REPORT
D6.13

Report on user satisfaction survey and questionnaires

Madrid, 1st June 2024

Contact

Nuria Díaz Antón
VAND arquitectura
nuria@vandarquitectura.info

OUTPHIT – DEEP RETROFITS MADE FASTER, CHEAPER AND MORE RELIABLE
outPHit pairs such approaches with the rigour of Passive House principles to make deep retrofits cost-effective, faster and more reliable. On the basis of case studies across Europe and in collaboration with a wide variety of stakeholders, outPHit is addressing barriers to the uptake of high quality deep retrofits while facilitating the development of high performance renovation systems, tools for decision making and quality assurance safeguards.
outphit.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957175. The presented contents are the author's sole responsibility and do not necessarily reflect the views of the European Union. Neither the CINEA nor the European Commission are responsible for any use that may be made of the information contained therein.

Table of Contents

1. QUESTIONNARIE METHODOLOGY

Questionnaires for the inhabitants of the Case Study buildings of the project have been designed to collect qualitative information on user satisfaction based on tenants' well-being and perceived changes of their living conditions after the renovations and how the handling of new mechanical equipment (ventilation, heating, cooling, hot water production) or RES influences their day to day living.

The questionnaires have a clean and structured format that allows us to obtain precise information with a clear objective.

The list of 44 questions is available in English. It is adapted to evaluate the user satisfaction in the buildings before and after the renovation works and include the following fields:

- General questions
- Winter comfort /heating
- Summer comfort / cooling
- Domestical hot water
- Ventilation
- Renovation / construction works
- Sensor technology / monitoring
- Investment

The questionnaires can be completed using the online form created on the outPHit project platform, using Excel sheets or using any other platform available to partners.

Every partner will include the following information about the questionnaires carried on for each Case Study:

General overview

- Survey length: e.g. 20 questions
- Mode: online, email, telephone, in person
- Dates presented, for example, July 1 to 15, 2022
- Number of respondents

Presentation of the findings

- Summary of the evaluation results, including quantitative and qualitative data presented in a clear and logical manner.
- Include negative and positive findings

- Highlight key takeaways using data visualizations, such as charts, to display crucial information.

Interpretation of the findings / Conclusions

- Closed-ended questions with set answer options were designed as they are easier to analyze. Review the responses rates for each option and calculate the weighted average.
- For open-ended questions, use qualitative analysis to uncover themes.
- Provide context around the findings to make them meaningful.
- Provide recommendations on future actions to take based on the findings

1.1. LIST OF QUESTIONS (ENGLISH VERSION)

GENERAL QUESTIONS	
1.	How many people live in your home?
1.b	How many are children?
2.	How many people are in the house on average during the day?
	M-F
	Weekend
3.	What was the main reason for moving here?
	I/We like the house
	The area is attractive (infraestructures, child friendly …)
	Appropiate home size
	Economic reasons (goog cost-benefit ratio)
	Comfort
	Energy eficiency
	Other:…
4.	Where is your house located within the building?
	Ground floor/ Intermediates floors /Last floor or attic
5.	How important was it for you to move into a Passivhaus?
	Very important /quite important / important / less important /nothing important
6.	Have you been instructed on how to deal with your new home?
6.b	If yes, in what way?
6.c	Was this information useful to you?
6.d	What would you like to know more about? What information was insufficient?
7.	Do you have a contact person when you have questions about how to manage your home?
7.a	If yes: Do you find this important and useful?
8.	How do you dry the laundry?
	electric dryer / inside the house (rope, line) /drying room outside the house / outside
9.	How satisfied are you with your home?
	Strongly satisfied / satisfied / neither satisfied or dissatisfied / somewhat dissatisfied /very dis-satisfied
10.	Do you have any suggestion to improve the quality of the house?

WINTER COMFORT /HEATING

11.	How satisfied are you with the confort of the house in winter?
	Strongly satisfied / satisfied / neither satisfied or dissatisfied / somewhat dissatisfied /very dissatisfied
11.b	If you are not satisfied. Why?
11.c	Have you noticed an improvement in comfort in winter compared to the original house?
	Yes / No
12.	What is the average temperature in the house in winter?
	Aprox. xx ºC
	I don't know
12.b	Is this temperature right for you?
	Yes / No
12.c	If not, what temperature would be ideal for you?
13.	How would you evaluate the operation of the heating system of the house?
	Very good / good / neither good or bad / bad / very bad
14.	How would you evaluate the manageability of the heating system of the house?
	Very easy / easy / neither easy or complicated / complicated / very complicated
15.	How many hours a day do you keep the heating system on?

SUMMER COMFORT /COOLING

16.	How satisfied are you with the confort of the house in summer?
	Strongly satisfied / satisfied / neither satisfied or dissatisfied / somewhat dissatisfied /very dissatisfied
16.b	If you are not satisfied. Why?
16.c	Have you noticed an improvement in comfort in summer compared to the original house?
	Yes / No
17.	What is the average temperature in the house in summer?
	Aprox. xx ºC
	I don't know
17.b	Is this temperature right for you?
	Yes/ No
17.c	If not, what temperature would be ideal for you?
18.	What do you do to avoid overheating in summer?
	Open windows in the morning / at sunset / at night
	Solar potection in windows
19.	What type of solar protection have the windows of your home?
	External shutters
	Interior blinds
	Overhang or canopy
20.	Is it possible to open the windows at night to cool down the house?
	Yes / No
21.	If not, which is the reason?
	Outside noise

Mosquitoes or other insects
Fear of intruders / robbery

22. Does the house have an active cooling system?
Yes / No

23. How would you evaluate the manageability of the heating system of the house?
Very easy / easy / neither easy or complicated / complicated / very complicated

24. How many hours a day do you keep the cooling system on?

DOMESTICAL HOT WATER

25. How satisfied are you with the production of domestic hot water?
Strongly satisfied / satisfied / neither satisfied or dissatisfied / somewhat dissatisfied /very dissatisfied

25.b If you are not satisfied. Why?

VENTILATION

26. Have you noticed the improvement in air quality in your home by incorporating a mechanical ventilation system?
Yes / No

27. Does anyone smoke in the house?
Yes / No

28. How effective is ventilation in removing bad smells?

Very effective / effective / partially effective / not very effective / not at all effective

29. How would you evaluate the manageability of the ventilation system?
Very easy / easy / neither easy or complicated / complicated / very complicated

30. What configuration of your ventilation system do you mainly use?
In winter: off / 0 / 1 / 2 / 3
In summer: off / 0 / 1 / 2 / 3

30.b Do you change the configuration at any time?
If yes. Why?

31. How satisfied are you with the air quality of the house in winter?
Strongly satisfied / satisfied / neither satisfied or dissatisfied / somewhat dissatisfied /very dissatisfied

31.b If you are not satisfied. Why?

32. How do you evaluate the humidity of the air in winter?
Too much humidity / a little humidity / perfect / a little dry / very dry

33. Do you open the windows to ventilate in winter?

33.b. How long?

33.c At what time of the day?
In the morning / noon / afternoon / evening

34. How satisfied are you with the air quality of the house in summer?
Strongly satisfied / satisfied / neither satisfied or dissatisfied / somewhat dissatisfied /very dissatisfied

34.b If you are not satisfied. Why?

35 Do you open the windows to ventilate in summer?

35.b How long?

35.c At what time of the day?
In the morning / noon / afternoon / evening

RENOVATION

If the residents were already in the building before the renovation or during the renovation:

36.a. How did you find the restructuring process affecting your everyday life?

Very good /good /slightly disturbing /disturbing /cannot be assessed

36.b. If disturbing or slightly disturbing. What did you find disturbing?

Duration of the renovation measure
Noise level
Structural interventions in your own living space
Restrictions on access routes (footpath or road) by construction site vehicles and materials
Others

36.c. If very good, What did you find particularly positive?

Free answer

SENSOR TECHNOLOGY

37.a. How do you feel about the use of sensors in your home?

Disturbing / somewhat disturbing / not disturbing /cannot be assessed

37.b. If disturbing, why?

Data protection/surveillance
Optics/conspicuousness in the room
Other

38. Would you be interested in the data?

Yes/no/not assessable

39. Would you be interested in energy and comfort-related suggestions for improving your living situation?

Yes/no/not assessable

40. Would you welcome more sensors in the building if you got the results?

Yes/no/not assessable

INVESTMENT

41. Were you involved in the decision-making process for the renovation?

Yes/No/no answer

42. Are you satisfied with the energetic goals?

Yes/no/not assessable

43. What was the motivation behind the renovation?

Better Energy efficiency
Increase in the value of the property
Sustainability
Comfort improvement
Other

44.a. Would you have liked to invest more?

Yes/no/not assessable

44.b. If the answer is no: Why did this fail?

Free answer

2. PRESENTATION OF THE FINDINGS

2.1. VAND CS17

2.1.1. General overview

- Survey length: 35 questions
- Mode: online / telephone
- Dates presented: 8 November 2023 and 12 June 2024
- Number of respondents: 6

2.1.2. Presentation of the findings

1.a. ¿Cuántas personas viven en su vivienda?

Short answer

- **0 (0%): No response**
- 2
- 2
- 2
- 2 + 3 gatos
- 4
- 2

1.b. ¿Cuántas son niños?

Short answer

- **0 (0%): No response**
- 0
- 1
- 1
- 0
- 3
- NO

2.a. ¿Cuántas personas están presentes de media durante el día de lunes a viernes?

Short answer

- **0 (0%): No response**
- 2
- 2
- 2
- 2. 24 horas, solo salidas a recados
- 4, a partir de las 16:30h
- 2

2.b. ¿Cuántas personas están presentes de media durante el día el fin de semana?

Short answer

- **0 (0%): No response**
- 1
- 2
- 2
- 2. 24 horas, solo salidas a recados
- Un fin de semana sí y uno no, los niños están fuera
- 2

3. ¿Cuál fue la principal razón para mudarse aquí?

Checkboxes

5 (83%): **Razones económicas (buena relación coste-beneficio)**

3 (50%): La vivienda me/nos gustó (la arquitectura, la distribución...)

3 (50%): Confort

2 (33%): La zona es atractiva (infraestructuras, amigable para niños...)

1 (17%): Tamaño apropiado de la vivienda

1 (17%): Eficiencia energética

1 (17%): Otros

0 (0%): No response

4. ¿Dónde se encuentra su vivienda dentro del edificio?

Dropdown

4 (67%): **Plantas intermedias**

1 (17%): Planta baja

1 (17%): Planta última o ático

0 (0%): No response

5. ¿Cómo de importante era para usted mudarse a una vivienda Passivhaus?

Dropdown

3 (50%): **Importante**

1 (17%): Muy importante

1 (17%): Poco importante

1 (17%): Nada importante

0 (0%): No response

0 (0%): Parcialmente importante

6.a. ¿Ha sido instruido en cómo tratar con su vivienda?

Dropdown

5 (83%): **Sí**

1 (17%): No

0 (0%): No response

6.b. En caso afirmativo: ¿de qué manera?

Short answer

- **0 (0%): No response**
- A Través de un dosier, y con personas especializadas.
- Nos enseñaron al principio como usar el termostato, que fue muy complicado programarlo por primera vez, ahora que ya está programado pasar de modo invierno a verano es fácil, pero poco intuitivo. Nos enseñaron a usar adecuadamente el sistema de ventilación y que usará la campana extractora al cocinar.
- Que no hace falta ventilar la casa
- Necesitan más explicaciones. Lo ven moderno para ellos y les cuesta.
- Poca información
- A medias. No es suficiente. Son mayores. Se fueron ayudando entre vecinos

6.c. ¿Le ha resultado útil esa información?

Dropdown

4 (67%): **Sí**

2 (33%): No

0 (0%): No response

6.d. ¿Sobre qué le gustaría saber más? ¿Qué información fue insuficiente?

Short answer

- **2 (33%): No response**
- La utilización de los termostatos
- Sobre los sistemas activas activos, aerotermia, ventilación.
- Sobre la ventilación. Me parece que enteran olores de la calle, como de la cocina de otros vecinos. También sobre el funcionamiento de la climatización
- Climatización

7.a. ¿Tiene alguna persona de conctacto cuando le surgen dudas sobre el manejo de su vivienda?

Dropdown

6 (100%): **Sí**

0 (0%): No response

0 (0%): No

7.b. En caso afirmativo: ¿Le parece esto importante y útil?

Dropdown

6 (100%): **Sí**

0 (0%): No response

0 (0%): No

8. ¿Cómo seca usted la colada?

Checkboxes

4 (67%): **Dentro de la vivienda (cuerda, tendal)**

4 (67%): **En el exterior**

0 (0%): No response

0 (0%): Secadora eléctrica

0 (0%): Cuarto de secado fuera de la vivienda

9. ¿Cómo de contento está con la vivienda en general?

Dropdown

6 (100%): **Muy contento**

0 (0%): No response

0 (0%): Contento

0 (0%): Parcialmente contento

0 (0%): Poco contento

0 (0%): Nada contento

10. ¿Tiene alguna sugerencia para mejorar la calidad de la vivienda?

Short answer

- **1 (17%): No response**
- No
- El agua caliente de vez en cuando se estropea y no tenemos. s
- No. Solo quitarían el escalón de la balconera
- No
- Una persona de contacto fines de semanas. Mas precisión con los horarios de visitas para limpieza filtros o revisión

11.a. ¿Cómo de contento está con el confort de la vivienda en invierno?

Dropdown

5 (83%): **Muy contento**

1 (17%): Parcialmente contento

0 (0%): No response

0 (0%): Contento

0 (0%): Poco contento

0 (0%): Nada contento

11.b. En caso de estar parcialmente/poco/nada contento ¿Por qué?

Short answer

- **5 (83%): No response**
- Tenemos problemas con la climatización, en verano no funcionaba la refrigeración y ahora en noviembre todavía no nos han encendido la calefacción cuando fuera hace -2 grados.

11.c. ¿Ha notado mejoría en el confort en invierno con respecto a la vivienda original?

Dropdown

6 (100%): **Sí**

0 (0%): No response

0 (0%): No

12.a. ¿Qué temperatura hay de media en la vivienda en invierno?

Short answer

- **0 (0%): No response**
- 22 grados
- 22°C
- 24
- 22
- 19-20 sin calefacción
- 20

12.b. ¿Es esta temperatura adecuada para usted?

Dropdown

5 (83%): **Sí**

1 (17%): No

0 (0%): No response

12.c. En caso negativo, ¿qué temperatura sería la ideal para usted?

Short answer

- **5 (83%): No response**
- 23

13. ¿Cómo valoraría el funcionamiento del sistema de calefacción?

Dropdown

5 (83%): **Muy bueno**

1 (17%): Insuficiente

0 (0%): No response

0 (0%): Bueno

0 (0%): Regular

14. ¿Cómo calificaría el manejo del sistema de calefacción?

Dropdown

3 (50%): **Muy sencillo**

2 (33%): Complicado

1 (17%): Sencillo

0 (0%): No response

0 (0%): Normal

0 (0%): Muy complicado

15. ¿Cuántas horas al día mantiene encendido el sistema de calefacción?

Short answer

- **0 (0%): No response**
- 0
- Ninguna. Ocasionalmente los días de más frío en invierno, la temperatura bajo a 20 grados y la encendí, pero rápidamente subió a 21-22 grados y se mantiene, hasta por la noche.
- Este invierno no lo utilice ya que habían 24 grados sin necesidad de encender la calefacción
- Va solo, no sabe
- Todavía ninguna
- 2

16.a. ¿Cómo de contento está con el confort de la vivienda en verano?

Dropdown

3 (50%): **Muy contento**

3 (50%): **Parcialmente contento**

0 (0%): No response

0 (0%): Contento

0 (0%): Poco contento

0 (0%): Nada contento

16.b. En caso de estar parcialmente/poco/nada contento ¿Por qué?

Short answer

- **3 (50%): No response**
- Por qué no hemos conseguido que funciones todavía
- Este verano hemos tenido mucho calor
- No funciona bien el aire acondicionado.

16.c. ¿Ha notado mejoría en el confort en verano con respecto a la vivienda original?

Dropdown

5 (83%): **Sí**

1 (17%): No

0 (0%): No response

17.a. ¿Qué temperatura hay de media en la vivienda en verano?

Short answer

- **0 (0%): No response**
- 26
- 25°C
- 25
- 26, no sube mas de 27
- 27
- 25-27

17.b. ¿Es esta temperatura adecuada para usted?

Dropdown

3 (50%): **Sí**

3 (50%): **No**

0 (0%): No response

17.c. En caso negativo, ¿qué temperatura sería la ideal para usted?

Short answer

- **3 (50%): No response**
- 20
- 23
- 24

18. ¿Qué hace usted para evitar el sobrecalentamiento en verano?

