move us

ICT cloud-based platform
and mobility services available,
universal and safe for all users

www.moveus-project.eu

Energy Efficiency Workshop

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- Objectives
- Methodology benchmarking for energy efficiency and carbon footprint assessment
- Energy efficiency calculator

Objectives

The main objective of this methodology is to help cities to improve their energy efficiency by defining strategies and taking actions and in the specific case of MoveUs project, in the transportation domain.

Allow authorities to learn from mobility projects, either previous or similar projects, or from other cities.

Objectives

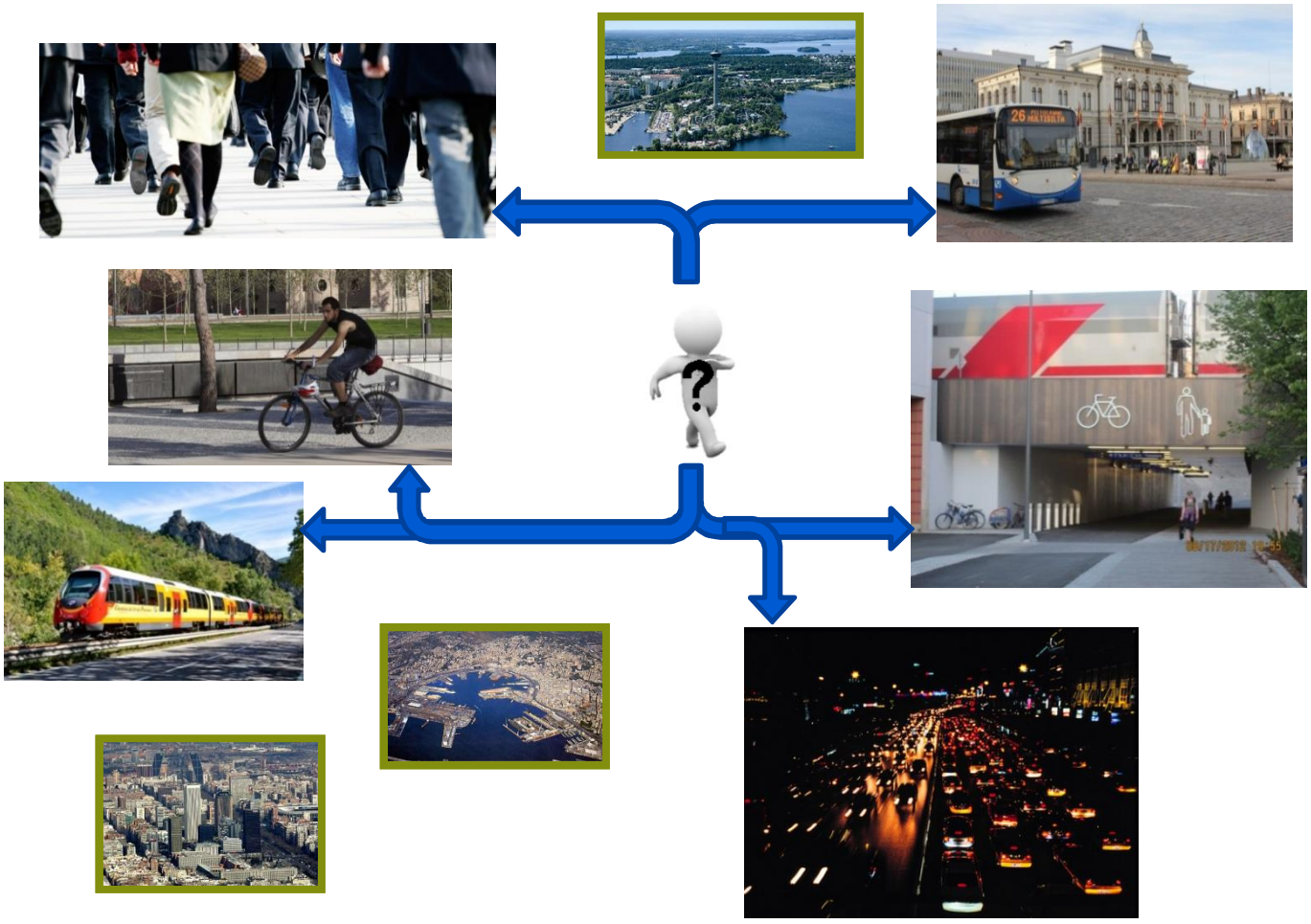
To measure the energy efficiency gains of the ICT solutions applied in each pilot.

