

# ZenH Balkan

## Towards Zero Energy Hospitals in the Balkan Region

Newsletter  
Issue 4



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The Project aims to facilitate the implementation of the EU's Energy Performance of Buildings Directive (EPBD), by defining characteristics and standards in terms of zero energy in hospitals (ZenH) in the southern Balkan region. The project will contribute to the improvement of energy efficiency in the construction sector.

The ZenH Project is supported by the INTERREG Balkan-Mediterranean program.

*This project is co-financed by the European Union and National Funds*



## Project Progress

### Cyprus, The Cyprus Institute

The Procurement procedures for WP4 and WP5 were launched and Meridionale Impianti was assigned the contracts. In collaboration with the Cyl team the reports for WP4 Energy Technologies Assessment - and for WP5 - Benchmark and Design Guidelines - were developed and submitted. The work related to WP4 has been completed with the acceptance of the final reports (Fig.1.). WP5 is expected to be concluded by the end of October 2020, pending the final approval of the submitted deliverables by the Cyl team (Fig.2).

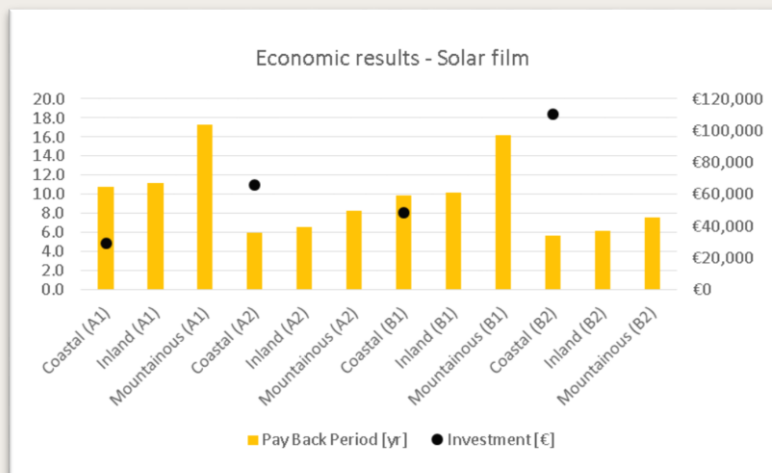


Fig. 1 - Economic results from adding solar films on glazing (from D4.2.2)

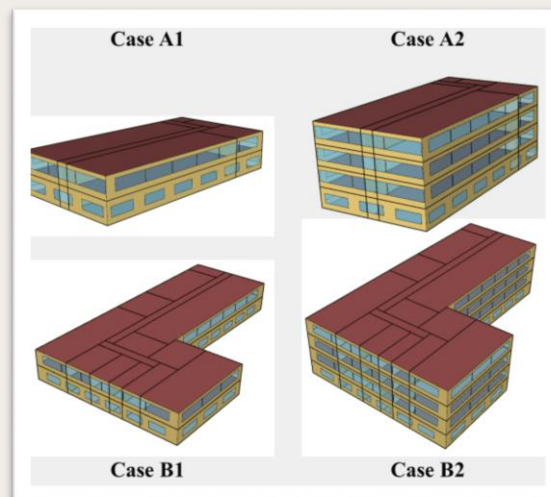


Fig. 2 - The modular prototypes models of hospitals created in Sketchup environment (from D5.3)

Under WP6, The Cyl participated and presented at the Training Seminar on HP, Biomass & Geothermal Technologies in Tirana (Fig.3).

There has also been progress in WP2 (Project Communication & Dissemination) with the finalization of D2.4.5 regarding the Hospital Data Exchange with Building Data Hubs (Fig. 4). Concerning the dissemination of the projects' results the Cyl team has submitted a paper "Mediterranean Hospital Energy Performance Mapping - The energy auditing as a tool towards Zero Energy Healthcare facilities" to the WREC conference for presentation and inclusion in the proceedings. The work under WP2 is ongoing and has been expanded recently to include a new deliverable with the primary aim of propagating and Advancing the project through dissemination of the results to Health Authorities.



Fig. 3 - Cyl presentation at Tirana's Seminar on CHP, Biomass & Geothermal Technologies (from D6.4)

