

PROJECTAANVRAAG



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Project name : Guidebook: Towards nZEB Hospitals Buildings
Project nr. : BE3112-100-101
Project request : W.H. Maassen
Project manager : H. Besselink
Version : Update of Final (d.d. April 12th 2018)

Title

Towards nZEB Hospital Buildings

powered by TVVL/REHVA/ASHRAE and Royal HaskoningDHV in co-operation with Eindhoven University of Technology

General scope

Hospital Buildings and HVAC systems within the scope of the EU nZEB definition.

Background

EU legislation (Energy Performance Directive for Buildings) demands all EU member states to set maximum energy usage requirements for new buildings by 2020. Also hospitals have to comply. The so-called nearly Zero Energy Building (nZEB) requirements set by the Dutch Government d.d. July 2015 now imply for new buildings a significant energy reduction of building en building services related energy by 2020 compared to the current requirement. These NL nZEB requirements were set preliminary and are still under consideration.

nZEB Requirements for existing buildings will follow in 2050. Furthermore besides nZEB requirements for new buildings hospitals also have to reduce the energy consumption in the existing Buildings by 2020. The Academic Hospitals have to realize together a reduction of energy consumption of 30% in 2020 compared to the energy consumption in 2005. In 2015 they achieved a reduction of 14% and consequently they are facing the challenge of reducing a further 16% in less than 5 years. To achieve their target they have to reduce instead of 1.4% energy reduction per year in the last 10 years now > 3% energy reduction per year each year from 2015 to 2020.

For hospitals this will be an even greater challenge than for example offices. This is due to the special focus on the primary process, relatively low energy tariffs which negatively effect sound business cases for energy saving measures and consequently the way energy management is organized in hospitals. Although specific attention is given to energy reduction compared to other organizations the successful implementation of energy saving measures stayed behind.

Hospitals consume circa 1 % of the primary energy in the Built Environment. Studies show that only 25% - 40% of the energy use by Academic Hospitals is for appliances and medical equipment. The rest is building and building services related to realize the required indoor conditions.

To achieve the energy reduction and nZEB goals hospitals are now focusing on the 3 pillars: organization, behavior (awareness) and technology. Wherein future scenarios of required building performances, functions/usage of the buildings, technological innovations and business case parameters, e.g. energy tariffs and rates, are part of the technology pillar.

Target Group

Hospital Building Designers, especially HVAC consultants, hospital owners, developers and users.

Specific objective and added value

TVVL/ REHVA/ASHRAE and RHDHV-TU/e want to:

- Give information and insight in nZEB developments that will occur in the near future and what the consequences of these developments are for Hospital Buildings and in particular for Building Services.
- Contribute to the road to nZEB for Hospital Buildings and help our society to make the right choices. The Guidebook will be published to communicate, inspire, seduce/convince (evidence based) and enable the target group to search for, find, select, apply, use and maintain/optimize safe evidence based nZEB Hospital Building design solution.

Task Force/Reviewers/Authors

This publication will be prepared under the auspices of REHVA TRC and ASHRAE Technical Committee (TC) 9.6, Healthcare Facilities.

TASKFORCE	
REHVA TRC	ASHRAE TC 9.6
Hans Besselink – TVVL Jarek Kurnitski – EKVU Wim Maassen – TVVL Frank Mills - CIBSE	David Eldridge Travis English Maya Salabasheva Heather Burpee Frank Mills Wim Maassen
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Plan of work

This REHVA Guidebook will be realized following the steps:

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1. Define outline Guidebook
2. Invite authors
3. Set structure and content
4. Define Workpackages
5. Deliver concept chapters
6. Optimize
7. Deliver final chapters
8. Edit final version
9. Review by authors
10. Review by REHVA

Meetings will be held in combination with ASHRAE and REHVA meetings and using skype.

Detailed plan:

	complete content 50%												80%						in books Final				
	2017				2018								2019										
	Q1	Q2	Q3	Q4	Jan	Feb	Mrt	Apr	Mei	Jun	Jul	Aug	Sep	Okt	Nov	Dec	Jan	Feb	Mrt	Apr	Mei	Jun	
ASHRAE Meetings																							
Long Beach 2017		x																					
TC 9.6 & Seminar & Workshop		x																					
CHICAGO 2018					x																		
TC 9.6 & Workshop					x																		
HOUSTON 2018										x													
TC 9.6 & Seminar & Workshop										x													
ATLANTA 2019																	x						
TC 9.6 & Seminar & Workshop																	x						
Kansas City 2019																							x
TC 9.6 & Seminar & Workshop																							x
? 2020																							
Additional meetings																							
NL															x								
UK									(x)							x							
NL/UK (skype)																			x				
REHVA CLIMA2019																							x
BUCHAREST																							
Activities																							
Define outline Guidebook	x																						
Invite authors		x																					
REHVA Journal				x																			
Set structure and content					x																		
Define Workpackages					x																		
write concept chapters						x	x	x	x														
Deliver concept chapters										x													
Optimize										x													
adjust concept chapters											x	x	x										
edit concept version															x	x							
Deliver final chapters																	x	x					
Reviewing by sounding panel (decision maker eg CEO Hospital)																							
Edit final version																x	x	x	x				
Review by authors																	x	x	x				
Review by REHVA																	x	x	x				
Edit and published REHVA																				x	x		
Review - Professional Writer - Broader audience																				x	x		
Presenting final version																						x	x

Draft Table of Contents

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pag. 3-8

- Overview of future Hospital Building requirements
- Method how to fulfill these requirements
- Overview design solutions
- Overview future innovations
- Best practice case providing evidence of safe and effective solutions
- Indication of financial feasibility of nZEB Hospital Building solutions using LCC (EU cost optimality method) and LCPD (EU method including benefits and scenario's) calculations.

