a high level quality monitoring and to make optimal use of the obtained information. Necessary resources include the team responsible for the monitoring, recruitment and training of the observers;
2. Quality monitoring – It is essential to set up the right framework for data gathering and reporting, data analysis and communication with observers;
3. Quality improvement actions – Once the monitoring results are obtained it is necessary to choose the right public transport improvements and investment that should be taken by the transport operators to improve the service quality, also seen from a cost-benefit perspective.
4. Communication with the users and wider public - The ultimate objectives of ENERQI can only be fully achieved if the quality improvement actions implemented locally are properly translated into perceived quality by regular and non-regular public transport users and to incite new citizens, to start using public transport. To achieve this goal, communication campaigns are essential.
5. Evaluation of process and high level results - In order to take full advantage of the lessons learnt from the ENERQI process, the public transport operator can also assess the effects that the ENERQI methodology had on modal shift, energy and emissions. This topic will summarise the methodology that can be used to evaluate the process and its main results.

Finally we will be addressing the seven steps that allow for a correct set up of the actual quality monitoring tool. In the following sections these topics are explained in more detail.

## 2.2 Building resources

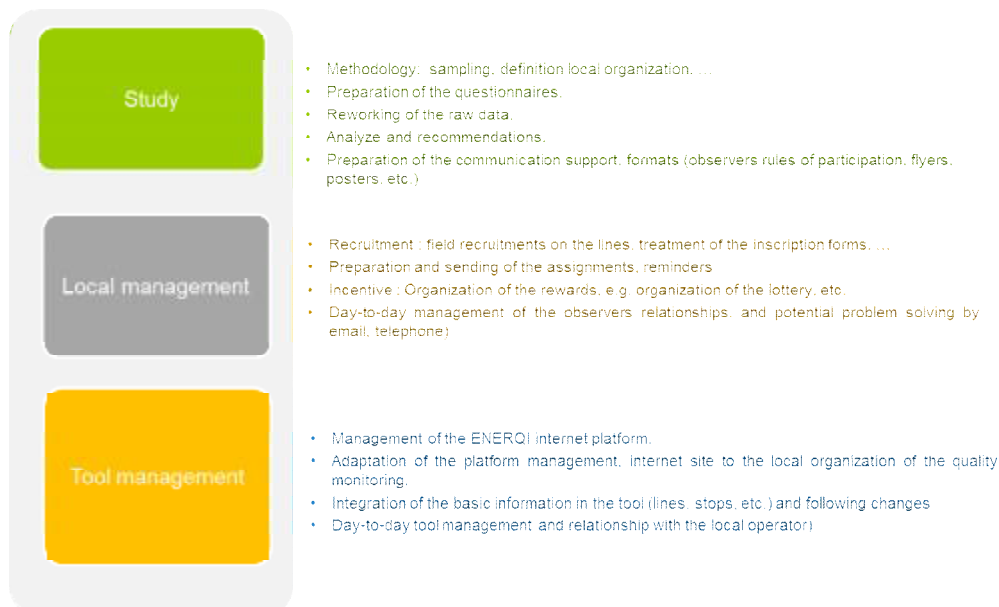
The building resources corresponds to the set-up of necessary resources for the operation process, particularly the definition of the team responsible for the monitoring management, recruiting, training and communicating with observers and involving any external entities with interest to the project.

### *Setting up the team responsible for the local organisation*

To successfully implement the ENERQI methodology, it is important to define at the first stage of the process the human resources that will be allocated to the project. The necessary make up of such a team are relatively diverse and specific. The main tasks involved are:

- Preparation of the energy monitoring (targets, sampling, local ENERQI quality loop, questionnaires)
- Observer recruitment and management;
- Database management, assignments, basic data input, day-to-day management;
- Data analysis; raw data treatment, analysis and recommendations
- Specification and management of local quality improvements;
- Communication campaigning

Especially the two latter ones will most probably implicate the participation of different departments to follow-up on the recommendation of the ENERQI monitoring. In the following figure the different tasks the teams have specifically to cater for are detailed.



**Figure 2.1.1 Specific task for the local ENERQI management team**

Taking into consideration and depending on the size of the local monitoring plan and number of recruited observers. After an initial set-up and recruitment of observers, in

terms of resources the local ENERQI management takes between a half and one full time occupation, together with a small communication and rewarding budget.

### ***Observer recruitment***

The observer recruitment process should consider two issues: how to contact potential observers and how to motivate potential observers.

The appropriate method for contacting observers depends on which are the targeted user groups and services – different target groups may be reachable through different means – and which means and resources are available locally. Some possible means of contacting observers are direct face to face contact (in public transport vehicles or infrastructure), phone, advertisements in vehicles, infrastructure or media or internet social networks.

The ability to motivate potential observers to cooperate may be very distinct from place to place. This has been clearly shown in the ENERQI test sites. In some places people are not used to the concept of directly cooperating with public authorities, while in others they are happy to do so. Different social and age groups may have different willingness to cooperate as well. However, the experience shows that in almost all cases it is important to provide some kind of reward for cooperation. The appropriate types of incentives may again be different depending on culture and availability of resources. For example, in the Netherlands a small monetary reward is given for each report delivered, in Lisbon there is a lottery for the most cooperating observers, while in other places small gifts are given. For non-users of public transport, the minimum requirement will be to offer tickets corresponding to the trips reported. Additionally, an effective and costless incentive seems to be simply the promise of giving feedback to observers on the results of the quality monitoring. A continuous and close contact with observers is also an important factor of motivation.

### ***Observer training***

One of the major differences of the observer based monitoring in relation to other monitoring methodologies is that observers are made aware beforehand on the configuration of their assignments. In principle the observers should know in advance in detail what aspects of quality will be assessed in the trips assigned. Moreover, the observers must be acquainted with the system of observation assignment and reporting. This might imply some kind of prior instruction or even training. Observer 'training' can take various forms, namely through either personal or remote and individual or collective contact. Several tests within ENERQI showed that no specific training has to be provided to the observers. The quality information from trained and untrained observers does not significantly differ.

### **Observer contact**

The relevant factors for a correct choice of a communication platform(s) with the observers depend on the survey design and used questionnaire format (internet, paper, telephone), characteristics of the observers (e.g. age, education, and technological knowledge) and timing of survey application defined. As for the survey format and feedback reporting of results, internet communications are the least resource consuming ones, but they may be inappropriate for certain user groups. In all cases, feedback to the observer on how their feedback is used is crucial. In addition a more personal contact can be recommended out of the point of view of identification and commitment to the project by the observers, e.g. by organising regular discussion events for the observers.

## **2.3 Quality monitoring**

The quality monitoring involves selecting and sending assignments to observers, collecting and analysing them. Additionally the process should include the monitoring of the rate of participation of observers in order to improve their motivation and or refresh the group of volunteers if necessary.

### **Providing assignments and collecting surveys**

This phase is where the process unfolds: the assignments are provided to the observers, the observer provides answers to the questionnaires which are then submitted into a database (by the observers themselves, if it is an online questionnaire, or by the managing organization in case of paper/phone questionnaires).

The choice of assignments to deliver should be based on the initial plan of continuous monitoring but can and should be complemented by new needs of data that emerge either from the building of knowledge on customer preferences and quality of service given by data analysis of previous assignments or from the introduction of new measures or appearance of relevant 'hot topics' to study on an *ad hoc* basis (e.g. snow in the street).