To measure the energy consumption of the ICT solutions applied in each pilot.

Objectives

To translate energy consumption/ carbon footprint to a less abstract parameter. Behavioral change toward sustainable transport modes is driven only through user awareness of how much they consume in relation with something they understand and value.

WHY?



- High complexity of the transport sector.
- Mobility projects in Energy efficiency/ carbon foot print are difficult to evaluate .
- There is not a common frame for the evaluation, makes impossible to compare similar projects results.

The methodology is based on: an Intelligent Energy Europe project SUMO, Competitive and sustainable growth project MOST-MET and an international standard ISO 50001

SUMO

System for Evaluation of Mobility Projects

MOST

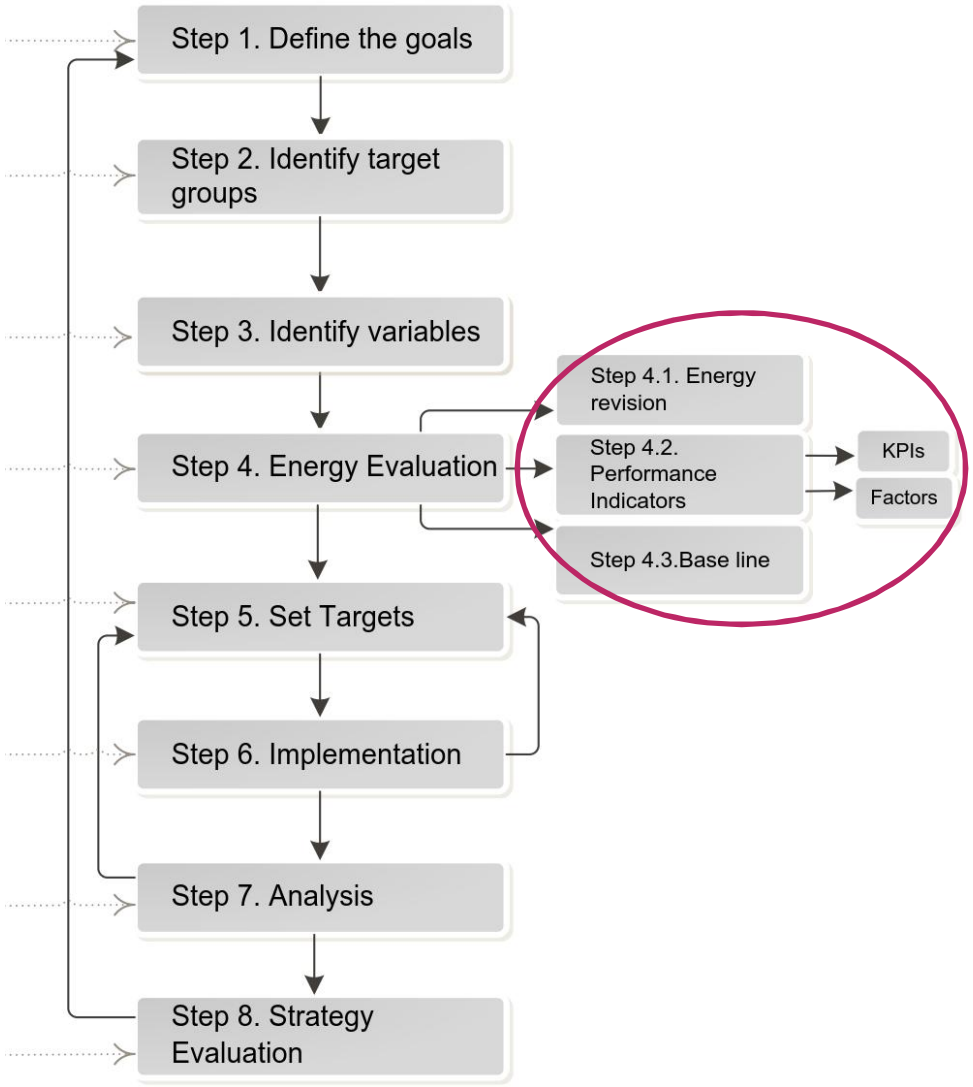
Mobility Management Strategies for the next decades

ISO 50001
ENERGY MANAGEMENT

MOVE US Methodology

for Energy Efficiency Assessments

Methodology benchmarking for energy efficiency and carbon footprint



Step1 Define the Goals

RMC1

Question	Objectives				
	1	2	3	4	Description
Who	Tampere city Public Transport Department	Tampere city Public Transport Department	Tampere city Public Transport Department	Tampere city Public Transport Department	*Who is involved?*
What	Reduce the use of private car	Increase modal share of alternative modes (bicycle and walking)	Increase modal share of Public transport	Increase public transport awareness	*What does the city want to accomplish?*
Where	In city urban area	In city urban area	In city urban area	In city urban area	*Where? Identify a location, if it is local impact*
When	Long term	Long term	Long term	Short term	*When? Establish a time frame (Short, medium or long term)*
Why	- Increase the energy efficiency and reduce carbon emissions. - Less pollution=air quality - Less congestion and traffic jams due to reduced number of cars	- Increase inhabitants health - Environmental protection (no pollution, no noise) - Maintenance of a safe and lively urban area - No emissions of greenhouse gases - Health	- Makes more energy efficient the system - Reduced noise - Larger green areas and a lower number of/ less need for car parks and parking lots - Faster and more reliable public transport	- Increase public transport modal share - Increase knowledge about energy efficiency - Increase the access to public transport system	*Why? Specific reasons or benefits of accomplishing the goal*

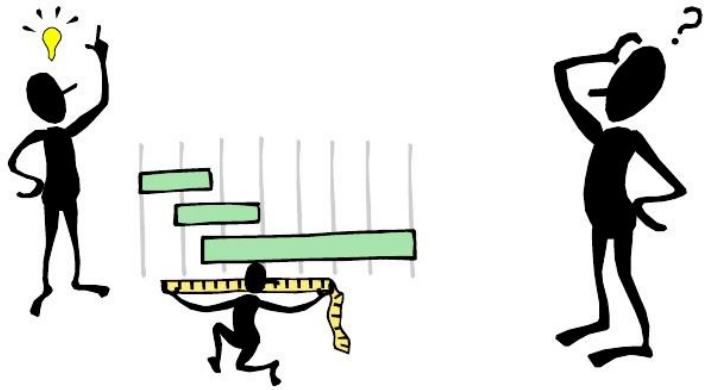
- Target group is a group of people that has similar needs and travel patterns
- Identify the target group in the earlier steps allows city pilots to measure results more effectively and to design more focused programs, so it makes easier to take data and calculate the impact of their strategies.

Target group

- Tampere had 220,446 inhabitants by 31 December of 2012, which are identify as Tampere commuters.
- The number of private cars registered in Tampere is 90,906; and in this case, Tampere will assume that one private car is equivalent to one user.

Finland's Car occupancy in Urban driving average 1,03 taken from:http://lipasto.vtt.fi/yksikkopaastot/henkiloliikennee/tieliikennee/henkiloautote/habense.htm. Access on 07/10/2014

- identify the variables that describe the objectives of the project



Variable	Objective
Energy consumption per vehicle	1,3,4
Fuel consumption per vehicle	1,3,4
Calories consumption in alternative modes	1,2
Modal share percent in each mode	1,2,3,4
Number of public transport passengers	3,4
Number of cyclists	2

Number	Objective
1	Reduce the use of private car
2	Increase modal share of alternative modes (bicycle and walking)
3	Increase modal share of Public transport
4	Increase public transport awareness

