






CONCERTO is co-funded by the European Commission




RENAISSANCE LYON
WP Progress and Plans
**WP 2.3: Common Monitoring
and Analysis**

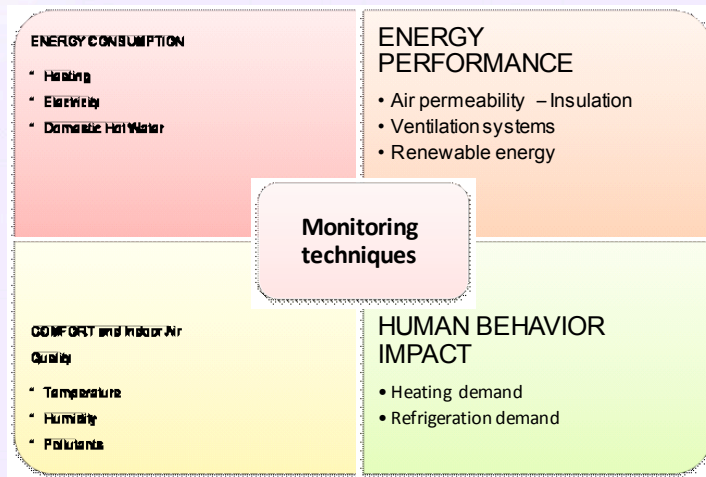
Hervé Pabiou
INSA-CETHIL



**WP 2.3: Common Monitoring and
Analysis**

WP 2.3: State of progress





Energy Consumptions

Energy	Zaragoza	Lyon
Gas	• Global consumption by blocks	• Global measurement by block; Detailed measurement by dwelling (boiler and cooking)
Electricity	<ul style="list-style-type: none"> • Daily demand curve and monthly total demand by groups of dwelling • Devices to measure individual heating radiators within the dwelling • Groups of blocks energy consumptions by CT's (Transformation Center) • Urbanization illumination consumptions • Energy consumptions of pneumatic garbage collections system 	<ul style="list-style-type: none"> • Several measurements by dwelling (detailed electricity uses) and in common part electricity use <p>Common electricity consumption (parking, external lights)</p>
Domestic Hot Water	<ul style="list-style-type: none"> • Global measurement by block • Solar contribution • Auxiliary system contribution • Thermal balance (p12 & p13) 	<ul style="list-style-type: none"> • Identification of the share between solar/complementary energy • Heating/DHW distribution • Auxiliary system contribution (Gas and Wood)
Cold Water	• By block and whole urbanization	One measurement/building
Wood Bumer		• Biomass consumptions (Wood)



Energy Performance

	Zaragoza	Lyon
Envelop	<ul style="list-style-type: none"> • Permeability measurement (blower door) • Infra - red camera diagnostic • Façade Transmittance test (<ul style="list-style-type: none"> • Permeability measurement (blower door)** • Infra - red camera diagnostic
Ventilation	<ul style="list-style-type: none"> • Night cross - ventilation 	<ul style="list-style-type: none"> • Mechanical ventilation system comparison (hygro + double flow) • Natural ventilation test
Renewable Production	<ul style="list-style-type: none"> • One block monitored (solar hot water rate, temperature, ...) 	<ul style="list-style-type: none"> • PV : electrical characteristics • Wood & solar collectors (cf. previous category)



COMFORT and Indoor Air Quality

Measurement	Zaragoza	Lyon
Temperature	<ul style="list-style-type: none"> • Three points per dwelling : living room – green house – bedroom north located 	<ul style="list-style-type: none"> • C Two points per dwelling
Humidity	<ul style="list-style-type: none"> • One point per dwelling living room 	<ul style="list-style-type: none"> • One point per dwelling: Living Room
Wind	<ul style="list-style-type: none"> • Speed inside (outside /inside blocks) 	<ul style="list-style-type: none"> • Wind speed
Indoor Air Quality	N/A	VOC, CO2, Radon punctual



HUMAN BEHAVIOR

Behaviors	Zaragoza	Lyon
Inadequate Ventilation	<ul style="list-style-type: none"> • High impact in heating demand • No sensors to detect open windows 	<ul style="list-style-type: none"> • Sensor to detect open windows
Curtains in the greenhouse	<ul style="list-style-type: none"> • Typical behavior that decrease exterior windows solar gains 	<ul style="list-style-type: none"> • Brochure to residents for the proper use of windows
Greenhouse as storage room	<ul style="list-style-type: none"> • Typical behavior that decrease exterior windows solar gains, decrease exterior windows solar gains 	<ul style="list-style-type: none"> • Brochure to residents for the proper use of windows
Close the internal doors	<ul style="list-style-type: none"> • Don't allow distribute heat from living room and greenhouse 	<ul style="list-style-type: none"> • Brochure to residents for the proper use of flats
High thermostat temperature set	<ul style="list-style-type: none"> • Increase energy use 	<ul style="list-style-type: none"> • Brochure to residents for the proper use of the thermostat
Inefficient electrical appliances	<ul style="list-style-type: none"> • Increase electric energy 	<ul style="list-style-type: none"> • Measures by kind of electrical appliances