### **Data Analysis**

With the information that comes from the observations, different types of analysis have to be taken to best assess the quality of service and evaluate which should be the most cost-effective quality improvement measures. Some standard reporting is catered for within the ENERQI tool, yet a more detailed analysis following a reworking of the raw data allows:

- **to identify the major weaknesses of the public transport service, network and individual lines** - The analysis of quality perceptions before the implementation of quality improvement actions will help identifying which are, for the observers, the major quality weaknesses.



- **understand which of the identified weaknesses are most relevant for the users** – Situations may occur where the major weaknesses identified by the users are afterwards not found to be relevant for the overall satisfaction of public transport' quality of service. So identifying the quality items that are more relevant for the perceived quality of the observers will be useful to define and implement the most cost-effective quality improvement measures.
- **benchmark analysis** – Followers of ENERQI methodology are able to compare their results with the test sites used in ENERQI or other cities whose quality monitoring has data to compare with. The benchmarking allows the public transport operator to measure its level in terms of quality of service and position themselves in relation to other operators to see if the current state of quality service is within what is practiced elsewhere. Finally it allows the local operator to benchmark with its own results over time.

### *Understanding the evolution of perceptions:*

Throughout the period of the observation it is expected that there will be some adjustment of expectations by the observers. Past experiences have shown that during the quality monitoring process, users tend to become more demanding considering the quality of public transport service. This can also occur, for example if the quality improved measures don't follow their expectations, or if the impact of communication campaigns didn't go as expected. Therefore it is important to distinguish the **expected quality** (level of quality desired by passengers) from the **perceived quality** (level of quality perceived by users during their journey).

### *Analysing the effects of the quality improvement actions*

By comparing the reported user perceptions from before and after the implementation of the quality improvement actions, it will be possible to assess the real effects of these actions on the perceived quality by users and on increasing public transport usage. For example, comparing experienced journey times before and after the implementation of punctuality improvement actions and verifying if the time saved was enough to change the users' perceptions.

### *Monitoring the rate of participation*

The organisation should monitor on a constant basis the rate of participation throughout the process and check the need to improve the communication channels with the observers.

It is important to assure that the volunteers are motivated and willing to proceed with the observations along the projected time. Some important points to be taken in consideration might be:

- accommodating assignments with the observers regular routines;



- observers have to feel that they are part of the organisation and that their collaboration is crucial for the success of the process. To improve the commitment between the observers and the ENERQI organisation it might be important to set a training meeting instead of just giving the observers written instructions;
- keeping the observers informed about the results of the ENERQI process;
- in case the rate of participation is low, further encouraging the fulfilment of questionnaires by observers with additional communication and rewards.

If the rate of participation is decreasing or unsatisfactory, these mechanisms of motivating observers should probably be reinforced or new observers must be recruited.

## 2.4 Quality improvement actions

This step deals with the decision on the choice of quality improvement actions to carry out in response to the feedback provided by the monitoring process or fine-tuning of previous actions. The observer based continuous monitoring methodology has the ability to provide continuous and almost real time information which enables a very quick response to new problems or needs.

According to the ENERQI methodology the characteristics in any public transport that influence the perceived quality can be divided into 4 dimensions of service:

1. Physical aspects (including accessibility, neatness and design),
2. Nature of the service offered in accordance with the customer's travel needs (including reliability and information);
3. Personnel (including competence of the personnel, consideration of the customer and politeness), and
4. Image of public transport, which is partly defined by the first 3 dimensions, yet also by the communication strategy of the public transport operator.

The quality improvement actions should be outlined following a cost-efficiency perspective. The goal should be to improve quality as much as possible with a minimum consumption of additional resources. These quality improvement actions should seek to respond to the public transport service needs and can be used to transform the attitudes of users. The choices have nevertheless to take into account the implementation costs and feasibility of these quality improvement actions.

From the results taken from the observers questionnaires, it is possible to sort the major weaknesses in terms of quality of service. This is important because there might be quality items that, although having a good potential for improvement are not considered by users as relevant as other elements whose improvement would contribute more for improving global satisfaction.

The tables below present lists of quality improvement actions according to their potential to fulfil quality gaps of different categories of quality. The first table refers particularly to impacts on user perceptions according to the groups of indicators set out in the EN 13816:2002. The second table refers to the same indicators ??? structured in the

standard ENERQI questionnaire. This type of assessment is useful in the choice of appropriate measures to respond to particular weaknesses as identified by the observers. The first table is oriented to the perspective of the customer. The second one is more oriented to the perspective of the operator as it is organised in terms of activities/objects of the operator.

**Table 1.4.1 – Quality perception improvement actions (EN13816:2002 items)**

Quality improvement action	Effect on perceptions: (according to EN 13816:2002 Items)							
	Availability	Accessibility	Information	Time	Customer Care	Comfort	Security	Environmental Impact
Bus driver training in customer service/hospitality	-	-	-	-	+++	-	-	-
Bus driver training in driving style	-	-	-	-	++	+++	++	+
Investments in new vehicles	++	-	-	-	-	++	+	++
Intensified vehicle cleaning programs	-	-	-	-	-	++	-	-
Smart cards, SMS ticketing	+	++	-	+	+	-	-	+
Better shelters for bus stops	-	++	-	-	-	++	-	-
Punctuality improvement measures	+	-	+	+++	-	-	-	-
Improved passenger information systems	-	-	+++	++	+	-	-	-
Increase of frequency	++	-	-	+++	-	+	-	-
Operation control systems (e.g. through GPS)	++	-	++	++	-	-	-	-
Introduction of additional services (e.g. Wi-Fi in public transport)	-	-	-	-	-	++	-	-
New bus/tram lines	+++	-	-	+	-	-	-	-
Green branding of public transport	-	-	+	-	-	-	-	++
Campaigns on healthy lifestyle and public transport	-	-	+	-	-	-	-	++

Table 2.4.2 – Quality improvement actions (ENERQI items)

Quality improvement action	Effect on perceptions: (according to standard ENERQI survey items)										
	Value for money	Tickets and tariffs	Level of crowding	Safety and security	Stops and shelters	Vehicle condition	Journey speed	Staff service	Information	Disruption / Incidents	Customer support
Bus driver training in customer service/hospitality	+	-	-	-	-	-	-	+++	-	-	++
Bus driver training in driving style	+	-	-	++	-	-	-	++	-	+	-
Investments in new vehicles	++	-	-	+	-	+++	-	-	-	++	-
Intensified vehicle cleaning programs	+	-	-	-	-	+++	-	-	-	-	-
Smart cards, SMS ticketing	++	+++	-	-	+	-	-	-	+++	-	+
Better shelters for bus stops	++	-	++	-	+++	-	-	-	+	-	-
Punctuality improvement measures	+++	-	-	-	-	-	++	-	+	++	-
Improved passenger information systems	+	-	-	-	-	-	-	-	+++	+	++
Increase of frequency	++	-	++	-	-	-	+++	-	-	+	-
Operation control systems (e.g. through GPS)	++	-	-	-	-	-	++	-	+	++	-
Introduction of additional services (e.g. Wi-Fi inside bus)	++	-	-	-	-	+	-	-	+	-	-
New bus/tram lines	+++	-	-	-	-	-	-	-	-	-	-
Green branding of public transport	++	-	-	-	-	+	-	-	-	-	-
Campaigns on healthy lifestyle and public transport	++	-	-	-	-	+	-	-	-	-	-

In the decision of which quality improvement measures to apply, the operator should additionally take into account some of the risks that may surge in its implementation, such as:

- Insufficient funding
- Organisation and administrative changes
- Lack of innovativeness
- Lack of political support
- Major changes on infrastructures and built environment

## 2.5 Communication

The ultimate objectives of ENERQI can only be fully achieved if the quality improvement actions implemented locally are properly translated into perceived quality by regular and non-regular public transport users. To achieve this goal communication actions may be necessary. In the case of regular customers it is not guaranteed that quality improvements delivered will actually translate into improvement of perceived quality, especially when the users may not notice the changes in question (e.g. the introduction of more environmentally friendly fuelled vehicles). In these cases it may be useful to launch a communication campaign in order to bring delivered quality into perceived quality. The comparison of data on delivered quality (e.g. punctuality) and perceived quality is a way to assess this need.

