

## **Work Package 2**

Pilot's solution set data analysis

### **Annex I - Deliverable D2.5**

Solution Database

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## 1. Introduction

This Annex to the deliverable D2.5- “Standard benchmarking spreadsheet including manual” reports the complete set of worksheets of the Excel document considered as the main output of the Task T2.3 Energy saving potential hypothesis and benchmarking model definition.

The Annex reports the sheets as follows:

- *Instructions* sheet – Reported in 5 pages presents the instructions for the database use;
- *Case Studies* sheet – Reported in 1 page presents the solution implemented;
- *-Hospital-* sheet – Reported in 5 pages presents the main database sheet; it contains the main characteristics of the described Hospital and the solutions implemented;
- *AOR Sheet* - Reported in 5 pages presents the solution implemented in AOR;
- *SGH Sheet* - Reported in 7 pages presents the solution implemented in SGH;
- *HVN Sheet* - Reported in 10 pages presents the solution implemented in HVN;
- *HML Sheet*- Reported in 5 pages presents the solution implemented in HML;
- *Back up* sheet – Reported in 1 page presents the lists and the menus useful for the document construction.

## Instruction for the database use

### Sheet: Case Studies

In this sheet the Case studies of the project are listed in a table showing the type of solution implemented. The implemented solutions belong to two main areas: HVAC and LIGHTING system. The table, and the database, has been thought so as to be used also for other cases and other type of implemented solutions. In the filling cell of the table the Name of the solution is reported; the solution are explained in the following sheets.

### Sheet: -Case name-

Each pilot case is described in a different datasheet

DATABASE INFORMATION	EXPLANATION	FILLING INSTRUCTIONS
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<b>Case Name</b>	identification of the building	TEXT CELL: type the name of the building
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#### GENERAL DATA

Address of the project		
Year of construction		
Year of renovation		
Gross floor area m2	Gross floor area is defined as the total number of square metres measured between the principal exterior surfaces of the enclosing fixed walls, including vent shafts and stairwells. It is the gross surface indicated in energy audit.	NUMBER CELL: insert only the number in m2 following this format: 000,00

Gross volume m3	Gross floor volume is the total number of cubic metres measured between the principal exterior surfaces of the enclosing fixed walls	NUMBER CELL: insert only the number in m3 following this format: 000,00
Number of occupants		
Number of staffed beds		

## BUILDING ENERGY SAVING

In this section the effect of all the solutions implemented in each pilot case is shown.

Each data is characterized by:

<b>Assessment</b>	before the implementation
<b>Final Results</b>	after the implementation
<b>Delta [%]</b>	$(\text{Assessment} - \text{Final}) / \text{Assessment} \%$

Described data:

Whole Building SITE Energy Consumption	The energy consumption of the whole building
Whole Building SOURCE Energy Consumption	The source energy consumption is calculated starting from the site energy consumption through the thermal factor conversion specified in the Annex to D2.1: "Notes on metrics"

## SOLUTION SET

### SOLUTION:

identification of the solution

TEXT CELL

### SOLUTIONS DESCRIPTION

Solution brief description

insert a brief description of the major modification and possible notes on the solution's choice

TEXT CELL

Type of solution (select what applies):

Choose from:  
 no/low-cost --> up to 500 €  
 medium-cost --> 500 to 10000 €  
 high-cost --> more than 10000 €  
 The split is made on a basis cost following the "IEA Energy Process and Assessment Protocol".

DROP-DOWN MENU CELL

Gross surface interested by solution, m2

The total number of square metres interested by the solution

NUMBER CELL: insert only the number in m2 following this format: 000,00

Gross volume interested by solution, m3

The total number of cubic metres interested by the solution

NUMBER CELL: insert only the number in m2 following this format: 000,00

Implementation date

Indicate month and year of implementation

DATE CELL: format jan-01

Is the solution submetered?

Is it possible to evaluate the energy consumption of the system or of the area interested by the solution's implementation?

TEXT CELL: indicate the energy source that can be metered, the type and number of installed meters.

