



MANUAL FOR VERIFICATION OF  
ACTIVE HOUSE PROJECTS  
APPLYING FOR A LABEL

VERSION 1 - 19 APRIL 2016

MADE FOR THE ACTIVE HOUSE ALLIANCE  
BY DANISH TECHNOLOGICAL INSTITUTE  
Amdi Worm and Henrik Laue Poulin

## Tabel of content

Introduction.....	2
Manual for verification of Active House Radars (project level) .....	2
1. Building owner.....	2
2. Commissioner.....	3
2.1. Requirements for commissioner .....	3
2.2. Screening .....	3
2.3. Verification .....	3
2.4. Dialog.....	4
2.5. Checklist - commissioner .....	4
3. Verifier .....	6
3.1 Requirements for verifier .....	6
3.2 Verification .....	6
3.3 Dialog.....	6
3.4 Statement.....	7
3.5 Documentation.....	7
3.6 Validity.....	8
3.7 Checklist - verifier .....	8
4. Validation fees.....	11

## Introduction

This note is a manual for verification of Active House radars (on project level). The manual is carried out by senior consultant (MSc) Amdi Schjødt Worm and consultant (MSc) Henrik Poulin, Danish Technological Institute. The note is based on experience with several Active House evaluations and thereby a thorough experience with Active House tools and specifications.

## Manual for verification of Active House Projects

The verification of an Active House radar includes an examination of the completeness, plausibility, consistency and transparency of the calculations and the project report.

The Active House Alliance is responsible for making a list of all the verifiers attached to the Alliance and for storing all the verification reports as classified material.

This manual is divided into four sections:

- 1. Building owner**
- 2. Commissioner**
- 3. Verifier**
- 4. Verification fees**

### 1. Building owner

A building owner, who has a verified building registered with the Active House Alliance, is under an obligation, during the entire validity period, to notify the verifier through the Alliance of any radical changes done to the building, which have an influence on the data and results stated in the building radar.

The building owner are only allowed to use and publish the label, when the project has been approved, registered and published by the Active House Alliance. False or misleading use of the label must not take place.

The Active House Alliance has all rights to the label and any use of the label shall follow the guidance from the Active House Alliance.

## 2. Commissioner

The commissioner is the company or person who calculate and bring forward the project

### 2.1. Requirements for commissioner

In order to be allowed to bring forward an Active House project for verification, the commissioner has to participate in a one day Active House course (webinar). Furthermore, the commissioner needs:

- An education in engineering, architecture or other relevant scientific education
- Thorough knowledge of buildings and their performance in relation to energy, indoor environment and environment (LCA)
- Knowledge with the relevant standards used in Active House eg. national energy standards, the EN15251 standard on indoor comfort and the EN15978 on Assessment of environmental performance of buildings.

### 2.2. Screening

The commissioner shall collect general information and documents and send it to the verifier for him or her to verify and screen:

- Radar calculation file (Excel)
- File with a description of the qualitative values
- Drawing material in PDF
- Floor plan for each floor
- Sectional drawings
- Facade drawings
- Drawing or description of the technical installations
- File with calculated areas

### 2.3. Verification

When the building owner decides to have the project verified, the commissioner must contact the Active House Alliance, who will provide the project team with contact information on the verifier for the project.

Verification includes the above detailed calculations, which shall be send to the verifier, when the verifier asks for it, in order for him/her to validate the calculations. Supplementary to this the verifier can make further investigation of 2-3 indicators in the radar. The verifier can ask for the following detailed calculations:

- Energy frame calculation
- LCA calculation
- Daylight calculation
- Indoor environment calculation
- Calculation of freshwater consumption
- Calculation of sustainable construction

### **2.4. Dialog**

To avoid mistakes and misunderstandings in the active house evaluation, it is recommended, that the verifier – to a certain extend - is included in the first processes of the project, so the verifier regularly can help the commissioner with any questions he/she might have through the calculation / verification process.

During verification of the radar, the commissioner should be available for answering questions. If the verifier doesn't find any mistakes or misunderstandings in the project, it will be approved, but if the verifier finds minor errors, the project will get the statement *verified and approved with reservations*. Then the commissioner needs to correct the mistakes and send back the documentation to the verifier. The project will then be approved. If the verifier finds any larger errors, the project will get the statement *project not approved in its present form*. Then the commissioner needs to correct the mistakes and send back the documentation to the verifier, whereupon the verification process will start all over.

It is the commissioner's responsibility to contact and make arrangements with a qualified verifier and he/she is also in charge of the communication with the verifier and handling of all the documents which are relevant for the verification. The verifier must verify the radar and project report and prepare a verification report according to the standardised procedure in the verification template not later than 4 weeks after receiving the project information.

### **2.5. Checklist - commissioner**

The below checklist for the commissioner is carried out as a guidance-document for the commissioner. Going through the checklist, the commissioner will be guided in relation to the required information needed for the verification.

The sections in the checklist below must be checked during the verification process. Some issues are mandatory to check and some are optional. If the issue is in line with the requirements and/or accepted by the verifier, the box "checked and approved" can be ticked.

