

Smart Cities Marketplace



**Self Reporting Tool webinar
July, 2022**





The Smart Cities Marketplace: Self Reporting Tool activities

Rudy Rooth,

*Senior Consultant, DNV, monitoring expert Smart Cities
Marketplace*



European
Commission



Agenda Smart Cities Marketplace: SRT webinar

- Introduction
- Focus on KPI
- SRT access
- Explanation on the data form creation (Fields of Action)
- PED form explanation
- Timeline for Self Reporting Tool use
- Introduction to the visualization of data

Origin of Key Performance Indicators (KPI) in SCM

A pragmatic approach based on EU call requirements and existing KPI sets



KPI sets already existing that have been taken into account

- **KPI are based on individual actions and can be aggregated/filtered in various ways (geographic, technology, etc)**
- **KPI are (pilot) project based, not city based**
- **Currently implemented KPI are based on existing KPI and result of expert workshop March 2018**

The following sources have been used:

- CONCERTO Premium Indicator Guide
- CONCERTO Premium Guidebook for Assessment
- H2020 work programme, 2016-2017. 10. 'Secure, Clean and Efficient Energy'
- ISO 37120: 2014_Sustainable development of communities – Indicators for city services and quality of life [ISO 37120]
- Citykeys project
- European Innovation Partnership on Smart Cities and Communities - Operational Implementation Plan [EIP - OIP]
- Specific Project KPIs from CELSIUS SCC project and CiTyFied FP7 project
- International Telecommunication Union - Focus Group on Smart Sustainable Cities: Key performance indicators related to the use of information and communication technology in smart sustainable cities [ITU-T]
- "Ideal grid for all- IDE4L project", funded by the European Electrical Grid Initiative
- European Energy Award [eea]
- Covenant of Mayors [CoM]
- CIVITAS
- GRID+
- DIN EN 15603:2008-07



Key Performance Indicators (KPI) in SCM

Buildings and energy systems

Implemented in the self-reporting tool (SRT)

Buildings (new and refurbished)

- Final energy consumption (kWh/m²a)
- Primary energy consumption (kWh/m²a)
- RES production (kWh/a, % of final energy consumption)
- CO₂ emissions reductions (kgCO₂/m²a)
- Economic performance (Payback time, €/tonne CO₂ reduced

Energy systems

- Final energy production (kWh/a)
- Primary energy consumption (kWh/a)
- RES production (kWh/a)
- CO₂ emissions reductions (kgCO₂/a)
- Economic performance (Payback time, €/tonne CO₂ avoided

KPI are based on individual actions and can be aggregated/filtered in various ways (geographic, technology, etc.).



Key Performance Indicators (KPI) in SCM

Mobility & Transport and ICT

Implemented in the self-reporting tool (SRT)

Mobility and transport

- Number of electric vehicles
- Primary energy consumption reduction (kWh/a)
- CO₂ emissions reductions (kgCO₂/a)
- Economic performance (Payback time, €/tonne CO₂ reduced)
- ...



ICT

- Number of users aware of energy consumption
- Number of Smart Lamp posts
- Building Energy Management Systems deployed
- System flexibility
- ...



KPI will be based on individual actions and can be aggregated/filtered in various ways (geographic, technology, etc.).



European
Commission



Key Performance Indicators (KPI) in SCM – 1

PED

Implemented in the self-reporting tool (SRT)

Positive energy districts, technical

- Total net energy need, kWh/a
- Total net energy need without appliances, kWh/a
- Total net incoming energy, kWh/a
- % of total net energy need covered by resources coming from outside district boundaries

Positive energy districts, environmental

- GHG emissions, ton/a
- Total local RES, kWh/a
- % of total net energy need covered by local RES

KPI will be based on individual actions and can be aggregated/filtered in various ways (geographic, technology, etc.).



Key Performance Indicators (KPI) in SCM – 2

PED

Implemented in the self-reporting tool (SRT)

Positive energy districts, economical

- Total Investments (excl. VAT), €
- Grants, €
- Net energy savings/value of improvements, €/a
- Total Operating costs (in €/a)
- Dynamic Payback Period, a
- Return on Investment, %

Positive energy districts, social

- Citizens directly involved
- Number of jobs created

KPI will be based on individual actions and can be aggregated/filtered in various ways (geographic, technology, etc.).

How to get Smart Cities Marketplace – SRT access ?

Steps to take



- A prerequisite is that the project has been created in the SC Marketplace website. This is initiated by requesting a project intake form from info@smartcitiesmarketplace.eu (action at project level). Please indicate for which project it is.
- Based on the intake form the SCM team creates the project entry including the so-called demo sites. These are necessary as the access to the SRT is connected with the demo sites.
- Access to SRT is then again requested at info@smartcitiesmarketplace.eu (normally by the person responsible for monitoring and evaluation).
- Info required:
 - Full name of person, project name, demosite for access, email address, phone number
- The SCM team then creates accounts for these person(s). The system will send out instructions on account activation.



Example of SRT demo site level information

General information for the demo site

Welcome to the Smart Cities Information System – Self-reporting!

The website will guide you through the self-reporting process. To help you out in case of questions there is a guideline available for download here.

It is highly recommended to use the guide when working on the data provision.