### Main solution impact on existing systems

In this section the main changes implemented are briefly listed

Equipment substitution/improvement

Describe the equipment that have been modified in the solution implementation

TEXT CELL

Building management system substitution/improvement

Describe the software changes that have been implemented

TEXT CELL



operating time schedule changes	Describe the implemented changes in the operating schedule of occupation, system operation	TEXT CELL
Setpoint and regulation logics changes	Describe the implemented changes in the systems' setpoints and regulation logics	TEXT CELL
Other changes	Describe possible changes not included in the above items	TEXT CELL

**Solution's improvement**

Solution's improvement.  
Indicate which aspect/aspects can be improved by this solution, evaluating each aspect from 1 to 5 choosing from:

- Energy saving
- O&M cost decrease
- Longer life of the system
- Non-energy resource saving
- Direct emissions reduction
- Comfort conditions

Legend

- 1: worsened
- 2: slightly worsened
- 3: unchanged
- 4: slightly improved
- 5: improved

DROP-DOWN MENU CELLS: for each aspect it will be possible to evaluate from 1 to 5.  
The question have been written in such way so as to help the filling: "5: improved" means a good thing in all the points.

**Solution area operating plan**

Occupation schedule	Indicate the number of daily occupation hours before and after the solution implementation	NUMBER CELL
Lighting system schedule (please indicate the daily operating hours)	Indicate the number of daily operating hours before and after the solution implementation	NUMBER CELL
Heating system schedule (please indicate the daily operating hours)	Indicate the number of daily operating hours before and after the solution implementation	NUMBER CELL

Cooling system schedule (please indicate the daily operating hours)	Indicate the number of daily operating hours before and after the solution implementation	NUMBER CELL
Fresh air system schedule (please indicate the daily operating hours)	Indicate the number of daily operating hours before and after the solution implementation	NUMBER CELL

**Solution's analysis**

Each data is characterized by:

Assessment	before the implementation
Final Results	after the implementation
Delta [%]	$(\text{Assessment}-\text{Final})/\text{Assessment} \%$

Described data:

Solution Area SITE Energy Consumption	The energy consumption of the area interested by the solution implementation before the solution implementation	The consumption should be indicated as annual energy consumption, distinguishing the data on the basis of the type of energy source
Solution Area SOURCE Energy Consumption	The source energy consumption is calculated starting from the site nergy consumption through the thermal factor conversion specified in the Annex to D2.1: "Notes on metrics"	
BACS Reached function (ref. EN 15232)	Indicate the initial performance class according to EN 15232 and the reached class after the solution implementation	



## Energy Saving Solution Set Case Studies

Case studies			Energy Efficiency Solutions								
			HVAC Systems						Lighting Systems		
Building Name	Country	Acronym	AHU Control	Terminal Unit Control	Ventilation Control	Building Heating production	Building Cooling production	DataCentre Cooling system	Lamp Substit.	Presence Detection	Dimming
Azienda Ospedaliero Universitaria Ospedali Riuniti Umberto I – G.M. Lancisi – G. Salesi	Italy	AOR						AOR 1	AOR 2	AOR 2	AOR 2
General Hospital Chania Saint George	Greece	SGH		SGH 1						SGH 2	SGH 2
Hospital Virgen de las Nieves	Spain	HVN	HVN 1A 1B					HVN 2			
Hospital de Mollet	Spain	HML			HML 1	HML 2	HML 2				

**- Hospital name -**

**GENERAL DATA**

Address of the project	
Year of construction	
Year of renovation	
Gross floor area m2	
Gross volume m3	
Number of occupants	
Number of staffed beds	

**BUILDING ENERGY SAVING**

	Assessment	Final Results	Delta [%]
Whole Building SITE Energy Consumption			
Whole Building SOURCE Energy Consumption			

# SOLUTION SET

## SOLUTION: AOR 1

### SOLUTIONS DESCRIPTION

Solution brief description	
Type of solution (select what applies):	
Gross surface interested by solution, m2	100,00
Gross volume interested by solution, m3	300,00
Implementation date	gen-01
Is the solution submetered?	Y/N

### Main solution impact on existing systems

Equipment substitution/improvement	
bulding management system substitution/improvement	
operating time schedule changes	
Setpoint and regulation logics changes	
Other changes	

### Solution's improvement

Solution's improvement. Indicate which aspect/aspects can be improved by this solution, evaluating each aspect from 1 to 5 choosing from:	Energy saving		Legend 1: worsened 2: slightly worsened 3: unchanged 4: slightly improved 5: improved
	O&M cost decrease		
	Longer life of the system		
	Non-energy resource saving		
	Direct emissions reduction		
	Comfort conditions		
Other: ....			

**Solution area operating plan**

Item	Before solution implementation	After solution implementation
Occupation schedule	24/7	
Lighting system schedule (please indicate the daily operating hours)		
Heating system schedule (please indicate the daily operating hours)		
Cooling system schedule (please indicate the daily operating hours)		
Fresh air system schedule (please indicate the daily operating hours)		

**Solution's analysis**

	Assessment	Final Results	Delta [%]
Solution Area SITE Energy Consumption (kWh)			
Solution Area SOURCE Energy Consumption (kWh)			
BACS Reached function (ref. EN 15232)			

**SOLUTION:**

**AOR 2**

**SOLUTIONS DESCRIPTION**

Solution brief description	
Type of solution (select what applies):	
Gross surface interested by solution, m2	100,00
Gross volume interested by solution, m3	300,00
Implementation date	gen-01
Is the solution submetered?	Y/N

**Main solution impact on existing systems**

Equipment substitution/improvement	
building management system substitution/improvement	
operating time schedule changes	
Setpoint and regulation logics changes	
Other changes	

**Solution's improvement**

Solution's improvement. Indicate which aspect/aspects can be improved by this solution, evaluating each aspect from 1 to 5 choosing from:	Energy saving	
	O&M cost decrease	
	Longer life of the system	
	Non-energy resource saving	
	Direct emissions reduction	
	Comfort conditions	
	Other: ....	

Legend  
 1: worsened  
 2: slightly worsened  
 3: unchanged  
 4: slightly improved  
 5: improved

**Solution area operating plan**

Item	Before solution implementation	After solution implementation
Occupation schedule	24/7	
Lighting system schedule (please indicate the daily operating hours)		
Heating system schedule (please indicate the daily operating hours)		
Cooling system schedule (please indicate the daily operating hours)		
Fresh air system schedule (please indicate the daily operating hours)		

**Solution's analysis**

	Assessment	Final Results	Delta [%]
Solution Area SITE Energy Consumption (kWh)			
Solution Area SOURCE Energy Consumption (kWh)			
BACS Reached function (ref. EN 15232)			

**Azienda Ospedaliero Universitaria Ospedali Riuniti Umberto I- G.M. Lancisi – G. Salesi**

**GENERAL DATA**

Address of the project	Via Conca 71, Ancona, Italy
Year of construction	1970
Year of renovation	2001
Gross floor area m2	120000
Gross volume m3	360000
Number of occupants	3100 employes
Number of staffed beds	756

**BUILDING ENERGY SAVING**

	Assessment	Final Results	Delta [%]
Whole Building SITE Energy Consumption	N/A	N/A	N/A
Whole Building SOURCE Energy Consumption	N/A	N/A	N/A

# SOLUTION SET

**SOLUTION:** **AOR 1**

**SOLUTIONS DESCRIPTION**

Solution brief description	Smart lighting system
Type of solution (select what applies):	High cost
Gross surface interested by solution, m2	347,00
Gross volume interested by solution, m3	1041,00
Implementation date	ott-13
Is the solution submetered?	Y

**Main solution impact on existing systems**

Equipment substitution/improvement	LED light, presence-luminance sensors installation
building management system substitution/improvement	New contro infrastructure installation
operating time schedule changes	Y according to occupancy
Setpoint and regulation logics changes	Y according to national laws
Other changes	Natural - artificial light mix