Checkboxes

4 (67%): **Abrir ventanas por la noche**

4 (67%): **Utilizar protecciones en las ventanas para que no entre el sol**

1 (17%): Abrir ventanas por la mañana

0 (0%): No response

0 (0%): Abrir ventanas al atardecer

19. ¿Qué tipo de protecciones solares utiliza en las ventanas de su vivienda?

Checkboxes

4 (67%): **Persianas/ toldos por el exterior**

3 (50%): Voladizo o porche

2 (33%): Persianas por el interior

0 (0%): No response

0 (0%): Ninguna

20. ¿Es posible abrir las ventanas para ventilar por la noche?

Dropdown

5 (83%): **Sí**

1 (17%): No

0 (0%): No response

21. En caso negativo, ¿cuál es la razón?

Checkboxes

4 (67%): **No response**

2 (33%): Mosquitos u otros insectos

1 (17%): Ruido exterior

0 (0%): Miedo a intrusos / robo

22. ¿Cuenta la vivienda con sistema de refrigeración activa?

Dropdown

6 (100%): **Sí**

0 (0%): No response

0 (0%): No

23. ¿Cómo calificaría el manejo del sistema de refrigeración?

Dropdown

4 (67%): **Muy sencillo**

1 (17%): Coplicado

1 (17%): Muy complicado

0 (0%): No response

0 (0%): Sencillo

0 (0%): Normal

24. ¿Cuántas horas al día mantiene encendido el sistema de refrigeración?

Short answer

- **0 (0%): No response**
- 24
- Según el calor y si estamos en casa
- Pocas
- Va solo, no sabe. El verano pasado no funcionó la aerotermia.
- No lo sé, lo pongo cuando hace calor y lo apago al cabo de un rato.
- Todo el día

25.a. ¿Cómo de contento está con la producción de agua caliente sanitaria?

Dropdown

3 (50%): **Muy contento**

2 (33%): Parcialmente contento

1 (17%): Contento

0 (0%): No response

0 (0%): Poco contento

0 (0%): Nada contento

25.b. En caso de estar parcialmente/poco/nada contento ¿Por qué?

Short answer

- **1 (17%): No response**
- Nos hemos quedado bastantes días sin agua caliente en casa.
- Muchos días no hay agua caliente
- Tarda en salir caliente
- Al principio hubo problemas y no funcionaba correctamente. Ahora ya se ha resuelto.
- Da problemas a veces

26. ¿Ha notado la mejoría de la calidad del aire en su vivienda al incorporar un sistema de ventilación mecánica?

Dropdown

4 (67%): **Sí**

2 (33%): No

0 (0%): No response

27. ¿Fuma alguien en la vivienda?

Dropdown

5 (83%): **No**

1 (17%): Sí

0 (0%): No response

28. ¿Cómo de efectiva es la ventilación para eliminar los malos olores?

Dropdown

3 (50%): **Muy efectiva**

3 (50%): **Efectiva**

0 (0%): No response

0 (0%): Parcialmente efectiva

0 (0%): Poco efectiva

0 (0%): Nada efectiva

29. ¿Cómo calificaría el manejo del sistema de ventilación?

Dropdown

4 (67%): **Muy sencillo**

1 (17%): Sencillo

1 (17%): Normal

0 (0%): No response

0 (0%): Complicado

0 (0%): Muy complicado

30.a. ¿Qué configuración de su sistema de ventilación utiliza principalmente en invierno?

Dropdown

2 (33%): **Off**

2 (33%): **1**

2 (33%): **2**

0 (0%): No response

0 (0%): 0

0 (0%): 3

30.b. ¿Qué configuración de su sistema de ventilación utiliza principalmente en verano?

Dropdown

3 (50%): **2**

2 (33%): 1

1 (17%): Off

0 (0%): No response

0 (0%): 0

0 (0%): 3

30.c. ¿Cambia la configuración de vez en cuando?

Dropdown

4 (67%): **Sí**

2 (33%): No

0 (0%): No response

30.d. En caso afirmativo. ¿Por qué?

Short answer

- **2 (33%): No response**
- Por que haya humo por cocinar y si tengo visita en la casa
- Es automático, baja a 1 pero nunca sube a 3
- Ahora mismo la hemos apagado porque vemos que el aire que entra está frío y no hay calefacción
- Cuando cocina, hay mucha gente

31.a. ¿Cómo de contento está con la calidad del aire de su vivienda en invierno?

Dropdown

4 (67%): **Muy contento**

1 (17%): Contento

1 (17%): Poco contento

0 (0%): No response

0 (0%): Parcialmente contento

0 (0%): Nada contento

31.b. En caso de estar parcialmente/poco/nada contento ¿Por qué?

Short answer

- **5 (83%): No response**
- Por los olores que entran de la calle

32. ¿Cómo calificas la humedad del aire en invierno?

Dropdown

5 (83%): **Perfecto**

1 (17%): Un poco seco

0 (0%): No response

0 (0%): Demasiada humedas

0 (0%): Un poco de humedad

0 (0%): Muy seco

33.a. ¿Abre las ventanas para ventilar en invierno?

Dropdown

3 (50%): **Sí**

3 (50%): **No**

0 (0%): No response

33.b. ¿Cuánto tiempo?

Short answer

- **3 (50%): No response**
- 10 min
- Pocas veces, en caso de abrir lo hago por la mañana
- 5 minutos

33.c. ¿En qué momento del día?

Checkboxes

3 (50%): **No response**

3 (50%): **Por la mañana**

0 (0%): Al medio día

0 (0%): Por la tarde

0 (0%): Por la noche

34.a. ¿Cómo de contento está con la calidad del aire de su vivienda en verano?

Dropdown

4 (67%): **Muy contento**

2 (33%): Poco contento

0 (0%): No response

0 (0%): Contento

0 (0%): Parcialmente contento

0 (0%): Nada contento

34.b. En caso de estar parcialmente/poco/nada contento ¿Por qué?

Short answer

- **4 (67%): No response**
- No funciona
- Por los olores que entran de la calle

35.a. ¿Abre las ventanas para ventilar en verano?

Dropdown

5 (83%): **Sí**

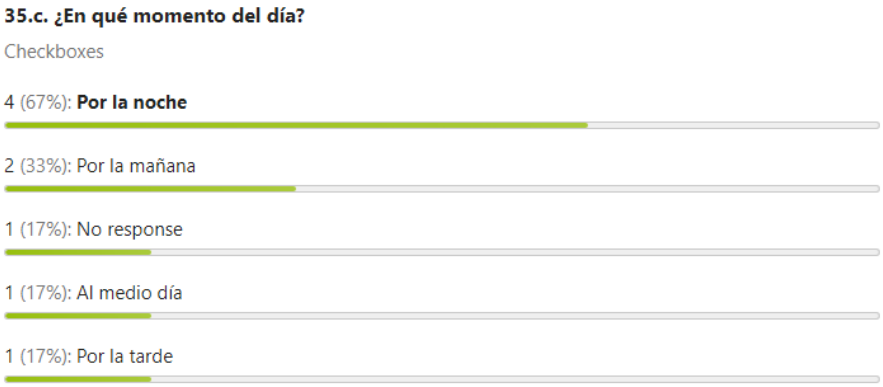
1 (17%): No

0 (0%): No response

35.b. ¿Cuánto tiempo?

Short answer

- **1 (17%): No response**
- 8 horas
- Por la noche
- 1 hora
- La puerta de la terraza está abierta todo el día para que el gato pueda entrar y salir.
- 1 hora



2.1.3. Interpretation of the findings / Conclusions

It is important to highlight that the first two surveys were carried out in the month of November at a time when the heat pump was not working correctly. That meant that it did not work at all to cool during the first summer and to heat the apartments the first cold weeks of the winter. The surveys together with the monitoring data helped diagnose the problem and solve it. The other four surveys were made in June, after the first year of living in the houses.

The inhabitants of these social housing have not chosen to live in an Enerphit building with high comfort features and low energy consumption, since it is public housing assigned by the local administration.

All of them value the new home positively, compared to their previous home. Some elderly people comment even that they have never enjoyed such comfortable housing and they are sorry to have discovered EnerPHit quality at the end of their lives.

The owner (Aragón government) has designated a contact person to instruct and resolve tenants' questions, which has made adaptation to the new systems much easier. Although most of them are old people and it is difficult for them to understand it. Most of the doubts arise regarding the ventilation system with heat recovery, since it is very unusual in homes in Spain. In the survey we can see how some tenants even turn off the ventilation system because they consider that it brings cold air into the home.

During the completion of the questionnaire we have detected how many of the participants are not clear about the temperatures at which they feel comfortable in summer and winter, considering it important to include this information in future trainings. This results in poor user behavior when setting thermostat temperatures.

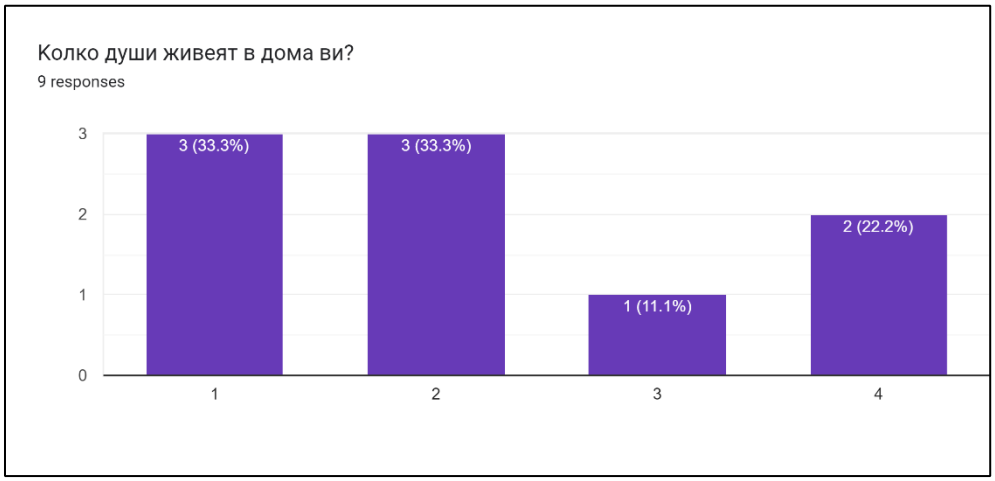
It should be noted that during this first year there have been several problems with the production of hot water, and several negative comments have been collected in this regard.

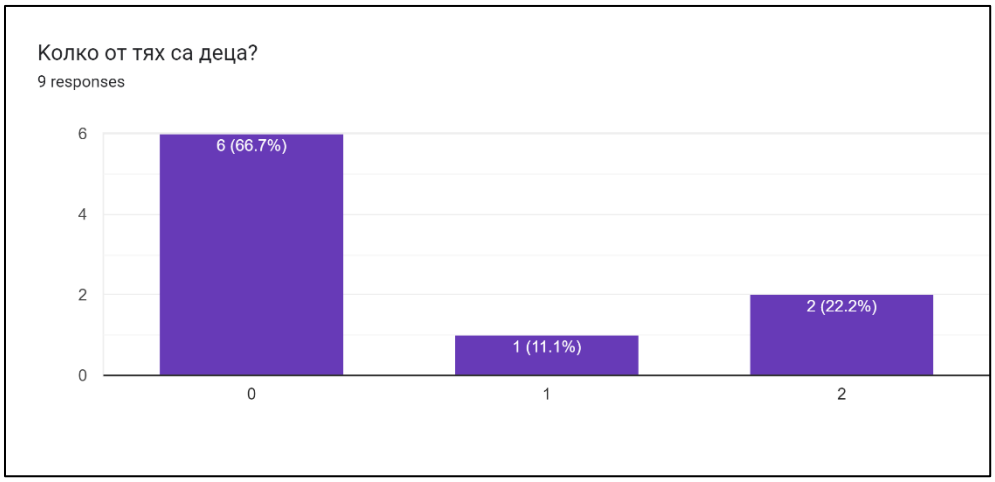
2.2. ENEFFECT OP32 BURGAS – SOCIAL HOUSING

2.2.1. General overview

- Survey length: 49 questions
- Mode: online via Google Forms
- Dates presented: 30 May – 1 June 2024
- Number of respondents: 9

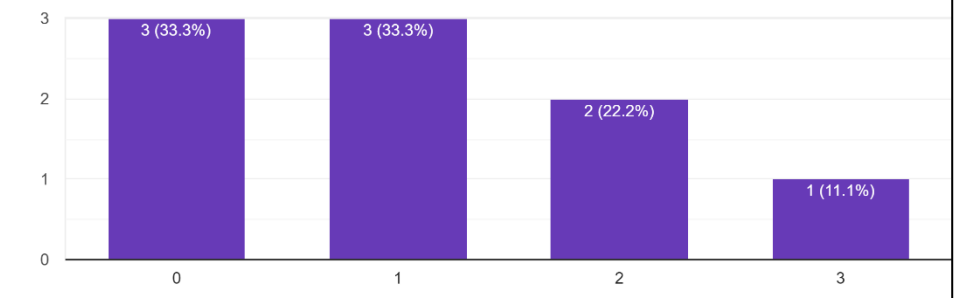
2.2.2. Presentation of the findings





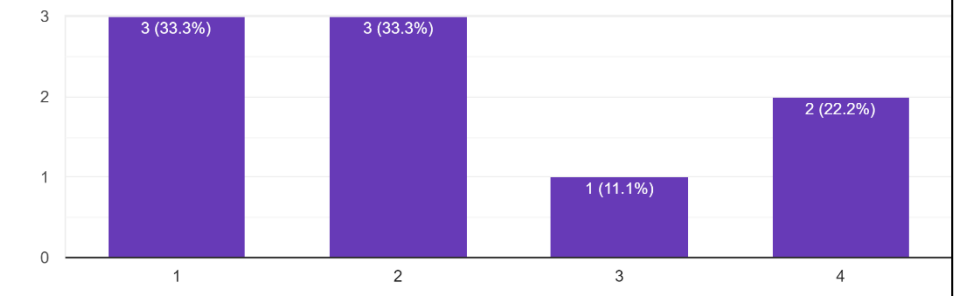
Колко души са средно в жилището през деня през седмицата?

9 responses



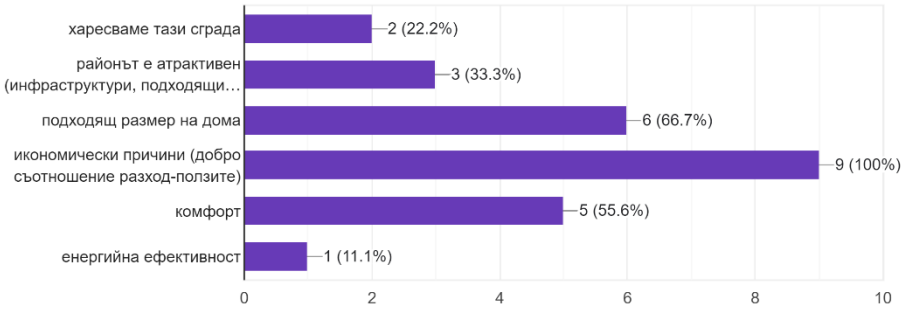
Колко души са средно в жилището през деня през почивните дни?

9 responses



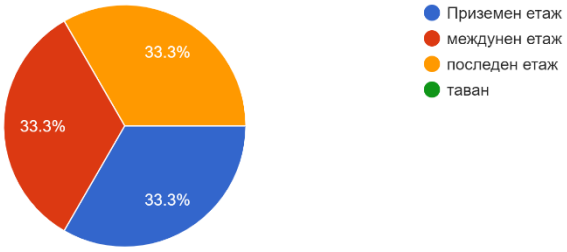
Каква беше основната причина за преместването тук?

9 responses



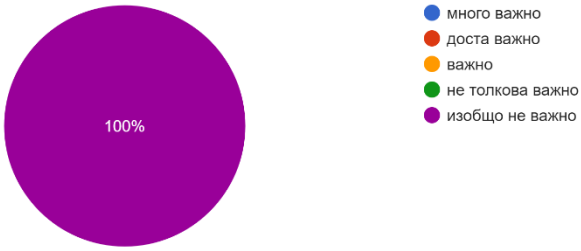
Къде се намира вашата жилище в сградата?

9 responses



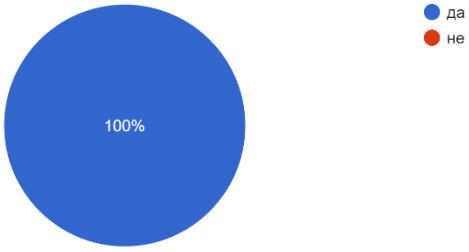
Колко важно беше за вас да се преместите в пасивна къща?

1 response



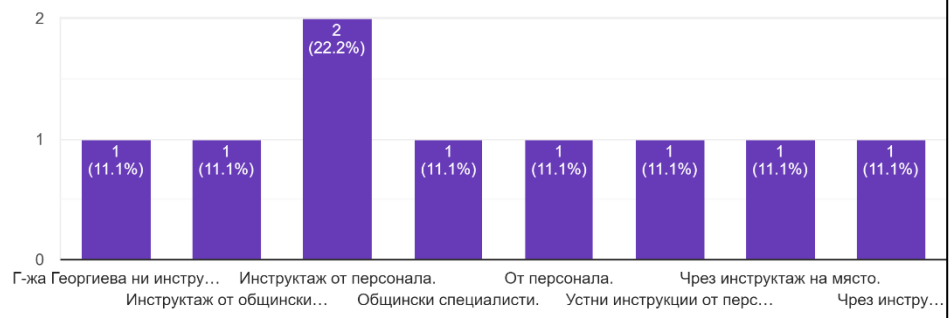
Инструктирани ли сте как да се справите с новия си дом?

9 responses



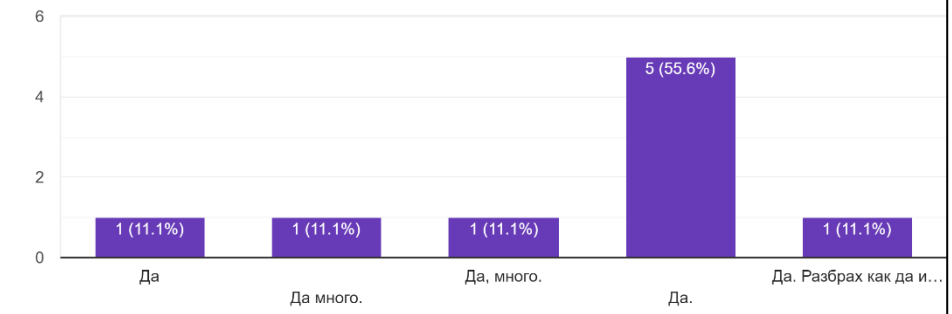
Ако да, по какъв начин?

9 responses



Полезна ли Ви беше тази информация ?

9 responses



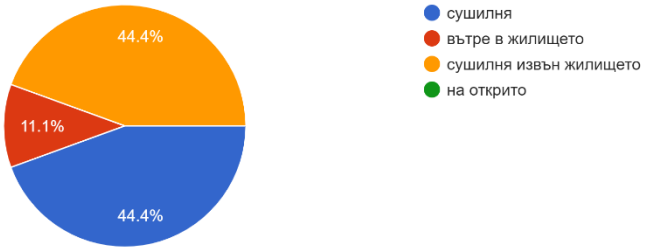
Имате ли контактно лице, когато имате въпроси как да управлявате дома си?

9 responses

- Общинските служители.
- Да, служител на общината.
- Офиса в общината.
- Персонала в сградата.
- Г-жа Георгиева.
- Да, от общината.
- Общински работник.
- Да, в общинския офис.
- Управителят на сградата

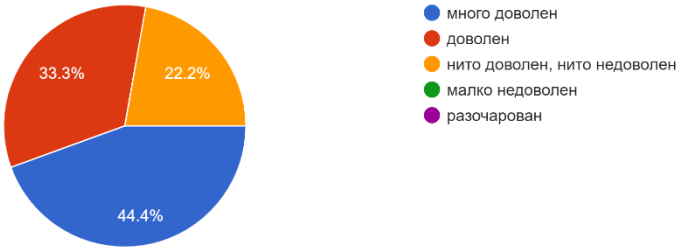
Как си изсушавате прането?

9 responses



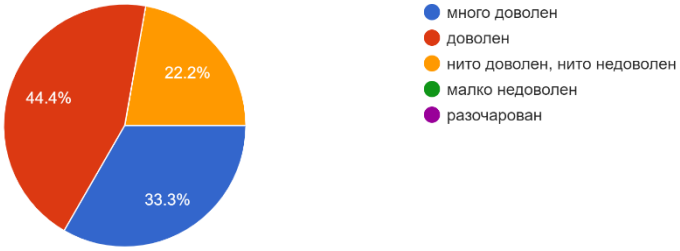
Колко сте доволни от дома си?

9 responses



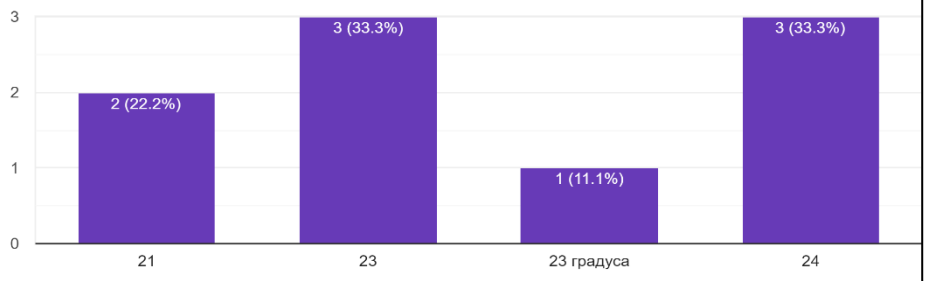
Колко сте доволни от комфорта на жилището през зимата?

9 responses



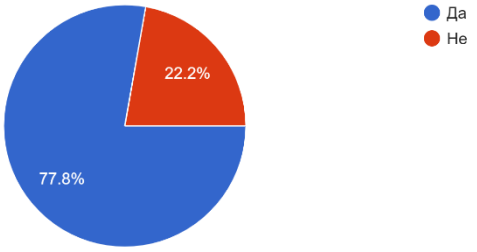
Каква е средната температура в жилището през зимата?

9 responses



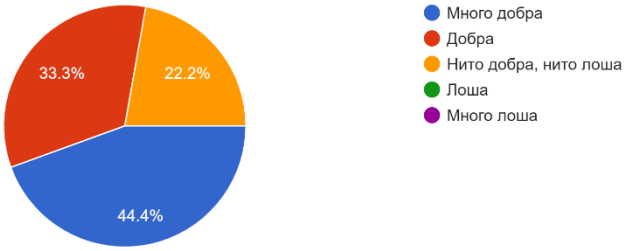
Подходяща ли е тази температура за вас?

9 responses



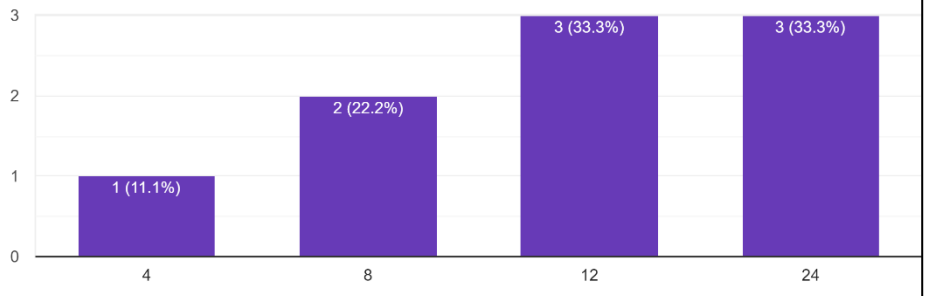
Как бихте оценили работата на отоплителната система на жилището?

9 responses



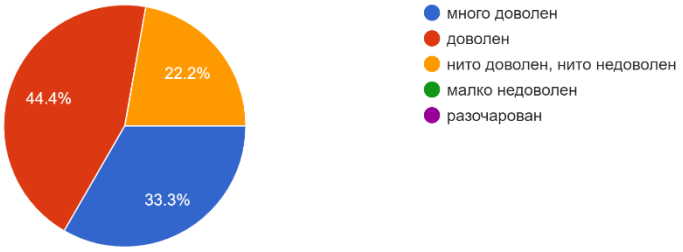
Колко часа на ден е включена отоплителната система?

9 responses



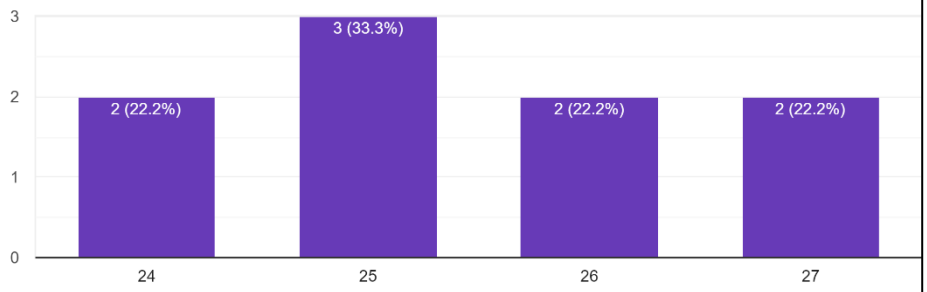
Колко сте доволни от комфорта на жилището през лятото?

9 responses



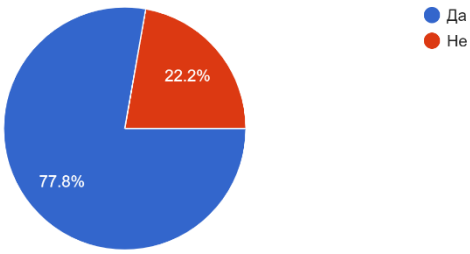
Каква е средната температура в жилището през лятото?

9 responses



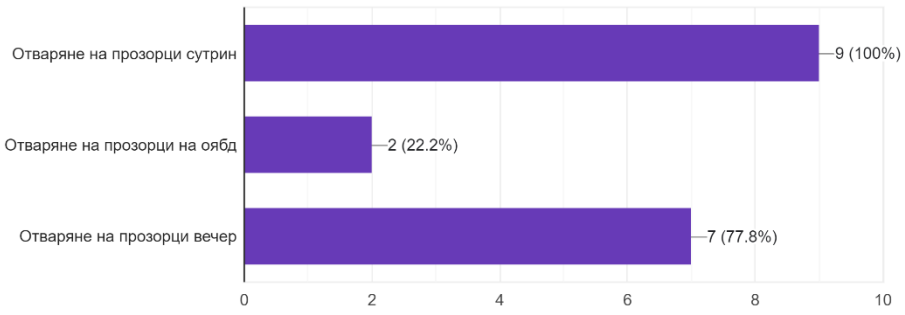
Подходяща ли е тази температура за вас?

9 responses



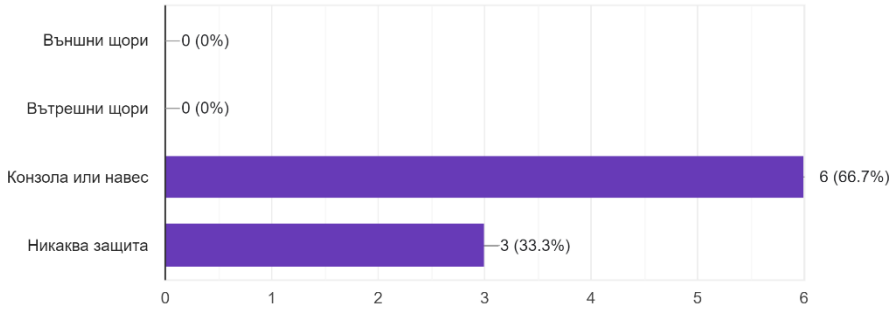
Какво правите, за да избегнете прегряване през лятото?

9 responses



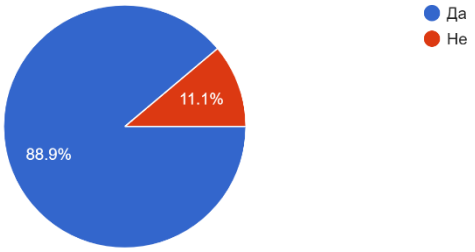
Какъв вид слънчева защита имат прозорците на дома ви?

9 responses



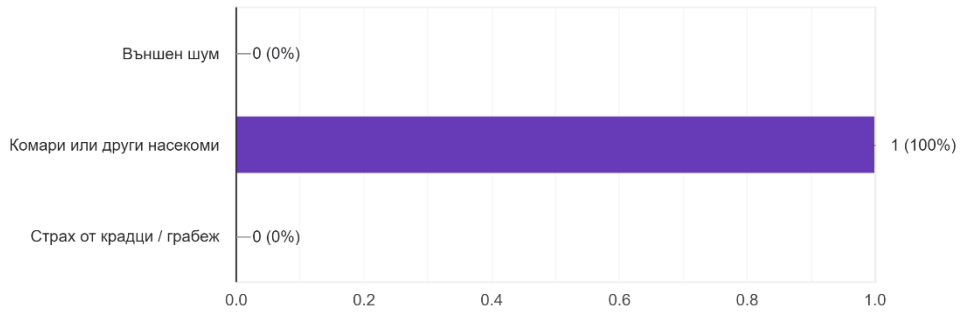
Възможно ли е да отворите прозорците през нощта, за да охладите къщата?

9 responses



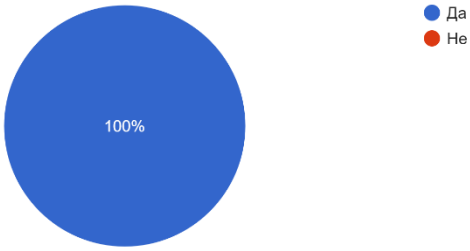
Ако не, коя е причината?

1 response



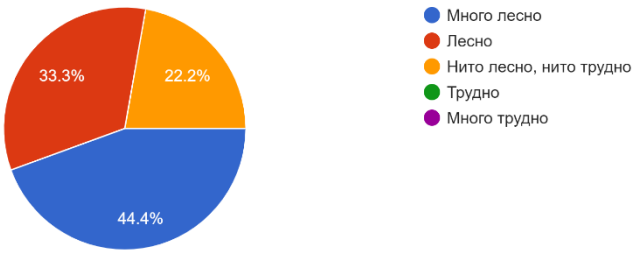
Жилището има ли активна охлаждаща система?

9 responses



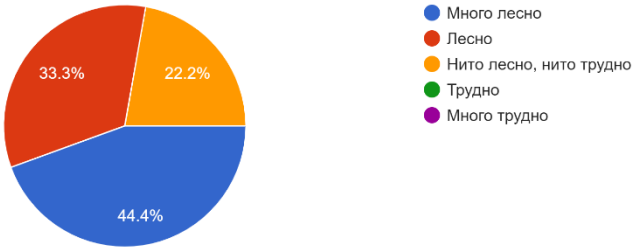
Как бихте оценили управлението на охладителната система на жилището?

9 responses



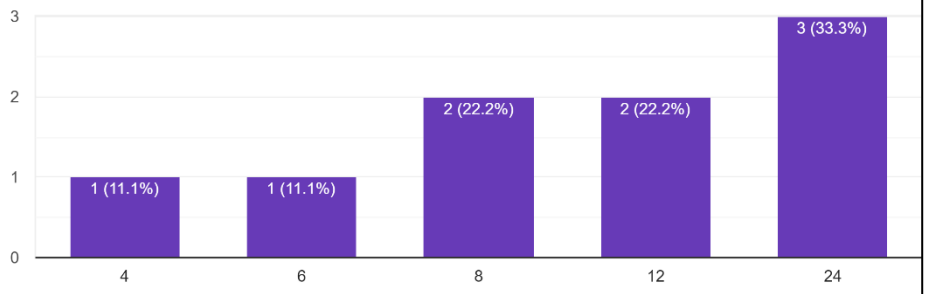
Как бихте оценили управлението на охладителната система на жилището?

9 responses



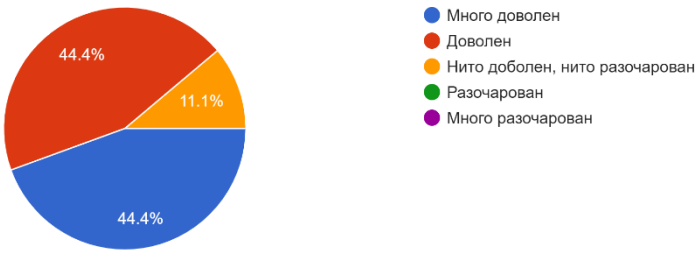
Колко часа на ден поддържате охлаждащата система включена?

9 responses



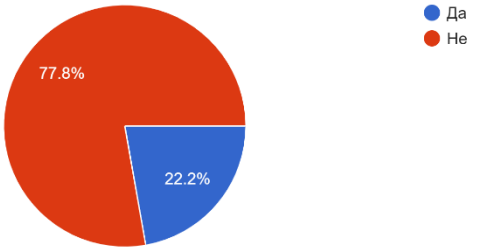
Колко сте доволни от производството на битова топла вода?

9 responses



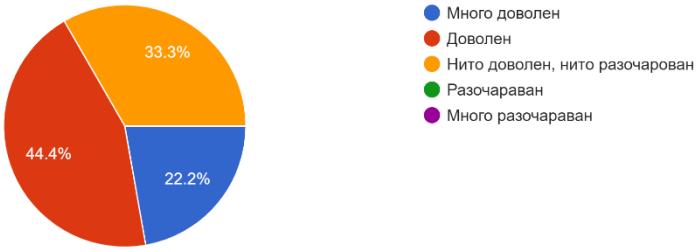
Някой пуши ли в къщата?

9 responses



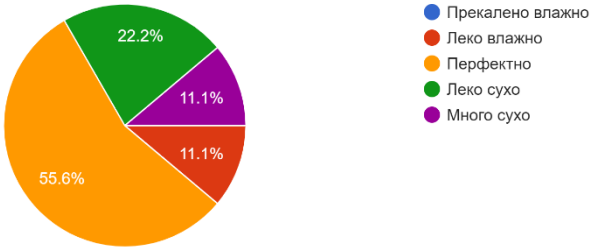
Колко сте доволни от качеството на въздуха в жилището през зимата?

9 responses



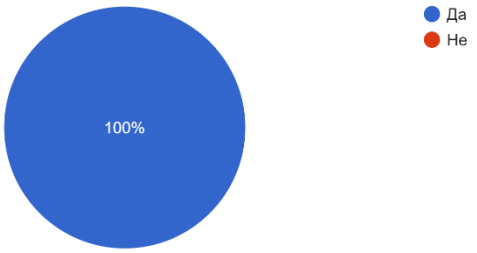
Как оценявате влажността на въздуха през зимата?

9 responses



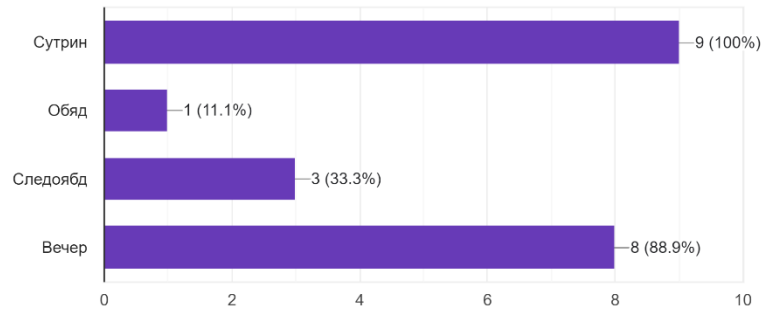
Отваряте ли прозорците за вентилация през зимата?

9 responses



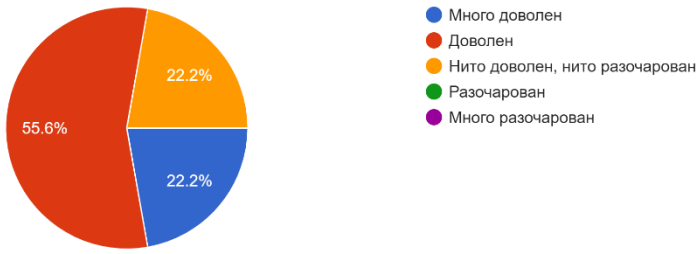
В какво време от деня?

9 responses



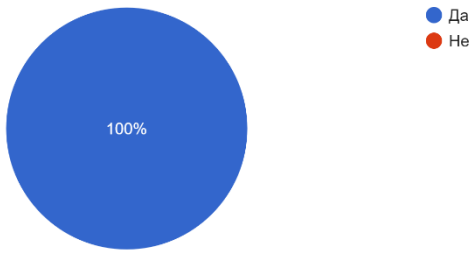
Колко сте доволни от качеството на въздуха в къщата през лятото?

9 responses



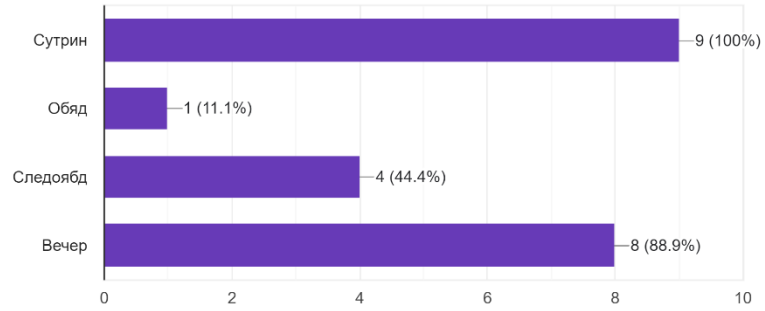
Отваряте ли прозорците за вентилация през лятото?

9 responses



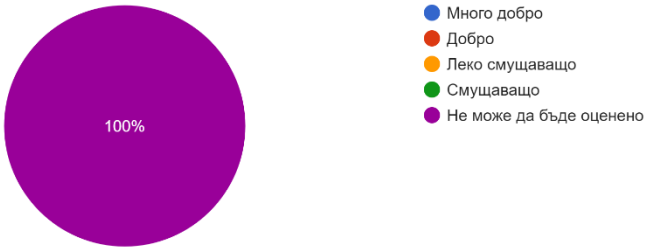
В какво време от деня?

9 responses



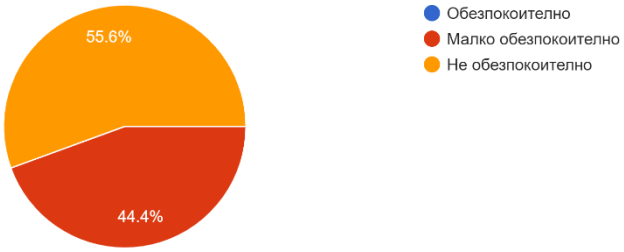
Как намерихте процеса на обновяване да засяга ежедневието ви?

7 responses



Как се чувствате за използването на сензори в дома ви?

9 responses

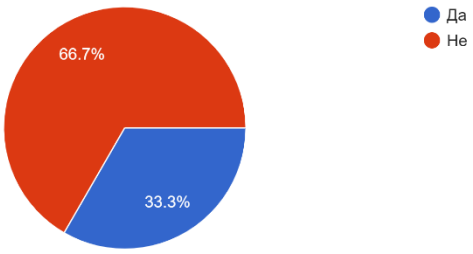


Ако сте били обезпокоени, защо?

4 responses

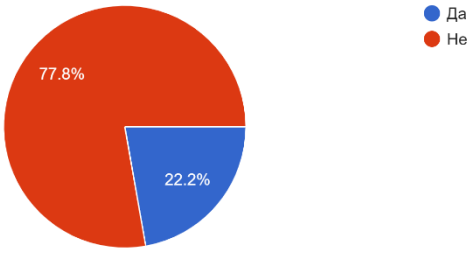
Интересувате ли се от данните?

9 responses



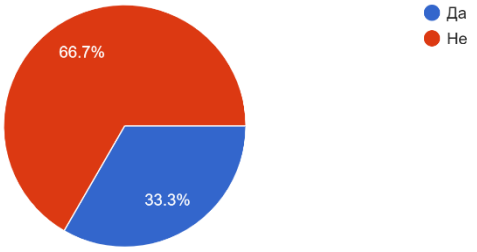
Бихте ли се интересували от предложения, свързани с енергията и комфорта за подобряване на жизнената си ситуация?

9 responses



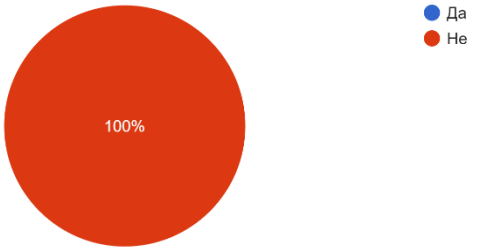
Бихте ли приветствали повече сензори в сградата, ако получите резултатите?

9 responses



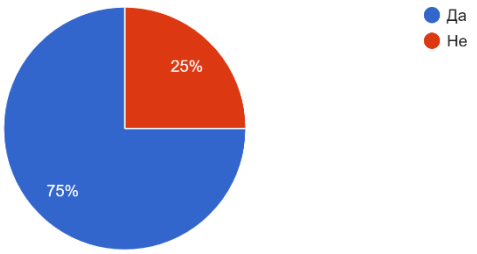
Участвахте ли в процеса на вземане на решения за обновяването?

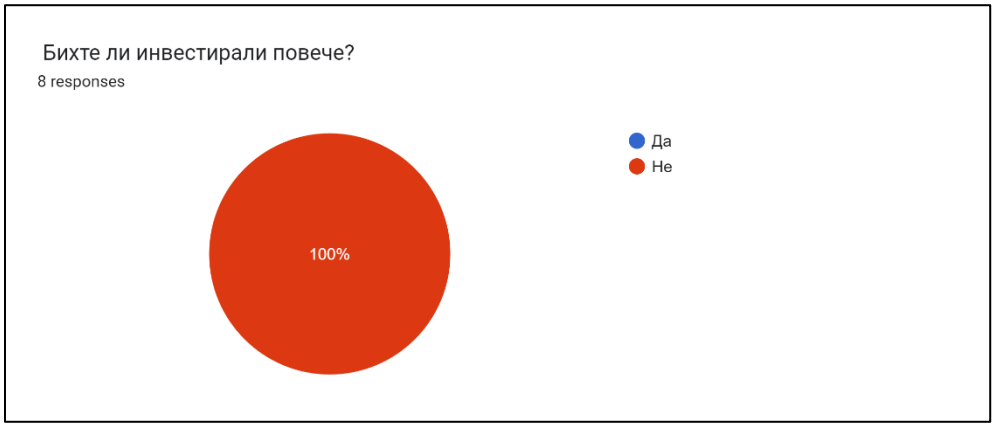
9 responses

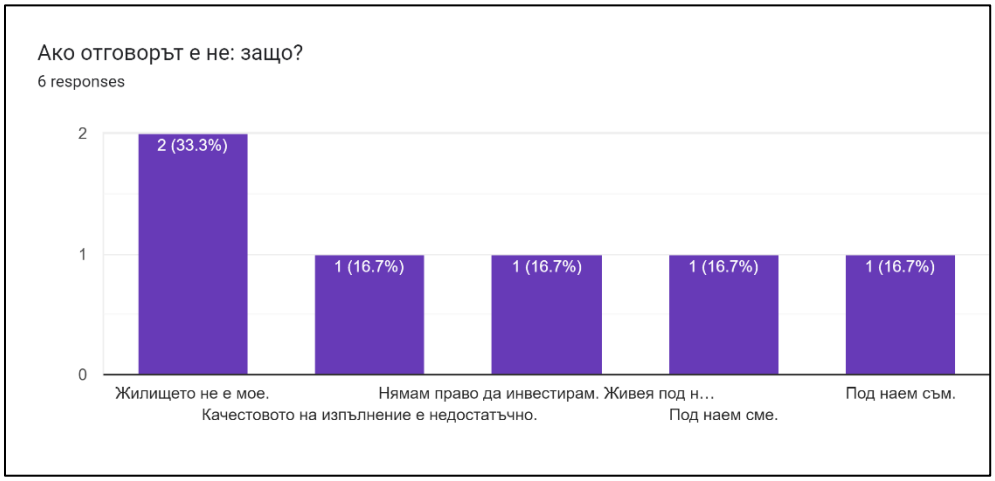


Доволен ли сте от енергийните цели?

8 responses







2.2.3. Interpretation of the findings / Conclusions

Demographics and Occupancy: The questionnaire reveals that most households consist of 2-3 people, with a significant number having children. Occupancy patterns show that during weekdays, apartments typically have 1-2 people present, while on weekends, this increases to 2-3 people. This suggests that residents likely work or study outside the home during weekdays.

Relocation and Building Awareness: The primary reasons for moving to this building were equally split between "better living conditions" and "lower rent," indicating that the project successfully attracts residents with both quality of life and affordability concerns. Interestingly, only one respondent considered moving to a passive house important, suggesting that energy efficiency may not have been a primary motivator for most residents.

Most residents (7 out of 9) received instructions on how to manage their new home, primarily through verbal explanations and user manuals. All respondents found this information useful, which highlights the importance of proper education for residents in energy-efficient buildings.

Thermal Comfort and Energy Systems: Winter Comfort: Residents generally express high satisfaction with winter comfort. The majority report average winter

temperatures between 20-22°C, which most find suitable. The heating system is rated positively, with most residents using it for 5-10 hours per day.

Summer Comfort: Summer comfort levels are also high, with temperatures typically ranging from 22-26°C. To avoid overheating, residents primarily rely on opening windows and using internal blinds or curtains. While all apartments do have active cooling systems, those that do use them do so for varied durations.

Ventilation and Air Quality: Residents report high satisfaction with air quality in both winter and summer. Most open windows for ventilation in both seasons, typically in the morning or evening. This suggests good natural ventilation practices, which is important for maintaining indoor air quality in energy-efficient buildings. Mechanical ventilation is not present in the building.

Hot Water and Laundry: Satisfaction with hot water production is generally high. For laundry, most residents use a combination of indoor drying racks and outdoor drying, which aligns well with energy-efficient practices.

Smart Home Features: Residents show a mixed response to the use of sensors in their homes, with some expressing concerns about privacy. However, there's a strong interest in energy and comfort-related data and suggestions for improving living conditions. Most residents would welcome more sensors if they received the results, indicating an openness to smart home technologies when there's a clear benefit.

Decision-Making and Energy Goals: While none of the residents took part in the construction decision-making process, the majority are satisfied with the energy goals. There's a split opinion on whether they would invest more, with those unwilling citing financial reasons or satisfaction with current conditions.

Conclusions:

1. The Observer Project 32 appears to be successful in providing comfortable, energy-efficient housing that meets residents' needs in terms of both living conditions and affordability.

2. Resident education on operating their homes efficiently is crucial and well-received, suggesting this should be a key component of similar projects.

3. The building performs well in terms of thermal comfort and air quality across seasons, indicating successful implementation of some of the passive house principles.

4. There's a positive attitude towards energy efficiency and smart home technologies, but with some reservations about privacy. This suggests a need for clear communication about the benefits and data protection measures in place.

5. While residents are generally satisfied with energy goals, there's limited willingness to invest more personally. This highlights the importance of balancing energy efficiency measures with affordability in social housing projects.

Overall, the Observer Project 32 demonstrates that energy-efficient social housing can successfully meet resident needs and preferences while achieving sustainability goals. The insights gained from this survey could inform future projects, particularly in areas of resident education, smart home technology implementation, and balancing efficiency with affordability.

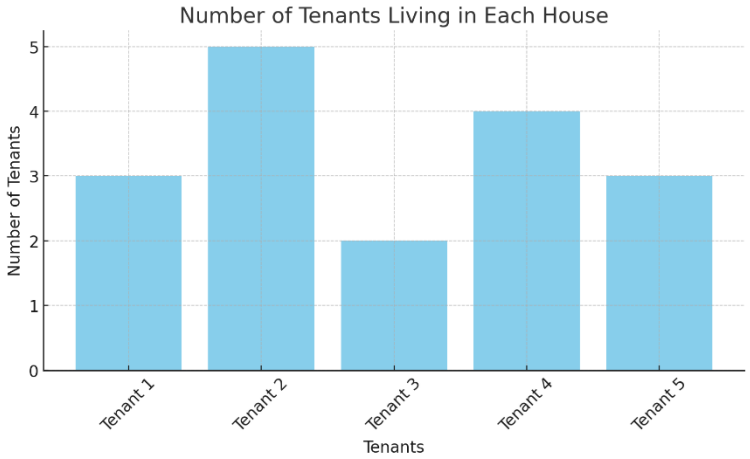
2.3. PHFNL CS30 GOESE POLDER – SOCIAL HOUSING

2.3.1. General overview

- Survey length: 44 questions and in total 70 answers
- Mode: personal by Frank Grootenboer
- Dates presented: 1 July – 25 August 2024
- Number of respondents: 5

2.3.2. Presentation of the findings

Below a summary and a table of the general question for the interviewed 5 tenants of the 194 social houses in Goese Polder at Goes, the Netherlands. The occupation is on average 3.6 person per Household, whereby the average in the weekend is much higher than during the weeks. The homeowners are carefully instructed by the social housing company and the contractor, and the homeowners found this guidance very useful. At the start the tenants did not know what a passive house was, but it sounds exactly to good to be true based on what the newsletter stated. the tenants did not move; they were already living in these houses, and it was renovated when they lived in this house. The tenants had questions about shading and cooling their homes, to reduce overheating and how they can use the ventilation system to reduce this overheating. Inquiries revealed the social housing company provided the option for installing sun blinds on the facade outside the window, which is individually choice for the tenants. See below the answers on the questions.

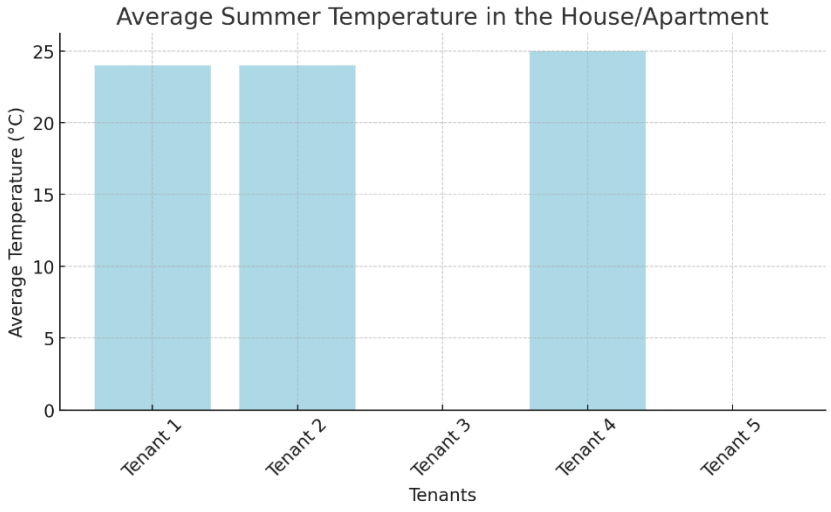


	GENERAL QUESTIONS		1	2	3	4	5
1.a	How many people live in your home?		Inwoners	Average a house:			
	ANSWERS:		18	3,6			
1.b	How many are children?		Inwoners jonger dan 18 jaar	Average a house:			
	ANSWERS:		8	1,6			
2.	How many people are in the house on average during the day?		Total Maandag-vrijdag	Total Weekend			
	ANSWERS:		9	18			
3.	What was the main reason for moving here?		Ik / Wij vinden het huis leuk	De omgeving is aantrekkelijk (infrastructuur, kindvriendelijk ...)	Geschikte woninggrootte	Economische redenen (goede kosten-batenverhouding)	Comfort
	ANSWERS:		no anwers				
4.	Where is your house/appartment located within the building?		Begane grond	Tussenvloer	Bovenste verdieping of zolder		
	ANSWERS:		5				
5.	How important was it for you to move into a Passivhaus?		Zeer belangrijk	Heel belangrijk	Belangrijk	minder belangrijk	niet belangrijk
	ANSWERS:						5
6.a	Have you been instructed on how to deal with your new home?		JA	GEEN			
	ANSWERS:		5				
6.b	If yes, in what way?		Overzicht van antwoorden				
	ANSWERS:		Nieuwsbrief				
6.c	Was this information useful to you?		JA	GEEN			
	ANSWERS:		5	0			
6.d	What would you like to know more about? What information was insufficient?		Overzicht van antwoorden				
	ANSWERS:		Niets, was voldoende	Ventileren	niets	Ventileren in de zomer	Koelen in de zomer
7.a	Do you have a contact person when you have questions about how to manage your home?		JA	GEEN			
	ANSWERS:		5	0			
7.b	If yes: Do you find this important and useful?		Overzicht van antwoorden				
	ANSWERS:		niet echt	ja	nee	ja	geen ervaring mee
8.	How do you dry the laundry?		elektrische droger	binnen het huis (touw, lijn)	droogruimte buiten het huis	buiten (touw, lijn)	
	ANSWERS:		3	1		1	
9.	How satisfied are you with your home?		Zeer tevreden	tevreden	noch tevreden noch ontevreden	enigszins ontevreden	zeer ontevreden
	ANSWERS:		3	2			
10.	Do you have any suggestion to improve the quality of the house?		Overzicht van antwoorden				
	ANSWERS:		Zonwering aanbrengen	-	nee	Koelen in de zomer	Koeling zomermaanden

Below a summary and a table of winter comfort and heating questions for the interviewed 5 tenants of the social houses in Goese Polder at Goes, the Netherlands. most tenants are very satisfied with the comfort of their homes during winter. 80% sees a improvement in winter, after renovation and everyone is happy with the temperature. The average indoor temperature reported by the 5 tenants is 21 degrees Celsius. Almost all tenant finds the manageability of the heating system of the house very easy or easy to use. Therefore, some tenants do not know how many hours a day the heating works, most tenants keep the thermostat set at a stable temperature, around the 21 degrees Celsius. See below the answers on the questions.

	WINTER COMFORT / HEATING		1	2	3	4	5
11.a	How satisfied are you with the confort of the house in winter?		Zeer tevreden	tevreden	tevreden noch ontevreden	enigszins ontevreden	zeer ontevreden
	ANSWERS:		3	1	1		
11.b	If you are not satisfied. Why?		Overzicht van antwoorden				
	ANSWERS:						
11.c	Have you noticed an improvement in comfort in winter compared to the original house?		JA	GEEN			
	ANSWERS:		4	1			
12.a	What is the average temperature in the house / appartment in winter?		App. ºC (gemiddelde voor antwoorden)	Ik weet het niet			
	ANSWERS:		21 graden	22 graden	20 graden	-	21 graden
12.b	Is this temperature right for you?		JA	GEEN			
	ANSWERS:		5				
12.c	If not, what temperature would be ideal for you?		App. ºC (gemiddelde voor antwoorden)				
	ANSWERS:						
13.	How would you evaluate the operation of the heating system of the house?		Zeer goed	goed	noch goed noch slecht	slecht	zeer slecht
	ANSWERS:		2	2	1		
14.	How would you evaluate the manageability of the heating system of the house?		Zeer gemakkelijk	Gemakkelijk	noch gemakkelijk noch ingewikkeld	Gecompliceerd	Zeer ingewikkeld
	ANSWERS:		2	3			
15.	How many hours a day do you keep the heating system on?		Verwarmingsuren per dag				
	ANSWERS:		geen idee	soms	gaat automatisch	niet bekend	thermostaat bijft altijd op 21 staan

Below a summary and a table of summer comfort and cooling questions for the interviewed 5 tenants of the social houses in Goese Polder at Goes, the Netherlands. Tenants expected a better temperature in the summer and were hoping that is was like a fridge, well insulated so it would be cool. But many tenants did not have sunscreens to protect against the sun. Nevertheless, the average indoor temperature during summer is 25 degrees Celsiuswhich the acceptable range for a Passive House. Although the tenants may have had higher expectations, the comfort has increased compared to the old situation. in the previous situation, the wooden beams in the attic floor would often creak due to temperature changes, this was solved after insulation during the renovation.



	SUMMER COMFORT / COOLING		1	2	3	4	5
16.a	How satisfied are you with the confort of the house in summer?		Zeer tevreden	tevreden	tevreden noch ontevreden	enigszins ontevreden	zeer ontevreden
	ANSWERS:				2	2	1
16.b	If you are not satisfied. Why?		Overzicht van antwoorden				
	ANSWERS:		het blijft lang warm	het wordt na de renovatie ook te warm	het wordt na de renovatie ook te warm	te warm na een langere tijd hoge buiten temperaturen	
16.c	Have you noticed an improvement in comfort in summer compared to the original house?		JA	GEEN			
	ANSWERS:		3	2			
17.a	What is the average temperature in the house in summer?		App. ºC (gemiddelde voor antwoorden)	Ik weet het niet			
	ANSWERS:		24 graden	24 graden	no idea	25 graden	no idea
17.b	Is this temperature right for you?		JA	GEEN			
	ANSWERS:		1	4			
17.c	If not, what temperature would be ideal for you?		App. ºC (gemiddelde voor antwoorden)				
	ANSWERS:		20 graden			22 graden	22 graden
18.a	What do you do to avoid overheating in summer? OPEN WINDOWS		Open ramen ... in de ochtend	...bij zonsondergang	...'s nachts		
	ANSWERS:				5		
18.b	What do you do to avoid overheating in summer? SOLAR PROTECTION		JA	GEEN			
	ANSWERS:			5			
19.	What type of solar protection have the windows of your home?		Externe rolluiken	Binnenzonwering	Overstek of luifel		
	ANSWERS:				5		
20.	Is it possible to open the windows at night to cool down the house?		JA	GEEN			
	ANSWERS:		5				
21.	If not, which is the reason?		Buitengeluid	Muggen of andere insecten	Angst voor indringers / overvallen		
	ANSWERS:						
22.	Does the house have an active cooling system?		JA	GEEN			
	ANSWERS:			5			
23.	How would you evaluate the manageability of the cooling system of the house?		Zeer gemakkelijk	Gemakkelijk	noch gemakkelijk noch ingewikkeld	Gecompliceerd	Zeer ingewikkeld
	ANSWERS:						
24.	How many hours a day do you keep the cooling system on?		Koeluren per dag				

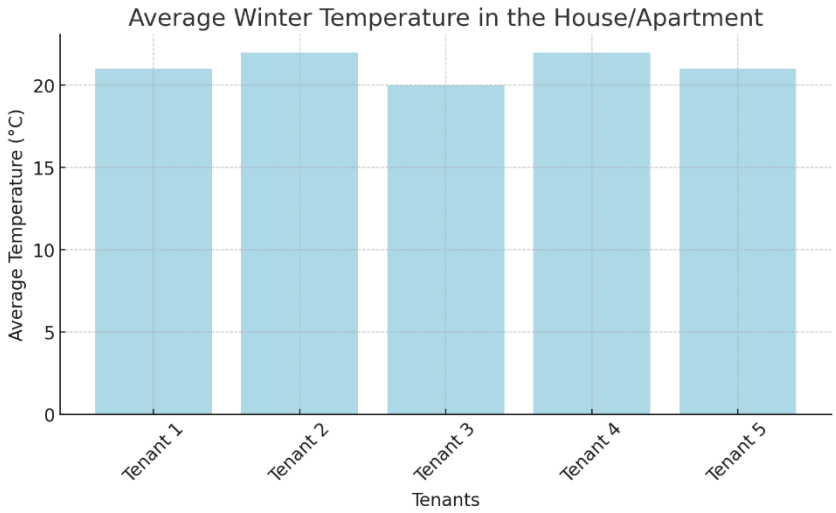
Below a summary and a table of domestic hot water questions for the interviewed 5 tenants of the social houses in Goese Polder at Goes, the Netherlands.

On average tenants are happy with the production of domestic hot water. In the Netherlands there is no hot water circuit compared to Germany, so the waiting time for warm tap water is slightly longer.

	DOMESTICAL HOT WATER		1	2	3	4	5
25.a	How satisfied are you with the production of domestic hot water?		Zeer tevreden	tevreden	tevreden noch ontevreden	enigszins ontevreden	zeer ontevreden
	ANSWERS:			3	1	1	
25.b	If you are not satisfied. Why?		Overzicht van antwoorden				
	ANSWERS:			Duurt lang voordat je beneden warm water hebt.			

Below a summary and a table of ventilation questions for the interviewed 5 tenants of the social houses in Goese Polder at Goes, the Netherlands.

Every tenant has noticed a significant improvement in air quality in their homes caused by a goof functioning mechanical ventilation system with heat recovery. In the winter times the ventilation could be lowered to level 1 instead of level 2. Advantage of Goese Polder that is close by the sea, therefore the temperatures will not drop to very low levels during winter times and will be very high during summer times. Also, the humidity is quite high during winter times close by the sea, so the necessity to get one level lower of the ventilation is advised, but it will be all right when it is not a really cold winter. Every tenant is satisfied of the ventilation system, with heat recovery and the maintenance and the change of filters is done by the social housing company. During the summer most tenant will open their windows during the night for summer -night ventilation.



	VENTILATION		1	2	3	4	5
26.	Have you noticed the improvement in air quality in your home by incorporating a mechanical ventilation system?		JA	GEEN			
	ANSWERS:		5				
27.	Does anyone smoke in the house?		JA	GEEN			
	ANSWERS:		1	4			
28.	How effective is ventilation in removing bad smells?		Zeer effectief	effectief	gedeeltelijk effectief	niet erg effectief	helemaal niet effectief
	ANSWERS:		1	2	1	1	
29.	How would you evaluate the manageability of the ventilation system?		Zeer gemakkelijk	eenvoudig	noch gemakkelijk noch ingewikkeld	ingewikkeld	erg ingewikkeld
	ANSWERS:		1	4			
30.a	What configuration of your ventilation system do you mainly use IN WINTER?		uit	1	2	3	
	ANSWERS:				5		
30.b	What configuration of your ventilation system do you mainly use IN SUMMER?		uit	1	2	3	
	ANSWERS:				4	1	
30.c	Do you change the configuration at any time?		JA	GEEN			
	ANSWERS:			5			
30.d	If yes. Why?		Overzicht van antwoorden				
	ANSWERS:						
31.a	How satisfied are you with the air quality of the house in winter?		Zeer tevreden	tevreden	tevreden noch ontevreden	enigszins ontevreden	zeer ontevreden
	ANSWERS:			5			
31.b	If you are not satisfied. Why?		Overzicht van antwoorden				
	ANSWERS:						
32.	How do you evaluate the humidity of the air in winter?		Te veel vochtigheid	een beetje vocht	perfect	een beetje droog	erg droog
	ANSWERS:						x
33.a	Do you open the windows to ventilate in winter?		JA	GEEN			
	ANSWERS:		3	2			
33.b.	How long?		Openingstijd per dag				
	ANSWERS:		1 uur	3 uur			2 uur
33.c	At what time of the day?		In de ...ochtend	...op de middag	...middag	...avond	
	ANSWERS:		3				
34.a	How satisfied are you with the air quality of the house in summer?		Zeer tevreden	tevreden	tevreden noch ontevreden	enigszins ontevreden	zeer ontevreden
	ANSWERS:			3	2		
34.b	If you are not satisfied. Why?		Overzicht van antwoorden				
	ANSWERS:						
35.a	Do you open the windows to ventilate in summer?		JA	GEEN			
	ANSWERS:		x				
35.b	How long?		Openingstijden per dag				
	ANSWERS:		8	-	7	8	10
35.c	At what time of the day?		In de ...ochtend	...op de middag	...middag	...avond	
	ANSWERS:		1			5	

Below a summary and a table of renovation questions for the interviewed 5 tenants of the social houses in Goese Polder at Goes, the Netherlands. Communication was a key factor for both the social housing company and the contractor. Especially when in the social housing sector, with differentiated inhabitants and population groups population. The questioned tenants were mostly satisfied how the renovations were done and they appreciated the contractor's assistance in clearing the attic floor, what was needed for the roof insulation. Particularly positive was the speed of the renovation process, much faster than expected, even though they had promised this.

	RENOVATION		1	2	3	4	5
	If the residents were already in the building before the renovation or during the renovation:						
36.a.	How did you find the restructuring process affecting your everyday life?		Zeer goed	goed	licht verontrustend	storend	Beoordeling niet mogelijk
	ANSWERS:		1	2	2		
36.b.	If disturbing or slightly disturbing. What did you find disturbing?		Duur van de renovatiemaatregel	Geluidsniveau	Structurele ingrepen in je eigen leefruimte	Beperkingen op toegangswegen (voetpad of weg) voor voertuigen en materialen van de bouwplaats	Anderen
	ANSWERS:				1	1	
36.c.	If very good, What did you find particularly positive?		Overzicht van antwoorden				
	ANSWERS:				Snelheid	Snelheid	

Below a summary and a table of sensor technology questions for the interviewed 5 tenants of the social houses in Goese Polder at Goes, the Netherlands. due to the housing corporation's caution, fearing the renovation might be disappointing, we were ultimately not allowed to install sensors, even though this had been promised earlier. Now that the results are very satisfactory and the residents are happy, we have agreed to implement this in the coming period. We are happy to do this because we are looking forward to the verified results that we get from the measurements of the sensors.

