

QUICK WINS

for reducing energy consumption in public transport



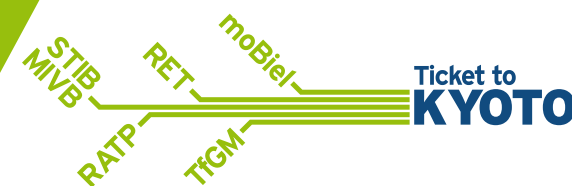
MANCHESTER

BIELEFELD

PARIS

ROTTERDAM

BRUSSELS





Public transport operators can strongly improve their energy efficiency in a relatively simple way by implementing small actions referred as **Quick Wins**. This brochure aims at sharing the knowledge acquired by the five transport operators grouped within the European project Ticket to Kyoto.

During four years, the partners have exchanged on best practices and have proven that energy consumption can be reduced efficiently and significantly without the need for large investments.

Through various examples, you'll find out how 25% of the energy use has been reduced through HVAC optimization. Metro and bus ecodriving programs have resulted in savings of 1 GWh of electricity and thousands of fuel liters, and staff awareness has been raised by the organization of several events on energy management.

Discover the
INFOGRAPHICS
on page 8
presenting
potential actions
and expected
savings.



1. Why is it necessary to manage energy?

Public transport context

Public transport operators faced significant energy price increases over the last few years. This situation has had direct impacts on their activities due to the financial pressures it generates. Moreover, climate change requires a dramatic drop in energy consumption to meet the Kyoto objectives. These economic and environmental challenges lead to a critical situation for operators and actions must be taken now to mitigate the effects. But public transport companies are facing important difficulties when considering initiatives to reduce energy use and CO₂ emissions (Atkins, 2012):

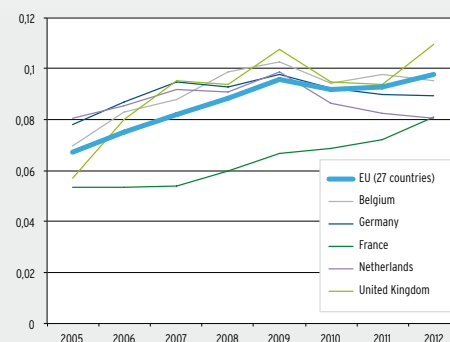
- trade-off between high short-term costs and potential long-term benefits;
- balancing public transport emission reduction with wider transport sector policy objectives
- split responsibilities and incentives
- informational failures and uncertainty
- carbon price externality
- policy and regulatory frameworks
- technology risk
- high search and transaction costs
- path dependency (lock-in)
- inertia and behavioural barriers.

Electricity prices

45% increase between 2005 and 2012

Electricity prices for industrial consumers rose considerably during the last few years. The European average price for one kWh increased by 45% between 2005 and 2012, rising from 6,72 c€/kWh to 9,76 c€/kWh. The situation is slightly different in each country but a common trend is clearly noticeable. This situation is particularly critical for large public transport companies operating several metro and tram lines as it has a direct impact on their operational costs.

Fig. 1 – Evolution of the electricity prices for industrial consumers between 2005 and 2012 (EUR/Kwh) (EUROSTAT)

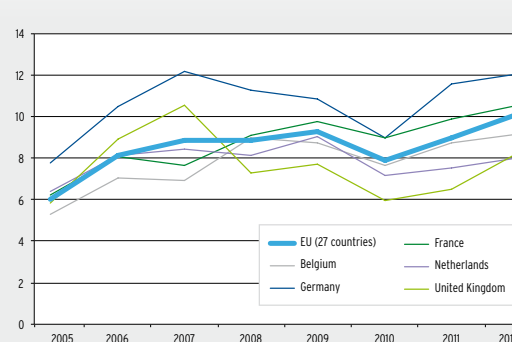


Gas prices

Slight upwards trend

Gas prices have been following an increasing curve over the last years although the prices increased relatively less than for electricity. A significant drop can be observed in all European countries in 2010. However, the overall trend is clearly upwards and impacts the heating costs of large buildings such as offices, depots, workshops and stations.

Fig. 2 – Evolution of the gas prices for industrial consumers between 2005 and 2012 (EUR/Gigajoule) (EUROSTAT)

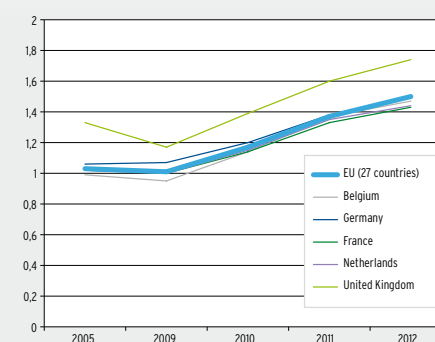


Gasoline prices

1,4€/litre in 2012 compared to 1€ in 2005

As far as automotive diesel prices are concerned, all European countries have been facing the same upwards trend with prices increasing to more than 1,4€/litre in 2012 compared to 1€ in 2005. The costs of operating large bus networks are directly linked to the fuel price and this rapid increase was difficult to manage for transport operators. Fuel prices have shown a high degree of volatility, which means that transport companies are exposed to large financial and operational risks.

Fig. 3 – Evolution of the automotive diesel oil prices between 2005 and 2012 (EUROSTAT)



Why is it necessary to manage energy?