During the process you will be asked to:

- 1) Provide general data about the demo site
- 2) Create the "Fields of Actions" which are relevant for the demo site
- 3) Provide data on the "Fields of Actions" which were created by you

E2REBUILD Site London

Climate Parameters
(Please, provide the climate parameters for the demo site location)

Heating Degree Days (HDD_{18/15})

Design (HDD _{18/15})	Heating Degree Days used for design	Year
Demosite level	1500	2005
Country average level		

Monitoring (HDD _{18/15})	Heating Degree Days used for monitoring	Year	Actions
	1500	2014	⊖ ⊕ ⬆ ⬇ ⬇ ⬇ ⬆ ⊕
	1700	2015	⊖ ⊕ ⬆ ⬇ ⬇ ⬇ ⬆ ⊕

Cooling Degree Days (CDD_{18/22})

Design (CDD _{18/22})	Cooling Degree Days used for design	Year
Demosite level		
Country average level		

Monitoring (CDD _{18/22})	Cooling Degree Days used for monitoring	Year	Actions
			⊖ ⊕ ⬆ ⬇ ⬇ ⬇ ⬆ ⊕

Global solar radiation (GSR)

Design (GSR)	Global solar radiation (kWh/m ² a)	Year
Demosite level		

Monitoring (GSR)	Global solar radiation (kWh/m ² a)	Year	Actions
			⊖ ⊕ ⬆ ⬇ ⬇ ⬇ ⬆ ⊕

Climate data for the design form as well as for (multiple) monitoring years can be entered. Financial parameters here are the default for all data forms.

Financial Parameters

Please provide a reference value for the Energy costs for electricity and gas for your location in order to establish a baseline.
In case no data is provided, average data for EU-28 will be used.

Grid Electricity price (€/kWh) (required) 0.2078 Average grid electricity price in EU-28: 0.2 €/kWh (source: EUROSTAT)

Gas price (€/kWh) (required) 0.0664 Average gas price in EU-28: 0.07 €/kWh (source: EUROSTAT)

Year of Reference





Example of FoA creation on demo site level

PED example

Fields of Actions

Amsterdam Buiksloterham Positive Energy District

Field of Action *(required)*

Amsterdam Buiksloterham Positive Energy District

Thematic Field *(required)*

Positive Energy District (PED)

Define Fields of action

Help Scenario

- A Field of Action represents all measures taken within a specific thematic field, which are:
 - Creation of New Buildings
 - Refurbished Buildings
 - Energy Systems Integration
 - Mobility and Transport
 - Information and Communication Technologies
 - Positive Energy District (PED)
- You can create and delete "Fields of Actions" via the "+" and "-" symbols from the toolbar.
- Please select the Thematic Field(s) and provide a descriptive and unique name for each of the selected Clusters.
- It should be possible to identify the Cluster by the provided name as well as to clearly identify it within the Project
- Deliverables. We recommend to use the project internal naming extended by additional information, such as the quantity, location and other characteristics.

- Choose a PED Field of Action (FOA) if the focus is on the description of the energy balance of a neighbourhood and ambition is very high
- Once saved, you cannot change the name or thematic field of the FOA, so think well about the naming





Example of FoA creation on demosite level

ESI example

test esi storage

Field of Action (required): test esi storage

Thematic Field (required): Energy System(s) Integration

Energy Systems Type (required): Storage

Energy systems type of storage (required): ☒ Electrical Storage ☐ Thermal Storage

test esi sust gen trigen

Field of Action (required): test esi sust gen trigen

Thematic Field (required): Energy System(s) Integration

Energy Systems Type (required): Sustainable Generation

Energy Systems sustainable generation (required): TRI-generation

Energy Carriers (required): Biogas x Energy crop x

Fields of Actions

test esi infra

Field of Action (required): test esi infra

Thematic Field (required): Energy System(s) Integration

Energy Systems Type (required): Infrastructure & System Integration

Energy System(s) Integration (required): ☒ DHC extension

Energy systems services

Energy Carriers: Biogas x Geothermal heat x Wood Chips 30% moisture x

- Choose an Energy System Integration Field of Action if the focus is on the description of the energy system and its performance rather than that of e.g. a building, mobility or ICT solution.

Example of forms - 1

New buildings

TEST-Buildings New-Buildings: Example (NEW BUILDING S cluster)

Design Delete POA

Example
Design

1 General data

Number of buildings

Number of monitored buildings in this building group

Completion year of the building/building group

2 Building typology characteristics, dimensions and HTC

Building type

Number of apartments

Number of inhabitants

Number of occupants

Total gross floor area in m² (external)

Total heated net floor area in m² (internal)

Total cooled net floor area in m² (internal)

3 Envelope - Heat Transfer Coefficient (U-Value)

Title	Unit	HTC according to national requirements	HTC realised for the demonstration buildings
Year - National Requirements		<input type="text"/>	<input type="text"/>
Overall average HTC of the building envelope surfaces	W/(m²K)	<input type="text"/>	<input type="text"/>
average HTC roof	W/(m²K)	<input type="text"/>	<input type="text"/>
average HTC facade/external walls	W/(m²K)	<input type="text"/>	<input type="text"/>
average HTC ground floor	W/(m²K)	<input type="text"/>	<input type="text"/>
average HTC windows (frame and pane)	W/(m²K)	<input type="text"/>	<input type="text"/>
average energy transmittance of windows (g-value)	%	<input type="text" value="XX"/>	<input type="text"/>

Information & Communication Technologies

Building features

☐ Please specify if the following building features were used in this building / group of buildings.

Save design

4 Parameters - Technologies & Energy Carriers

Renewable Energy Sources - Environmental & Economic Parameters

1 Installed Renewable Energy Source photovoltaic

Electricity production (in kWh/a)

Financial data for the Renewable energy source

Total Investment costs (in €)

Total Operating costs (in €/a)

Grants and subsidies (in €)

Payback (years): calculated

Payback (years)

Energy Carriers - Environmental & Economic Parameters

1 Technology heat pump: compression

Energy carrier "Green" electricity

Building service heating (only)

Environmental

Parameter	Unit	Factors (national/local)	Standard values from Norm	Source
Greenhouse Gas Emissions (CO2-equivalent) factor	gCO2-equ/kWh	<input type="text" value="XXX.XX"/>	24	Covenant of Mayor
Primary Energy Factor	kWhPE/kWhFE	<input type="text" value="XXX.XX"/>	1.01	ENAS
Year of collection of energy price	Year	<input type="text" value="YYYY"/>		
Energy price (Energy carrier), excluding VAT, grants	€/kWh	<input type="text" value="XX.XX"/>	0.21	Eurostat

Consumption

Parameter	Unit	Value
FINAL ENERGY INPUT	kWh/a	<input type="text" value="XXXXXXXX"/>
Overall System Performance (output divided by input)	%	<input type="text" value="XX"/>

Financial

Parameter	Unit	Value	Reference	SCIS calculation
Total investment costs	€	<input type="text" value="XXXXXXXXXX"/>	<input type="text"/>	
Total operating costs	EUR/a	<input type="text"/>	<input type="text"/>	
Grants and subsidies	€	<input type="text" value="XXXXXXXXXX"/>	<input type="text"/>	
Total energy costs	€/a	<input type="text" value="XXXXXXXXXX"/>	<input type="text"/>	
Dynamic payback period	a	<input type="text"/>	<input type="text"/>	

Save design

Please, provide a system of reference. This system should be based in BAU and be designed to produce the same comfort levels as the reference scenario.



Example of forms – 1a

New buildings, KPI



KPIs

Technical KPIs

Title	Unit	Demonstration building / Group of buildings	Savings compared to reference building	Reference	SCIS calculation
Total Final Energy Demand	kWh/m2a	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>
Final Energy Demand for Space Heating	kWh/m2a	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>
Final Energy Demand for Cooling	kWh/m2a	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>
Final Energy Demand for Domestic Hot Water	kWh/m2a	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>
Final Energy Demand Electricity	kWh/m2a	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>

Environmental KPIs

Title	Unit	Value (calculated)	Value (optional - overrides calculation)	Savings (SCIS calculation)	Reference value
Total CO2 Emissions	kgCO2eq/a	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>
Total Primary Energy Demand	kWh/m2a	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>
Total Share of Local Renewable Energy	%	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>

Economic KPI

Title	Unit	Baseline situation	Demonstration Building/ Building group	SCIS calculation
Total Investments (excl. VAT)	€	<input type="text" value="000000000"/>	<input type="text" value="000000000"/>	<input type="text" value="000000000"/>
Total additional Energy Related Investments	€	<input type="text" value="000000000"/>	<input type="text" value="000000000"/>	<input type="text" value="000000000"/>
Total Operating costs per year	€/a	<input type="text" value="000000000"/>	<input type="text" value="000000000"/>	<input type="text" value="000000000"/>
Grants	€	<input type="text" value="000000000"/>	<input type="text" value="000000000"/>	<input type="text" value="000000000"/>
Total Energy cost per year	€/a	<input type="text" value="000000000"/>	<input type="text" value="000000000"/>	<input type="text" value="000000000"/>
Dynamic Payback Period	a	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>
Return on Investment	%	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>	<input type="text" value="0000000"/>

Social KPIs

Citizens directly involved

Number of jobs created



Example of forms - 2

Refurbished buildings

TEST-Buildings New-Buildings: Example Refurbished (REFURBISHED BUILDING S cluster)

1 General data

Number of buildings:

Number of monitored buildings in this building group:

Completion year of the building/building group:

2 Building typology characteristics, dimensions and HTC

Building type:

Number of apartments:

Number of inhabitants:

Number of occupants:

Total gross floor area in m² (external):

Total heated net floor area in m² (internal) before refurbishment:

Total heated net floor area in m² (internal):

Total cooled net floor area in m² (internal) before refurbishment:

Total cooled net floor area in m² (internal):

3 Envelope - Heat Transfer Coefficient (U-Value)

Title	Unit	HTC according to national requirements	HTC realised for the demonstration buildings	Existing Building
Year - National Requirements		<input type="text"/>	<input type="text"/>	<input type="text"/>
Overall average HTC of the building envelope surfaces	W/m²K	<input type="text"/>	<input type="text"/>	<input type="text"/>
average HTC roof	W/m²K	<input type="text"/>	<input type="text"/>	<input type="text"/>
average HTC facade/external walls	W/m²K	<input type="text"/>	<input type="text"/>	<input type="text"/>
average HTC ground floor	W/m²K	<input type="text"/>	<input type="text"/>	<input type="text"/>
average HTC windows (frame and pane)	W/m²K	<input type="text"/>	<input type="text"/>	<input type="text"/>
average energy transmittance of windows (g-value)	%	<input type="text" value="65"/>	<input type="text"/>	<input type="text"/>