**Solution's improvement**

Solution's improvement. Indicate which aspect/aspects can be improved by this solution, evaluating each aspect from 1 to 5 choosing from:	Energy saving	5,00
	O&M cost decrease	5,00
	Longer life of the system	5,00
	Non-energy resource saving	5,00
	Direct emissions reduction	5,00
Comfort conditions	5,00	

Legend  
 1: worsened  
 2: slightly worsened  
 3: unchanged  
 4: slightly improved





	Other: ....	5: improved
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**Solution area operating plan**

Item	Before solution implementation	After solution implementation
Occupation schedule	24/7 or 12/5 according to areas	24/7 or 12/5 according to areas
Lighting system schedule (please indicate the daily operating hours)	24/7 or 12/5 according to areas	24/7 or 12/5 according to areas (presence and setpoint based)
Heating system schedule (please indicate the daily operating hours)		
Cooling system schedule (please indicate the daily operating hours)		
Fresh air system schedule (please indicate the daily operating hours)		

**Solution's analysis**

	Assessment	Final Results	Delta [%]
Solution Area SITE Energy Consumption	17658,00	8476,00	52 (77 including light retrofit)
Solution Area SOURCE Energy Consumption	38317,86	18392,92	52 (77 including light retrofit)
BACS Reached function (ref. EN 15232)	B	A	Ref: item 5.1, 5.2

**SOLUTION:**

**AOR 2**

**SOLUTIONS DESCRIPTION**

Solution brief description	Data centre cooling optimization
Type of solution (select what applies):	Low cost
Gross surface interested by solution, m2	34,00
Gross volume interested by solution, m3	102,00
Implementation date	set-11
Is the solution submetered?	Y

**Main solution impact on existing systems**

Equipment substitution/improvement	N
building management system substitution/improvement	N
operating time schedule changes	N
Setpoint and regulation logics changes	Freecooling setpoint and operating temperature setpoints modified
Other changes	

**Solution's improvement**

Solution's improvement. Indicate which aspect/aspects can be improved by this solution, evaluating each aspect from 1 to 5 choosing from:	Energy saving	5,00
	O&M cost decrease	3,00
	Longer life of the system	4,00
	Non-energy resource saving	3,00
	Direct emissions reduction	5,00
	Comfort conditions	3,00
Other: ....		

- Legend
- 1: worsened
  - 2: slightly worsened
  - 3: unchanged
  - 4: slightly improved
  - 5: improved

**Solution area operating plan**

Item	Before solution implementation	After solution implementation
Occupation schedule	24/7	24/7
Lighting system schedule (please indicate the daily operating hours)		
Heating system schedule (please indicate the daily operating hours)		
Cooling system schedule (please indicate the daily operating hours)	24/7	24/7
Fresh air system schedule (please indicate the daily operating hours)		

**Solution's analysis**

	Assessment	Final Results	Delta [%]
Solution Area SITE Energy Consumption (kWh)	12659,00	9435,00	25,5
Solution Area SOURCE Energy Consumption (kWh)	27470,03	20473,95	25,5
BACS Reached function (ref. EN 15232)	B	A	Ref: item 4.5

## - Chania General Hospital "St. George" -

### GENERAL DATA

Address of the project	MOYRNIES CHANIA, CRETE
Year of construction	2000
Year of renovation	N/A
Gross floor area m <sup>2</sup>	58992,54
Gross volume m <sup>3</sup>	2030012,72
Number of occupants	465 per day, 29363 total for year 2011
Number of staffed beds	460

## BUILDING ENERGY SAVING

	Assessment	Final Results	Delta [%]
Whole Building SITE Energy Consumption	20344981	20343671	0,01%
Whole Building SOURCE Energy Consumption	34529999	34526201	0,01%

## SOLUTION SET

**SOLUTION:**
**SGH 1**

### SOLUTIONS DESCRIPTION

Solution brief description	Fan coils management
Type of solution (select what applies):	Medium cost
Gross surface interested by solution, m2	59,35
Gross volume interested by solution, m3	207,73
Implementation date	mag-13
Is the solution submetered?	Y