	SENSOR TECHNOLOGY		1	2	3	4
37.a.	How do you feel about the use of sensors in your home?		Storend	Enigszins verontrustend	Niet storend	Beoordeling niet mogelijk
	ANSWERS:					5
37.b.	If disturbing, why?		Gegevensbescherming / bewaking	Optiek / opvallendheid in de kamer	Andere	
	ANSWERS:					
38.	Would you be interested in the data?		JA	GEEN	Beoordeling niet mogelijk	
	ANSWERS:					
39.	Would you be interested in energy and comfort-related suggestions for improving your living situation?		JA	GEEN	Beoordeling niet mogelijk	
	ANSWERS:					
40.	Would you welcome more sensors in the building if you got the results?		JA	GEEN	Beoordeling niet mogelijk	

Below a summary and a table of investment questions for the interviewed 5 tenants of the social houses in Goese Polder at Goes, the Netherlands. The project is owned by a housing corporation and the time had come to renovate the homes. Because the tenants are not owners, they cannot answer the investors questions. Before the start of the renovation, the tenants were informed and kept up to date by means of newsletters, among other things. Most tenants are not familiar with the passive construction method, and it sounded too good to be true. This set the bar high, and the parties were very cautious about monitoring, because if they do, it will often happen when something is wrong. They wanted to avoid any perception that there were issues with the renovated buildings

	INVESTMENT		1	2	3	4	5
41.	Were you involved in the decision-making process for the renovation?		JA	GEEN	Geen antwoord		
	ANSWERS:			5			
42.	Are you satisfied with the energetic goals?		JA	GEEN	Beoordeling niet mogelijk		
	ANSWERS:				5		
43.	What was the motivation behind the renovation?		Betere energie-efficiëntie	Stijging van de waarde van het onroerend goed	Duurzaamheid	Comfortverbetering	Andere
	ANSWERS:						
44.a.	Would you have liked to invest more?		JA	GEEN	Beoordeling niet mogelijk		
	ANSWERS:				5		
44.b.	If the answer is no: Why did this fail?		Overzicht van antwoorden				
	ANSWERS:						

2.3.3. Interpretation of the findings / Conclusions

The questionnaire indicates that most households have 2 to 5 occupants, with a significant number having children. All tenants received instructions on how to manage their new home, primarily through verbal explanations and user manuals. All respondents found this information useful, which highlights the importance of proper education for residents in energy-efficient buildings. Tenants generally express high satisfaction with winter comfort. The majority report average winter temperatures between 20-22°C, which are most finding suitable. The heating system is rated positively. Summer comfort levels are also high, with temperatures typically ranging from 22-26°C. To avoid overheating, residents primarily rely on opening windows and using internal blinds or curtains.

While completing the questionnaire, we noticed that several participants are not clear about the temperatures at which they feel comfortable in summer and winter, important it is constant and when it is too 'cold' it can be heated up very quickly. Tenants may install sun blinds at their own cost. There are attachment points and preparations made in the prefabricated facade to make it function properly. That will help to reduce during summer the summer heating. Because it Goese Polder is close to the sea, there is often a breeze, which makes summer – night ventilation faster and more effective.

Residents report high satisfaction with air quality in both winter and summer. Most open windows for ventilation in both seasons, typically in the morning or evening. Satisfaction with hot water production is generally high. For laundry, most residents use a tumble dryer. Some use indoor drying racks or outdoor drying.

Sensors were unfortunately still not installed in some homes en while none of the residents took part in the construction decision-making process, the majority are satisfied with the energy goals and the renovation time.

The Goese Polder Project appears to be very successful in providing comfortable, energy-efficient housing that meets tenants' needs in terms of both living conditions and affordability.

2.4. PHI CS37 DARMSTAD ARHEILIGEN – SINGLE FAMILY HOME RETROFIT

2.4.1. General overview

- Survey length: 72 questions
- Mode: personal
- Dates presented: 20 August 2024
- Number of respondents: 1

2.4.2. Presentation of the findings

The renovation works for single family house at Arheilgen, Darmstadt, had started in Autumn 2023. The retrofit intended to achieve the EnerPHit standard according to the component method. Due to it´s poor orientation, bad compactness and lots of thermal bridges that couln´t be solved with justifiable effort, it became clear that a heating demand below 25 kWh/(m²a) would not be realistic. Due to cost constraints, the building owner supported the renovation works with several so-it-yourself measures, for example the insulation of the wall to the neighbours with conventional insulation panels, or perimeter and basement ceiling insulation. External wall renovation with a timber stud system, window replacement, roof renovation and ventialtion as well as heat pump installation were carried out by professionals. The renovation works were completed in summer 2024 and the retrofit project was certified as EnerPHit renovation with a heating demand of just above 40 kWh/(m²a).

With the start of the renovation works, a monitoring system, connected to a database, had been installed, documenting room temperatures, indoor humidity and CO2 levels as well as weather conditions and energy consumption. Of course, during the renovation works, especially when the windows had been replaced in spring, these monitored conditions are not representative for the improvement of the thermal envelope. Ever since the building envelope has been completed and airtightness measures have been in place, the monitoring is documenting the considerably improved living conditions of the family.

Demographics and Occupancy: The building is occupied by the family owning the building. The family consists of 4 persons, 1 younger than 18 years. Occupancy during the day throughout the week is estimated at 2.5 persons, 3.5 persons on the weekend.

Relocation and Building Awareness: The reason to move into the house was the the size of the home, the attractive area with good infrastructure, the family also liked the house in small street with few traffic only and a garden. The family wanted the house to be retrofitted to a high energy efficiency standard and was consulted by an experienced Passive House Architect, who managed the renovation project. If there are questions related to the highly efficient building concept and it´s equipment, the family receives answers from the architect which is considered to be very helpful.

Thermal Comfort and Energy Systems: Winter Comfort: The residents are strongly satisfied with the thermal comfort in the renovated building. As soon as the windows were replaced in early spring, the considerable improvement of the indoor conditions could be experienced. The building is now considered to be warm and comfortable, in contrary to the winters before the renovation. The average winter temperature is reported at 22.5°C, which the family finds suitable. The manageability of the heating system is rated positively, also it´s operation.

Summer Comfort: At the time of this questionnaire the shading systems were still missing, the owner thereby thinks that this may have an additional effect on the summer comfort. For shading, external shutters will be installed to avoid overheating. Otherwise, summer comfort levels are considered to be high after renovation, with temperatures typically at 24°C. Opening the windows at night for night ventilation isn´t possible due to outside noise through the Frankfurt airport. The cooling concept thereby has foreseen a split unit to guarantee summer comfort, that is operated for approximately 2 hours per day. Th operation and manageability of the cooling system is said to be easy.

Hot Water and Laundry: Satisfaction with hot water production is high. However the existing pipes for domestic hot water are installed in within the masonry walls and couldn´t be insulated, thereby cause thermal loads in summer. For laundry, the residents use a combination of indoor drying racks and an electric dryer.

Ventilation and Air Quality: The owner family clearly noticed the improvement in air quality ever since the ventilation system was installed. The ventilation unit system very effectively removes smells, even one of the inhabitants smokes, and can be managed easily. The general setting of the ventilation unit for winter and summer is 2 and doesn´t need to be changed. The owner family thereby is very satisfied with the ventilation system, for winter as well as for summer. The family estimates to additionally open the windows 0.5h per day in winter and 4h per day in summer, in the morning mainly.

Smart Home Features: Before the renovation a simplified monitoring had been installed, that collects data on room temperature, indoor humidity and CO2 levels to a database. It also documents energy consumption and weather conditions and thereby allows the owner to understand the families living comfort and energy consumption. Further smart home technology may be installed at a later time, then also controlling cooling and ventilation units.

Decision-Making and Energy Goals: The owners wanted a deep energy retrofit for their single family home and had been consulted by the experienced architect and now are very satisfied with the achieved energy efficiency results. It is not only the very low energy consumption, however, but also the considerably improved living comfort, that came along with the EnerPHit renovation of the building. In order to achieve the EnerPHit standard even with the budget limitations, the building owners carried out works themselves.

Conclusions:

1. The Case Study Project CS37 appears to be highly successful in providing comfortable, energy-efficient housing that meets residents' needs in terms of both living conditions and low energy consumption.

2. The operation of all building systems is experienced to be easy enough and the inhabitants are highly satisfied with their new technical equipment. In case of questions regarding the technical equipment, answers are provided by the architect.

3. The building performs well in terms of thermal comfort and air quality across summer and winter, indicating the successful realization of passive house principles in the EnerPHit retrofit.

4. There's a positive attitude towards energy efficiency and smart home technologies, that may be installed at a later point of time. For the time being, the owner is satisfied with the simplified monitoring.

5. With the retrofit, the building owners were aiming for highest energy efficiency with the EnerPHit standard and are generally satisfied with energy goals. Though there were budget constraints, the owners invested do-it-yourself work to achieve the efficiency goals.

Overall, the Observer Project 37 demonstrates that deep energy retrofits can successfully be carried out, even if the budget is limited and the owners may have to participate in the works to save money. The satisfaction with the improved living conditions is high as well as with the considerably reduced energy consumption of the single family home. The building owener was even happy to have the renovation project visited during workshops or Passive House Open Day events and participated in presentations to share his ambitions and experiences with the EnerPHit retrofit.

2.5. HPHI SUMMARY OF CS2, CS3 &CS4

2.5.1. General overview

Survey length: 29 questions before renovation and 44 questions after renovation to Passive House

Mode: online

Dates presented: 8 November 2023 and 12 June 2024

Number of respondents: 3

2.5.2. Presentation of the finding

Before the renovation

Strongly satisfied / satisfied / neither satisfied nor dissatisfied / somewhat dissatisfied /very dissatisfied

Very good / good / neither good nor bad / bad / very bad

Q1:

CS2:3 | CS3:1 |CS4:3.5 on average for all the case studies: 2.5

Q1b:

CS2:0 | CS3:0 |CS4:0 on average for all the case studies: 0

Q2:

CS2:1 | CS3:1 |CS4:3.5 on average for all the case studies: 1.5

Q3:

CS2 & CS3: owned the house |CS4: liked the house

Q4:

CS2: SFH | CS3: Apartment in MFH|CS4: SFH with 3 floors

Q5:

CS2- CS4: outside of the house

Q6:

CS2 & CS3: somewhat dissatisfied |CS4: neither satisfied nor dissatisfied

Q7:

CS2 CS3 CS4 all said install insulation

Q8:

CS2 CS3 CS4 all said: very dissatisfied

Q8b:

CS2 & CS3: high humidity and cold inside the house

CS4: high energy cost without results

Q9:

CS2:15 | CS3:15 |CS4: 20 the average Temperature is 16.6

Q10:

CS2 CS3 CS4 all said: No

Q10b:

CS2: 21 | CS3: 21 | CS4: 23 the average Temperature is 21.6

Q11:

CS2 CS3 CS4 all said: neither good nor bad

Q12:

CS2 CS3 CS4 all said: Very easy

Q13:

CS2:5 | CS3:6 |CS4: all day Low Temperature

Q14:

CS2 CS3 CS4 all said: Very Dissatisfied

Q14B:

CS2 & CS3: Hot inside CS4: Too hot inside

Q15:

CS2 & CS3: 31 |CS4:27.5 on average the Temperature was : 29.8 Celsius

Q16:

CS2 CS3 CS4 all said: No

Q16b:

CS2:22 | CS3:23 |CS4:25 the average Temperature is 23.3

Q17:

CS2 CS3 CS4 all said: Open windows at night

Q18:

CS2 CS3 CS4 all said: External Shutter

Q19:

CS2 CS3 CS4 all said: Yes

Q20:

Zero Response

Q21:

CS2 CS3 CS4 all said: Yes

Q22:

CS2 CS3 CS4 all said: Very easy

Q23:

CS2:5 | CS3:6 |CS4:10 on average for all the case studies: 8

Q24:

CS2 CS3 CS4 all said: Very Satisfied

Q24b:

Zero Response

Q25:

CS2 CS3 CS4 all said: Dissatisfied

Q25b:

CS2 & CS3: Smells from Fireplaces | CS4: High Co2

Q26:

CS2: 1| CS3:1.5 |CS4:0.5 on average for all the case studies:1 Hour

Q27:

CS2 CS3 CS4 all said: In the morning

Q28:

CS2:8 | CS3:9 |CS4:10 on average for all the case studies: 9 Hours

Q29:

CS2 CS3 CS4 all said: Evening

After Renovation

Q5:

CS2 CS3 CS4 all said: Very important

Q6:

CS2 CS3 CS4 all said: Yes

Q6b:

CS2 CS3 CS4 all said: HPHI

Q6c:

CS2 CS3 CS4 all said: For the use of the Ventilation

Q6d:

Zero Response

Q7:

CS2 CS3 CS4 all said: HPHI

Q7a:

CS2 CS3 CS4 all said: Very useful

Q8:

CS2 CS3 CS4 all said: outside

Q9:

CS2 CS3 CS4 all said: Strongly Satisfied

Q10:

CS2 CS3 CS4 all said: No

Q11:

CS2 CS3 CS4 all said: Very Satisfied

Q11b:

Zero responses

Q11c:

CS2 CS3 CS4 all said: Yes

Q12:

CS2:21 | CS3:21 |CS4:24 on average the Temperature is: 22

Q12b:

CS2 CS3 CS4 all said: Yes

Q12c:

Zero responses

Q13:

CS2 & CS3: Very easy |CS4: Easy

Q14:

CS2 CS3 CS4 all said: Very easy

Q15:

CS2:3.5 | CS3:3 |CS4:7.5 on average for all the case studies: 4.6 Hours

Q16:

CS2 CS3 CS4 all said: Very Satisfied

Q16b:

Zero Responses

Q16c:

CS2 CS3 CS4 all said: Yes

Q17:

CS2:23 | CS3:23 |CS4:25 on average the Temperature: 23.6

Q17b:

CS2 CS3 CS4 all said: Yes

Q17c:

CS2:3 | CS3:1 |CS4:3.5 on average for all the case studies: 2.5

Q18:

CS2& CS3: Open windows at night CS4: Nothing

Q19:

CS2: External Shutter | CS3 & CS4: Canopy

Q20:

CS2 & CS3: Yes | CS4: No

Q21:

CS2: No response | CS3: No response | CS4: extra cooling at night

Q22:

CS2 CS3 CS4 all said: Yes

Q23:

CS2 CS3 CS4 all said: Very easy

Q24:

CS2:3 | CS3:4 |CS4:15 low fan / average for all the case studies: 7.3 Hours

Q25:

CS2 CS3 CS4 all said: Very Satisfied

Q25b:

Zero responses

Q26:

CS2 CS3 CS4 all said: Yes

Q27:

CS2 CS3 CS4 all said: No

Q28:

CS2 CS3 CS4 all said: Very effective

Q29:

C CS2 CS3 CS4 all said: Easy

Q30:

CS2 CS3 CS4 all said: Level 2 Ventilation in winter and summer

Q30b:

Zero responses

Q31:

Zero responses

Q31b:

CS2 CS3 CS4 all said: Yes

Q32:

CS2 CS3 CS4 all said: Perfect

Q33:

CS2 CS3 CS4 all said: No

Q33b:

Zero responses

Q33c:

Zero responses

Q34:

CS2 CS3 CS4 all said: Very Satisfied

Q34b:

Zero responses

Q35:

CS2 CS3 CS4 all said: No

Q35b:

Zero responses

Q35c:

Zero responses

Q36:

CS2: Disturbing | CS3 & CS4: Slightly Disturbing

Q36b:

CS2 & CS3: Duration of the renovation measure | CS4: Restrictions on access routes (footpath or road) by construction site vehicles and materials

Q36c:

Zero responses

Q37:

CS2 CS3 CS4 all said: No disturbing

Q37b:

Zero responses

Q38:

CS2 CS3 CS4 all said: Yes

Q39:

CS2 CS3 CS4 all said: Yes

Q40:

CS2 CS3 CS4 all said: Yes

Q41:

CS2 CS3 CS4 all said: Yes

Q42:

CS2 CS3 CS4 all said: Yes

Q43:

CS2 CS3 CS4 all said: Better Energy efficiency

Q44:

CS2 CS3 CS4 all said: not assessable

Q44b:

Zero responses

2.5.3. Interpretation of the findings / Conclusions

It is important to highlight that the before and after renovation questionnaire was conducted from May to the end of June. All respondents had been living in a passive house for at least one year. The average number of occupants per house was 2.5. The three houses were different and located in different areas.

Before the renovation, all respondents reported being dissatisfied or very dissatisfied with their houses. Two were dissatisfied with winter comfort due to high humidity and low temperatures inside the house, while the third was dissatisfied because of high bills without achieving comfort. The average temperature in winter was 16.6 ºC, and the heating system was considered very easy to use by all respondents. Heating strategies varied: one group kept the system on almost all day at a low temperature, while the other used it for a few hours at a high temperature. Similar to winter, all participants were very dissatisfied with their summer comfort, with average indoor temperatures above 29.8 ºC and high bills. The cooling system, which was also considered very easy to use (air conditioning), was used for an average of 8 hours per day. All participants had external shutters and opened the windows in the morning in wintertime and at night in summertime.

Regarding domestic hot water, two respondents were strongly satisfied due to having solar water heaters, while the third was very dissatisfied due to having an electrical water heater, which resulted in high bills. Air quality was low before the renovation, with most participants somewhat dissatisfied due to smells from fireplaces and high CO2 levels. Windows were opened for ventilation for 30 minutes to one hour every morning.