Information & Communication Technologies:

Building features:

Save design

4 Parameters - Technologies & Energy Carriers

Renewable Energy Sources - Environmental & Economic Parameters

1 Installed Renewable Energy Source photovoltaic - building integrated

Electricity production (in kWh/a):

Financial data for the Renewable energy source

Total Investment costs (in €):

Total Operating costs (in €/a):

Grants and subsidies (in €):

Payback (years): calculated

Payback (years):

Energy Carriers - Environmental & Economic Parameters: before refurbishment

1 Technology boiler

Energy carrier Domestic gas - grid-bound

Building service heating and DHW

Environmental

Parameter	Unit	Factors (national/local)	Standard values from Norm	Source
Greenhouse Gas Emissions (CO ₂ -equivalent) factor	gCO ₂ -equ/kWh	<input type="text" value="XXX.XX"/>	305	Eurostat
Primary Energy Factor	kWhPE/kWhFE	<input type="text" value="XXX.XX"/>	1.36	EN Standard - 156
Year of collection of energy price	Year	<input type="text" value="YYYY"/>		
Energy price (Energy carrier), excluding VAT, grants	€/kWh	<input type="text" value="XX.XX"/>	0.0664	Eurostat

Consumption

Parameter	Unit	Value
FINAL ENERGY INPUT	kWh/a	<input type="text" value="XXXXXXXX"/>
Overall System Performance (output divided by Input)	%	<input type="text" value="XX"/>





Example of forms - 3

Mobility & Transport - Vehicles

REMOURBAN Site Tepebaşı : E Bikes (VEHICLES cluster)

[Delete POA](#)

1 General data

Technology used	<input type="text" value="--Please select--"/>
Description of the intervention	<input type="text"/>
Date of commissioning	<input type="text"/>

2 KPIs

Number of biofuel/electric/hydrogen vehicles deployed in the area

Title	Unit	Baseline situation	After intervention	Improvement (%)
Number of cars	number	<input type="text"/>	<input type="text"/>	<input type="text"/>
Number of buses	number	<input type="text"/>	<input type="text"/>	<input type="text"/>
Bikes	number	<input type="text"/>	<input type="text"/>	<input type="text"/>
Others	number	<input type="text"/>	<input type="text"/>	<input type="text"/>

Clean mobility utilization

Title	Unit	Baseline situation	After intervention	Improvement (%)
Number of kms	km/a	<input type="text"/>	<input type="text"/>	<input type="text"/>
Number of trips	trips/a	<input type="text"/>	<input type="text"/>	<input type="text"/>

Modal split

Title	Unit	Baseline situation	After intervention	Improvement (%)
Public and collective transport	%	<input type="text" value="XX"/>	<input type="text"/>	<input type="text"/>
Private vehicles	%	<input type="text" value="XX"/>	<input type="text"/>	<input type="text"/>
Biking and walking	%	<input type="text" value="XX"/>	<input type="text"/>	<input type="text"/>
Average occupancy	%	<input type="text" value="XX"/>	<input type="text"/>	<input type="text"/>

Automatic Improvement and savings calculations

Energy consumption

Title	Unit	Baseline situation	After intervention	Savings (%)
Final Energy Consumption	kWh/a	<input type="text" value="XXXXXXXX"/>	<input type="text"/>	<input type="text"/>

Environmental KPI

Title	Unit	Baseline situation	After intervention	Savings (%)
Total CO2 Emissions	kgCO2eq/a	<input type="text"/>	<input type="text"/>	<input type="text"/>
Total Primary Energy Demand	kWh/a	<input type="text" value="XXXXXXXX"/>	<input type="text"/>	<input type="text"/>

Economic KPI for the mobility action

Title	Unit	Intervention
Total Investments (excl. VAT)	€	<input type="text" value="XXXXXXXXXX"/>
Grants	€	<input type="text" value="XXXXXXXXXX"/>
Net energy savings/value of improvements	€/a	<input type="text" value="XXXXXXXXXX"/>
Total Operating costs	€/a	<input type="text" value="XXXXXXXXXX"/>
Dynamic Payback Period	a	<input type="text"/>
Return on Investment	%	<input type="text" value="XX"/>

Social KPIs

Citizens directly involved	<input type="text"/>
Number of jobs created	<input type="text"/>





Example of forms - 4

Mobility & Transport - Infrastructure

TEST-Mobility E-mobility: 20181126 Rudy 2 (INFRASTRUCTURE cluster)

1 General data

Technology used	Bidirectional charging
Description of the intervention	Installation of 2 bidirectional chargers and vehicles
Date of commissioning	

2 KPIs

Energy consumption data aggregated by sector fuel (GJ)

Mode	Public transport BEFORE	Private vehicles BEFORE	Public transport AFTER	Private vehicles AFTER
LPG				
Motor Spirit				
Kerosene - Jet Fuels				
Diesel Oil				
Heavy Fuel Oil				
Natural gas				
Biodiesel				
Electricity - grid				
Electricity - RES				

Transport system

Improvement	Unit	Baseline situation	After intervention	Improvement (%)
New e-hub/charging/fueling stations	outlets	0	2	Infinity
Deployment of bicycle lanes and pedestrian roads	km			
Deployment of public transport system	km/100000 inhabitant			
New car sharing/car pooling locations	spaces			

Automatic Improvement and savings calculations

Kilometers				
Mode	Public transport BEFORE	Private vehicles BEFORE	Public transport AFTER	Private vehicles AFTER
passenger-kilometer				
Environmental KPI				
Title	Unit	Baseline situation	After intervention	Savings (%)
Total CO2 Emissions	kgCO2eq/a			
Total Primary Energy Demand	kWh/a	xxxxxxxx		
Economic KPI				
Title	Unit	Intervention		
Total Investments (excl. VAT)	€	10000		
Grants	€	2000		
Net energy savings/value of improvements	€/a	500		
Total operating costs	€/a	100		
Dynamic Payback Period	a	20		
Return on Investment	%	10x		
Social KPIs				
Citizens directly involved				
Number of jobs created				

Save





Example of forms - 5

ICT

TEST-Mobility E-mobility: 20181126 (ICT cluster)

Automatic Improvement and savings calculations

1 General Data

Description of the intervention	<input type="text" value="Installation of 100 smart lampposts"/>
Thematic field of ICT Intervention	<input type="text" value="City level"/>
Type of ICT Intervention (City level)	<input type="text" value="Smart lampposts"/>
Date of commissioning	<input type="text" value="2020"/>

2 KPIs

Demand Side Management

Title	Unit	Baseline situation	After intervention	Improvement (%)
Reliability in terms of power interruptions	number/a	<input type="text"/>	<input type="text"/>	<input type="text"/>
Power Quality and Quality of Supply (DSO+TSO): Time needed for awareness of grid faults	minutes	<input type="text"/>	<input type="text"/>	<input type="text"/>

Focus on Energy Savings

Title	Unit	Baseline situation	After intervention	Improvement (%)	Improvement (%)
Increased flexibility from energy players	Amount of load c	<input type="text"/>	<input type="text"/>	<input type="text"/>	1000
Reduction of energy cost	Electricity at a glw	<input type="text"/>	<input type="text"/>	<input type="text"/>	
Peak load reduction	Peak demand	<input type="text"/>	<input type="text"/>	<input type="text"/>	
Increased RES and DER hosting capacity	Hosting capacity	<input type="text"/>	<input type="text"/>	<input type="text"/>	
Increased hosting capacity for electric vehicles and other new loads	Hosting capacity	<input type="text"/>	<input type="text"/>	<input type="text"/>	
Energy price (averaged over a year)	€/kWh	<input type="text" value="XX.XX"/>	<input type="text"/>	<input type="text"/>	
Peak load level	MW	<input type="text"/>	<input type="text"/>	<input type="text"/>	
RES and DER hosting capacity	MW	<input type="text"/>	<input type="text"/>	<input type="text"/>	
Hosting capacity for electric vehicles and other new loads	MW	<input type="text"/>	<input type="text"/>	<input type="text"/>	

Consumers engagement

Title	Unit	Baseline situation	After intervention	Improvement (%)
Number of end users involved	#	<input type="text"/>	<input type="text"/>	<input type="text"/>
Number of people with increased ability to manage their energy consumption	#	<input type="text"/>	<input type="text"/>	<input type="text"/>

Environmental KPI

Title	Unit	Baseline situation	After intervention	Savings (%)
Total CO2 Emissions	kgCO2eq/a	<input type="text"/>	<input type="text"/>	<input type="text"/>
Total Primary Energy Demand (due to the ICT measure implemented)	kWh/a	<input type="text" value="XXXXXXXX"/>	<input type="text"/>	<input type="text"/>

Economic KPI

Title	Unit	Intervention
Total Investments (excl. VAT)	€	<input type="text" value="XXXXXXXXXX"/>
Grants	€	<input type="text" value="XXXXXXXXXX"/>
Annual value of improvements	€/a	<input type="text" value="XXXXXXXXXX"/>
Total operating costs	€/a	<input type="text" value="XXXXXXXXXX"/>
Dynamic Payback Period	a	<input type="text"/>
Return on Investment	%	<input type="text" value="XX"/>

Social KPIs

Citizens directly involved	<input type="text"/>
Number of jobs created	<input type="text"/>





Example of forms - 6

Energy System Integration – Electricity storage

- Automatic Improvement and savings calculations

TEST-Mobility E-mobility: 20181126 E Storage (ELECTRICAL STORAGE cluster)

1 General data

Date of commissioning

2019

2 KPIs

Technical KPIs

Title	Unit	Value
Maximum charging/discharging power	kW	1000
Storage volume	m³	30
Electrical storage capacity	kWh	1200
Roundtrip efficiency	%	90
Energy density	kWh/kg	
Discharge time (in use)	hr	20000
Cycles in lifetime	cycles	3000

Environmental KPIs

Title	Unit	Demonstration power plant (calculated)	Demonstration power plant	Savings (SCIS calculation)	Reference value
Total CO2 Emissions	kgCO2eq/a				
Total Primary Energy Demand	kWh/a		1000000		

Please, provide the savings of your system compared with a system of reference. This system should be based in BAU (e.g. gas boiler for heating) and be designed to produce the same output as the reported technology (e.g. the input should be different due to different performance ratios). If no savings are entered, SCIS provides calculation of savings from BAU baseline.

Economic KPI for the Energy System Integration Unit

Title	Unit	Value	Reference value	SCIS calculation
Total Investments (excl. VAT)	€	500000	0	
Grants	€	200000	0	
Energy sales revenues for electricity	€/a	6000	0	
Energy sales revenues for delivered heating energy	€/a	0	0	
Energy sales revenues for delivered cooling energy	€/a	0	0	
Total Operating costs per year	€/a	100000000		
Dynamic Payback Period	a			50
Return on Investment	%	XX		

Social KPIs

Citizens directly involved

Number of jobs created

Gross floor area in m² served by the new system in m2

Save



Example of forms – 7

Positive Energy District (PED)



E2REBUILD Site London: Instruction Sample (POSITIVE ENERGY DISTRICT PED cluster)

Design Add monitoring form - Delete FOA

1 General data

Buildings

ADD NEW ITEM

Building name	Building creation	Year of commissioning	Use type	Gross conditioned floor area [m2]	Actions
Building 1	New build	2022	tertiary	10000	
Building 2	New build	2023	residential	5000	

2 Building net energy need (fuels, electricity final energy)

Buildings

Building name	Space heating, cooling, and air conditioning (kWh/m2/a)	Space heating, cooling, and air conditioning (kWh/a)	Hot water (kWh/a)	Lighting (kWh/m2/a)	Lighting (kWh/a)	Appliances (kWh/m2/a)	Appliances (kWh/a)	Subtotal net energy need (kWh/a)
Building 1	10	100000	5000	3	30000	4	40000	175000
Building 2	9	45000	8000	2	10000	3	15000	78000

Total net energy

Totals only correct after saving the form

Title	Unit	Value
Total net energy need	kWh/a	253000
Total net energy need without appliances	kWh/a	198000

- Enter energy data at the arrows.
- Automatic calculations



Example of forms – 7-2

Positive Energy District (PED)

3 Local RES (within the boundaries of the project district)

Buildings/locations

Building/location name	Photovoltaic (kWp)	Photovoltaic (kWh/a)	Solar Thermal (kWh/a)	Biomass (kWh/a)	ATES (kWh/a)	Wind (kWh/a)	Subtotal local RES (kWh/a)	Actions
Location PV	50	40000	0	0	0	0	40000	<div>+</div> <div>-</div> <div>^</div> <div>v</div>
Location Wind	0	0	0	0	0	30000	30000	<div>+</div> <div>-</div> <div>^</div> <div>v</div>

Total local RES

Totals only correct after saving the form

Title	Unit	Value
Total local RES	kWh/a	70000
% of total net energy need covered by local RES:	%	47.2972972973

- Automatic calculations for totals



Example of forms – 7-3

Positive Energy District (PED)

4 Energy in/out through district boundaries

Energy in/out

Energy carrier name	Unit	in	out (if applicable)	Actions
Electricity	kWh/a	100000	30000	⊖ ⊕ ^ v
Gas	kWh/a	0	0	⊖ ⊕ ^ v
Biomass	kWh/a	0	0	⊖ ⊕ ^ v
District heating	kWh/a	0	0	⊖ ⊕ ^ v
District cooling	kWh/a	0	0	⊖ ⊕ ^ v

⊖ Electricity, Gas, Biomass, District heating or choose your own.

Total net incoming energy (in minus out)

Title	Unit	Calculated
Total net incoming energy	kWh/a	70000
% of total net energy need (without appliances) covered by resources coming from outside district boundaries	%	47.2972972973

5 Building energy consumption related GHG emissions emitted within the district boundaries

GHG emissions

Title	Unit	Value
GHG emissions emitted within the district boundaries	ton/a	28

- Automatic calculations for totals
- The SRT guide provides default values for the GHG emission factors





Example of forms – 7-4

Positive Energy District (PED)

6 Energy management measures (check when applicable)

District level

Key	Energy management systems	Smart grids	User interaction	Other
district	<input type="radio"/> no <input checked="" type="radio"/> yes	<input type="radio"/> no <input checked="" type="radio"/> yes	<input checked="" type="radio"/> no <input type="radio"/> yes	<input checked="" type="radio"/> no <input type="radio"/> yes

Buildings/locations

Building/location name	Energy management systems	Smart grids	User interaction	Other	Actions
Building 1	<input type="radio"/> no <input checked="" type="radio"/> yes	<input checked="" type="radio"/> no <input type="radio"/> yes	<input checked="" type="radio"/> no <input type="radio"/> yes	<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="button" value="+"/> <input type="button" value="-"/> <input type="button" value="up"/> <input type="button" value="down"/>
Building 2	<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> no <input checked="" type="radio"/> yes	<input checked="" type="radio"/> no <input type="radio"/> yes	<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="button" value="+"/> <input type="button" value="-"/> <input type="button" value="up"/> <input type="button" value="down"/>

7 Storage

District level

Key	Storage type	Unit	Value	Actions
District	Batteries <small>ⓘ Reuse 'Thermal', 'Batteries' or your own storage type.</small>	kWh	10000	<input type="button" value="+"/> <input type="button" value="-"/>

Buildings/locations

Building/location name	Storage type	Unit	Value	Actions
Building 1 <small>ⓘ Reuse building names from General data.</small>	Batteries <small>ⓘ Use storage types from District level.</small>	kWh	10000	<input type="button" value="+"/> <input type="button" value="-"/> <input type="button" value="up"/> <input type="button" value="down"/>

- Click the appropriate energy management measures and provide storage details



Example of forms – 7-5

Positive Energy District (PED)

8 Other measures

District level

[+ ADD NEW ITEM](#)

Key	Measure	Actions
District	<input type="text" value="Feedback device"/>	-
District	<input type="text" value="CHP"/>	-

Buildings

Buildings	Measure	Implemented
Building 1	Feedback device	<input type="radio"/> no <input checked="" type="radio"/> yes
Building 1	CHP	<input checked="" type="radio"/> no <input type="radio"/> yes
Building 2	Feedback device	<input checked="" type="radio"/> no <input type="radio"/> yes
Building 2	CHP	<input type="radio"/> no <input checked="" type="radio"/> yes

- On district level, provide 1 “other measure” per line.
- Additional items can be created by pressing the upper left “Add new item” button.
- For each building all measures will appear. Select which building features which measure by pressing yes or no in the right column. Default is no.





Example of forms – 7-6

Positive Energy District (PED), KPI

KPI

Technical KPI

Title	Unit	Value	Overridden
Total net energy need	kWh/a	203000	<input type="text" value="xxxxxx"/>
Total net energy need without appliances	kWh/a	148000	<input type="text" value="xxxxxx"/>
Total net incoming energy	kWh/a	70000	<input type="text" value="xxxxxx"/>
% of total net energy need covered by resources coming from outside district boundaries	%	47.2972972972973	<input type="text" value="xx"/>

Environmental

Title	Unit	Value	Overridden
GHG emissions	ton/a	28	<input type="text"/>
Total local RES	kWh/a	70000	<input type="text" value="xxxxxx"/>
% of total net energy need covered by local RES	%	47.2972972972973	<input type="text" value="xx"/>

Economic

Title	Unit	Intervention	SCIS calculation
Total Investments (excl. VAT)	€	<input type="text" value="3000000"/>	
Grants	€	<input type="text" value="1000000"/>	
Net energy savings/value of improvements	€/a	<input type="text" value="200000"/>	
Total Operating costs (in €/a)	€/a	<input type="text" value="1000"/>	
Dynamic Payback Period	a	<input type="text"/>	10.050251256281408
Return on Investment	%	<input type="text" value="50"/>	

Social KPIs

Citizens directly involved

Number of jobs created

- Technical and environmental KPI are based on values entered earlier.
- Values can be overridden
- Economic and social data need to be entered manually



Monitoring forms versus Design forms

Monitoring forms are prefilled copies of the design form to be edited with actual results

In the design form, a monitoring form can be created

A screenshot of the Smart Cities Marketplace interface. On the left, there is a sidebar with a green button labeled 'Demo sites' with a dropdown arrow, a blue button labeled 'ATELIER Amsterdam', and text indicating 'Amsterdam Buiksloterham Positive Energy District' and 'Design'. The main area shows the title 'ATELIER Amsterdam: Amsterdam Buiksloterham Positive Energy District PED cluster)'. Below the title, there are two tabs: 'Design' and 'Add monitoring form' with a dropdown arrow. A teal arrow points from the 'Add monitoring form' tab to a green circle with the number '1' and the text 'General data'.



Important notes

- In the buildings forms, the data on energy consumption per energy carrier are metered values, corrected for degree days, if applicable
- In the buildings forms, use at least one building service with electricity as energy carrier
- Total final energy use is (Renewable production + sum of energy carriers consumption)/ net heated floor space
- First completely fill out the design forms, then start with monitoring
- Instruction manual SRT link: <https://smart-cities-marketplace.ec.europa.eu/insights/publications/self-reporting-tool-srt-guide>
 - Chapter 4 Overview of calculations
 - Chapter 5-9 How to fill in the forms
 - Chapter 10 How to use the visualisation



Sample timeline for Smart Cities Marketplace SRT system use

- Ideally, during proposal writing
 - Familiarize yourself with the EU SCIS related requests by consulting the Technical monitoring guide, KPI guide and SRT guide. In this way you are able to write the monitoring part of your proposal in line with the EU requirements. https://smart-cities-marketplace.ec.europa.eu/insights/publications?f%5B0%5D=publication_type%3Amonitoring_guide
- First year of the project
 - Assign responsible persons for SRT use, obtain credentials by requests sent to info@smartcitiesmarketplace.eu. For each person indicate: Name, email address, telephone number, project acronym, demosite name for which access is needed
 - Create the Fields of Action (FoA) in the demosite (see the SRT guide), based on Dow, BEST and most recent insights. The FoA are actual demonstrators in the demosite, e.g. a refurbishment project or a clean mobility project. By saving, design forms are created.
- Until the completion of the demonstrator
 - Update and save the FoA definition and data in the created form if needed
- At completion of the demonstrator
 - Finalize it by saving and creation of a monitoring form (selectable from 2005-2030). From this point the design forms should not be changed as the monitoring form is derived from it. (A form can be saved locally as a pdf by pressing ctrl-P, and saving the result. A print can also be useful to work on the form data collection off-line)
- At the end of each monitoring year (selectable from 2005-2030)
 - Fill out the monitoring data



Data visualization

Disclosure of relevant SRT data (KPI's) on the public website

- Both design data and monitoring data will be available as open data
- In case multiple monitoring forms are created (each for a separate year) The system will prompt for indicating the most relevant year (this will be used for visualization)

Demo sites

E2REBUILD Site Voiron

E2REBUILD Site Voiron: Refurbished Building (REFURBISHED BUILDING S cluster)

Design20172018Add monitoring formDelete monitoring yearDelete FOA

Refurbished building

Design

1 General data

Number of buildings

1

Number of monitored buildings in this building group

1111

Completion year of the building/building group

1111

NEXT-BUILDINGS Site Amsterdam: Brede School

Design20152016Add monitoring form- Year for visualisation - Set



Data visualization - samples

Disclosure of relevant SRT data (KPI's) on the public website - interface

Smart Cities Marketplace

[Home](#)
[Projects and sites](#)
[Insights](#)
[Matchmaking](#)
[Community](#)
[Scalable cit](#)

[Home](#) > [Data captured through the Self-Reporting Tool](#)

Data captured through the Self-Reporting Tool

[View](#)
[Edit](#)
[Delete](#)
[Revisions](#)

The KPI data captured through the self-reporting tool of the Marketplace (SRT, previously maintained as part of the SCIS project) is available as open data below. The csv column headers are explained in the KPI explanation file.

Open data

- [New buildings](#)
- [Refurbished buildings](#)
- [ICT](#)
- [Energy Systems Integration](#)
- [Boiler](#)
- [Co-generation](#)

- <https://smart-cities-marketplace.ec.europa.eu/scis-kpis>
- An explanation of the data parameters can be found in the [kpi_explanation_csv.pdf](#), see screenshot

- Vehicles and infrastructure
- All data from above combined

Documents

kpi_explanation_csv.pdf

English (65.19 KB - PDF)

Download



Data visualization – samples

Disclosure of relevant SRT data (KPI's) on the public website – steps to take

- Grouping over cities, countries etc.
- Standard KPI graphs on project and demosite pages, aggregated over pilot projects.....

Description

Demo Site Expected Impact

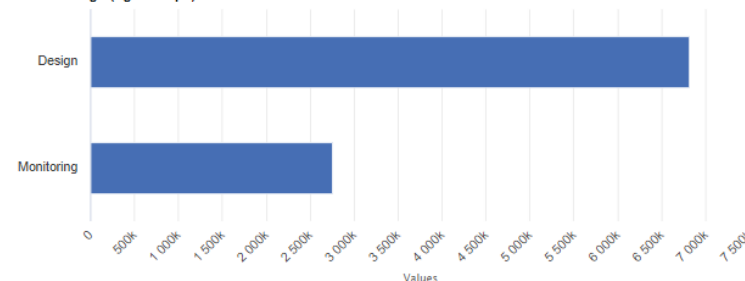
Technologies

Contact

Refurbished Building(s)

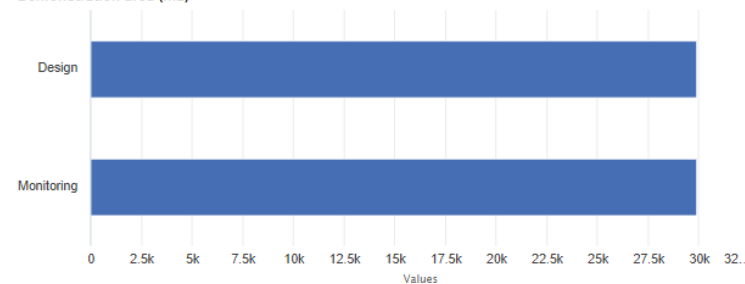
Project data

CO2 savings (kgCO2eq/a)



● CITY-ZEN Site Amsterdam

Demonstration area (m2)



● CITY-ZEN Site Amsterdam



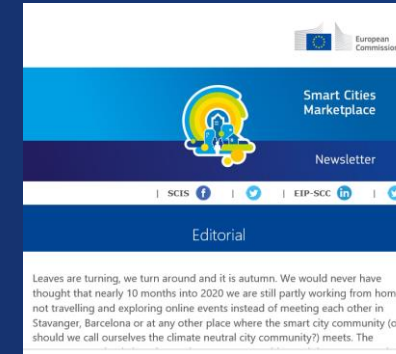
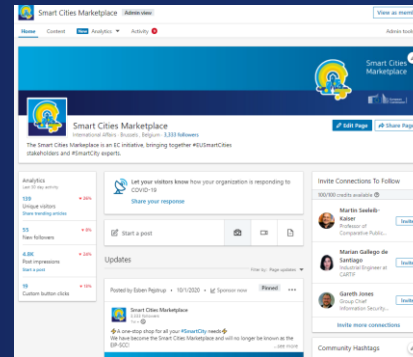
Smart Cities Marketplace

Q/A





GET IN TOUCH!



<https://smart-cities-marketplace.ec.europa.eu>

Sign up for our newsletter [here](https://bit.ly/34ReJEV): <https://bit.ly/34ReJEV>



info@smartcitiesmarketplace.eu



[@EUsmartcities](https://twitter.com/EUsmartcities)



LinkedIn - <https://www.linkedin.com/company/eusmartcities/>



European
Commission