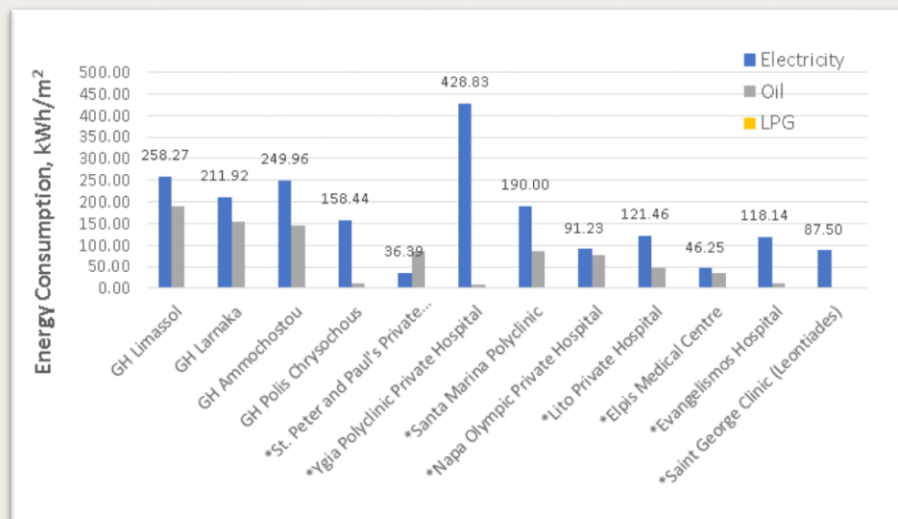


Fig. 4 - Energy Consumption, kWh/m² surface, for each hospital in coastal region. (from D2.5)

## Project Progress

### Republic of North Macedonia, CeProSARD

Report about hospitals' energy data gives an overview of the current situation of the 16 analyzed hospitals and the energy, climate and cost data related thereto. The Report includes detailed energy data for each hospital, the methodology approach for the analysis, as well as individual, summary and average based analyses, all presented in respective tables and graphs, duly explained and referenced.

The Report also lists the relevant EU and national legislation and standards, which were used to prepared this Report. Additionally, it addresses the EU targets with regards to primary energy consumption in terms of nearly Zero Energy Buildings (nZEBs), and relevant certain recommendations how to achieve said targets.

Report also includes an Annex containing all input data for each hospital, and some specific summary tables not presented elsewhere in the main text.

Graphic overview of each energy source equivalent for all hospitals is presented in Fig. 5.

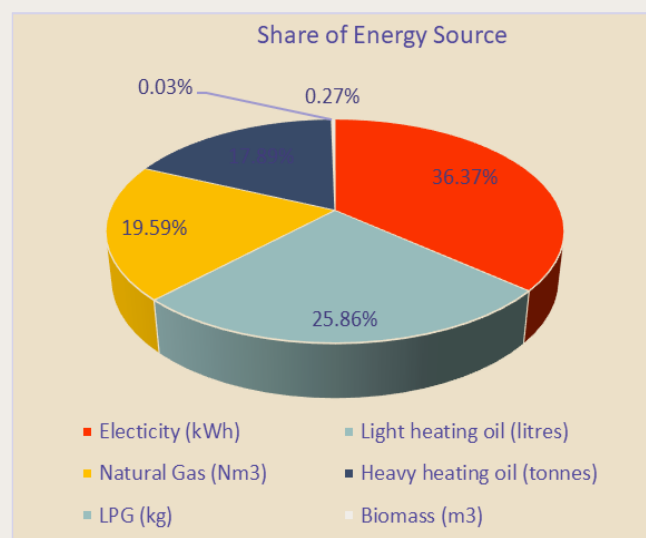


Fig 5. Share (%) of Energy Source for all hospitals

No.	Hospital	Town / City No.	Climate type	Total primary energy consumption per m2 per annum - kWh/m2/a	Energy class total
1	Hospital No. 1	1	C-SM	321,22	C
2	Hospital No. 2	2	HC	537,63	E
3	Hospital No. 3	3	C-SM	651,96	F
4	Hospital No. 4	4	HC	364,66	C
5	Hospital No. 5	5	C-SM	183,58	B
6	Hospital No. 6	6	HC	196,78	B
7	Hospital No. 7	7	C-SM	678,59	G
8	Hospital No. 8	8	C-SM	227,84	B
9	Hospital No. 9	9	HC	196,25	B
10	Hospital No. 10	10	C-SM	297,30	C
11	Hospital No. 11	11	HC	529,01	E
12	Hospital No. 12	12	C-SM	258,30	B
13	Hospital No. 13	13	HC	254,17	B
14	Hospital No. 14	14	SM	298,01	C
15	Hospital No. 15	15	HC	174,31	B
16	Hospital No. 16	16	HC	109,91	A

Table 1: Total Primary Energy



In addition to the individual primary energy consumption, another useful information may be the consumption by months for all hospitals, indicating the critical months for consumption by energy source.

Energy Source (in kWh equivalent)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Electricity	26%	27%	28%	46%	68%	61%	79%	79%	55%	38%	32%	23%	36%
Light heating oil	34%	34%	36%	15%	0%	0%	0%	0%	0%	24%	36%	33%	26%
LNG (natural gas)	22%	23%	19%	25%	13%	12%	13%	13%	10%	14%	21%	23%	20%
Heavy heating oil	17%	16%	17%	14%	19%	27%	7%	7%	35%	24%	10%	21%	18%
LPG (liquified petroleum gas)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Biomass (firewood)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>TOTALs</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

**Table 2:** Energy source utilization (%) by month for all hospitals

The final energy consumption was calculated with primary energy factors for conversion of primary to final energy. The results are presented in the following table:

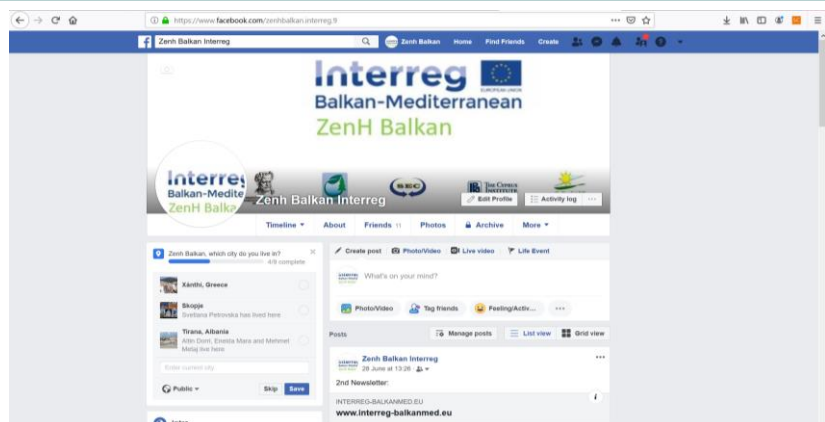
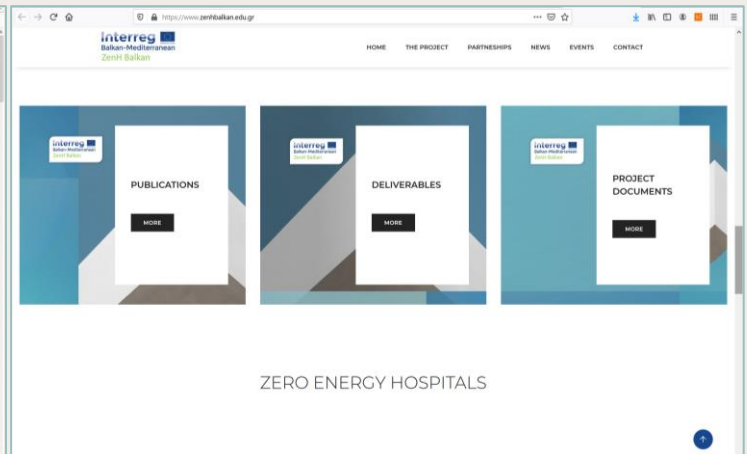
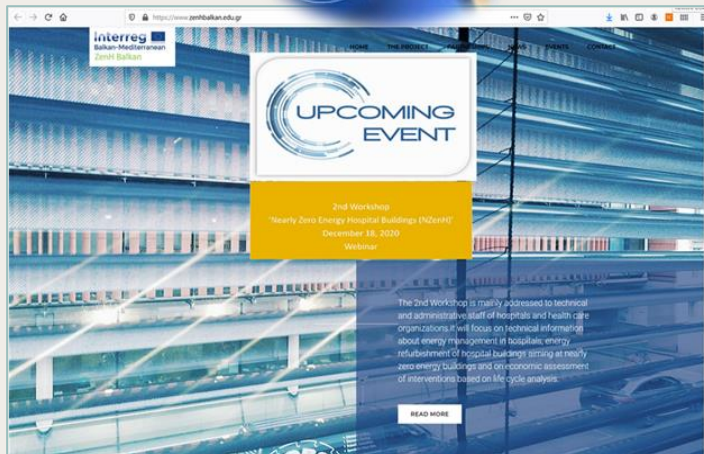
Ser.	Hospital Name	Total primary energy per annum - kWh/a	Total final energy per annum - kWh/a	Primary to Final Energy ratio (P2FER)
1	Hospital No. 1	16.703.598	22.108.995	0,76
2	Hospital No. 2	2.043.009	3.454.812	0,59
3	Hospital No. 3	2.927.066	5.342.307	0,55
4	Hospital No. 4	3.726.836	6.501.863	0,57
5	Hospital No. 5	2.065.107	3.740.558	0,55
6	Hospital No. 6	5.371.962	8.755.968	0,61
7	Hospital No. 7	3.384.819	5.984.753	0,57
8	Hospital No. 8	2.150.135	3.261.118	0,66
9	Hospital No. 9	2.747.540	4.063.452	0,68
10	Hospital No. 10	2.972.984	4.459.447	0,67
11	Hospital No. 11	1.746.785	2.759.828	0,63
12	Hospital No. 12	2.110.040	3.313.157	0,64
13	Hospital No. 13	6.951.428	10.937.383	0,64
14	Hospital No. 14	2.430.260	4.402.843	0,55
15	Hospital No. 15	8.715.642	17.433.985	0,50
16	Hospital No. 16	857.948	1.632.411	0,53
	<b>TOTAL</b>	<b>66.905.158</b>	<b>108.152.882</b>	<b>0,62</b>

**Table 3:** Total energy consumption per annum (kWh/a) and Primary to Final Energy (P2FER)

## Website and Social Media



<https://www.zenhbalkan.edu.gr/>



Zenh Balkan Interreg

## Upcoming Events

A/W 2020: 2nd Workshop, Webinar, on “Nearly Zero Energy Hospital Buildings (NZenH)”, Dec 18 2020.

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