After the renovation, all respondents stated that moving to a passive house was "very important" and all were strongly satisfied with their house. They received instructions from HPHI, with the most useful being how to use the ventilation system. All respondents were strongly satisfied with their comfort in winter and summer, with average temperatures of 22 ºC and 23.6 ºC, respectively. The heating and cooling systems were easy to use, with an average daily use of 4.5 hours in winter and 8 hours in summer.

All respondents were strongly satisfied with the hot water, as they all had solar water heaters. Additionally, all reported better air quality with no smells, less humidity, and lower CO2 levels. The ventilation system was usually set at the second stage and was easy to use. Most respondents did not open the windows in winter, and only two opened them at night during the summer for a few hours.

Most respondents found the renovation process slightly disturbing, with some facing issues related to the duration and others with restrictions on access routes caused by construction vehicles and materials. None reported problems with the sensors, and all wanted to know more about the data from their houses. Everyone involved in the renovation process was satisfied with their investment and the energy goals achieved, and the primary motivation for the renovation was to achieve better energy efficiency.

In conclusion, all respondents were satisfied with their new passive houses due to better thermal comfort, improved air quality, and significantly lower costs for these conditions. It is important to note that the questionnaire was conducted from May to June when temperatures in Greece were not very high. Additionally, the respondents were used to living in very different conditions, with extremely low temperatures in winter and high temperatures in summer. Some may now feel comfortable at 18 or 19 ºC in winter and 26 or 27 ºC in summer. Further study is highly recommended in order to also consider the thermal comfort of the individual as well as the previous situation that they used to leave before the renovation to passive house standards. It is also recommended that the duration of the study be year-round in order to more accurately reflect the changing external weather conditions and how they affect the internal.

3. USER SATISFACTION QUESTIONNARIES

	Project Information		Country	CS / OP code	Project Name	City	Building typology	quantity of appartments in the building	Quantity of questionnaires answered
			Spain	CS17	Social Housing Parque Maquinaria de	Teruel	Apartment house	10	6

	GENERAL QUESTIONS		1	2	3	4	5	6	7
1.a	How many people live in your home?		Inhabitants						
	ANSWERS:		2,333333333						
1.b	How many are children?		Inhabitants younger than 18 years						
	ANSWERS:		0,833333333						
2.	How many people are in the house on average during the day?		Monday-Friday	Weekend					
	ANSWERS:		2,333333333	1,833333333					
3.	What was the main reason for moving here?		I / We like the house	The area is attractive (infraestructures, child friendly …)	Appropiate home size	Economic reasons (goog cost-benefit ratio)	Comfort	Energy eficiency	Other
	ANSWERS:		3	2	1	5	3	1	1
4.	Where is your house/appartment located within the building?		Ground Floor	Intermediate Floor	Top Floor or Attic				
	ANSWERS:		1	4	1				
5.	How important was it for you to move into a Passivhaus?		Very important	Quite important	Important	less important	not important		
	ANSWERS:		3	1	0	1	1		
6.a	Have you been instructed on how to deal with your new home?		YES	NO					
	ANSWERS:		5	1					
6.b	If yes, in what way?		Sumary of answers						
	ANSWERS:		See report						
6.c	Was this information useful to you?		YES	NO					
	ANSWERS:		4	2					
6.d	What would you like to know more about? What information was insufficient?		Sumary of answers						
	ANSWERS:		See report						
7.a	Do you have a contact person when you have questions about how to manage your home?		YES	NO					
	ANSWERS:		6						
7.b	If yes: Do you find this important and useful?		YES	NO					
	ANSWERS:		6						
8.	How do you dry the laundry?		electric dryer	inside the house (rope, line)	drying room outside the house	outside (rope, line)			
	ANSWERS:		0	4	0	4			
9.	How satisfied are you with your home?		Strongly satisfied	satisfied	neither satisfied or dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:		6	0	0	0	0		
10.	Do you have any suggestion to improve the quality of the house?		Sumary of answers						
	ANSWERS:		See report						

	WINTER COMFORT / HEATING		1	2	3	4	5	6	7
11.a	How satisfied are you with the confort of the house in winter?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:		5	1					
11.b	If you are not satisfied. Why?		Sumary of answers						
	ANSWERS:		See report						
11.c	Have you noticed an improvement in comfort in winter compared to the original house?		YES	NO					
	ANSWERS:		6	0					
12.a	What is the average temperature in the house / appartment in winter?		App. ºC (average for answers)	I don't know					
	ANSWERS:		21,66666667						
12.b	Is this temperature right for you?		YES	NO					
	ANSWERS:		5	1					
12.c	If not, what temperature would be ideal for you?		App. ºC (average for answers)						
	ANSWERS:		23						
13.	How would you evaluate the operation of the heating system of the house?		Very good	good	neither good or bad	bad	very bad		
	ANSWERS:		5	1					
14.	How would you evaluate the manageability of the heating system of the house?		Very easy	Easy	neither easy nor complicated	Complicated	Very complicated		
	ANSWERS:		3	1	0	2	0		
15.	How many hours a day do you keep the heating system on?		Heating hours per day						
	ANSWERS:		It is automatic, they don't know						

	SUMMER COMFORT / COOLING		1	2	3	4	5	6	7
16.a	How satisfied are you with the confort of the house in summer?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:		3	3					
16.b	If you are not satisfied. Why?		Sumary of answers						
	ANSWERS:		Cooling system did not work during the first summer						
16.c	Have you noticed an improvement in comfort in summer compared to the original house?		YES	NO					
	ANSWERS:		5	1					
17.a	What is the average temperature in the house in summer?		App. ºC (average for answers)	I don't know					
	ANSWERS:		25,83333333						
17.b	Is this temperature right for you?		YES	NO					
	ANSWERS:		3	3					
17.c	If not, what temperature would be ideal for you?		App. ºC (average for answers)						
	ANSWERS:		22,33333333						
18.a	What do you do to avoid overheating in summer? OPEN WINDOWS		Open windows ...in the morning	...at sunset	…at night				
	ANSWERS:		1		4				
18.b	What do you do to avoid overheating in summer? SOLAR PROTECTION		YES	NO					
	ANSWERS:		4	0					
19.	What type of solar protection have the windows of your home?		External shutters	Interior blinds	Overhang or canopy				
	ANSWERS:		4	2	3				
20.	Is it possible to open the windows at night to cool down the house?		YES	NO					
	ANSWERS:		5	1					
21.	If not, which is the reason?		Outside noise	Mosquitoes or other insects	Fear of intruders / robbery	No response			
	ANSWERS:		1	2					
22.	Does the house have an active cooling system?		YES	NO					
	ANSWERS:		6	0					
23.	How would you evaluate the manageability of the cooling system of the house?		Very easy	Easy	neither easy nor complicated	Complicated	Very complicated		
	ANSWERS:		4	0	0	1	1		
24.	How many hours a day do you keep the cooling system on?		Cooling hours per day						
	ANSWERS:		It is automatic, they don't know						

	DOMESTICAL HOT WATER		1	2	3	4	5	6	7

25.a	How satisfied are you with the production of domestic hot water?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:		3	1	2				
25.b	If you are not satisfied. Why?		Sumary of answers						
	ANSWERS:		It did not work good at the beginning. Now problems are solved						

	VENTILATION		**1**	**2**	**3**	**4**	**5**	**6**	**7**
26.	Have you noticed the improvement in air quality in your home by incorporating a mechanical ventilation system?		YES	NO					
	ANSWERS:		4	2					
27.	Does anyone smoke in the house?		YES	NO					
	ANSWERS:		1	5					
28.	How effective is ventilation in removing bad smells?		Very effective	effective	partially effective	not very effective	not at all effective		
	ANSWERS:		3	3	0	0	0		
29.	How would you evaluate the manageability of the ventilation system?		Very easy	easy	neither easy nor complicated	complicated	very complicated		
	ANSWERS:		4	1	1	0	0		
30.a	What configuration of your ventilation system do you mainly use IN WINTER?		off	1	2	3			
	ANSWERS:		2	2	2	0			
30.b	What configuration of your ventilation system do you mainly use IN SUMMER?		off	1	2	3			
	ANSWERS:		1	2	3	0			
30.c	Do you change the configuration at any time?		YES	NO					
	ANSWERS:		4	2					
30.d	If yes. Why?		Sumary of answers						
	ANSWERS:		See report						
31.a	How satisfied are you with the air quality of the house in winter?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:		4	1	0	1	0		
31.b	If you are not satisfied. Why?		Sumary of answers						
	ANSWERS:		See report						
32.	How do you evaluate the humidity of the air in winter?		Too much humidity	a little humidity	perfect	a little dry	very dry		
	ANSWERS:		0	0	5	1	0		
33.a	Do you open the windows to ventilate in winter?		YES	NO					
	ANSWERS:		3	3					
33.b.	How long?		Opening time per day						
	ANSWERS:		5-10 minutes						
33.c	At what time of the day?		In the ...morning	…at noon	…afternoon	…evening			
	ANSWERS:		3	0	0	0			
34.a	How satisfied are you with the air quality of the house in summer?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:		4	0	0	2	0		
34.b	If you are not satisfied. Why?		Sumary of answers						
	ANSWERS:		See report						
35.a	Do you open the windows to ventilate in summer?		YES	NO					
	ANSWERS:		5	1					
35.b	How long?		Opening hours per day						
	ANSWERS:		See report						
35.c	At what time of the day?		In the ...morning	…at noon	…afternoon	…evening			
	ANSWERS:		2	4	1	1			

	Project Information		Country	CS / OP code	Project Name	City	Building typology	quantity of appartments in the building	Quantity of questionnaires answered
			Spain	OP19	Cartagena50	Madrid	Residential	21	2

	GENERAL QUESTIONS		1	2	3	4	5	6	7
1.a	How many people live in your home?		Inhabitants						
	ANSWERS:		1,5						
1.b	How many are children?		Inhabitants younger than 18 years						
	ANSWERS:		0						
2.	How many people are in the house on average during the day?		Monday-Friday	Weekend					
	ANSWERS:		1	1,5					
3.	What was the main reason for moving here?		I / We like the house	The area is attractive (infraestructures, child friendly …)	Appropiate home size	Economic reasons (goog cost-benefit ratio)	Comfort	Energy eficiency	Other
	ANSWERS:		1	0	1	2	1	1	
4.	Where is your house/appartment located within the building?		Ground Floor	Intermediate Floor	Top Floor or Attic				
	ANSWERS:		1	0	1				
5.	How important was it for you to move into a Passivhaus?		Very important	Quite important	Important	less important	not important		
	ANSWERS:		1	1					
6.a	Have you been instructed on how to deal with your new home?		YES	NO					
	ANSWERS:		2						
6.b	If yes, in what way?		Sumary of answers						
	ANSWERS:		User manual						
6.c	Was this information useful to you?		YES	NO					
	ANSWERS:		2						
6.d	What would you like to know more about? What information was insufficient?		Sumary of answers						
	ANSWERS:		Nothing						
7.a	Do you have a contact person when you have questions about how to manage your home?		YES	NO					
	ANSWERS:		1	1					
7.b	If yes: Do you find this important and useful?		Sumary of answers						
	ANSWERS:		2						
8.	How do you dry the laundry?		electric dryer	inside the house (rope, line)	drying room outside the house	outside (rope, line)			
	ANSWERS:		1	1		1			
9.	How satisfied are you with your home?		Strongly satisfied	satisfied	neither satisfied or dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:		2						
10.	Do you have any suggestion to improve the quality of the house?		Sumary of answers						
	ANSWERS:		See report						

	WINTER COMFORT / HEATING		1	2	3	4	5	6	7
11.a	How satisfied are you with the confort of the house in winter?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:		2						
11.b	If you are not satisfied. Why?		Sumary of answers						
	ANSWERS:		0						
11.c	Have you noticed an improvement in comfort in winter compared to the original house?		YES	NO					
	ANSWERS:		2						
12.a	What is the average temperature in the house / appartment in winter?		App. ºC (average for answers)	I don't know					
	ANSWERS:		20,5						
12.b	Is this temperature right for you?		YES	NO					
	ANSWERS:		2						
12.c	If not, what temperature would be ideal for you?		App. ºC (average for answers)						
	ANSWERS:								
13.	How would you evaluate the operation of the heating system of the house?		Very good	good	neither good or bad	bad	very bad		
	ANSWERS:		2						
14.	How would you evaluate the manageability of the heating system of the house?		Very easy	Easy	neither easy nor complicated	Complicated	Very complicated		
	ANSWERS:		1	1					
15.	How many hours a day do you keep the heating system on?		Heating hours per day						
	ANSWERS:		1						

	SUMMER COMFORT / COOLING		1	2	3	4	5	6	7
16.a	How satisfied are you with the confort of the house in summer?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:		2						
16.b	If you are not satisfied. Why?		Sumary of answers						
	ANSWERS:								
16.c	Have you noticed an improvement in comfort in summer compared to the original house?		YES	NO					
	ANSWERS:		2						
17.a	What is the average temperature in the house in summer?		App. ºC (average for answers)	I don't know					
	ANSWERS:		24						
17.b	Is this temperature right for you?		YES	NO					
	ANSWERS:		2						
17.c	If not, what temperature would be ideal for you?		App. ºC (average for answers)						
	ANSWERS:								
18.a	What do you do to avoid overheating in summer? OPEN WINDOWS		Open windows ...in the morning	...at sunset	…at night				
	ANSWERS:				2				
18.b	What do you do to avoid overheating in summer? SOLAR PROTECTION		YES	NO					
	ANSWERS:		2						
19.	What type of solar protection have the windows of your home?		External shutters	Interior blinds	Overhang or canopy				
	ANSWERS:		2		2				
20.	Is it possible to open the windows at night to cool down the house?		YES	NO					
	ANSWERS:		1	1					
21.	If not, which is the reason?		Outside noise	Mosquitoes or other insects	Fear of intruders / robbery				
	ANSWERS:		1						
22.	Does the house have an active cooling system?		YES	NO					
	ANSWERS:		2						
23.	How would you evaluate the manageability of the cooling system of the house?		Very easy	Easy	neither easy nor complicated	Complicated	Very complicated		
	ANSWERS:		1	1					
24.	How many hours a day do you keep the cooling system on?		Cooling hours per day						
	ANSWERS:		2						

	DOMESTICAL HOT WATER		1	2	3	4	5	6	7
25.a	How satisfied are you with the production of domestic hot water?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:		2						
25.b	If you are not satisfied. Why?		Sumary of answers						
	ANSWERS:								

	VENTILATION	**1**	**2**	**3**	**4**	**5**	**6**	**7**
26.	Have you noticed the improvement in air quality in your home by incorporating a mechanical ventilation system?	YES	NO					
	ANSWERS:	2	0					
27.	Does anyone smoke in the house?	YES	NO					
	ANSWERS:	0	2					
28.	How effective is ventilation in removing bad smells?	Very effective	effective	partially effective	not very effective	not at all effective		
	ANSWERS:	2	0	0	0	0		
29.	How would you evaluate the manageability of the ventilation system?	Very easy	easy	neither easy nor complicated	complicated	very complicated		
	ANSWERS:	1	1	0	0	0		
30.a	What configuration of your ventilation system do you mainly use IN WINTER?	off	1	2	3			
	ANSWERS:	0	2	0	0			
30.b	What configuration of your ventilation system do you mainly use IN SUMMER?	off	1	2	3			
	ANSWERS:	0	2	0	0			
30.c	Do you change the configuration at any time?	YES	NO					
	ANSWERS:	0	2					
30.d	If yes. Why?	Sumary of answers						
	ANSWERS:							
31.a	How satisfied are you with the air quality of the house in winter?	Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:	1	1	0	0	0		
31.b	If you are not satisfied. Why?	Sumary of answers						
	ANSWERS:							
32.	How do you evaluate the humidity of the air in winter?	Too much humidity	a little humidity	perfect	a little dry	very dry		
	ANSWERS:	0	0	2	0	0		
33.a	Do you open the windows to ventilate in winter?	YES	NO					
	ANSWERS:	1	1					
33.b.	How long?	Opening time per day						
	ANSWERS:	5 minutes						
33.c	At what time of the day?	In the ...morning	…at noon	…afternoon	…evening			
	ANSWERS:	1	0	0	0			
34.a	How satisfied are you with the air quality of the house in summer?	Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:	1	1					
34.b	If you are not satisfied. Why?	Sumary of answers						
	ANSWERS:	Noise						
35.a	Do you open the windows to ventilate in summer?	YES	NO					
	ANSWERS:	1	1					
35.b	How long?	Opening hours per day						
	ANSWERS:	10 minutes						
35.c	At what time of the day?	In the ...morning	…at noon	…afternoon	…evening			
	ANSWERS:	1	0	0	0			
	RENOVATION	**1**	**2**	**3**	**4**	**5**	**6**	**7**
	SENSOR TECHNOLOGY	**1**	**2**	**3**	**4**	**5**	**6**	**7**
37.a.	How do you feel about the use of sensors in your home?	Disturbing	Someqhat disturbing	Not disturbing	Assessment not possible			
	ANSWERS:	1	0	1				
37.b.	If disturbing, why?	Data protection / surveillance	Optics / conspicuousness in the room	Other				
	ANSWERS:	0	0	1				
38.	Would you be interested in the data?	YES	NO	Assessment not				
	ANSWERS:	2	0					
39.	Would you be interested in energy and comfort-related suggestions for improving your living situation?	YES	NO	Assessment not possible				
	ANSWERS:	2	0					
40.	Would you welcome more sensors in the building if you got the results?	YES	NO	Assessment not possible				
	ANSWERS:	2	0					
	INVESTMENT	**1**	**2**	**3**	**4**	**5**	**6**	**7**
41.	Were you involved in the decision-making process for the renovation?	YES	NO	No answer				
	ANSWERS:							
42.	Are you satisfied with the energetic goals?	YES	NO	Assessment not				
	ANSWERS:	2	0					
43.	What was the motivation behind the renovation?	Better Energy efficiency	Increase in the value of the property	Sustainability	Comfort improvement	Other		
	ANSWERS:							
44.a.	Would you have liked to invest more?	YES	NO	Assessment not				
	ANSWERS:							
44.b.	If the answer is no: Why did this fail?	Sumary of answers						
	ANSWERS:							