This need is even more stringent in relation to non-users who do not have the opportunity to feel any quality improvements through experiencing public transport. Apart from "spreading the word" phenomena, the way to change perceptions of non-users is mainly through communication campaigns.

Some of the means of communication campaigns foreseen in the ENERQI project are in vehicle screens, press release (bulletins, articles in local press), flyers, posters, free advertisements, social media or the website. It is more (cost) efficient to use these means to inform travellers of the implemented / planned quality improvements as well as to encourage them to register as a quality observer.

It is then useful to use the data on perceived quality to assess the effectiveness of the communication campaigns.

## 2.6 Evaluation

In order to take full advantage of the lessons learnt from the ENERQI process and to provide additional input for daily and strategic public transport management, the public transport operator should periodically evaluate the results of the customer based continuous quality monitoring.

A general evaluation of the evolution of **quality perceptions** is useful to understand the tendency of the costumers' opinions. As described above, this continuous evaluation should drive management decisions on the PT operations and related measures. At a higher level a general overview on the evolution of quality preferences is useful for the overall assessment of the use of the customer based continuous quality improvement.

This type of analysis should nonetheless take into account that customers' quality assessment depends on their expectations, which increase with time with the quality provided itself. As a consequence, the eventual increase of delivered quality may have results on reported perceived quality in the short-time but not in the longer-term as their standard of expectations adjust at a higher level. This phenomenon should be possible to identify and take into account through the patterns of evolution of data.

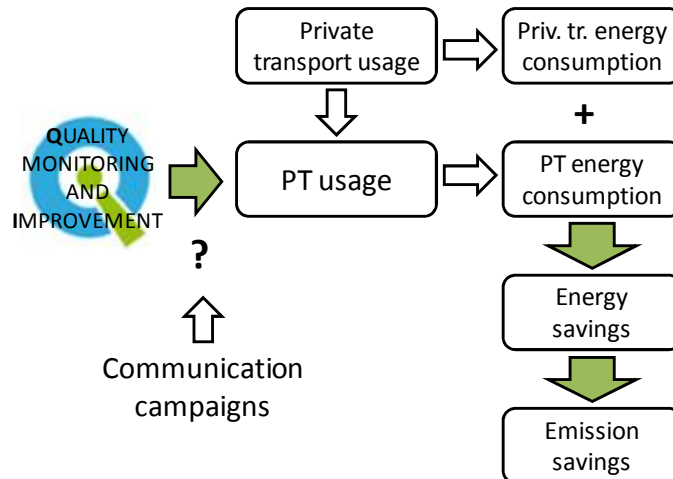
On the other hand, for an overall assessment of perceived quality evolution it must be guaranteed that the results are comparable through time, which may not happen if a common set of questions is not included or if the samples of compared costumers or PT services are not uniform.

Also important is to assess the actual high level effects that the monitoring approach might make and the related quality improvement measures that have been obtained. Particularly, it is relevant to assess the attainment of the strategic goals (see Step 1 in the Setup Manual) that resulted in the adoption of the quality monitoring, like increased public transport usage, modal shift, energy savings, environmental emissions and more generally well-being.

Can a relation between the evolution of public transport quality perceptions and the level of use of public transport be identified? Does improving quality of service really influence the mobility choices of people? To answer this question is a difficult task due to, on one hand the known inertia in changing the perceptions of non-public transport users (which are those that might potentially increase the PT usage) and on the other hand on the influence of external factors on the evolution of PT usage like economic performance, energy prices, other mobility policy, lifestyle, etc. Concerning the presence of external influence factors, their identification is crucial for a sound analysis of effects.

One way to identify external tendencies is to observe them from before the implementation of the scheme and its actions. If, for example, a given public transport operator shows a consistent decrease in PT usage this tendency will be regarded as such in the evaluation of results of ENERQI. Finally, it is also possible to better assess the influence of external factors and improvement actions if the improvement actions are only applied in some of the lines, allowing to isolate the different effects (in data is available per line).

Cross-information between quality improvements, communication campaigns and PT usage results might give indications on the importance of linking role of communication between actual quality and perceived quality of non-users.



**Figure 2.6.1 – Effects of the continuous observer based quality monitoring on public transport usage and on environment and energy consumption (as evaluated in the ENERQI project)**

Finally, to keep continuously improving the public transport quality of service, the operator can evaluate the implementation process of the ENERQI methodology: Local expert analysis on local implementation, external constraints due to particular events, etc. in order to deliver further insights and recommendations for the future design and implementation of quality monitoring.

The objective of this process evaluation is to provide useful indications for design and implementation of the scheme based on the lessons learned with the process of quality monitoring endeavoured. With it, the monitoring entity may learn lessons for the future for its own use and for others.

## 2.7 Setting up an ENERQI quality monitoring

Once the local ENERQI team set the following step plan, it helps the public transport authority/operator to set up a fully functioning, continuous quality monitoring program, with use of “real time” feedback in relation to quality improvements. The implementation is organised into seven main steps that conduct to the implementation of the ENERQI methodology in a public transport network:

1. **Select the lines for quality monitoring** – In the ENERQI tool you have to put in all the lines (with even the possibility to input (bus)stops) you want to observe. You can choose to observe the whole network or just some particular lines. The ENERQI approach may be applied on your whole network or on specific lines or services.

2. **Define the indicators target levels** –. In this second step you need to clarify and detail the objectives of the “customer perception based” quality monitoring. Based on the main objectives, the characteristics and expectations of the local PT users the quality indicators are chosen. The indicators on quality perceptions should reflect the attributes valued by the public transport users. For this ENERQI constituted a balanced set of indicators. However specific indicators may be useful to define in each place, for which recommendations are given.
3. **Set up the observers panel** – ENERQI allows you to set up the right customer panel taking into account customer profiles, lines observed and necessary sampling methods. Observers form an important part of the success of your quality measurement.
4. **Select the survey design and operation management** – the ENERQI tool provides a default questionnaire, which was developed and tested in the ENERQI project and can be used as a basis. You can make your own version of the questionnaire, developing any additional questions as necessary. In terms of survey applications, firstly the timing and regularity of the inputs given by the observers should be determined. Secondly, the survey format should be chosen. Several types of survey formats may be used, depending on the type of observers this can be a paper survey, internet access, interest groups consulting (students, elder people), quality audits, mystery client etc.
5. **Observer relationship management** – Observers have to be recruited and they form a representative sample of the relevant target groups Good observer communication allows for accurate quality monitoring, frequent reporting and enables observer rewarding without biasing the results. Also new observers have to be integrated to maintain the observer database. A strategy of communication with them and the way to motivate them has to be determined. A set of standard presentations, giveaways ideas, posters, and visuals have been developed that can be used to present the project, recruit and motivate observers and other stakeholders.
6. **System management** – Administrator roles have to be attributed, lines and stops information have to be integrated, initial observer lists (if available) have to be uploaded. The local system administrator has to acquire basic knowledge of the tool and its management, execute a few test rounds to check the correct functioning and handling of the tool, deal with some missing translations (a translation tool is integrated), deliver texts and local photos for the local front page.