### Main solution impact on existing systems

Equipment substitution/improvement	Sensors installation:Nose sensor (Measuring Temperature, Humidity, and CO2),Presence sensor,Window contact. Meters installation: For energy consumption of the fan, flow of fluid in the the coil,temperature of fluid in the coil. Actuator installation:An actuator for initiating the fan motor
building management system substitution/improvement	New control infastarcture: Controller FX07 which supports the N2 communication protocol of the hospital's BMS
operating time schedule changes	according to presence detection, indoor temperature prediction, outdoor temperature prediction

Setpoint and regulation logics changes	set point according to national laws/standards(Technical Chamber of Greece)
Other changes	

### Solution's improvement

Solution's improvement. Indicate which aspect/aspects can be improved by this solution, evaluating each aspect from 1 to 5 choosing from:	Energy saving	5,00	Legend 1: worsened 2: slightly worsened 3: unchanged 4: slightly improved 5: improved
	O&M cost decrease	5,00	
	Longer life of the system	5,00	
	Non-energy resource saving	5,00	
	Direct emissions reduction	5,00	
	Comfort conditions	5,00	
Other: ....			

### Solution area operating plan

Item	Before solution implementation	After solution implementation
Occupation schedule	24/7	24/7
Lighting system schedule (please indicate the daily operating hours)		
Heating system schedule (please indicate the daily operating hours)	24/7	24/7
Cooling system schedule (please indicate the daily operating hours)	24/7	24/7
Fresh air system schedule (please indicate the daily operating hours)		

**Solution's analysis**

	Assessment	Final Results	Delta [%]
Solution Area SITE Energy Consumption (kWh)	13770,45	1239,34	91
Solution Area SOURCE Energy Consumption (kWh)	39934,305	3594,086	91
BACS Reached function (ref. EN 15232)	D	A	Ref: item 1.1, 3.1

**SOLUTION:**
**SGH 2**
**SOLUTIONS DESCRIPTION**

Solution brief description	Artificial lighting management
Type of solution (select what applies):	Medium cost
Gross surface interested by solution, m2	59,35
Gross volume interested by solution, m3	207,73
Implementation date	mag-13
Is the solution submetered?	Y

**Main solution impact on existing systems**

Equipment substitution/improvement	Sensors installation:presence-luminance sensors, energy meter, Relays
Building management system substitution/improvement	New control infrastructure: Controller FX07 which supports the N2 communication protocol of the hospital's BMS
Operating time schedule changes	according to occupancy and luminance
Setpoint and regulation logics changes	set point according to national laws/standards(Technical Chamber of Greece)
Other changes	

**Solution's improvement**

Solution's improvement. Indicate which aspect/aspects can be improved by this solution, evaluating each aspect from 1 to 5 choosing from:	Energy saving	5,00	Legend 1: worsened 2: slightly worsened 3: unchanged 4: slightly improved
	O&M cost decrease	5,00	
	Longer life of the system	5,00	
	Non-energy resource saving	5,00	
	Direct emissions reduction	5,00	
	Comfort conditions	5,00	



	Other: ...		5: improved
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**Solution area operating plan**

Item	Before solution implementation	After solution implementation
Occupation schedule	24/7	24/7
Lighting system schedule (please indicate the daily operating hours)	24/7	24/7
Heating system schedule (please indicate the daily operating hours)		
Cooling system schedule (please indicate the daily operating hours)		
Fresh air system schedule (please indicate the daily operating hours)		

**Solution's analysis**

	Assessment	Final Results	Delta [%]
Solution Area SITE Energy Consumption (kWh)	541,26	70,36	87
Solution Area SOURCE Energy Consumption (kWh)	1569,654	204,044	87
BACS Reached function (ref. EN 15232)	D	A	Ref: item 5.1, 5.2