Update April 4th 2018, see presentation: "Chicago-2018-PPT_Final Guidebook NZE Hospital 180207.pdf" and concept Guidebook: "I&BBE3112R001D01 Guidebook nZEB Hospital Buildings 180207.pdf".

During the Atlanta meeting January 2019 the table of content was updated as follows:

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Time Schedule

The project will be executed in a period of 2,5 years.

Starting January 2017 and ending October 2019.

This includes review by REHVA (max 3 months) and making some adjustments (2 months) based on possible comments for revision.

During the Atlanta meeting January 2019 the timeline was updated as follows, see minutes Atlanta meeting:

Timeline

	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34			
ASHRAE																				Boekarest															
ATLANTA																				REHVA															
																				Clima2019															
skype meetings	x						x			x										x															

- W13-W16 First Review by Reviewers
- W17-W21 Preparing 99% version
- W22 CLIMA2019: announcement by ASHRAE president, Workshop, Meeting team
- W22 Final adjustments and Formal Review
- W26 ASHRAE Annual meeting Seminar
- W28-W29 Final update
- W30-W34 REHVA editorial work
- W35 Final Guidebook

14 ASHRAE-REHVA | January 13th 2019

Royal HaskoningDHV

Results:

This results in a REHVA Guidebook Design of nZEB Hospital Buildings (ca. 50 pages)

Update April 4th 2018, see presentation: "Chicago-2018-PPT_Final Guidebook NZE Hospital 180207.pdf" and concept Guidebook: "I&BBE3112R001D01 Guidebook nZEB Hospital Buildings 180207.pdf".

Market demand of the Guidebook:

We think that at least 500 Guidebooks will be sold (500 x € 50.-- = € 25,000.--). This is based on the assumption that at least in 64 countries that are related to ASHRAE ca 8 Guidebooks will be sold.

Project costs: excl Tax (B.T.W.)

Overall:

a)	project coördinator W. Maassen hours x tariff = 196 x 135	=	26.500
b)	out of pocket kosten: and hotel costs: required meetings e.g. ASHRAE and REHVA meetings)		19.000 *) (travel)
c)	REHVA production costs (pdf only):		4.500,--
TOTALE PROJECTKOSTEN:			€50.000

Funding: excl. Tax (B.T.W.)

<u>Overall:</u>	<u>jaarlijks:</u>	2017	2018	2019
a) TVVL		2.500	(2.500+2.500)	2.500
b1) PIT			5.000	4.700
b2) RVO			2.500	2.500
c) ASHRAE* (travel, hotel, meals)		3.000	8.000	8.000
d) Co-financiers RHDHV		8.000	8.000	0
TOTAAL€ 49.700		13.500	21.000	15.200

**In this overview only the estimated costs for travel, hotel and meals for W. Maassen are included. Please see Appendix A for the total costs including other team members.*

Approval: Name Date Paraaf

TVVL

Project coördinator:

Controller/ secr:

Pijler chair: Hans Besselink

REHVA

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ASHRAE

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References

- Report “(nearly) Zero Energy Hospital Buildings”, d.d. 25 January 2017
<https://tc0906.ashraetcs.org/l&BBE3112R001D01%20nZEB%20Hospital%20Buildings%201701125.pdf>
- REHVA Journal 17/05: “HVAC in Health Sector – NZEB Hospitals case studies”
<http://www.rehva.eu/publications-and-resources/rehva-journal/2017/052017.html>
- Chicago-2018-PPT_Final Guidebook NZE Hospital 180207.pdf
- concept Guidebook: “I&BBE3112R001D01 Guidebook nZEB Hospital Buildings 180207.pdf
- Participation nzeb hospital buildings guidebook 180403 part 1 of 2.pdf
- Participation nzeb hospital buildings guidebook 180403 part 2 of 2.pdf

Appendix – ASHRAE - Specification Travel, Hotel, Meals costs (excl Tax)

Costs already made

- ASHRAE LB 2017: € 3.100,--
- ASHRAE CHI 2018: € 2.750,--

Wim Maassen:

- ASHRAE HOUSTON 2018: € 3.000,--
- Meeting Editors (Wim Maassen and Frank Mills) in UK November 2018: € 1.500,--
- ASHRAE ATLANTA 2019: € 3.000,--
- REHVA CLIMA2019: € 2.000,--
- ASHRAE Kansas City 2019: € 3.000,--

Other participants requesting Travel, Hotel, Meals budget*:

- ASHRAE HOUSTON 2018: € 3.000,- x 4 = € 12.000,--
- Meeting Editors in UK November 2018: € 1.500,-- x 1 = € 1.500,--
- ASHRAE ATLANTA 2019: € 3.000,-- x 4 = € 12.000,--

**This budget is an estimation. It is assumed that not all authors (see list of authors) require travel and accomodation budget from this ASHRAE Guidebook budget for all meetings and also there will be a difference in costs because lenthof stay and distance to travel.*

Total:

- € 5.850,-- costs already made
- € 12.500,-- costs to be made by main Editor/Author Wim Maassen
- € 25.500,-- costs to be made by other Editor and Authors
- Total: € 43.850,--

Approval:	Name	Date	Paraaf
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ASHRAE: