



## REGARDING THE USE OF THE ECOLOGICAL AND BIOGENETICAL HEATING TECHNOLOGY IN ROMANIA

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### SYNOPSIS

The paper presents the Lexin heating technology and the results of the research done for the first time in Romania. The purpose of the research was to test, to apply and to develop this technology under different weather conditions. The research had to be done on a large scale of domains: electric energy-consume climatic and micro-climatic conditions, microbial loading of air, effects on pets, effects on plants and soil, prolusions over general health and comfort status of human being.

The results show that the Lexin heating technology is an ecological, biogenetical, clean, efficient, disposing non polluting emission and can be implemented successfully in Romania. In the present conditions regarding the strategy in the energetic field, Lexin technology is an innovating one.

### INTRODUCTION

The infrared is a fragment of the electromagnetic specter which is found in the whole Universe. Wrongfully, sometimes it is confounded with ultraviolet light. The natural infrared area has been researched many years and some areas of different wavelengths have applications in industry, agriculture and health. Most of the usual infrared sources emit in the area of short sequences of the specter or work at temperatures of thousands of degrees Celsius and the radiation in the visible specter is discerned just nearby the source (lamp) of emission. Lexin Technology combined two principles of quantum physics to produce energy-efficient warmth in "far" or long-wave infrared (Infrared "C"). This is the first time when this has ever been accomplished [Ruiter, 2005.]. Acting this way, the temperature of the emitting surface reaches a maximum of 150 °C, the distance as far as this waves are discerned is 3,5-4,5 m, emitting light only in the invisible specter. These radiations have effects on solid materials and biological organisms [Ruiter, 2005; Coman, 2008].

The elaborate research from the last years on technique and economic principles, but in the same time on ecological principles has concluded that this

technology to be used in domestic, public, farming and industrial estate. In the specialized literature are presented some successfully set-up's in different domains in Europe or SUA.

In Romania, research to test, apply and develop Lexin Technology was done for the first time during the winter 2007-2008 at the North University of Baia Mare.

## MATERIAL AND METHODS

The measurements took place in a room placed on the top floor of an edifice of the North University of Baia Mare, built in 1976. This room is placed in the corner; it has two walls to exterior, which are not isolated, and the ceiling, which is relatively well isolated. The dimensions of the room are: 6, 20 m long\* 2, 95 width \* 2, 85 height, and it is equipped with a new, well-isolating window, which has a North exposition and an entrance door from hall with a South exposition. The measurements were done in the following domains:

1. **Electric expenditure** - the hourly/daily electric-consumptions. The measurements were done using specialized control equipment used in connection scheme from Lexin Research Group.

### 2. **Climate**

a. Interior – 3 times a day (7:26; 13:26 and 19:26 hour), in 4 different points (the 1st point was placed in the corner, at 2 meters high, near the ceiling; the 2nd point was placed in the center of the room on a work table; the 3rd point was placed near a wall at a chair level; the 4th point was placed in the opposite corner of point no. 1, on the floor).

b. Exterior – near the building – 3 times a day, at the same hours, following the urban microclimate.

c. Baia Mare Weather Station – 3 times a day, at the same hours too, using DigiWeather software and Romanian Meteorological National site, following the regional climate.

The meteorological observations were done using a type WMR100 Meteorological station and with common measurement instruments, such as different mercury based thermometers and hygrometers. The data monitoring and evaluation was done using the PC integrated software of the weather station.

3. **Microbial loading of the air** – the analysis and probation had been done in collaboration with an accredited microbiology laboratory. The drawings were taken before “Lexin flat-screen heating panel” start function, during its running and after its stopping. The working method for analyses was standard „KOCH sedimentation method”.

### 4. **General health and comfort status of the human being**

There were 14 members for this research work. They were volunteers, and their age was amongst their selection criteria. The age intervals of the members of the research team are presented in the **table 1**. As sex criteria, there were 6 female and 8 male. The group was very diversity like characters and daily activity.

**Table 1. The age distribution of the members**

Age (years)	< 18	20-50	> 50
Number of selves	2	10	2

Each member of the team managed a „Personal Observation Form” during the project time. Here were marked personal observations regarding the comfort status, general and particular organic health and mental sanity.

## RESULTS AND DISCUSSIONS

### Electric expenditure-the hourly/daily electric-consumptions

The expenditure of electric current variations is presented in **table 2**.