## - Hospital Virgen de las Nieves de Granada - (Maternity Hospital and Government Building)

### GENERAL DATA

Address of the project	Avenida de las Fuerzas Armadas nº2, Granada, Spain
Year of construction	1973
Year of renovation	In continuous renovation
Gross floor area m <sup>2</sup>	29135
Gross volume m <sup>3</sup>	84184
Number of occupants	788 employes
Number of staffed beds	203

## BUILDING ENERGY SAVING

	Assessment	Final Results	Delta [%]
Whole Building SITE Energy Consumption	36592124,75	36468461,75	0,34%
Whole Building SOURCE Energy Consumption	43472351,69	43343965,69	0,30%

## SOLUTION SET

**SOLUTION:**
*HVN 1A (Surgery Theatres AHU Multizone)-Maternity Hospital*
**SOLUTIONS DESCRIPTION**

Solution brief description	Automatic regulation of water flows in AHU multizone's coils and air flow distribution for each zone
Type of solution (select what applies):	medium-cost --> 500 to 10000 €
Gross surface interested by solution, m2	570,00
Gross volume interested by solution, m3	1647,00
Implementation date	set-13
Is the solution submetered?	Y

**Main solution impact on existing systems**

Equipment substitution/improvement	Installation of electrical measurement equipment fan and thermal energy in each coil
Building management system substitution/improvement	Installing control instruments: Sensor: Air Pressure, Duct temperature sensor Room Temperature, outdoor temperature Controllers Electronic Controllers and auxiliary materials.
operating time schedule changes	N

Setpoint and regulation logics changes	Yes, Installing a new control program regulating of water flows in coils and air flow distribution for each zone
Other changes	Replacing electrical protection box.Improved outdoor air admission

### Solution's improvement

Solution's improvement. Indicate which aspect/aspects can be improved by this solution, evaluating each aspect from 1 to 5 choosing from:	Energy saving	5,00	Legend 1: worsened 2: slightly worsened 3: unchanged 4: slightly improved 5: improved
	O&M cost decrease	4,00	
	Longer life of the system	4,00	
	Non-energy resource saving	5,00	
	Direct emissions reduction	5,00	
	Comfort conditions	5,00	
Other: ....			

### Solution area operating plan

Item	Before solution implementation	After solution implementation
Occupation schedule	14 hours / 7 days	14 hours / 7 days
Lighting system schedule (please indicate the daily operating hours)		
Heating system schedule (please indicate the daily operating hours)	24/7 (According to season)	24/7 (According to season)
Cooling system schedule (please indicate the daily operating hours)	24/7 (According to season)	24/7 (According to season)
Fresh air system schedule (please indicate the daily operating hours)	24/7	24/7

**Solution's analysis\***

\* The table has been modified on the basis of available data

	Potential energy saving		
Solution Area SITE Energy Consumption (kWh)	101930		
Solution Area SOURCE Energy Consumption (kWh)	104371		
	Assessment	Final Results	Delta [%]
BACS Reached function (ref. EN 15232)	D	A	Ref: item 4.6

**SOLUTION:**
**HVN 1B (Emergency Zone AHU control)-Maternity Hospital**
**SOLUTIONS DESCRIPTION**

Solution brief description	Improved control of free cooling. Limitation of excess outside air and correction abnormal situations at specific times
Type of solution (select what applies):	medium-cost --> 500 to 10000 €
Gross surface interested by solution, m2	1021,00
Gross volume interested by solution, m3	2950,69
Implementation date	January 13
Is the solution submetered?	Y

**Main solution impact on existing systems**

Equipment substitution/improvement	Installing electric meter on the fan, and heat meter in the coil.
Building management system substitution/improvement	N
Operating time schedule changes	N
Setpoint and regulation logics changes	Y
Other changes	

**Solution's improvement**

Solution's improvement. Indicate which aspect/aspects can be improved by this solution, evaluating each aspect from 1 to 5 choosing from:	Energy saving	5,00	Legend 1: worsened 2: slightly worsened 3: unchanged
	O&M cost decrease	3,00	
	Longer life of the system	3,00	
	Non-energy resource saving	3,00	
	Direct emissions reduction	5,00	

to 5 choosing from.