WP 2.3: How to address the problem of "Common Monitoring and Analysis"



Remark from the author :

The following slides give ideas to launch the discussion about this WP. These ideas have to be discussed/modified/corrected/re-written... **to reach a new road map for this WP2.3**



Objectives of this technical session :

- WP2.3 must not be a catalogue of monitoring techniques, so we have to **define concrete objectives for this wp2.3**
 - Classification of monitoring data**
 - Identify what are the data that should be given to the ConcertoPlus communities**
- to define a calendar for the next 6 months and the next 12 months.



General questions about monitoring

- Q1) What are the quantities to measure?
- Q2) What are the relevant space scales to do monitoring?
- Q3) What are the relevant time scales to do monitoring?
- Q4) What are the appropriated monitoring methods and devices?
- Q5) How to present and compare results?



General questions about monitoring :

- Q1) What are the quantities to measure?

There are a lot of possible measurements.

What are the essential quantities to measure for each category :
« Energy consumption », « Energy performance », « Comfort and IAQ » and « Human behavior impact » ?



General questions about monitoring :

Q2) What are the relevant space scales to do monitoring?

appliance, dwelling, building, district ...

- Small scale (appliance) is the scale to evaluate human behavior impact and the efficiency of the appliance
- Large scale (district) is the scale to evaluate the impact of
 - x the policy for the urban development
 - x architecture of the district (morphology, compactness, green areas, ...)
- Medium scales : are all the scales necessary to evaluate « energy consumption », « energy performance » and « comfort – indoor air quality » ?



General questions about monitoring :

Q3) What are the relevant time scales to do monitoring?

day (blower door test), week, month, year, 10years ...

- Evaluation of the performances of systems during (or just after) construction (blower door test, IR camera, transmittance measurements) => short periods are sufficient
- Evaluation of quantities that depends on weather : one year (or two years) is necessary (energy consumption, renewable production, comfort...)
- Evaluation of ageing : 10-30 years measurements (efficiency decreasing rate, air tightness, solar components ...)



General questions about monitoring :

Q4) What are the appropriated monitoring methods and devices?

Remote measurements

- + possibility to do it during several years
- + same format for all data
- +
 - difficult to implement
 - difficult to do it on refurbish buildings
-

Dataloggers (autonomous sensors)

- + simple to implement
- + possibility to obtain detailed data
- +
 - the monitoring is limited in time
 - data are collected at the end of the monitoring
 - data not collected in the same format

(depending on the sensors)

- time synchronisation?

Intrusive measurements

- +use of complex technics to get quantites difficult to reach (permeability, wall properties...)
- +to try innovative techniques
- +
 - limited to empty dewllings
-

Indirect monitoring

- +questionnary
- +data from companies (energy providers,...)



General questions about monitoring :

Q5) How to present and compare results?

Presentation for each town

- Results can be classify by categories :
 - Energy consumption
 - Energy performance
 - Comfort and IAQ
 - Human behavior
- Analysis must be easy to read
- To identify :
 - x the barriers of each technics
 - x the hard spot of its implementation
 - x the results fiability
- Compromise cost/quality?

Comparaison of the results from Lyon and Zaragoza

- differences in the measured quantities
- difference in the method
- climate influence
- human behavior impact
-



Energy consumption



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Comfort and Indoor Air Quality



COMFORT and Indoor Air Quality

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Human behavior impact



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WP 2.3: Objectives for the next 6 months and the next 12 months



Objectives next 6 months:

- to present data for each city in a suitable format
- to define clearly the units (say kW/m²/year)
- to identify 3 or 4 monitoring scenarios (long time remote monitoring – short time not-centralized monitoring – others...) ?
- others?

Deliverables?



Objectives next 12 months:

- to begin the reflexion on the comparison between monitorings including the fact that there are differents conditions (different data, different monitoring solutions, different climates, ...)
- others?

Deliverables?

In Lyon, we probably will not have any data from ENERTECH (monitoring in dwellings) in the next 12 months ==> reflexion will be done without these data...

Data available for Lyon in the next 12 month : PV data, natural ventilation measurements depending on construction delays, weather...



Objectives next 18 months:

- to give advices toward the ConcertoPlus monitoring communities
- others?

Deliverables?

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Data available for Lyon in the next 12 month : PV data, natural ventilation measurements depending on construction delays, weather...





Conclusions



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RENAISSANCE : a CONCERTO project financed by the European Commission on the six framework programme