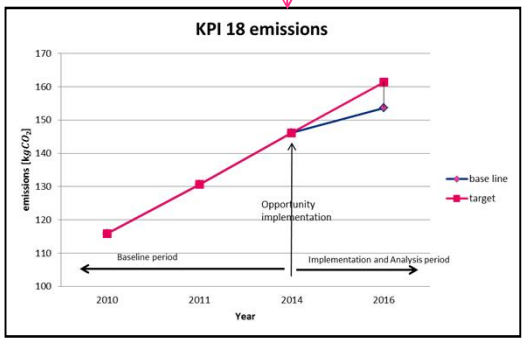
Energy Revision

How is the system now ->identification of opportunities for improvement

Performance indicators

KPIs and Affecting Parameters

Base Line

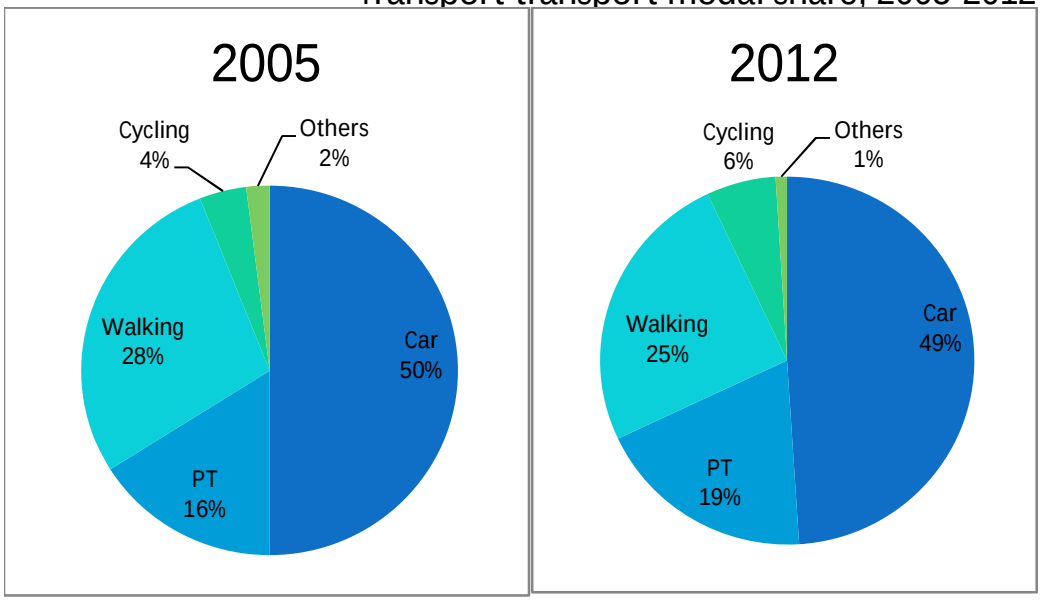


Energy sources in Tampere

Electricity
Conventional fuels: Gasoline Diesel Natural gas

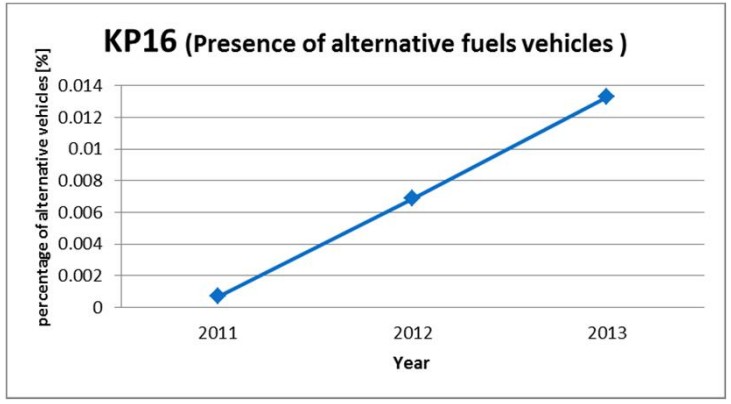
Number	Objective
1	Reduce the use of private car
2	Increase modal share of alternative modes (bicycle and walking)
3	Increase modal share of Public transport