7. **Organising regular quality reports to the public transport management** – In order to get the ENERQI quality feedback loop the collected data should be communicated within the organisation and other stakeholders. Correct reporting on the basis of a standardised reporting method allows public transport management to take informed decisions on quality improvements to be taken, and at a later stage receive information on how this respective improvement led to an improved quality perception. Therefore a periodic (in our case 3-monthly) feedback report has been developed, this report can be generated automatically.



### 3 ACHIEVEMENTS

#### 3.1 Achieved results

##### 3.1.1 Perceived quality results

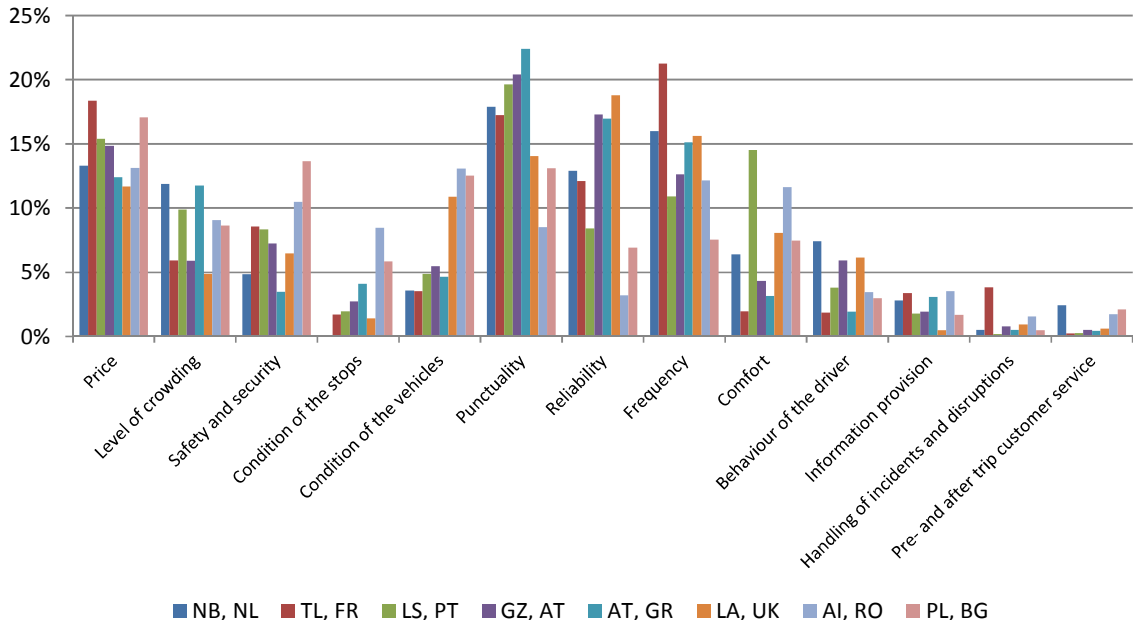
Each local ENERQI site monitored changes in perceived quality following the implementation of a set of public transport improvement actions. The ENERQI common monitoring allowed for a cross site benchmarking. The Benchmarking Indicator Quality Index (BIQI) allowed comparing results in aggregate indicators discounted of overall quantitative rating differences influenced by external factors including cultural aspects. By (at least partly) excluding such factor, the BIQI allows for each site to assess their standing relative to others for each indicator.

Another particularly useful insight was the given by the comparison of the quality aspects most important to the customers' opinions. It became clear that customers tend to point issues which are contributing to dissatisfaction and to forget issues with a very high quality (e.g. frequency and punctuality in Alba Iulia were comparatively not regarded as important aspects there while they are delivered with a very high level of service, often with a bus every three minutes). Considering this tendency of customers, the comparison of reported most important aspects also became a tool to assess each site's standing in relation to each quality aspect.

Overall, the benchmark analysis provides an additional means of interpretation of the local results and on the potential to improve perceived quality in each indicator.

**Table 3.1.1 - Benchmarking Indicator Quality Index results**

	Brabant, NL	Toulouse, FR	Lisbon, PT	Graz, AT	Athens, GR	Lancashire, UK	Alba Iulia, RO	Plovdiv, BG
Information	1.19	1.05	0.97	0.99	0.81	1.00	1.04	0.96
Time	1.11	1.00	1.00	1.01	1.09	0.82	0.97	1.03
Customer service	0.86	0.93	1.04	1.02	1.09	1.00	1.01	1.05
Comfort	0.96	0.98	1.01	0.97	1.01	1.07	1.01	1.00
Safety / Security	0.88	1.04	0.98	1.02	1.00	1.13	0.98	0.96



**Figure 2.1.1 – Comparison of results on most important quality aspects for the customers’ opinion (percentage of responses)**

The indicators with lower BIQI results should be regarded as points to improve at the local level. In fact, a lower BIQI result shows that the other sites manage to achieve a comparatively better standardised quality perception and that it would be possible to achieve the same result through some measures. Nonetheless, this may not be the case if the result is influenced by particular local external factors not controlled by the transport operator like weather or cultural factors influencing the customer valuation of some specific quality aspects (e.g. noise nuisance is perceived differently in different European countries). A comparison over time at the own local site is essential.

The following graphic and table detail the results of the question “Which were the items that influenced your opinion most?”<sup>3</sup> This question was meant to evaluate which quality aspects are most important for customers.

<sup>3</sup> The question let the respondent’s select up to three aspects that were the most important for them.