	Comfort conditions	4,00	4: slightly improved
	Other: ....		5: improved



**Solution area operating plan**

Item	Before solution implementation	After solution implementation
Occupation schedule	24/7	24/7
Lighting system schedule (please indicate the daily operating hours)		
Heating system schedule (please indicate the daily operating hours)	24/7 Depending on the season	24/7 Depending on the season
Cooling system schedule (please indicate the daily operating hours)	24/7 Depending on the season	24/7 Depending on the season
Fresh air system schedule (please indicate the daily operating hours)	24/7	24/7

**Solution's analysis\***

\* The table has been modified on the basis of available data

	Potential energy saving		
Solution Area SITE Energy Consumption (kWh)	18174		
Solution Area SOURCE Energy Consumption (kWh)	15901		
	Assessment	Final Results	Delta [%]
BACS Reached function (ref. EN 15232)	D	A	Ref: item 4.1, 4.5, 4.6

**SOLUTION:**
**HVN 2 (Data Center) - Government Building**
**SOLUTIONS DESCRIPTION**

Solution brief description	Improved management of the start and stop of the chiller. Avoid mixing return water in chillers and Regulatory system tuning through Improved adjustment of AHU and sequence extraction fans
Type of solution (select what applies):	medium-cost --> 500 to 10000 €
Gross surface interested by solution, m2	101,18
Gross volume interested by solution, m3	253,00
Implementation date	Still do not implemented?
Is the solution submetered?	Y

**Main solution impact on existing systems**

Equipment substitution/improvement	Installation of measurement equipment electrical and thermal energy in each chiller and measurement of electric energy in all other equipment (AHU and pumps)
building management system substitution/improvement	N
operating time schedule changes	N
Setpoint and regulation logics changes	Y, (bat still do not implemented)
Other changes	Improvement in exhaust air ducts

**Solution's improvement**

Solution's improvement	Energy saving	5,00
	O&M cost decrease	3,00

Legend

Solution's improvement. Indicate which aspect/aspects can be improved by this solution, evaluating each aspect from 1 to 5 choosing from:	Longer life of the system	4,00	1: worsened
	Non-energy resource saving	4,00	2: slightly worsened
	Direct emissions reduction	5,00	3: unchanged
	Comfort conditions		4: slightly improved
	Other: ....		5: improved

### Solution area operating plan

Item	Before solution implementation	After solution implementation
Occupation schedule	24/7	24/7
Lighting system schedule (please indicate the daily operating hours)	/	/
Heating system schedule (please indicate the daily operating hours)	/	/
Cooling system schedule (please indicate the daily operating hours)	24/7	24/7
Fresh air system schedule (please indicate the daily operating hours)	24/7	24/7

### Solution's analysis\*

\* The table has been modified on the basis of available data

	Potential energy saving		
Solution Area SITE Energy Consumption (kWh)	3559		
Solution Area SOURCE Energy Consumption (kWh)	8114		
	<b>Assessment</b>	<b>Final Results</b>	<b>Delta [%]</b>

BACS Reached function (ref. EN 15232)	D	B	Ref: item 3.8
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**- Hospital of Mollet -**

**GENERAL DATA**

Address of the project	Ronda dels Pinetons, 8; Mollet del Valles (08100)
Year of construction	2010
Year of renovation	----
Gross floor area m2	26.675,00
Gross volume m3	80.025,00
Number of occupants	750 employees
Number of staffed beds	160

**BUILDING ENERGY SAVING**

	Assessment	Final Results	Delta [%]
Whole Building SITE Energy Consumption	9.871.665,00	8.377.140,80	15,14%
Whole Building SOURCE Energy Consumption	18.997.469,81	16.847.350,81	11,32%

# SOLUTION SET

## SOLUTION: HML 1

### SOLUTIONS DESCRIPTION

Solution brief description	Regulation of the supply flow according to a particle counting in a SURGERY ROOM
Type of solution (select what applies):	Medium-cost
Gross surface interested by solution, m2	37,00
Gross volume interested by solution, m3	118,40
Implementation date	nov-13
Is the solution submetered?	Yes. 3 energy meters; 1 electrical meter; 1 particle counter meter