Transport transport modal share, 2005-2012



KPIs

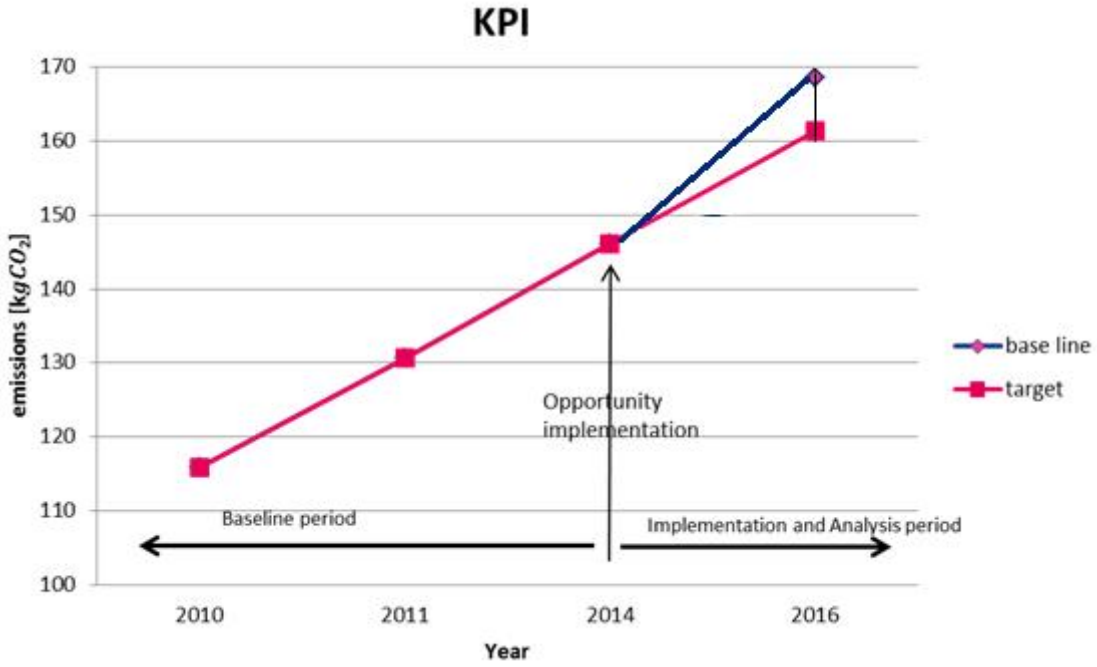
ID	Name
KP4	Density of passenger transport
KP5	Number of passenger transported by fuel unit
KP6	Number of fuel units per passenger
KP8	Total CO_2 emissions for travel (multiple modes) passengers
KP10	Private vehicles density rate
KP13	Share of public transport in total passenger traffic
KP16	Presence of alternative fuels vehicles
KP18	Traffic-free (TF) and on-road (OR) routes
KP19	Annual usage estimation in alternative modes
KP23	KPI's change per time unit
KP24	KPI's percentage of change



Affecting Parameters

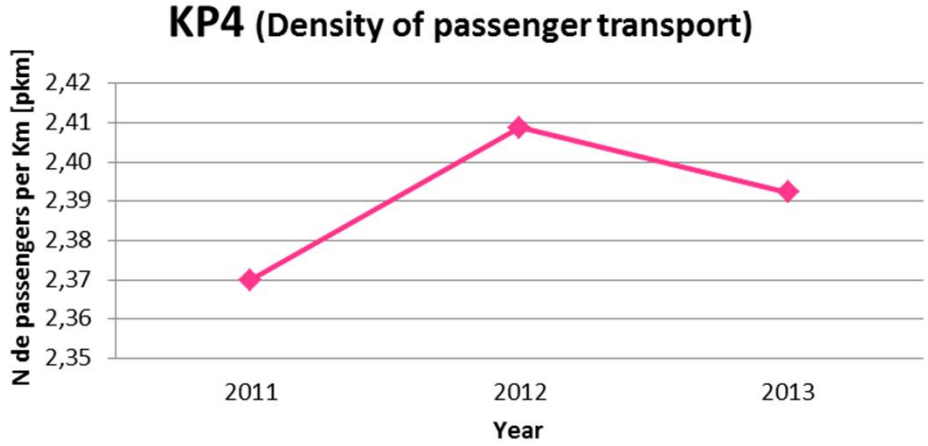
	MODES			
	Walking/ cycling	Public Transport	Private Car	Motorbike
Transport and Mobility offers				
Station/Stops distance	—	↑	—	—
Amount available				
Car/Motorbike	—	↓	↓	↓
Trip characteristics				
Travel distance	—	↓	↓	↓
Travel time	—	↓	↓	↓
Environment/weather conditions				
Temperature	—	↑	↑	↑
Precipitation	—	↓	↓	↓
Fog	—	↓	↓	↓
Infrastructure				
Support during winter (cleaning)	—	↓	↓	↓
Bike parking	—	—	—	—
Car parking	—	—	↓	↓
Lights	—	↓	↓	↓

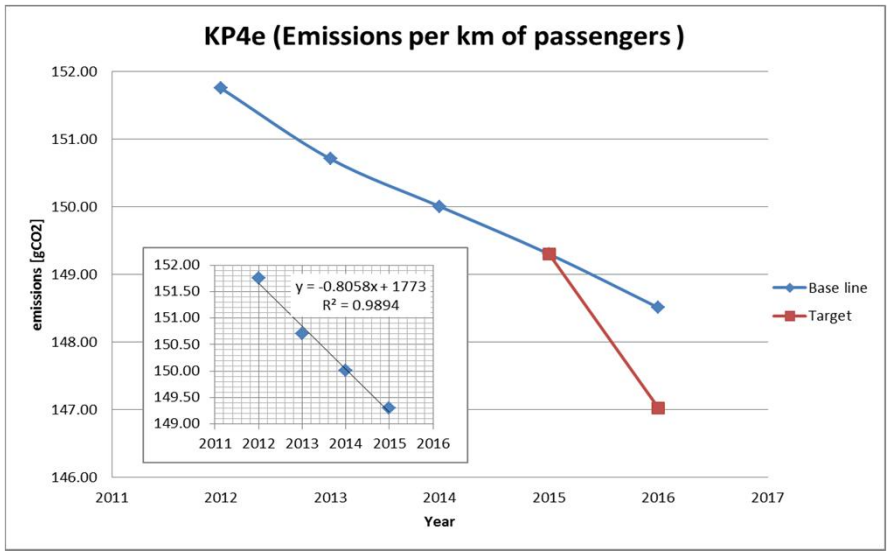
The base line predicts the KPI's future values from previous data

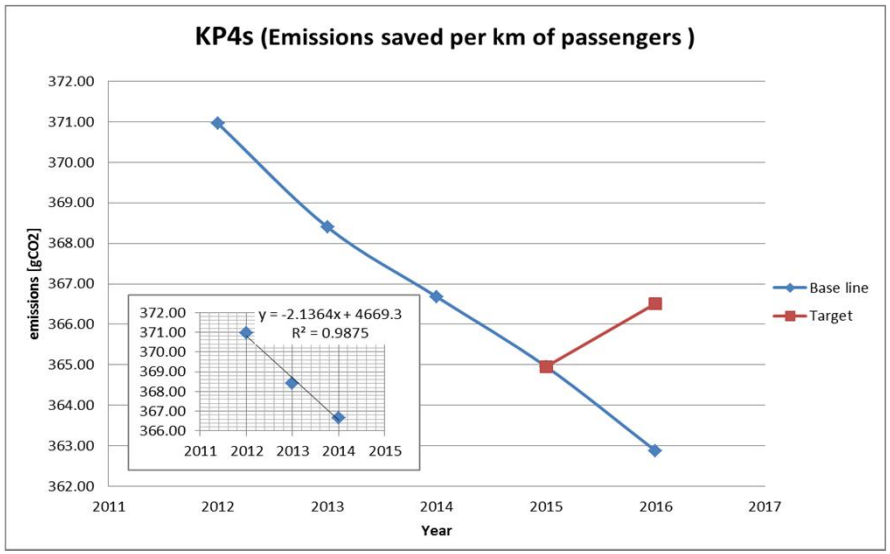


For each indicator set a target and a time frame to be reached. The targets and time frame must be supported by the measurement of the generated data over time related with the chosen indicators.

Step4.3 Base Line and Step5. Set Target

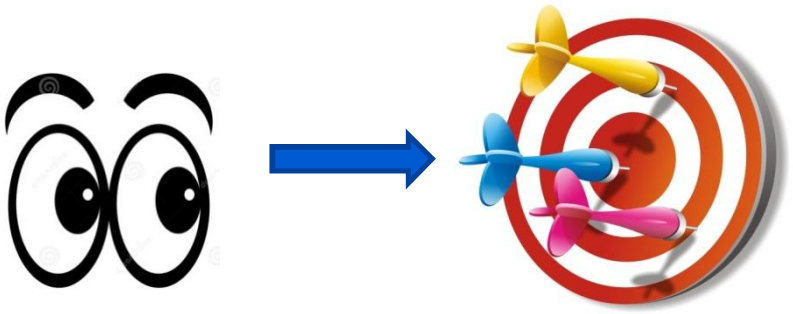






Implementation

- select the strategies
    - must corresponded to city goals as well as its capacity
        - If exceeds city capacity, the target set must be redefined.



Analysis

In this step an analysis of the performance indicators with respect to the set targets is performed. The frequency of this analysis depends on implementation time and the goal terms (short, medium and long term). Monitoring !!

Strategy evaluation

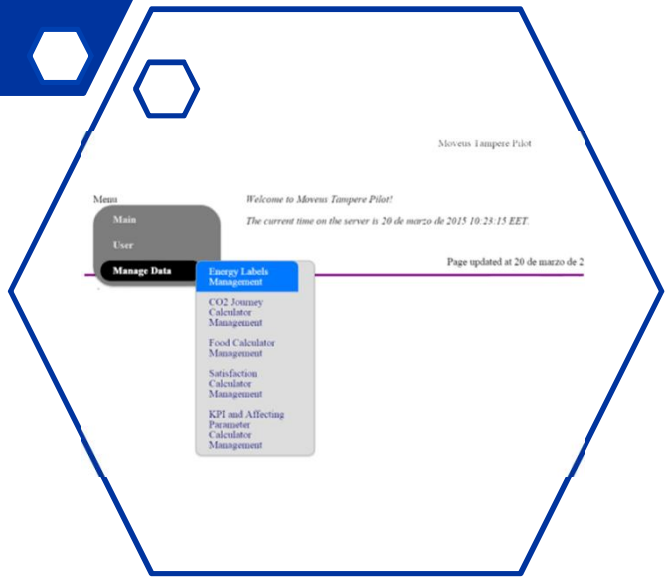
Monitor if the goals are achieved. If the goals are not achieved during the evaluation in this step, corrective actions are evaluated as well as the source of the delay (in achieving the goals) by performing an internal evaluation of the previous steps. To finalize the strategy evaluation, cities can stablish new goals and optimized the process.

Conclusions

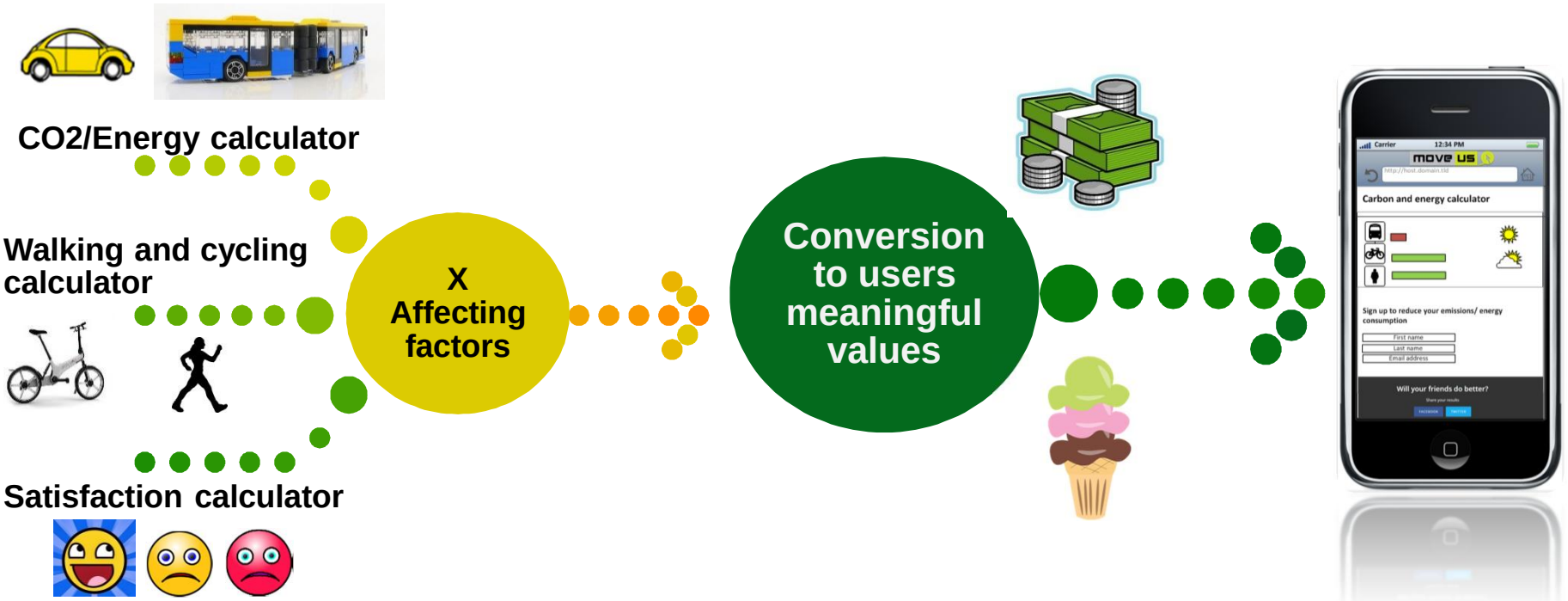
- Allows doing comparisons
- Basic planning process: clear definition of output
- Energy evaluation: current energy state of cities

Calculator for Final Users

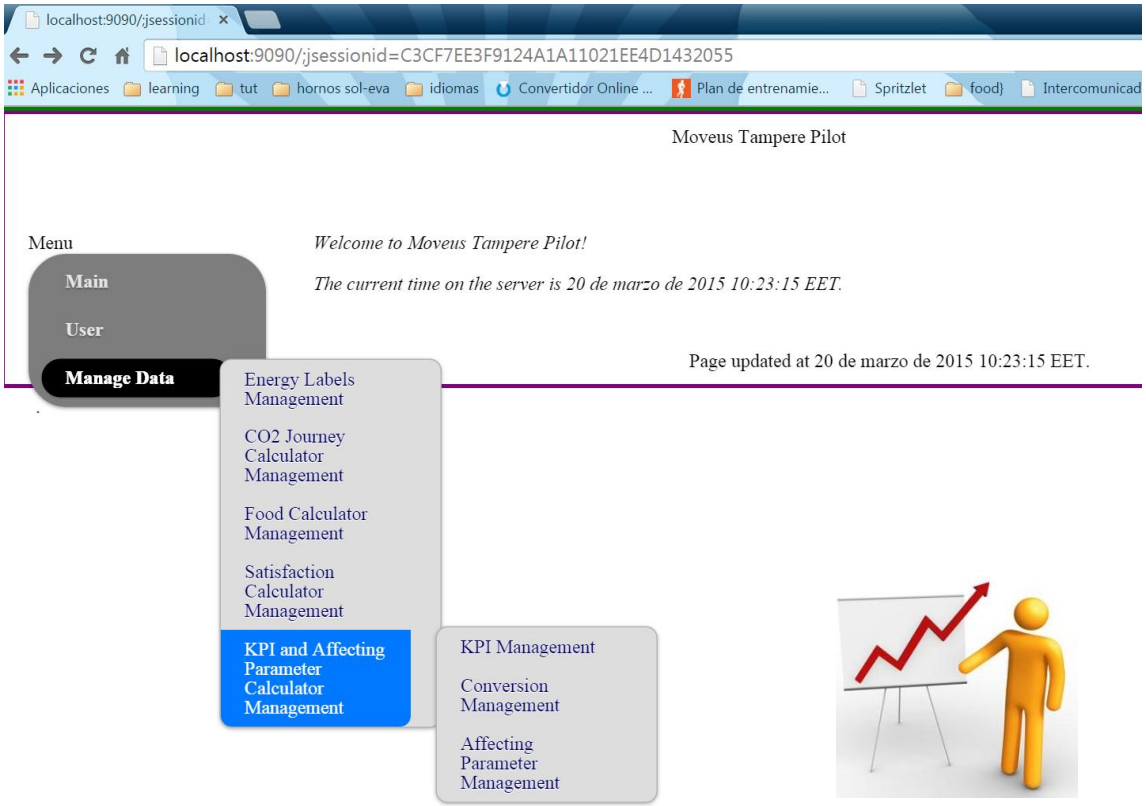
Calculator for Cities



Energy Calculators: Calculator for final users



Energy Calculators: Calculator for cities



- Allows cities to measure several aspects of their transport system in terms of energy
- Quantify the achievement of goals by setting, monitoring and measuring against a target.
- Reduces the complexity of the system.
- They are a common frame for comparisons between mobility projects and different cities.

Partners

Municipality of Genoa

Municipality of Tampere

Coordinator's Contact

Name .....@.....

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