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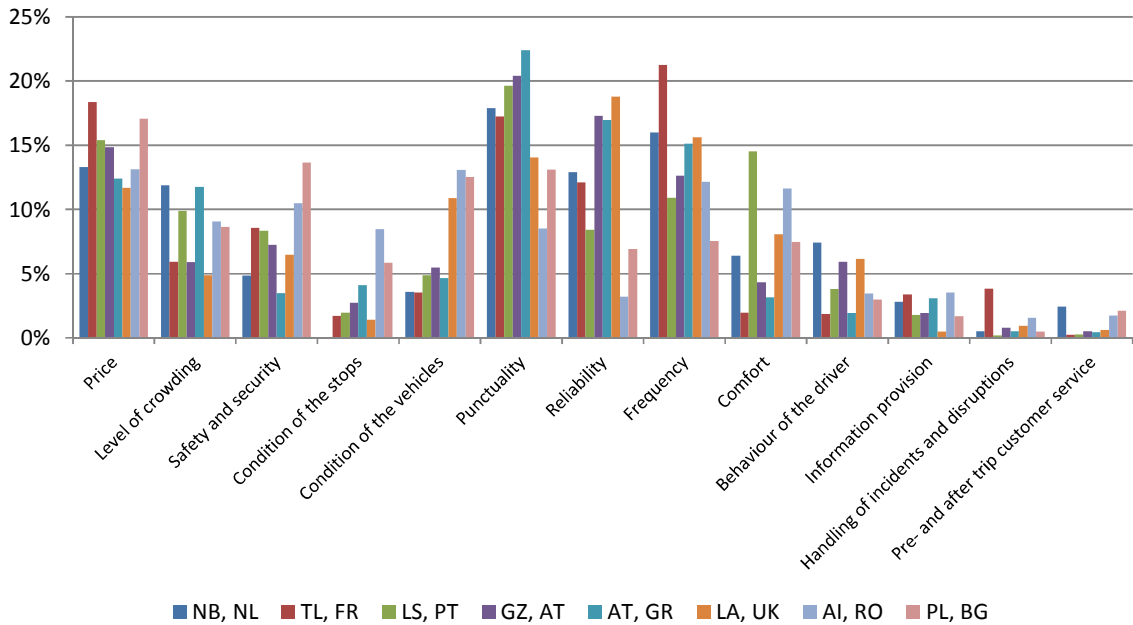


Table 3.1.2 – Most important quality aspects for costumers (percentage of responses)

	Price (value for money)	Level of crowding	Safety and security	Condition of the stops	Condition of the vehicles	Punctuality	Reliability	Frequency	Comfort	Behaviour of the driver	Information provision	Handling of incidents and disruptions	Pre- and after trip customer service
NB, NL	13%	12%	5%	0%	4%	18%	13%	16%	6%	7%	3%	1%	2%
TL, FR	18%	6%	9%	2%	4%	17%	12%	21%	2%	2%	3%	4%	0%
LS, PT	15%	10%	8%	2%	5%	20%	8%	11%	15%	4%	2%	0%	0%
GZ, AT	15%	6%	7%	3%	5%	20%	17%	13%	4%	6%	2%	1%	1%
AT, GR	12%	12%	3%	4%	5%	22%	17%	15%	3%	2%	3%	1%	0%
LA, UK	12%	5%	6%	1%	11%	14%	19%	16%	8%	6%	0%	1%	1%
AI, RO	13%	9%	10%	8%	13%	9%	3%	12%	12%	3%	4%	2%	2%
PL, BG	17%	9%	14%	6%	13%	13%	7%	8%	7%	3%	2%	0%	2%
total	15%	8%	9%	4%	7%	17%	10%	14%	8%	4%	3%	1%	1%

Overall, the most important aspect was punctuality, followed by frequency, price, reliability, safety and security, comfort, level of crowding and condition of the vehicles.

As already identified in the 1<sup>st</sup> Benchmark, there are clearly similar patterns on how people value the importance of these aspects in different countries. Still, there are

relevant differences in what the customers value the most. Some of the most stringent ones are outlined and updated from the previous benchmark:

- Price is among the top five of most important aspects in all sites except Alba Iulia. Lisbon is the place where price has a higher relative importance, which is very likely related to the recent drastic fare increases in this site;
- Safety and security is not perceived as an issue in Athens, and to some extent in Noord-Brabant and Graz;
- The conditions of the stops continues to be a relevant issue in Plovdiv and Alba Iulia;
- The conditions of the vehicles are clearly more valued in Alba Iulia, Plovdiv and Lancashire than in other places;
- Punctuality is within the top three aspects in all sites, except for Alba Iulia (where there is a very high frequency of the services).
- In Lancashire, Graz and Athens there is a significantly greater importance given to reliability than in other sites;
- Frequency is still the most referred aspect in Toulouse, while Plovdiv is the place where it is less referred by customers;
- Comfort is now given a very high importance in Lisbon, and still an important issue in Alba Iulia. In Toulouse, Athens and Graz it is not perceived as an important issue;
- Driver behaviour continues to be a relevant issue in some sites, particularly in Brabant, Lancashire and Graz, and now less so in Lisbon;
- The remaining quality aspects – information provision, handling of incidents and customer service – are not referred as important aspects in any site.

### ***3.1.2 Implemented local quality improvements***

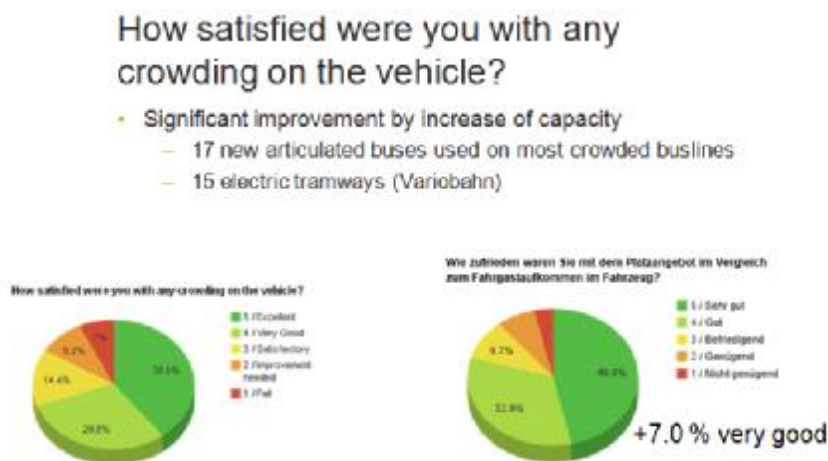
The following table presents the improvement measures taken during the ENERQI project by the different test sites. It includes a wide range of possible quality improvements, ranging from the procurement of new vehicles, timetable changes, to more customer service focused activities like an improved communication strategy and provision of customer information and driver training.

**Table 3.1.3 – Quality improvement measures implemented by test sites**

	Brabant, NL	Toulouse, FR	Lisbon, PT	Graz, AT	Athens, GR	Lancashire, UK	Alba Iulia, RO	Plovdiv, BG
<b>Availability/Accessibility</b>								
Route changes		x	x		x			
Network and timetable changes		x	x			x		
local traffic platform: - Buses and tramways are synchronized with train schedule - Public transfer will be much faster due to subsurface route - Much faster information regarding disruptions				x				
Training for working with the ramps for people with reduced mobility								x
<b>Information and Marketing</b>								
Improvement of provided information via Websites and mobile apps					x		x	x
billboards in 70% of the bus lines stops with actual arrival times							x	
PT maps at all stops and inside the buses							x	x
comprehensive bus timetable information with route maps								
Marketing campaigns	x		x			x	x	
Introduction of tram TV				x				
<b>Customer support</b>								
Infoline to improve traffic information, make suggestions and report incidents							x	
Round table for handicapped persons				x				
<b>Comfort (Stops and shelters, vehicle condition)</b>								
Repairs at stops, stations and vehicles					x			
trash bins on board / improved cleanliness				x				x
Buses new/refurbished				x		x		
Introduction of 'bike bus'			x					
wi-fi services on buses			x					x
Introduction of professional uniforms / identification								x
<b>Staff service</b>								
Drivers training	x		x	x			x	
<b>Tickets and tariffs</b>								
More friendly economical policy: Expansion of students' reduced fee for one month, tourist tariff, lottery for free monthly/weekly tickets in cooperation with a Cultural Centre of Athens					x			
Increased number of ticket selling machines				x				
SMS-ticketing								x
Electronic ticketing							x	
<b>Disruption / Incidents</b>								
Actions taken in order to improve the information availability, and reduce information time on interruption of services				x	x	x		
<b>Level of crowding</b>								
Increase of capacity by 33 new articulated buses used on most crowded buslines and 15 electric tramways (Variobahn)				x				

In the case of short-term measures which have an impact on operational quality it may be possible to identify their impacts on perceived quality. In some cases it was indeed possible to distinguish effects of concrete measures on perceived quality.

The case with clearer effects following an extensive set of quality improvements was Graz. Besides an overall increase in satisfaction and value for money perceptions, Holding Graz observed improvements in perceptions on crowding on vehicles (+7% 'very good' answers), conditions (+17.3%) and comfort (14.6%) of the vehicles, and information and solutions regarding disruptions (+13.5%). The three positive changes in perceptions most plausibly derived from delivered quality improvements related respectively with increase of capacity in the most crowded routes, introduction of new vehicles and investment in the 'tram TV' and the local workshops for employees responsible for disruption management and information.



**Figure 3.1.3.1 – Effects on perceived satisfaction on crowding on the vehicle following capacity improvements in Holding Graz**

Some more customer service oriented changes resulted also in large quality perception changes. In Alba Iulia and Lancashire it was possible to distinguish effects after the realisation of driver training. For example, in Alba Iulia the 'very good' answers regarding driving style have increased from 40.1% to 50.3%.

### STP – Driving style before and after driver training

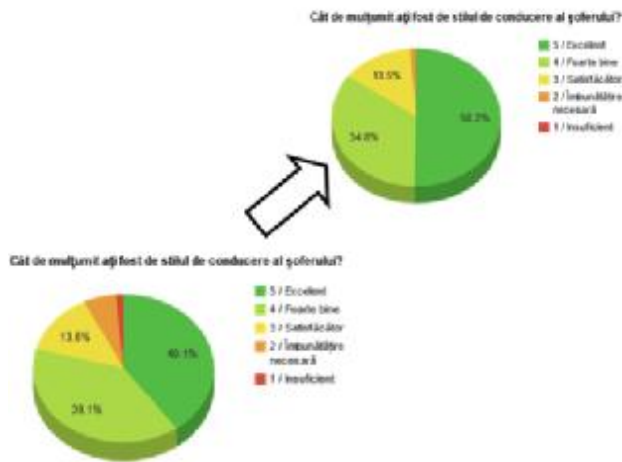


Figure 3.1.3.2 – Effects on perceived satisfaction on driving style following drivers training in Alba Iulia

It proved also to be possible to distinguish effects from reductions in delivered quality. The most obvious case was in Lisbon where the radical increases in tariffs caused observed low levels of satisfaction in the indicator value for money (“price-quality relation” in the Portuguese language). The tariffs were increased more than 50% in the beginning of 2012 and beginning of 2013. These price changes clearly are the cause of lows in the beginning of the ENERQI observations and later in January 2013. The evolution of perceptions is also illustrative of the role of adapting expectations that after the price increase in the beginning of 2012 there is an adaptation of declared satisfaction to a “normal” level some months after the price change.

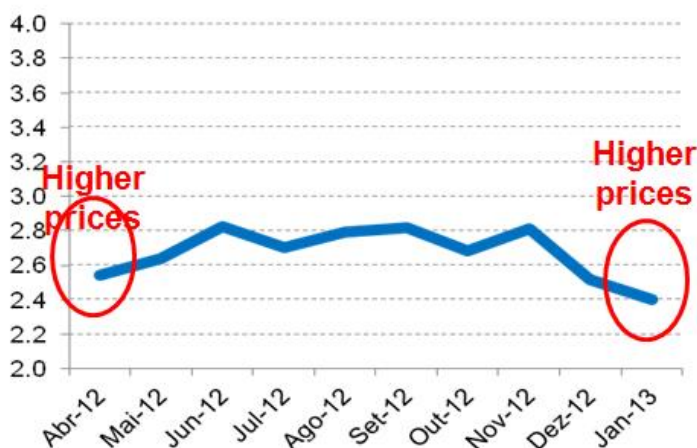


Figure 3.1.3.3 – Effects on perceived satisfaction on value for money following price increases in Lisbon

In some cases it was possible to clearly identify related changes in perceived quality of specific indicators following from specific actions undertaken. The same was true of

reductions in quality following budget cuts. As foreseen in the beginning of the project, other changes were not possible to detect through perceived quality observations due to limited scope of application (e.g. specific lines), sample size, effects not observable in the short-term or targeting to non-customers.

An aspect to improve in most sites is that the information provided by the client-observer approach is fully used by all divisions of the operators which can benefit from those results. In some cases the use of the method was centralised in a given division using the results specifically for its own activities. If the results (and design of the scheme) were extended to other divisions with influence on quality deployment and communication, the benefits in terms of quality improvement could be maximized.

### 3.1.3 Impacts on Energy and Environment

In order to evaluate if this project meets the objectives of energy efficiency and reduction of greenhouse gas (GHG) emissions, the potential modal transfer caused by the evolution of quality perceptions in sites is estimated. This assessment considers the estimated quantity of car kilometres not realised due to modal shift to public transport and estimates energy and CO<sub>2</sub> equivalent savings on the basis of average specific energy consumption and emissions of public transport and cars. The estimation assumes a variation of public transport passenger trips of the order of the indicatively estimated in the previous section, i.e. a 2% increase.

The following assumptions and simplifications are considered in the calculation:

**Table 3.1.4.1 – Assumptions used in energy and emission savings estimation**

Specific energy consumption of car trips (50% gasoline, 50% diesel)	0.07	liters / km
Total baseline ENERQI passenger trips	1069.94	million trips /year
Average trip distance	4	km/trip
% variation in PT trips	2%	
% trips shifted from car	25%	
Passenger-km attracted to PT	85.6	million pass-km/year
Passenger-km attracted to from car	21.4	million pass-km/year

It is also assumed that the existing supply of PT services is able to accommodate the change in demand. This is a simplification with a negligible impact on the final result.



The resulting effects in terms of tons of oil equivalent (toe) and emissions of CO<sub>2</sub> equivalent (CO<sub>2</sub>e) are the following, considering the longer-term effect in the ENERQI implementation cases:

**Table 3.1.4.2 – Estimation of energy and CO<sub>2</sub>e impacts in ENERQI sites**

<b>Energy savings</b>	<b>1,32</b>	<b>toe/year</b>
<b>CO<sub>2</sub>e emission savings</b>	<b>3,76</b>	<b>ton/year</b>

At a value per ton of CO<sub>2</sub> of 50€, the economic value of the emissions avoided is of about 190,000 Euros per year.

## **3.2 Review of the impact**

### **3.2.1 Influence of the local contexts**

The context is rather different in the various ENERQI sites. Urban density, local modal split, the passenger segments covered by the services, the pre-existent PT quality level and the related expectations by costumers vary a lot. These issues have significantly motivated the approaches followed in each site, partly determine the local specific objectives and influence results of quality measurements. The following table describes the main local characteristics at the beginning of the ENERQI project (2010).