Any deviations from the requirements should be reported by the verifier, and the dialogue between verifier and commissioner should be registered and made transparent.

<b>1</b>	<b>Requirements for commissioner</b>	<b>Mandatory/optional</b>	<b>Checked and approved</b>
1.1	Participation in 1-day Active House course (webinar)	M	
<b>1</b>	<b>Screening</b>	<b>Mandatory/optional</b>	<b>Checked and approved</b>
1.1	Send radar calculation file (Excel)	M	
1.2	Send file with a description of the qualitative values	M	
1.3	Send drawing material in PDF-format		
1.3.1	Floor plan for each floor	M	
1.3.2	Sectional drawings	M	
1.3.3	Facade drawings	M	
1.3.4	Drawing or description of the technical installations	M	
1.4	Send file with calculated areas	O	
<b>2</b>	<b>Verification</b>	<b>Mandatory/optional</b>	<b>Checked and approved</b>
2.1	Send calculation files – specified by the verifier	M	
2.1.1	Send energy frame calculation	O	
2.1.2	Send LCA calculation	O	
2.1.3	Send daylight calculation	O	
2.1.4	Send indoor environment calculation	O	
2.1.5	Send calculation of freshwater consumption	O	
<b>3</b>	<b>Dialog</b>	<b>Mandatory/optional</b>	<b>Checked and approved</b>
3.1	Establish contact with the Active House Alliance for information on the verifier	M	
3.2	Establish contact to the verifier	M	
3.3	Answer questions from verifier after handling over the documentation	M	
3.4	Correct errors if any occurs	M	

Table 1. Checklist for the commissioner

## 3. Verifier

The purpose of this section, is to ensure that all verifications are based on similar conditions.

A maximum of four weeks are allowed to pass, from the point where the verifier receives the first project material to the point where the verifier has approved or not-approved the project. The four week-period is initiated when project material for the screening is send to the verifier.

### 3.1 Requirements for verifier

The verifier must be an independent third party to the client as well as to the commissioner, which means that the verifier can't be organisationally attached to the client or the commissioner. In addition, the verifier also needs to have participated in the 1-day Active House course (webinar) and taken part in the development (as commissioner) of at least three radars.

The experience in radar evaluation (3 radars) must correspond to the type of project verified. For verification of new-build projects, it is required that the verifier has taken part in the development of 3 new-build radars. The same requirements are to be met for verification of renovation projects.

### 3.2 Verification

All projects must be individually verified. The verification process includes:

- Retrieving basic information from the commissioner as described in table 1.
- Verifying general project informations
- A screening of the project
- A further verification/investigation of 2-3 indicators in the radar

### 3.3 Dialog

To avoid mistakes and misunderstandings, it is recommended, that the verifier is contacted and included from the beginning of the project (design phase), so the verifier regularly can help the commissioner with any questions he/she might have.

All provided information and calculations in connection with the independent verification process must be kept confidential. Therefore, confidential information shall be kept, protected and handled properly with at least the same care, as the receiving party applies to their own business secrets. The parties are not allowed to use confidential information received from the other party for any other purpose than for own internal use for the original purpose, apart from any use to which the other party has granted his permission.

The verifier should store all important dialogs made with the commissioner.

### **3.4 Statement**

The verifier must state one of the following:

- Project verified and approved
- Project verified and approved with reservations
- Project not approved in its present form

If the radar is approved by the verifier, the verifier must forward a completed and signed verification report to the Alliance, who will make the final approval and publication.

If the radar is approved with reservations, the verifier must forward a completed verification report, describing the reservations, to the Alliance as well as to the commissioner. The verifier and the commissioner will then go into a dialogue about those parts of the project, which have resulted in the reservations. After clarification the verifier can approve the radar without reservations. The Alliance is notified by the forwarding of an updated verification report, and can make the final approval and publication.

If the verifier concludes that the calculations and/or project report contains mistakes and shortcomings to such an extent that radical changes and/or new calculations are necessary, the verifier may declare that the project can't be approved in its present form. If this happens, the commissioner must start the procedure all over again. The financial costs involved if a project is either approved with reservations or not approved, will be paid by the commissioner. Any issues in connection with this verification process may be reported to the Alliance who shall decide what to do in the specific case.

### **3.5 Documentation**

The verifier must give a statement about his/her work and the result, clarifying at minimum:

- That the work concerned a verification (not a certification)
- That the verification was done by a 3<sup>rd</sup> party independent
- That the radar was verified according to the checklist from appendix 1 and 2
- That the radar and documentation was verified according to Active House specifications version 2
- All mistakes found in the project (if any)
- Important dialog between commissioner and verifier (if any)
- Verified indicators



Example:

I hereby confirm, that there in the following detailed examination done by an independent 3<sup>rd</sup> party verifier, hasn't been found any relevant deviations or errors in the radar documentation [*project number*], issued for [*building owner*] by [*company name*].

The company-specific data have been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity.

Name and signature of

External inspector

Place and date

>>>

>>>

### 3.6 Validity

A verified Active House radar is valid until significant changes, which are of great importance to the radar, are made to the building. Then the project must be revised no later than one year after the changes are made.