Energy consumption

Public transport operators often face increases in their energy consumption due to services expansion or improved service level. The objective to reduce energy use and carbon emissions needs to be balanced with the wider objective to reduce overall transport sector emissions by encouraging more users to switch from private car to public transport and other low carbon modes. Initiatives to encourage this change in behaviour can result in increases in energy use and emissions for the public transport sector through the provision of additional services and equipment.

Table 1 – Energy mix for the T2K partners countries in 2009 (EEA)

Energy source	Belgium	France	Germany	Netherlands	UK
Electricity	6%	13%	16%	10%	7%
Nuclear	52%	76%	23%	4%	18%
Gases	33%	4%	14%	63%	45%
Petroleum products	0%	1%	2%	1%	1%
Solid fuels (coal mainly)	6%	5%	42%	21%	28%
Other	3%	1%	3%	1%	1%
Electricity carbon intensity (gCO ₂ /kWh)	224.8	70.9	672.2	413.3	508.5

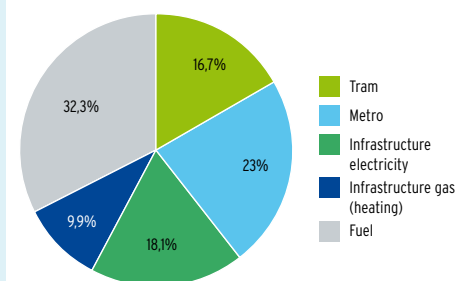
Energy mix and CO₂ emissions

We observe differences in electricity mixes and resulting carbon intensity across Europe. For example, in France, the high proportion of nuclear and hydro power results in relatively low carbon electricity. This means that initiatives, which aim to reduce energy carbon intensity, do not deliver the same benefits as in the Netherlands, Germany or the UK.

STIB (BRUSSELS)

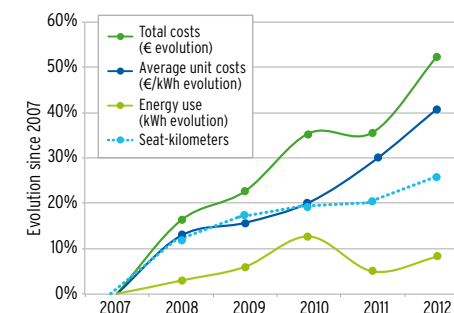
STIB spends approximately 20 M€ per year on electricity and 13 M€ per year on fuel (including support fleet). The energy costs rose by more than 50% between 2007 and 2012. This increase results from an 8% increase in energy consumption due to services

Fig. 4 – STIB energy use in 2012



expansion and from a 41% increase in the energy price. Energy efficiency was considerably improved over the period as transport services (expressed in places-kilometers) increased by 25% whereas the energy consumption increased by only 8%.

Fig. 5 – Energy evolution since 2007 (Energy costs and use, electricity, gas and fuel)



RET (ROTTERDAM)

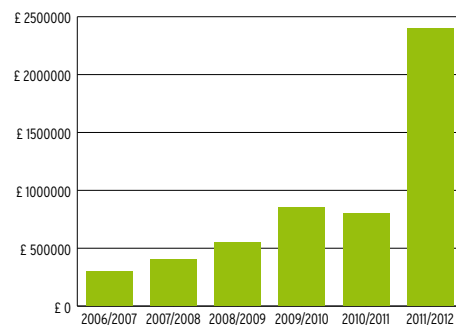
RET spends approximately 10 M€ on electricity, 7.8 M€ on fuel (buses and fleets) and 2.1 M€ on gas and district heating per year. Electricity use includes traction, stations, office buildings and depots.

Energy source	Volume used
Electricity	125 GWh
District heating (offices)	1.8 GWh
Natural gas (depots heating)	19 GWh
Gasoline (company fleet)	240,000 litres
Diesel (buses and ferry)	5.6 million litres

TfGM (MANCHESTER)

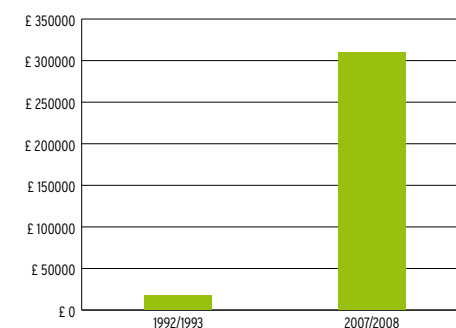
TfGM's energy costs were 2.5 M€ higher in 2011/2012 than they were in 2006/2007. This is because the company is building new infrastructures to expand the public transport network and improve the service quality for the passengers in order to reduce carbon emissions from travel in the Greater Manchester. But new bus stations are using much more energy than

Fig. 6 – TfGM energy costs evolution between 2006 and 2012



its predecessors due to the improvement in passenger waiting facilities. Old bus stations largely consisted of bus shelters and a small accommodation unit, but TfGM replace them progressively with large state of the art facilities to encourage the use of public transport.