**Table 3.2.2 – Local context and pre-existing quality aspects**

Site	Urban density of the PT operations area *	Modal split	Fleet age	Speed	Frequency	Passenger satisfaction
NL Noord-Brabant	Low	3%	4	NA	2	7,0/10
FR Toulouse	High	65%	1 (tram) 9 (metro)	20 (bus) 19 (tram) 33 (metro)	NA	90/100 (metro only)
PT Lisbon	Very high	32%	7 (bus) 16 (tram)	15 (bus) 10 (tram)	5	67/100
AT Graz	High	20%	8 (bus)	17 (tram) 22 (bus)	12 (tram) 10 (bus)	6.3/10
GR Athens	Very high	35%	9 (average of means)	18 (average of means)	NA	-
UK Lancashire	Low	8%	7	23	NA	-
RO Alba Iulia	Average	NA	5	29	20	84,2/100 (2011)
BG Plovdiv	High	37%	5	25	7	76/100

\* Qualitative scale on basis of subjective comparison between sites

\*\*Based on different types of surveys

The areas covered by the transport operators range from very dense urban areas (Athens, Lisbon) to low density regions (Noord-Brabant, Lancashire). Density and propensity to use other transport modes (like cycling in the Netherlands) also implies differences in terms of modal share of PT, which ranges from 3% in Noord-Brabant to 65% in Toulouse, with obvious implications for the segments of costumers covered, which range from strictly captive segments (Noord-Brabant, Lancashire) to nearly all segments of the population (Toulouse, Graz, Lisbon). Some indicators of pre-existent quality that are widely available are fleet age, speed, frequency or passenger satisfaction ratings. All sites started from their own local base line situation which had an effect on the level of perceived quality changes following an improvement action.

### **3.2.2 Different local implementation approaches**

The implementation of the ENERQI approach allows for some variations in the ways how it is implemented, as described in the ENERQI Guide and Methodology.

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The sites have made different choices in the approaches followed. The following table summarises some of the most important, including objectives at stake, targeted services, timing and format of surveys and targeted customer groups.

Table 3.2.2 – Summary of main implementation approaches across sites

Site	Local operator(s)	Main top objectives of quality monitoring	Targeted services	Surveys		Targeted customer groups	
				Timing	Format Internet, paper, phone		
NL	Noord-Brabant	Arriva and Veolia Transport Brabant	Increase the PT usage, improving perception of quality by customers	All bus lines	monthly	internet	all customers of Veolia and Arriva
FR	Toulouse	TISSEO	Improving perception of quality by customers, Increase satisfaction of customers	All metro and tramway lines 20 bus lines (1st step), then all bus lines	Monthly	Internet	All customers
PT	Lisbon	CARRIS	Increase costumers, Evaluation of actions	All services (bus, tram)	monthly	Phone, Internet	All costumers (with bias for internet users)
AT	Graz	Holding Graz Linien	increase quality of service	All services (bus, tram)	ongoing	Paper, Internet	All costumers (with bias for internet users)
GR	Athens	OASA	Increase number and satisfaction of costumers, Services' quality improvement	All services (bus, metro, railway, trolley, tram)	weekly	Internet and paper	All costumers
UK	Lancashire	Transdev Burnley, Pendle	Information regarding customers perception of quality of PT service/network in area	All Transdev B & P bus services.	Individual responses as frequent as possible	Internet	All customers of Transdev B&P
RO	Alba Iulia	STP	Evaluate the clients' satisfaction Increase customers	All lines (bus)	monthly	Mostly paper	All customers
BG	Plovdiv	Hebros Bus	Improving quality, Introducing customer-oriented monitoring	All urban bus lines	monthly	Internet, Paper	Mostly students

### 3.2.3 Recruitment of observers

One of the most important issues is the effective recruitment of volunteers. A successful recruitment plan is imperative for the development of a customers observations' based quality monitoring. A second challenge is to engage the people who took the initiative to register as observers to effectively participate delivering the requested observations.

The following table shows the results obtained in the sites regarding the number of observers recruited, the number of observations obtained and the rate of participation by the end of the ENERQI project.

**Table 3.2.3 – Total number of observers and observations, by site**

	<b>Observers recruited</b>	<b>Number of observations</b>	<b>Participating observers (last registered round)</b>	<b>Rate of participation</b>
Brabant, NL	208	5.958	74	35%
Toulouse, FR	1.500	4.101	792	53%
Lisbon, Portugal	765 (503 + 262)	5.020 (4.870 + 150)	626 (497+129)	74% (99% / 49%)
Graz, AT	418	2.740	74	18%
Athens, GR	162	1.584	89	55%
Lancashire, UK	253	264	32	14%
Alba Iulia, RO	557	3.200	199	36%
Plovdiv, BG	235	2.528	34	14%
<b>Total</b>	<b>4.094</b>	<b>25.395</b>	-	-
<b>Average</b>	<b>512</b>	<b>3.174</b>	<b>240</b>	<b>38%</b>

A total of **4,094 observers were recruited** for the ENERQI project, in an average of 512 per site. The initial target set was to achieve 500 observers per each site. Even if this ambitious target was not achieved in all places, the general result may be considered encouraging and sufficient for getting useful information on customer perceptions.

The most obvious reason for differences between sites in the number recruited is the total number of public transport customers. On the basis of the services covered and total numbers of public transport users, each site tried to recruit its own target number of observers.

An important explanation for relative differences in success of recruitment are cultural differences. The general predisposition of citizens to voluntarily cooperate for the common good seems to vary in different European cultures. While in countries like Austria and France there was a broad willingness of people to cooperate, other countries (particularly Eastern) like Bulgaria, Greece and Romania at an initial stage, this predisposition is lower. Citizens in these countries are less familiarised and less confident with participating in such a scheme.

However, this situation seems to have a potential for change. If the advantages of the scheme are well explained (e.g. Alba Iulia), this improves citizens' willingness to participate.

Several sites highlighted that the recruitment process would have benefited from larger campaigns or by using other recruitment methods. Some sites had the experience of significantly improving recruitment results after extending the campaigns and this was particularly visible in Toulouse, Lisbon and Athens which started with lower scale campaigns and saw clear improvements in recruitment rates after setting up larger campaigns. In Lisbon, for example, the first approach was to collect observers from web based communication channels (website and Facebook) and later it proved more successful to put posters and fliers in the vehicles. Therefore, wide reaching and targeted campaigns have proved to be a factor of success.

### ***3.2.4 Overall assessment of the method by local management***

Comparing this approach with other quality monitoring methods, all test sites consider this methodology by using volunteer observers as the most cost-effective. The aspects that have contributed the most for this opinion can be summarised as followed:

- Size of sample,
- High frequency of observations,
- Quick access to incidents info,
- Value for money,
- System is easy to use / online questionnaire approach.

## 4 CONCLUSIONS AND RECOMMENDATIONS

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Today the mobility patterns in European cities are changing. Public transport is crucial in our attempts to keep our cities and suburbs accessible, improve air quality and the quality of life. To maintain or increase the modal share it is essential for public transport to better satisfy their customers' needs. The choice of a transport mode is based on a lot of aspects but quality continues to become even more important. The quality of public transport is influenced by:

- Transport aspects: frequency, accuracy, speed;
- Service aspects: friendliness of the driver, information, quality of the vehicle, costs;
- Others: cleanliness of the stop, public transport image, feeling of safety and security.

The ENERQI local sites proved that optimal perceived quality leads to satisfied travellers and in the end a better product with even more customers – travellers. Targeting the recognised quality aspects allows an operator to be more cost effective and steer its investments wisely.