### 3.7 Checklist - verifier

The issues in the checklist below must be checked during the verification process. Some issues are mandatory to check and some are optional. If the issue is in line with the requirements and/or accepted by the verifier, the box "checked and approved" can be ticked.

Any deviations from the requirements should be reported by the verifier, and the dialogue between verifier and commissioner should be registered and made transparent. This can be done separately from the checklist (an example is provided in figure 1).

1	Requirements for verifier	Mandatory/ optional	Checked and approved
1.1	Participation in 1-day Active House course (webinar)	M	
1.2	Development of a minimum of three radars	M	
1.3	Third party to client and commissioner	M	
2	Verification	Mandatory/ optional	Checked and approved
2.1	Retrieve basic information	M	
2.1.1	Retrieve radar calculation file (Excel)	M	
2.1.2	Retrieve file with a description of the qualitative values	M	
2.1.3	Retrieve drawing material in PDF	M	
2.1.3.1	Floor plan for each floor	M	
2.1.3.1	Sectional drawings	M	
2.1.3.1	Facade drawings	M	
2.1.3.1	Drawing or description of the technical installations	M	
2.1.4	Retrieve file with calculated areas	O	
2.2	Verify project information	M	
2.3	Verify commissioner	M	
2.4	Verify date	M	
2.3	Screen the project	M	
2.3.1	Screen the radar and verify that there aren't any obvious mistakes	M	
2.3.2	Screen the qualitative values and verify that there aren't any obvious mistakes	M	
2.3.3	Screen the areas and verify that the areas are matching the drawing material?	M	
2.3.4	Verify that the technical installations used in the radar matches the description or drawing material	O	
2.3.5	Screen the radar report(s) and verify that there aren't any obvious errors	M	
2.4	Further verification of indicators	M	
2.4.1	Choose 2-3 indicators from the radar for further investigation (1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2 or 3.3)	M	
2.4.2	Get calculations for the chosen indicators	M	
2.4.2.1	Get energy frame calculation	O	
2.4.2.2	Get LCA calculation	O	
2.4.2.3	Get daylight calculation	O	
2.4.2.4	Get indoor environment calculation	O	
2.4.3	Verify indicator 1-3	M	
2.4.3.1	Verify assumptions	M	

2.4.3.2	Verify that scores and values are matching	M	
2.4.3.3	Verify calculation method, standards and tools	M	
<b>3</b>	<b>Statement and documentation</b>	<b>Mandatory/ optional</b>	<b>Checked and approved</b>
3.1	Specify verification results:	M	
3.2	Project verified and approved	O	
3.2.1	Write a short verification report	M	
3.2.2	Send report to the Active House Alliance	M	
3.3	Project verified and approved with reservations	O	
3.3.1	Write a verification report with reservations	M	
3.3.2	Send report to the Active House Alliance	M	
3.3.3	Go into dialog with commissioner regarding the parts causing the reservations	M	
3.3.4	After dialog and corrections, approve the new radar without reservations	M	
3.3.5	Write an updated verification report	M	
3.3.6	Forward the updated report to the Active House Alliance	M	
3.4	Project not approved in its present form	O	
3.3.1	Write a verification report, which states that the project isn't approved in its present form	M	
3.3.2	Send report to the Active House Alliance	M	
3.3.3	Go into dialog with commissioner regarding the parts with errors	M	
3.3.4	The process starts all over as a new project	M	

Table 2. Checklist for the verifier

Issue number	Question/comment	Response

Figure 1. Form for dialog

## 4. Validation fees

It is the Active House alliance responsibility to make sure, that the approved verifiers are qualified and have the necessary competences as requested.

The alliance will establish the contact between the commissioner and the verifier.

The costs for verification has to be paid directly between the commissioner/building owner and the verifier, and has to be paid when the verification process starts. Price-levels are written in section 4 in this document.

The additional financial costs involved if a project is either approved with reservations or not approved, will be paid by the commissioner. Any issues in connection with this verification process shall be reported to the Active House Alliance who shall decide what to do in the specific case.

The dialog between commissioner, building owner and verifier can be handled with the form illustrated in figure 1.

### 4.1. Fee

This section suggests the size of fee for validation. All suggested fees relates to residential buildings and Active House specifications version 2. It is suggested to make the fee variable depending on building-size and type (new-built / renovation). It is recommended to use fixed fees independent of verifier and decided by the Active House Allinace.

New-built and renovation projects:

(Design radar OR measured radar)

Area of the house	Fee
$\leq 350\text{m}^2$	1000 EUR
351-3000m <sup>2</sup>	650 EUR+ 1EUR /m <sup>2</sup>
$> 3000\text{m}^2$	4000 EUR

"Area" is calculated as the heated area of the house (external measures)

Design radar AND measured radar

Area of the house	Fee
$\leq 350\text{m}^2$	1500 EUR
351-3000m <sup>2</sup>	975 EUR+ 1,5EUR /m <sup>2</sup>
$> 3000\text{m}^2$	5000 EUR

The suggested fees covers both the screening and the verification of 2-3 selected indicators. All fees are excl. VAT (value added tax).