### Main solution impact on existing systems

Equipment substitution/improvement	The meters installed
Building management system substitution/improvement	The local SCADA regulates the supply flow according to particle counting
Operating time schedule changes	No
Setpoint and regulation logics changes	No
Other changes	No

### Solution's improvement

Solution's improvement. Indicate which aspect/aspects can be improved by this solution, evaluating each aspect from 1 to 5, choosing from:	Energy saving	5,00
	O&M cost decrease	5,00
	Longer life of the system	4,00
	Non-energy resource saving	3,00
	Direct emissions reduction	5,00

Legend  
 1: worsened  
 2: slightly worsened  
 3: unchanged



to 5 choosing from.	Comfort conditions	5,00	4: slightly improved
	Other: ....		5: improved

**Solution area operating plan**

Item	Before solution implementation	After solution implementation
Occupation schedule	24/7	24/7
Lighting system schedule (please indicate the daily operating hours)		
Heating system schedule (please indicate the daily operating hours)	24/7	24/7
Cooling system schedule (please indicate the daily operating hours)	24/7	24/7
Fresh air system schedule (please indicate the daily operating hours)	24/7	24/7

**Solution's analysis**

	Assessment	Final Results	Delta [%]
Solution Area SITE Energy Consumption (kWh)	86.255,58	77.477,34	-11,33%
Solution Area SOURCE Energy Consumption (kWh)			
BACS Reached function (ref. EN 15232)	C	A	Ref: item 4.1

**SOLUTION: HML 2**

**SOLUTIONS DESCRIPTION**

Solution brief description	Building Heating and cooling production
Type of solution (select what applies):	high-cost
Gross surface interested by solution, m2	26.675,00
Gross volume interested by solution, m3	80.025,00
Implementation date	nov-13
Is the solution submetered?	Yes. 8 energy meters; 5 electrical meters; 2 gas meter

**Main solution impact on existing systems**

Equipment substitution/improvement	The meters instal.led
bulding management system substitution/improvement	The local SCADA decided what machine works according to their performance
operating time schedule changes	No
Setpoint and regulation logics changes	Yes
Other changes	No

**Solution's improvement**

Solution's improvement. Indicate which aspect/aspects can be improved by this solution, evaluating each aspect from 1 to 5 choosing from:	Energy saving	5,00	Legend 1: worsened 2: slightly worsened 3: unchanged 4: slightly improved 5: improved
	O&M cost decrease	5,00	
	Longer life of the system	3,00	
	Non-energy resource saving	3,00	
	Direct emissions reduction	5,00	
	Comfort conditions	5,00	
	Other: ....		

**Solution area operating plan**





Item	Before solution implementation	After solution implementation
Occupation schedule	24/7	24/7
Lighting system schedule (please indicate the daily operating hours)		
Heating system schedule (please indicate the daily operating hours)	24/7	24/7
Cooling system schedule (please indicate the daily operating hours)	24/7	24/7
Fresh air system schedule (please indicate the daily operating hours)	24/7	24/7

**Solution's analysis**

	Assessment	Final Results	Delta [%]
Solution Area SITE Energy Consumption (kWh)	9.115.783,57	8.184.803,45	-11,37%
Solution Area SOURCE Energy Consumption (kWh)			
BACS Reached function (ref. EN 15232)	C	A	Ref: item 3.8

NOTE: this sheet is used for the drop down menus and other hidden tables and data  
It will not be printed in the final database and after partner's database sharing it will be hidden in the datasheet.

#### Case Sheet Notes

##### Type of solution

no/low-cost --> up to 500 €

medium-cost --> 500 to 10000 €

high-cost --> more than 10000 €

##### Solution's improvement.

Indicate which aspect/aspects that can be improved by this solution, evaluating each aspect from 1 (no/low improvement) to 5 (high improvement) choosing from:

- 1
- 2
- 3
- 4
- 5