The ENERQI methodology and tool allows operators to better listen to their customers; and to improve the quality of public transport based on their observations. ENERQI monitors experiences, needs and expectations of customers. It involves volunteer observers who are both frequent public transport users and non-frequent users, to answer questionnaires on a wide range of quality related issues regarding the public transport services (bus, tram and metro) they are using. Carried out on a continuous basis ENERQI helps the operator to increase the quality of the public transport services in the area.

In line with the European Standard EN 13816-2002 for public service quality ENERQI helps the operator to obtain this knowledge. The ENERQI Quality Loop helps public transport management take the right actions to improve the quality of the public transport services and to increase usage. The driver behind the quality improvements are observations made by regular travellers, the so-called observers. They get at least one assignment a month to fill in a questionnaire about a daily trip. With the help of a carefully constituted group of volunteer observers it is possible to get a reliable and sound overview of the perceived quality of the delivered public transport service and the effects of improvements. The quality loop gives direct “real time” inputs to the management of the public transport operator, allowing for more focused customer relation management, cost effective public transport improvements and a quality public transport service for all of its users.

## 5 SOURCES

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Enerqi brochure

Enerqi methodology

Enerqi guidelines

Enerqi 1<sup>st</sup> Benchmark report

Enerqi 2<sup>nd</sup> Benchmark report

Enerqi Final impacts



## ANNEX

## A. Glossary

Terms	Part of questionnaire	Definition
Primary	Subscription form : "What's your level of education ?"	First stage of compulsory education
Secondary		Last stage of compulsory education
University and higher		
Pupil	Subscription form : "What's your main profession ?"	Someone who studies at school (rather than college/University)
Student		Someone who studies at college or university
Employed		Someone who works, who has an professional activity
Unemployed		Someone who is out of work
Retired		Someone who has finished one's active working life
Week	Subscription form : "How often do you use a public transport service?"	Working days (Monday to Friday)
Week-end		Saturday and Sunday
Every day		Each days of the week or every working day (Monday To Friday)
Day		Working hours of the day (7 am to 7 pm)
Trip	Regular questionnaire	Short travel, to the stop / station where someone gets on a vehicle to the stop / station where someone gets out the vehicle. Only one type of vehicle and one line are used.
Journey	Regular questionnaire	Long travel, to the place of departure to the arrival place. Several vehicles and lines can be used.
Stop	Regular questionnaire	Place where bus stop to pick up or set down passengers.
Station	Regular questionnaire	Place with a ticket office, waiting room, ... where metro, tram and buses stop to pick up or set down passengers.
Vehicle	Regular questionnaire	Bus, trolleybus, tram, metro
Service (of public transport)	Regular questionnaire	The total service package offered to the customer from core transporting of the customer, ticket sold, the information provision and ambiance at stops and in vehicles
Value for money	Quality of the services	Perception of quality of the services regarding the price paid
Price	Quality of the services	Cost of the ticket
Level of crowding	Quality of the services	Perception of the number of people gathered together at the stop / station or into a vehicle.
Safety	Quality of the services	Feeling free from fear or anxiety depending of involuntary acts (ex: road accident)
Security	Quality of the services	Feeling free from fear or anxiety depending of voluntary acts (ex: theft, degradation, ...)
Personal Safety	Quality of the services (Questions 15 and 16)	Feeling free from fear or anxiety for someone (independing of the type of the act)
Punctuality	Quality of the services	Be on time, with "X" minutes before or after accepted
Reliability	Quality of the services	Respect of a period of time between two hours of passage of vehicle into a same line.

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Frequency	Quality of the services	Type of line. The vehicles of a same line pass every "XX" min at a stop / station. (In opposition with "Line with schedule". The vehicles of a same line pass at the hour indicated (interval aren't equal between two schedule).
Comfort	Quality of the services	State of ease and freedom
Driver behavior	Quality of the services	Respect of the driver to follow the rules
Incident	Quality of the services	Interruption of the services.
Disruption	Quality of the services	Case when the service of public transport doesn't work normally.
Route change	-	Modification of the way.
Shelter	Quality of the services	Place giving protection of bad weather or danger, to wait for the bus, the tram or an other vehicle.
Duration of the trip / of the journey	Quality of the services	Perception of the time of duration.
Trip / journey speed	Quality of the services	Perception of the speed of a trip / a journey.
Customer	-	Someone who uses the public transport,

**Table A 1 – Glossary of terms**

Part of the questionnaire	Questions	Types of scale	Meanings
Quality of the services	All questions with scale	1 to 5	1/5 = Not satisfied at all 2/5 = Not satisfied 3/5 = Neutral 4/5 = Satisfied 5/5 = Really satisfied
		1 to 10	1/10 = Not satisfied at all ... 10/10 = Really satisfied
Regular questionnaire	12. Condition of the traffic	Qualitative	Very busy Busy Clear
Regular questionnaire	13. Duration of the journey	Quantitative or Qualitative	Longer than normal Normal Shorter than normal
Regular questionnaire	14. Items that most influenced opinion	1 to 3	1st 2nd 3rd

**Table A 2 – Glossary of scales used in the ENERQI common questionnaire**

## **B. General conditions of participation by observers (ENERQI project)**

1) You are travelling on a regular basis on at least one of the lines of the operators (NAME OF THE OPERATOR OF OBSERVED NETWORK(S)) or prepared to do so. You will be asked and agree:

- on request to execute on a regular basis (INDICATE WHICH REGULARITY) a quality observation of your trip and to report back through the provided questionnaire;
- to do this for a longer periods;
- to be prepared to participate to ad-hoc theme based questionnaires.

2) You are in the possession of a computer or any other replacing device with an internet connections (please note that much experience of working with a computer is not requested)

2A) in case you are asked to return the questionnaire in a paper format the possession of a PC or any other replacing device with internet connection is not necessary. In that case you are asked to properly return the filled paper-based questionnaire as locally indicated.

3) You are aware that not every person that subscribes can automatically participate. In order to get a representative panel of observers a selection will take place.

4) Staff of the public transport operator is excluded from participation

5) Participation is allowed from 16 year (REPLACE BY LOCAL LEGAL AGE)

6) As a result of a change in the research methodology or focus of the research it might be possible that your participation is ended by the local organisation (INSERT NAME OF LOCAL MAIN RESPONSIBLE ORGANISATION)

7) The local organisation (INSERT NAME OF LOCAL MAIN RESPONSIBLE ORGANISATION) can at any moment decide to change the manner of rewarding for your participation. You maintain every right on reward(s) that you gained before this change

8) You will be asked to during any period that you are not able to execute a quality observation (for example vacation) to indicate this to the organisation. This can be done by sending an email to (INSERT EMAIL ADDRESS)

9) You are able at all times to end your participation by sending an email to (INSERT EMAIL ADDRESS)

10) You agree that the organisation sends you news items related to research, including a feedback on the local results

11) You agree that the local organisation (INSERT NAME) processes your personal information in line with the respective national privacy legislation and regulation in place.

12) You agree that the local organisation (INSERT NAME) uses your anonymous made data for analysis on the quality of public transport in the frame of the European ENERQI project [www.ENERQI-online.eu](http://www.ENERQI-online.eu)

(REPLACE or COMPLETE IF NECESSARY BY ANY OTHER LOCAL SPECIFICATION)