Fig. 7 – Comparison of the electricity usage of the old and new Middleton bus station in Manchester

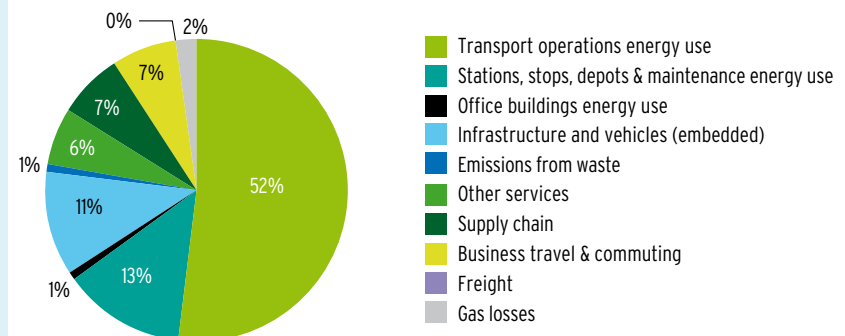


RATP (PARIS)

RATP has completed a carbon footprinting analysis ("Bilan Carbone®") including all RATP activities on the Greater Paris network: public transport operations, buildings and offices, infrastructure and vehicle maintenance, staff

travel, freight movements of suppliers as well as emissions from waste. Energy use appeared to be the most important source of emissions (66%), followed by infrastructure and vehicle embedded emissions (11%).

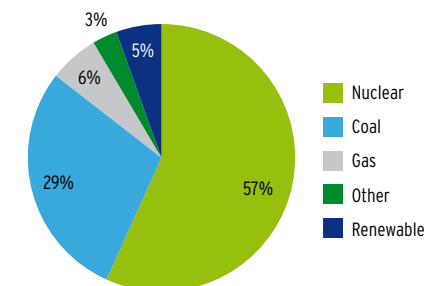
Fig. 8 – RATP Carbon footprint in 2008 (Source: RATP Bilan Carbone®).



moBiel (GERMANY)

The average figures at national level can be relatively different than the figures at the corporate level. The example of Bielefeld shows that the energy mix for electricity comprises a larger part of nuclear power than the national average in Germany. Replacing nuclear and coal power is a very ambitious goal set for 2018.

Fig. 9 – moBiel energy mix in 2011



2. How to manage energy in an efficient way?

The Quick Win concept

To improve energy consumption and reduce the related CO₂ emissions, three sequential strategies must be followed:

- Reducing energy use (less)
- Improving the efficiency of existing systems (better)
- Investing in new technologies and renewable energies (cleaner)

The first two strategies can largely be achieved by implementing energy-saving measures without the need for large investments. They refer to the Negawatt concept: a **negawatt** is a theoretical unit of power representing an amount of energy saved. The energy saved is a direct result of energy conservation or increased efficiency. The third strategy is longer-term and requires significant investments. A good energy management strategy should first consider reducing energy needs and improving energy efficiency before considering investments in renewable energy technologies. It is better to consume less energy than producing renewable energy to compensate higher energy needs. However, political priorities often focus on sustainable

DEFINITION OF A QUICK WIN

- leads to energy reduction;
- has a return on investment of less than 5 years;
- has a short implementation period (less than one year);
- offers energy savings, which can be measured or estimated;
- can be replicated in another similar context.

energy production instead of reducing energy use (top down approach). Public transport companies will gain more and more quickly by elaborating energy-saving strategies (bottom up approach) that will directly impact on their energy bill with less capital costs.

The **Quick Win** concept consists in implementing short-term actions that can bring significant financial and environmental benefits by optimizing existing assets and by encouraging more responsible behaviours among staff and subcontractors.

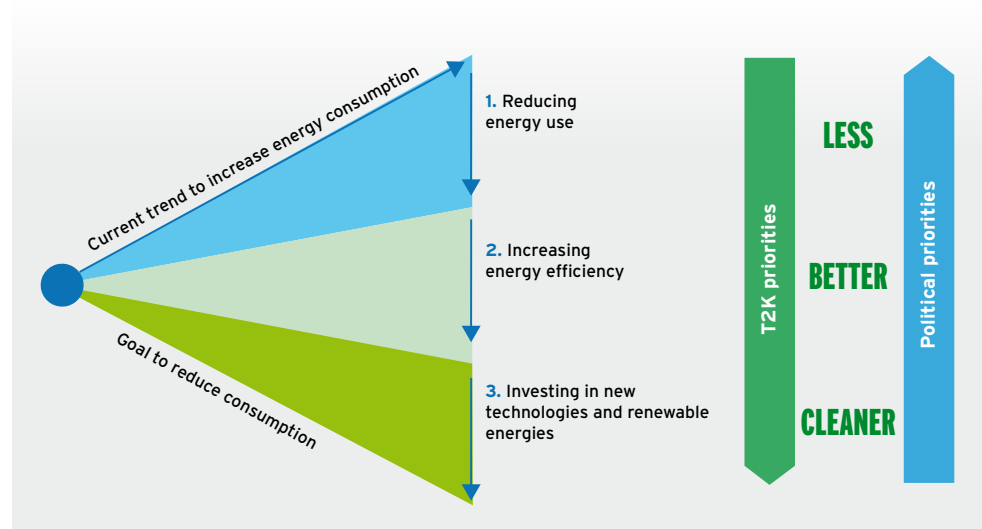
You can't manage what you don't measure

Having a good understanding of how equipment works and how much energy it consumes is a very important task in order to manage energy in a consistent way. Before implementing energy-saving projects, it is vital to develop a strategy regarding energy metering and audits.

Smart metering

Smart metering refers to the use of meters, which collect the consumption data enabling the processing of a wide variety of usage statistics. They can be used to measure electricity, gas or water consumption and can be integrated in a metering framework, in which

Fig. 10 – Strategy for reducing the energy consumption Source: Association Negawatt, Drawing by F.-O. Devaux, STIB, 2011



they interface remotely with the utility. Smart meters are similar in size to regular meters and are relatively easy to install. Energy managers should be aware that they will never have the opportunity to measure everything and that there is little benefit in analysing detailed energy use data from sites or equipment with very limited consumption. It is recommended to determine a threshold level of usage above which a smart meter would be installed.

Smart meters bring several benefits if data is monitored and targets are set: lower energy costs (often by a significant amount), no staff costs to read meters, less staff time required to liaise with suppliers over disputes, easy billing of tenants, etc.

Energy audit

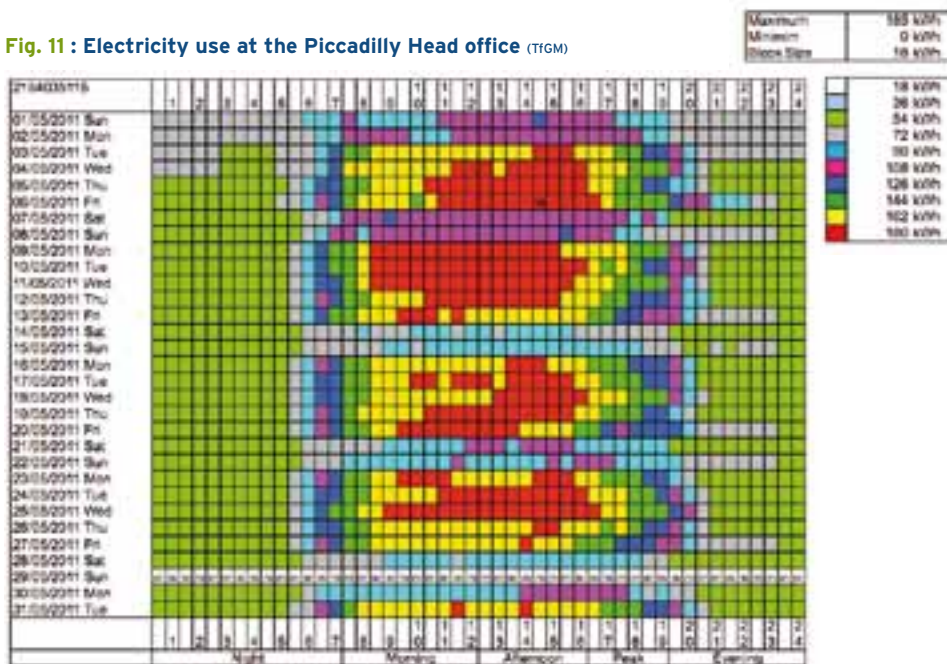
An energy audit is the analysis of the energy performance of existing assets. Energy audits assist companies in understanding how they use energy and help to identify the areas where waste occurs and where opportunities for improvement exist. These audits seek to prioritize actions to improve energy efficiency according to the greatest to least cost-effective opportunities for energy savings. It is therefore a very useful tool for energy managers in order to plan future investments. Most public transport estates such as workshops or depots were built some time ago and are not efficiently insulated from heat and cold. As a result, it is useful to undertake energy audits to identify energy losses and what actions are the most effective in order to reduce energy consumption.

TfGM (MANCHESTER): SMART METERING PROJECT

The majority of TfGM sites only had energy data from sporadic meter readings taken directly by staff, often just every few months. This project involved the replacement of existing electricity meters with “smart” meters, which provide half-hourly energy usage data. The data are downloaded and analysed to identify areas of energy waste. This enables a better understanding of energy consumption and allows monitoring and targeting of sites energy usage. The level of investment

required was minimal as TfGM leased the meters through the energy supplier with no capital costs. This project has led to energy waste being identified and in the first year following installation, TfGM saw a 6% reduction in metered electricity usage. TfGM has now installed gas and water loggers at all sites, in order to have the same level of data and utility management. This reflects the value smart meters have brought to the company.

Fig. 11 : Electricity use at the Piccadilly Head office (TfGM)



RATP (PARIS)

RATP underwent energy audits for all its office and industrial buildings in order to meet the French regulatory framework on sustainable development. This large investigation made it possible for RATP to have a clear view on the energy performance of its estates and to

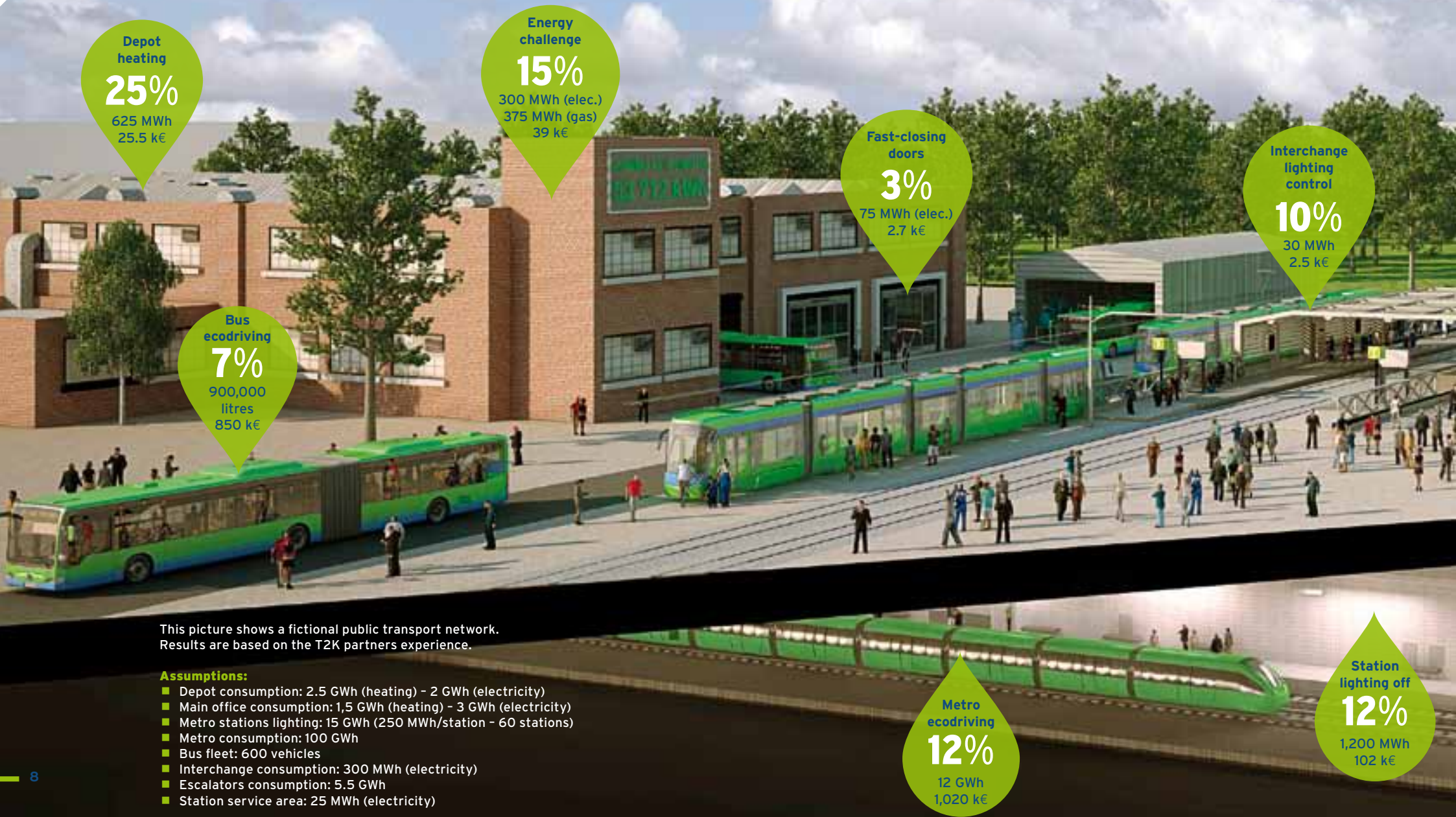
make useful comparisons between similar sites. The average energy bill for a RATP building amounted to 320 k€ per year with an average cost of 151 €/m²/year. It is also a great tool for monitoring over time the achievements made in the different buildings.

Fig. 12 – Infrared camera analysis of the Bords de Marne bus workshop (RATP)



3. Reviewing the Quick Wins implemented in public transport

Public transport operators can implement several Quick Wins in order to reduce energy consumption in a simple way with no need for large investment. This figure summarizes potential actions that can be taken by energy managers to reduce energy waste.



Green IT
2,5%
75 MWh
6,5 k€

Insulation
and green roof
25%
375 MWh
26 k€

Escalators
4%
210 MWh
18 k€

Service area
ecodesign
40%
10 MWh
850 €

Power
transformers
switch off
0,2%
160 MWh
13,5 k€

Heating, ventilation and cooling (HVAC)

Heating adjustments

Depots and workshops are large halls required for stabling and maintaining buses and rail vehicles. In order to guarantee a certain level of comfort for the employees, they must be heated during winter and cooled in summer. Heating is sometimes achieved by the use of radiant gas heaters but the installations are rarely optimized to work only during working hours. Properly adjusting the heating systems can strongly impact the energy use. Office buildings are usually better insulated. Nevertheless, a proper heating adjustment can also reduce energy use. The cost of this action is relatively low, as it will not require any investment, only some staff hours for analyzing the estate, defining the proper functioning of the heating system and conducting regular controls. Awareness campaigns will help to achieve the best results.

Ventilation control

Ventilation is required in bus depots and workshops to make sure that gas exhausts are correctly evacuated outside of the building, to prevent poisoning of the staff. These estates are usually fitted with an automatic ventilation system composed of extractors controlled by automatic timers. Ceilings may also be equipped with manual openings for the case where the ventilation system is out of order. Unfortunately, ventilation systems are often not properly configured so that important heating losses occur. Once the time schedule has been defined, the settings of the system can be adjusted.

Fast-closing doors

Public transport vehicles enter and leave depots and workshops several times across the day. Most of the time, the door remains open once the vehicle has left and must be closed manually. The installation of fast-closing doors enables a reduction in the time needed for opening and closing the doors so that heating losses can be reduced. A sensor detects the vehicle in front of the door and opens/closes it automatically. Besides reducing the heating and cooling needs, such an initiative can also avoid additional manual work risks related to the opening and closing of the doors.

Green roofs

In summer, when temperatures are high and the sun is shining, the rooftop of buildings can become very hot thus increasing the global temperature inside. The same happens during wintertime when the roof gets cold and impact on the temperature inside of the building. A green roof is a vegetative layer grown on a rooftop. It provides shade and removes heat from the air through evapotranspiration. Green roofs can be installed on a wide range of buildings, from industrial facilities to offices. While the initial costs of green roofs are higher than those of conventional materials, companies are able to offset the difference through reduced energy use and the longer lifespan of green roofs compared with conventional roofing materials.

RATP (PARIS)

The roof of the headquarters building of RATP was originally insulated in 1995. Following an energy audit, the company found out that heating and air-conditioning was responsible for 8% of the total energy consumption of the building. It was then decided to place a green roof when conducting the renovation works of the roof after 15 years. The extra cost amounted to 100 k€ but the energy consumption has been reduced by around 25%, with cost savings of 12.5 k€ per year.

Fig. 14 – Green roofs on RATP headquarters building, Quai de la Râpée (RATP)



RET (ROTTERDAM)

The heating installations in the RET depots and workshops were operated with no clear strategy for energy efficiency. A plan was developed to reduce the consumption by limiting the use of the gas heaters to normal working hours on days with temperatures below 15 degrees Celsius. Information campaigns have been organized for the 600 members of staff to make them understand why and how the company wanted to achieve this goal. This action allowed the company to reach 25% saving of gas consumption (4.6 GWh) resulting in a cost reduction of 200 k€ per year.

moBiel (BIELEFELD)

moBiel installed a fast-closing door in its bus workshop to reduce the energy costs. The advantage of the new system is the short opening and closing time of 5 seconds, in comparison with previous rolling gates requiring around 20 seconds. As a result, heat losses could be reduced. Energy savings can't be quantified at this stage due to the fact that only one door is currently installed.

Fig. 15 – View on the moBiel bus and tram workshop entrance in Bielefeld



Lighting

Lighting control systems

In many places such as stations, interchanges or workshops, lights can be switched off where and when there is sufficient natural light. However most traditional systems were not configured to react dynamically to the light levels throughout the day. A range of lighting control systems are available and their choice will depend on the location:

- **Occupancy control** consists in using a sensor to determine when people are in the vicinity, and reduce or eliminate unnecessary lighting if areas are empty.
- **Daylight responsive control** uses photosensors that assess the amount and quality of natural daylight in a particular space.
- **Time clock control** allows for the automatic control of lighting depending on the time of day (or night). Time clock control ensures that lighting levels are automatically set correctly for the coming time period.

Relighting

Many public transport companies operate old estates (depots, workshops, stations) with inefficient lighting, which has a strong impact on energy efficiency due to the long operational hours. Relighting consists of replacing and/or optimizing the lighting systems of a building. The replacement of old equipment by more energy-efficient technologies such as LED lighting can offer significant cost reduction and will improve the quality of light, thus making spaces safer and more comfortable to work or visit.

STIB (BRUSSELS)

Due to the low energy costs in the eighties, the lighting in the Brussels metro stations was not switched off during the night. The KYOLIGHT project started in 2011 and consists in switching off the operational lighting of the metro stations by matching the lighting switch off with the automatic closing of the security gates between 1 am and 4.30 am. This did not require any specific equipment but a close cooperation between maintenance and security services within the company. The project highlighted that some lighting equipment was defective and/or not correctly wired to the main power circuit. The energy savings represent some 9% of the energy consumption of the metro stations (1.56 GWh) with cost savings of 125 k€ per year.



TfGM (MANCHESTER)

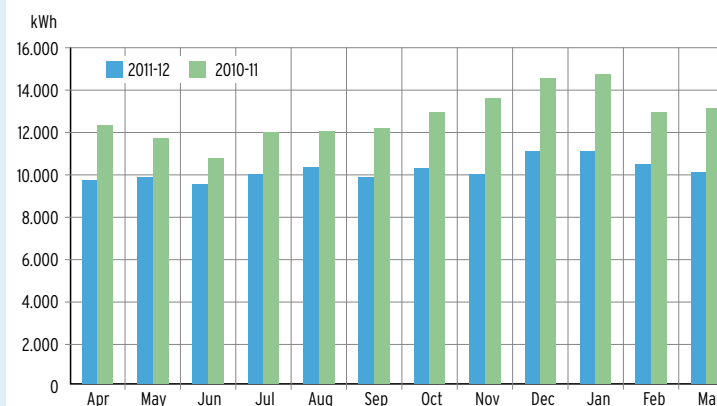
TfGM improved the lighting controls of the Manchester Shudehill interchange composed of a tram stop, bus-station and a car park. TfGM installed a range of lighting controls, including photocells, timeclocks and passive infra-red (PIR) controls. These were installed

following site energy audits, which identified the most suitable types of controls and the corresponding energy savings. The project allowed some 10% reduction of the lighting energy over a year, with peaks above 20% on specific days.

TfGM undertook the replacement of the traditional lighting at the Hyde bus station with LED lighting. Based on a comparison between 2010 and 2011, the total energy consumption was

reduced by 20% (30,000 kWh) and costs savings amount to 3,650€. TfGM also estimates that maintenance costs savings of some 6 k€/year will be achieved.

Fig. 15 – Energy savings with LEDs at Hyde Bus Station



Vehicles

Bus and corporate vehicle ecodriving

Due to inappropriate driving behaviours, drivers consume more fuel than they should, resulting in higher energy expenditure for the company. Ecodriving means smarter and more fuel-efficient driving. It requires strong behavioural changes that can only be obtained by training people and raising their awareness about the benefits linked to a more sustainable way of driving. The use of a display indicator is recommended as it gives drivers information about their driving behaviour in “real time” in order to help them improve their driving style. It also enables the company to monitor the driving style and the fuel consumption of each vehicle.

Rail vehicles ecodriving

The design of older rail vehicles did not take into account the energy consumption required for reaching their highest speed. When the distance between two stations is short, a vehicle will be accelerating to its top speed right before braking. This is useless and relatively inefficient. It is recommended to make simulations to investigate the rail vehicles consumption at various speeds and the potential delays on the network resulting from an ecodriving scheme. If delays prove to be acceptable, the network regulation software can be adapted to set parts of the network in ecodriving mode. Drivers must be trained and an appropriate signalling must be placed to inform drivers about the new speed limits.

moBiel (BIELEFELD)

moBiel organized a one-day training for their 300 bus drivers. The training course comprises a theoretical session for 5-6 drivers explaining what the key points for reducing fuel consumption are and a practical session with a bus fitted with an ecodriving display indicator. This ecodriving program allowed moBiel to reduce its fuel consumption by 10% (252,000 litres) resulting in a 3,500€ cost saving per bus every year.

TfGM (MANCHESTER)

TfGM has around 150 corporate vehicles used by technical staff to look after the public transport network facilities. The company bought a telematics system with a logger installed in each vehicle. This enables the drivers to instantly view their fuel consumption data and the company to track the vehicles and to monitor their consumption remotely. This project led to a 15% fuel savings with no specific training but communication campaigns. The system has also been used to see which vehicles were the most inefficient and to get rid of the ones with the highest costs and emissions.

STIB (BRUSSELS)

The STIB ecodriving project consisted in limiting the maximum authorized speed of metro vehicles to 60 km/h instead of 72 km/h and 50 km/h instead of 60 km/h when the ecodriving signalling is on. The reduced speed mode is disabled when delays are observed on the metro network, enabling the drivers to catch up the delay by driving faster. STIB has observed an energy reduction of 12% of the traction energy required (11.5 GWh) with cost savings of around 1 M€ per year. The project also improved the metro punctuality and had a positive impact for the drivers, who are under less stress since they can recover their delay when the ecodriving mode is off.

Fig. 16 – View of the Brussels metro ecodriving signalling



Reviewing the Quick Wins implemented in public transport

Equipment

Power transformers

Power transformers used to feed rail networks consume energy when idling, especially during the night when no vehicle is running on the network. Switching off one or more transformers when there is no or little load on the electrical network can bring significant energy savings. This requires a good knowledge on how the electricity network is used and sized. It is recommended to regularly evaluate the global sizing of the electricity network to make sure that all equipment is necessary. In the case of old transformers, operators must be cautious because regular disconnections can harm the systems and reduce their lifetime.

Escalators

Escalators located in public transport stations and buildings operate around 20 hours per day and are designed to support their maximum load of up to two persons on each stair. However, escalators run most of the time with no load or very low load and therefore offer significant energy-saving potential.

There are several strategies for improving the energy efficiency of escalators:

- Fitting old escalators with sensors detecting the presence of passengers;
- Reducing the supplied voltage to partially loaded motors to increase their efficiency;
- Installing less powerful motors;
- Defining a slow start mode in order to reduce the high load required for starting the escalator;
- Keeping the escalators in slow motion, which is more energy-efficient for heavy-duty

locations with many passengers and highly frequent start-stops;

- Optimizing the heating system used to avoid the escalator getting blocked when freezing. A temperature sensor can deactivate this feature when needed;
- Training agents to detect any defective escalator.

Green IT

Computer servers produce heat and must be cooled by the use of ventilation systems. As computer servers are becoming larger and more complex, cooling of the active components has become a critical factor for reliable operations. These cooling devices consume a lot of energy and work on a 24-hour basis. This action consists in analyzing whether computer servers' rooms are well insulated and whether temperature rises occur during summertime. If this is the case, windows can be blanked to avoid warming effects through the sunshine. It is also recommended to seal off unused rack spaces to prevent cool supply air mixing with hot server exhausts. Changing the layout of the room and installing partition walls around the servers will eventually minimize the amount of space to be cooled.

On the other hand, most computers remain turned on when unused. Although the power needed when idling is relatively small, their large number and their being continuously plugged in result in an increased energy usage for the company. In many cases, applications will unnecessarily prevent the embedded power management from working. The use of a third-party power management software can offer features beyond those present in the operating system and offer significant energy savings.

STIB (BRUSSELS)

STIB investigated to see whether power transformers could be switched off during the night or during off-peak time. The cut off of the transformers has been programmed in the power management software for high voltage equipment. The savings amounted to 0,16% of the total high voltage consumption (343 MWh) with cost savings of 30 k€/year.

STIB has equipped most of its escalators with movement sensors to avoid their continuous functioning. However, some escalators can become defective over time. STIB trained the station agents to enable them recognize defective escalators and inform the dispatching centre for repairing. This action resulted in fewer escalators running continuously with annual savings of around 96 MWh with cost savings of 7,500€ each year.

TfGM (MANCHESTER)

TfGM identified a need to manage the energy use in server rooms more efficiently and worked with both its IT department and external suppliers to develop an action plan. The server room has a dedicated cooling system, which was originally set to 18°C. TfGM installed blanking plates, reconfigured the layout and reset the set points in the server room to a higher temperature. TfGM also built a partition wall in the server room to minimize the amount of space that needed to be cooled to just the area that containing the servers. Once completed, all server room efficiency actions are estimated to cost 21 k€ and will save an estimated 45 MWh energy annually (4 years payback time).

RATP (PARIS)

The RATP "sleep office" project consisted in defining solutions for energy-efficient IT systems. This is a combination of Power Over Ethernet (PoE) and a software solution. IP phone sets and Wi-Fi Hotspots are set automatically in standby mode when not in use. The first results have shown an energy consumption reduction of 15%. As this involves a large number of users, it is necessary to make sure that the stand-by mode settings do not create problems in the working processes.

Awareness campaigns

Energy week

An energy week is an event aiming at raising awareness on energy during a limited period of time. Encouraging changes in people behaviour is known to be an effective way to reduce energy consumption due to the amount of energy wasted through unnecessary usage. The delivery of awareness campaigns may drive behavioural change in staff and enable measurable results to be achieved during a short period. The objective is to ensure all staff members understand that they have a role to play in reducing the company's energy use and to encourage them to take small steps towards improving the energy efficiency at their place of work. In addition, raising staff awareness makes it more obvious for them they can report energy waste.

An Energy Week is a great opportunity to communicate on all aspects related to energy efficiency and use. Different media can be used for raising awareness amongst employees:

- Posters and stickers to inform staff before the Energy Week to give them background information on the initiative;
- Publication of articles in internal publications and on the Intranet;
- Distributing information packs including information on energy usage and tips to save energy ;
- Daily energy saving tips can be emailed to all staff, as well as further e-bulletins and internal communications with information on energy saving;
- Organising of lunchtime seminars on specific topics;

- Rewarding with a prize those who have made an effort (i.e. leaving a chocolate bar for those who turned off their computers);
- Organising energy savings competitions and quizzes.

Energy challenge

People will best change their behaviour when they are encouraged to do so by offering them clear incentives. The organization of an energy challenge is a great way to mobilize the employees of a company towards energy savings. Performance-based rewards are useful to educate staff on energy efficiency measures. An important aspect of the challenge is the ability to conduct rigorous energy accounting so as to ensure that a good follow-up is possible and that efforts are recognized.

STIB (BRUSSELS)

STIB has implemented energy challenges in several depots and workshops for improving the behaviour of employees in relation to energy use. The success of this depends on the potential for improvement as well as the motivation of the participants. Once the right behaviours have been adopted, results remain stable if regular (monthly) reminding actions are planned. This requires the long-term involvement of one project manager and the support from the company hierarchy to ensure the full cooperation of all participants. STIB organized an energy challenge during the winter 2011-2012 in the Jacques Brel metro and bus depot. Gas savings reached 24 % (472 MWh/year) and electricity savings reached 12 % (419 MWh), reducing the annual energy bill by around 50 k€.



Ticket to Kyoto project

Ticket to Kyoto is a European project aiming at reducing CO₂ emissions in the public transport sector through more environmentally friendly behaviours and changes in infrastructure. To reach this goal, the project has identified five key action plans (work packages):

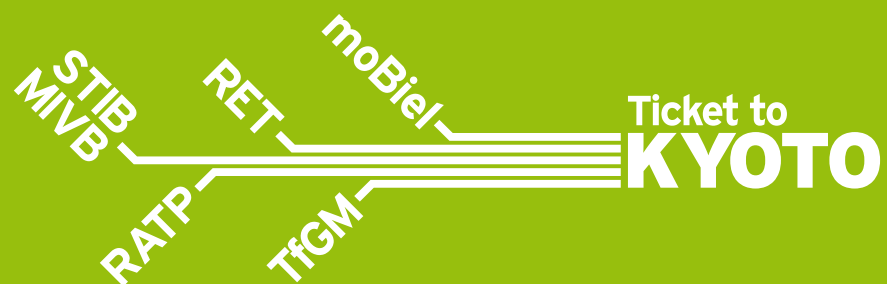
- WP1 - Achieving Quick Wins
- WP2 - Investing in infrastructures to reduce CO₂ emissions
- WP3 - Developing CO₂ strategies for 2020
- WP4 - Optimizing policies and regulations for CO₂ reduction measures
- WP5 - Mobilising people and industry through public campaigns

The project runs over four years (2010 to 2014) and is being co-financed by the INTERREG IVB North West-Europe Programme. Five partners collaborate to exchange on best practices and compare the results achieved through several energy-saving investments.

Project partners

- TfGM, Manchester, United Kingdom;
- moBiel, Bielefeld, Germany;
- RATP, Paris, France;
- RET, Rotterdam, Netherlands;
- STIB, Brussels, Belgium.





www.tickettokyoto.eu