**Table 2. Hourly expenditure of electric current, medium, maximal and minimal (kw/h)**

Month	Week	Date	Average exp. [kWh]	Max. Exp. [kWh]	Min. Exp. [kWh]
<b>November</b>	<b>1</b>	13.11.07.-18.11.07	0,88	0,89	0,86
	<b>2</b>	19.11.07-25.11.07	0,88	0,89	0,86
	<b>3</b>	26.11.07-02.12.07	0,88	0,91	0,85
			<b>0,88</b>		
<b>December</b>	<b>4</b>	03.12.07-09.12.07	0,87	0,89	0,84
	<b>5</b>	10.12.07-16.12.07	0,87	0,9	0,86
	<b>6</b>	17.12.07-23.12.07	0,89	1,11	0,73
	<b>7</b>	24.12.07-30.12.07	0,93	1,6	0,48
			<b>0,89</b>		
<b>January</b>	<b>8</b>	31.12.08-06.01.08	0,9	0,97	0,85
	<b>9</b>	07.01.08-13.01.08	1,06	1,65	0,43
	<b>10</b>	14.01.08-20.01.08	1,21	1,64	0,8
	<b>11</b>	21.01.08-27.01.08	1,1	1,43	0,73
	<b>12</b>	28.01.08-03.02.08	1,12	1,41	0,62
			<b>1,08</b>		
<b>February</b>	<b>13</b>	04.02.08-10.02.08	0,73	1,6	0,33
	<b>14</b>	11.02.08-17.02.08	1,25	1,63	0,86
	<b>15</b>	18.02.08-24.02.08	1,02	1,68	0,04
	<b>16</b>	25.02.08-02.03.08	0,73	0,93	0,49
			<b>0,93</b>		

Due to the concrete conditions in which the experiment has been made, the hourly average consume of electrical power has values between 0,88kw/h and 1.08kw/h. These high values are the effect of bad thermal isolation of the building

which has not benefited of thermal isolation when built: 1976. Also, the work-room has three walls with exterior contact, so the heat loss is maximum.

We have noticed that the electric energy consumption takes values between 0.33kw/h and 1.68kw/h. The minimum values of electric energy consumption is registered when the temperature at night oscillated around 0 °C and at midday, in hours of the sun maximum isolation, between 7 °C and 11 °C. The maximum values of electric energy consumption was registered when outside temperature remained under 0 °C even at noon and inside the temperature was to be maintained at a comfortable temperature of over 20 °C.

The energetic consumption is an important economical indicator, it is influenced by both environment and thermal isolation factors, but the consumers' option must also be taken to consideration: the temperature from each room and the usual day-night alternation.

### Climate

The environment and weather specialized literature mentions that: For the Baia Mare region, and for the Romania geographical area, January is the coldest recorded month of winter (Clima R.P.Romane, vol II, 1961, Atlasul Romaniei, 1976, Marcu, 1984, Coman, 2005). Presented in the table 3 there are the maxim, the minimum and the average temperature values for air, recorded in the winter season when the experiment took place.

**Table 3. The maxim, the minim and the average temperature (°C) in comparison with the Weather Station at University (kw/h)**

Month	Baia Mate Meteorological Weather Station				University –Urban Climate		
	MAX	MIN	AVG.	MULTI.	MAX	MIN	AVG.
November	9.2	-6.0	1.2	4.9	12.0	-4	3.3
December	12.6	-7.0	-1.5	-0,2	9.0	-3.5	0.8
January	8.0	-7.0	-0.07	-2.4	10.6	-4.0	3.2
February	15.3	-10.0	2.07	-0.1	14.7	-5.4	5.9

We noticed that the urban air temperature is about 2 °C higher than the temperature recorded by the regional weather station. Thermal amplitudes are normal for this period of the year and the minimum temperatures from the urban environment (which are higher than the regional ones) have to be used in programming the equipment.

Obtaining a temperature in the 19-21 °C intervals inside a room is the main objective in the cold periods of the year. Considering the preferences, the comfortable temperature can vary with a couple of grades in a 24 hour cycle. In **fig. 1** it is shown the daily temperature variation inside the room and in the urban environment (outside), the temperature being measured during the experiment.

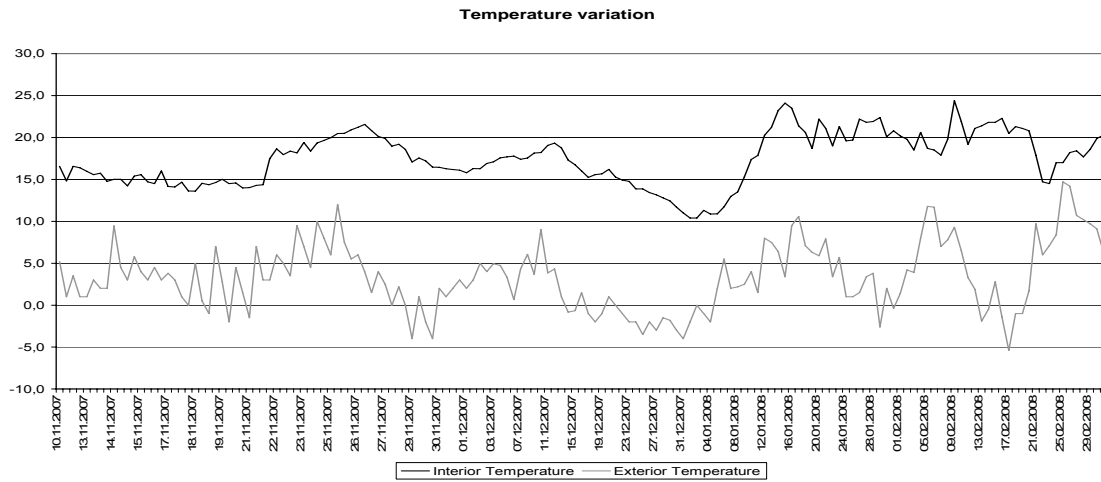


Fig. 1. The temperature variation inside and outside

It is easy to notice that there were no difficulties in reaching and then maintaining the comfortable temperature. The vast variety is the result of “preference game”. Lexin Technology offers a flexibility with no effort in what makes a great surrounding climate, according to the momentarily demands, but it marks clearly and with influence the weather evolution, especially when dealing with long severe cold.

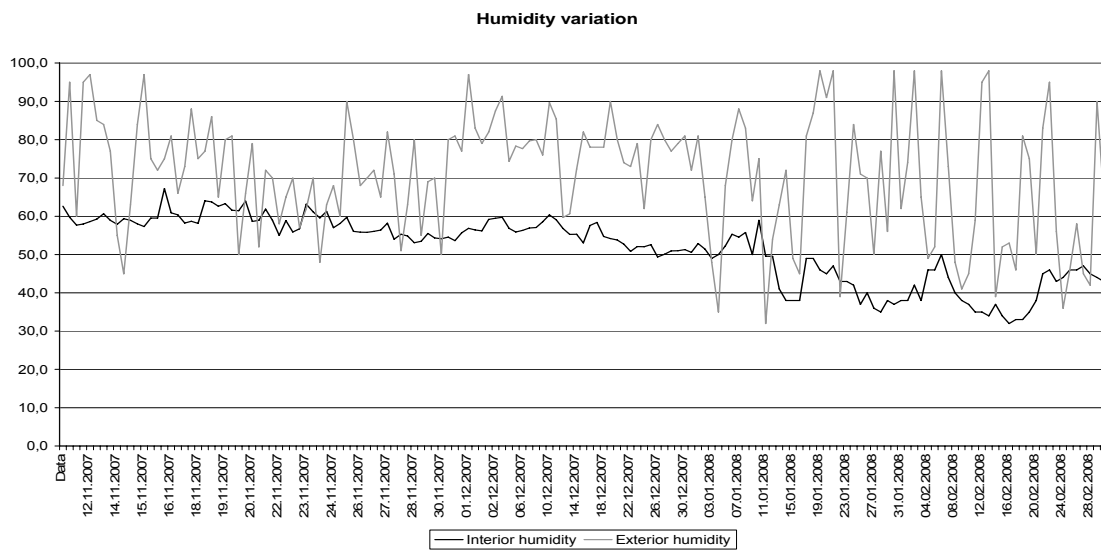


Fig. 2. The relative humidity variation inside and outside

The relative humidity of air shows very small variation in the work-room while the relative humidity of the atmospheric air registers normally large variations. This

homogeneous environment, created by the relative air humidity makes a microclimate that is well tolerated by the sensitive organisms.

A correlation between the air temperature and the relative humidity in the room shows that for these experimenting conditions, maintaining the temperature over 20 °C, the relative humidity of the air registers values around 40%. This modification has not been reported as discomfort by the subjects, but it has been registered by the researchers as the object of ulterior studies in which there other parameters of the building will also be studied.

### Microbial loading of air

The results of microbial loading air analyses are presented in **table 4**.

**Table 4 Recorded values on the air micro flora**

Indicator	Sample/Recorded value/m <sup>3</sup>				Norm values (lack of standard)
	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	
Total number of germs (TNG)	1731	1416	314.8	314.8	1500-2000
Pathogenic Staphylococcus ( <i>Staphylococcus sp.</i> )	78.7	absent	absent	absent	0
Haemolytic Streptococcus ( <i>Streptococcus sp.</i> )	absent	absent	absent	absent	0

One has noticed that both quantitative and quality changes in the air loading in the same using conditions for the space were recorded. The quantitative changes are major. After 6 weeks the microbial loading air has stabilized on the low level. The last sample was collected after 10 days the Lexin panel stops. One has noticed that the hygiene of the room was maintained at the same level.

The specialized literature shows that there are no Romanian standards for domestic hygiene. So, as a hygiene level, it was used the collectivity norm values.

### General health and comfort status of human being

From the analysis of the individual „Personal Observation Form” records we present the following:

- The children’s opinion was „Sense of wellbeing. It’s O.K.”. Their parents, members of the research team, didn’t observe any dysfunction or health problems during the experimental time. It wasn’t noticed any skin or eyes problems. They have been noticed the flu, particular illness for children during winter time, was registered only once, respectively twice but in a slight form.
- The grown-ups’ opinion was that the atmosphere is balance, pleasant and comfortable, sense of wellbeing relief, back pain/ spinal column pains amelioration.

This group was very heterogenous. There were hard-working students, computer addicted, and sport addicted students. There were 4 females and 6 males. The computer addicted students usually have back pains. They realized that they can use Lexin heating for their therapy. The sport addicted students usually have muscle bound from hard sport exercises. They considered that the pleasant atmosphere help to get back. They also required a sauna Lexin panel. There were members who remarked only the easy atmosphere and no health problems.

- The elders' opinion was that they felt calming effect, positive effects against flu, rheumatic pain amelioration and, for one person, diabetes analysis improvements. They were very careful with their glasses and eyes. They noticed that there was no problem on this point. They also requested to have a similar panel in their home.

As a general observation, the persons who stayed continuously for several hours in that room felt the instinctive need to align under the Lexin panel.

## CONCLUSIONS

In actual conditions considering the European strategy in the domain of energy and emissions, the research results show that Lexin Technology:

- is innovative and promising for the future, from ecologic and biogenetic point of view;
- is clean, efficient, non polluting emission technology;
- can be used in a very large scale of domains;
- The agro-industrial applications of Lexin Technology are at the beginning;
- The benefic effects of this technology over the organisms can be fragmentary quantified for the moment;
- It can be successfully implemented in Romania.

This research shows that the target set by the Protocol of Kyoto can be reached quicklier and more efficiently using Lexin Technology. So, it is time to develop it more and more.

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## LITERATURE

BUNGET, I. & Eds (1988): Physics Abridgement, *Scientific and Enciclopedic Press*, Bucharest, 904 pp.

- COMAN M., TARO G., POP R., POP P., NAFOREANU T., SINGEORZAN A. (2008): On the Use of the Ecologic, Biogenetic Heating System of Lexin Type in Romania (I). In: Scientific Papers, A Serious, LI, 1010-1015, Bucharest.
- COMAN M., UNGUREANU, N., UNGUREANU, M. (2008),: Research in the Use of Lexin Type Ecological Heating, Journal CA Systems in Production Planning, no. 1, vol. 9, 18-20, Bratislava.
- IONUT, V. (1998): Methods for air contamination and surfaces. In: Practice in Environment Health. *Medical University Press*, Cluj-Napoca, pp. 128-138
- MANESCU, S., TANASESCU, GH, CUCU, M., DUMITRACHE, S. (1996): Sanitation, *Medical Press*, Bucharest, 564 pp.
- MARCU, M., (1983): *Forestry Meteorology and climatology*, Ceres Press, Bucharest, 368 pp.
- MARCU, M., (1993) : Premises for a new Romanian Climatic Map. In : Jubiliary Scientific Session, „Transilvania” University of Brasov, pp.28-35.
- MARCU, M., MARCU V., (1997): Tide in climate evolution. Ecological effects. In: The 4th National Conference for Environment through biological and biotechnical methods, Braşov, pp.163-170.
- \*\*\* (2008): Infrared Heating. Available from: [http://www.lexin.com/gb/index.php?option=com\\_content&task=view&id=46&Itemid=3](http://www.lexin.com/gb/index.php?option=com_content&task=view&id=46&Itemid=3) (Data of acces:August, 25, 2008).