	Project Information		Country	CS / OP code	Project Name	City	Building typology	quantity of appartments in the building	Quantity of questionnaires answered
			Bulgaria	OP32	Social Housing	Burgas	Apartment house	10	9

	GENERAL QUESTIONS		1	2	3	4	5	6	7
1.a	How many people live in your home?		Inhabitants						
	ANSWERS:		2,222222222						
1.b	How many are children?		Inhabitants younger than 18 years						
	ANSWERS:		0,555555556						
2.	How many people are in the house on average during the day?		Monday-Friday	Weekend					
	ANSWERS:		1,333333333	2,222222222					
3.	What was the main reason for moving here?		I / We like the house	The area is attractive (infraestructures, child friendly …)	Appropiate home size	Economic reasons (goog cost-benefit ratio)	Comfort	Energy eficiency	Other
	ANSWERS:		2	3	6	9	5	1	0
4.	Where is your house/appartment located within the building?		Ground Floor	Intermediate Floor	Top Floor or Attic				
	ANSWERS:		3	3	3				
5.	How important was it for you to move into a Passivhaus?		Very important	Quite important	Important	less important	not important		
	ANSWERS:		0	0	0	0	9		
6.a	Have you been instructed on how to deal with your new home?		YES	NO					
	ANSWERS:		9						
6.b	If yes, in what way?		Sumary of answers						
	ANSWERS:		See report						
6.c	Was this information useful to you?		YES	NO					
	ANSWERS:		9						
6.d	What would you like to know more about? What information was insufficient?		Sumary of answers						
	ANSWERS:		See report						
7.a	Do you have a contact person when you have questions about how to manage your home?		YES	NO					
	ANSWERS:		9						
7.b	If yes: Do you find this important and useful?		YES	NO					
	ANSWERS:		9						
8.	How do you dry the laundry?		electric dryer	inside the house (rope, line)	drying room outside the house	outside (rope, line)			
	ANSWERS:		4	1	4	0			
9.	How satisfied are you with your home?		Strongly satisfied	satisfied	neither satisfied or dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:		5	3	1	0	0		
10.	Do you have any suggestion to improve the quality of the house?		Sumary of answers						
	ANSWERS:								

	WINTER COMFORT / HEATING		1	2	3	4	5	6	7
11.a	How satisfied are you with the confort of the house in winter?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:		3	5	1				
11.b	If you are not satisfied. Why?		Sumary of answers						
	ANSWERS:								
11.c	Have you noticed an improvement in comfort in winter compared to the original house?		YES	NO					
	ANSWERS:								
12.a	What is the average temperature in the house / appartment in winter?		App. ºC (average for answers)	I don't know					
	ANSWERS:		22,88888889						
12.b	Is this temperature right for you?		YES	NO					
	ANSWERS:		8	1					
12.c	If not, what temperature would be ideal for you?		App. ºC (average for answers)						
	ANSWERS:		23						
13.	How would you evaluate the operation of the heating system of the house?		Very good	good	neither good or bad	bad	very bad		
	ANSWERS:		5	3	1				
14.	How would you evaluate the manageability of the heating system of the house?		Very easy	Easy	neither easy nor complicated	Complicated	Very complicated		
	ANSWERS:		5	3	1	0	0		
15.	How many hours a day do you keep the heating system on?		Heating hours per day						
	ANSWERS:		14,22222222						

	SUMMER COMFORT / COOLING		1	2	3	4	5	6	7
16.a	How satisfied are you with the confort of the house in summer?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:		3	4	2				
16.b	If you are not satisfied. Why?		Sumary of answers						
	ANSWERS:								
16.c	Have you noticed an improvement in comfort in summer compared to the original house?		YES	NO					
	ANSWERS:								
17.a	What is the average temperature in the house in summer?		App. ºC (average for answers)	I don't know					
	ANSWERS:		25,44444444						
17.b	Is this temperature right for you?		YES	NO					
	ANSWERS:		6	3					
17.c	If not, what temperature would be ideal for you?		App. ºC (average for answers)						
	ANSWERS:		23						
18.a	What do you do to avoid overheating in summer? OPEN WINDOWS		Open windows ...in the morning	...at sunset	…at night				
	ANSWERS:		9	7	0				
18.b	What do you do to avoid overheating in summer? SOLAR PROTECTION		YES	NO					
	ANSWERS:		0	0					
19.	What type of solar protection have the windows of your home?		External shutters	Interior blinds	Overhang or canopy				
	ANSWERS:		0	0	6				
20.	Is it possible to open the windows at night to cool down the house?		YES	NO					
	ANSWERS:		8	1					
21.	If not, which is the reason?		Outside noise	Mosquitoes or other insects	Fear of intruders / robbery	No response			
	ANSWERS:		0	1	0	8			
22.	Does the house have an active cooling system?		YES	NO					
	ANSWERS:		9	0					
23.	How would you evaluate the manageability of the cooling system of the house?		Very easy	Easy	neither easy nor complicated	Complicated	Very complicated		
	ANSWERS:		5	3	1	1	1		
24.	How many hours a day do you keep the cooling system on?		Cooling hours per day						
	ANSWERS:		13,55555556						

	DOMESTICAL HOT WATER		1	2	3	4	5	6	7
25.a	How satisfied are you with the production of domestic hot water?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:		4	4	1				
25.b	If you are not satisfied. Why?		Sumary of answers						
	ANSWERS:								

	VENTILATION		1	2	3	4	5	6	7
26.	Have you noticed the improvement in air quality in your home by incorporating a mechanical ventilation system?		YES	NO					
	ANSWERS:								
27.	Does anyone smoke in the house?		YES	NO					
	ANSWERS:		2	7					
28.	How effective is ventilation in removing bad smells?		Very effective	effective	partially effective	not very effective	not at all effective		
	ANSWERS:								
29.	How would you evaluate the manageability of the ventilation system?		Very easy	easy	neither easy nor complicated	complicated	very complicated		
	ANSWERS:								
30.a	What configuration of your ventilation system do you mainly use IN WINTER?		off	1	2	3			
	ANSWERS:								
30.b	What configuration of your ventilation system do you mainly use IN SUMMER?		off	1	2	3			
	ANSWERS:								
30.c	Do you change the configuration at any time?		YES	NO					
	ANSWERS:								
30.d	If yes, Why?		Sumary of answers						
	ANSWERS:								
31.a	How satisfied are you with the air quality of the house in winter?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:		2	4	3	0	0		
31.b	If you are not satisfied. Why?		Sumary of answers						
	ANSWERS:								
32.	How do you evaluate the humidity of the air in winter?		Too much humidity	a little humidity	perfect	a little dry	very dry		
	ANSWERS:		0	1	5	2	1		
33.a	Do you open the windows to ventilate in winter?		YES	NO					
	ANSWERS:		9	0					
33.b.	How long?		Opening time per day						
	ANSWERS:		5-10 minutes						
33.c	At what time of the day?		In the ...morning	…at noon	…afternoon	…evening			
	ANSWERS:		9	1	3	8			
34.a	How satisfied are you with the air quality of the house in summer?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:		2	5	2	0	0		
34.b	If you are not satisfied. Why?		Sumary of answers						
	ANSWERS:								
35.a	Do you open the windows to ventilate in summer?		YES	NO					
	ANSWERS:		9	0					
35.b	How long?		Opening hours per day						
	ANSWERS:		5-10 minutes						
35.c	At what time of the day?		In the ...morning	…at noon	…afternoon	…evening			
	ANSWERS:		9	1	4	8			
	RENOVATION		1	2	3	4	5	6	7
	If the residents were already in the building before the renovation or during the renovation:								
36.a.	How did you find the restructuring process affecting your everyday life?		Very good	good	slightly disturbing	disturbing	Assessment not possible		
	ANSWERS:						9		
36.b.	If disturbing or slightly disturbing. What did you find disturbing?		Duration of the renovation measure	Noise level	Structural interventions in your own living space	Restrictions on access routes (footpath or road) by construction site vehicles and materials	Others		
	ANSWERS:								
36.c.	If very good, What did you find particularly positive?		Sumary of answers						
	ANSWERS:								
	SENSOR TECHNOLOGY		1	2	3	4	5	6	7
37.a.	How do you feel about the use of sensors in your home?		Disturbing	Somewhat disturbing	Not disturbing	Assessment not possible			
	ANSWERS:			4	5				
37.b.	If disturbing, why?		Data protection / surveillance	Optics / conspicuousness in the room	Other				
	ANSWERS:		3	3					
38.	Would you be interested in the data?		YES	NO	Assessment not possible				
	ANSWERS:		3	6					
39.	Would you be interested in energy and comfort-related suggestions for improving your living situation?		YES	NO	Assessment not possible				
	ANSWERS:		7	2					
40.	Would you welcome more sensors in the building if you got the results?		YES	NO	Assessment not possible				
	ANSWERS:		6	3					
	INVESTMENT		1	2	3	4	5	6	7
41.	Were you involved in the decision-making process for the renovation?		YES	NO	No answer				
	ANSWERS:			9					
42.	Are you satisfied with the energetic goals?		YES	NO	Assessment not possible				
	ANSWERS:		7	2					
43.	What was the motivation behind the renovation?		Better Energy efficiency	Increase in the value of the property	Sustainability	Comfort improvement	Other		
	ANSWERS:								
44.a.	Would you have liked to invest more?		YES	NO	Assessment not possible				
	ANSWERS:			9					
44.b.	If the answer is no: Why did this fail?		Sumary of answers						
	ANSWERS:		Municipal ownership.						

	Project Information		Land	CS / OP-code	Naam project	Stad	Type gebouw	Aantal appartementen in het gebouw
			Netherlands	CS30	Goes Polder	Goese	Social Housing	

	GENERAL QUESTIONS	1	2	3	4	5	6
1.a	How many people live in your home?	Inwoners	Average a house:				
	ANSWERS:	18	3,6				
1.b	How many are children?	Inwoners jonger dan 18 jaar	Average a house:				
	ANSWERS:	8	1,6				
2.	How many people are in the house on average during the day?	Total Maandag-vrijdag	Total Weekend				
	ANSWERS:	9	18				
3.	What was the main reason for moving here?	Ik / Wij vinden het huis leuk	De omgeving is aantrekkelijk (infrastructuur, kindvriendelijk ...)	Geschikte woninggrootte	Economische redenen (goede kosten-batenverhouding)	Comfort	Energie-efficiëntie
	ANSWERS:	no anwers					
4.	Where is your house/appartment located within the building?	Begane grond	Tussenvloer	Bovenste verdieping of zolder			
	ANSWERS:	5					
5.	How important was it for you to move into a Passivhaus?	Zeer belangrijk	Heel belangrijk	Belangrijk	minder belangrijk	niet belangrijk	
	ANSWERS:					5	
6.a	Have you been instructed on how to deal with your new home?	JA	GEEN				
	ANSWERS:	5					
6.b	If yes, in what way?	Overzicht van antwoorden					
	ANSWERS:	Nieuwsbrief					
6.c	Was this information useful to you?	JA	GEEN				
	ANSWERS:	5	0				
6.d	What would you like to know more about? What information was insufficient?	Overzicht van antwoorden					
	ANSWERS:	Niets, was voldoende	Ventileren	niets	Ventileren in de zomer	Koelen in de zomer	
7.a	Do you have a contact person when you have questions about how to manage your home?	JA	GEEN				
	ANSWERS:	5	0				
7.b	If yes: Do you find this important and useful?	Overzicht van antwoorden					
	ANSWERS:	niet echt	ja	nee	ja	geen ervaring mee	
8.	How do you dry the laundry?	elektrische droger	binnen het huis (touw, lijn)	droogruimte buiten het huis	buiten (touw, lijn)		
	ANSWERS:	3	1		1		
9.	How satisfied are you with your home?	Zeer tevreden	tevreden	noch tevreden noch ontevreden	enigszins ontevreden	zeer ontevreden	
	ANSWERS:	3	2				
10.	Do you have any suggestion to improve the quality of the house?	Overzicht van antwoorden					
	ANSWERS:	Zonwering aanbrengen	-	nee	Koelen in de zomer	Koeling zomermaanden	

	WINTER COMFORT / HEATING	1	2	3	4	5	6
11.a	How satisfied are you with the confort of the house in winter?	Zeer tevreden	tevreden	tevreden noch ontevreden	enigszins ontevreden	zeer ontevreden	
	ANSWERS:	3	1	1			
11.b	If you are not satisfied. Why?	Overzicht van antwoorden					
	ANSWERS:						
11.c	Have you noticed an improvement in comfort in winter compared to the original house?	JA	GEEN				
	ANSWERS:	4	1				
12.a	What is the average temperature in the house / appartment in winter?	App. ºC (gemiddelde voor antwoorden)	Ik weet het niet				
	ANSWERS:	21 graden	22 graden	20 graden	-	21 graden	
12.b	Is this temperature right for you?	JA	GEEN				
	ANSWERS:	5					
12.c	If not, what temperature would be ideal for you?	App. ºC (gemiddelde voor antwoorden)					
	ANSWERS:						
13.	How would you evaluate the operation of the heating system of the house?	Zeer goed	goed	noch goed noch slecht	slecht	zeer slecht	
	ANSWERS:	2	2	1			
14.	How would you evaluate the manageability of the heating system of the house?	Zeer gemakkelijk	Gemakkelijk	noch gemakkelijk noch ingewikkeld	Gecompliceerd	Zeer ingewikkeld	
	ANSWERS:	2	3				
15.	How many hours a day do you keep the heating system on?	Verwarmingsuren per dag					
	ANSWERS:	geen idee	soms	gaat automatisch	niet bekend	thermostaat bijft altijd op 21 staan	

	SUMMER COMFORT / COOLING	1	2	3	4	5	6
16.a	How satisfied are you with the confort of the house in summer?	Zeer tevreden	tevreden	tevreden noch ontevreden	enigszins ontevreden	zeer ontevreden	
	ANSWERS:			2	2	1	
16.b	If you are not satisfied. Why?	Overzicht van antwoorden					
	ANSWERS:	het blijft lang warm	het wordt na de renovatie ook te warm	het wordt na de renovatie ook te warm	te warm na een langere tijd hoge buiten temperaturen		
16.c	Have you noticed an improvement in comfort in summer compared to the original house?	JA	GEEN				
	ANSWERS:	3	2				
17.a	What is the average temperature in the house in summer?	App. ºC (gemiddelde voor antwoorden)	Ik weet het niet				
	ANSWERS:	24 graden	24 graden	no idea	25 graden	no idea	
17.b	Is this temperature right for you?	JA	GEEN				
	ANSWERS:	1	4				
17.c	If not, what temperature would be ideal for you?	App. ºC (gemiddelde voor antwoorden)					
	ANSWERS:	20 graden			22 graden	22 graden	

18.a	What do you do to avoid overheating in summer? OPEN WINDOWS		Open ramen ... in de ochtend	...bij zonsondergang	...'s nachts			
	ANSWERS:				5			
18.b	What do you do to avoid overheating in summer? SOLAR PROTECTION		JA	GEEN				
	ANSWERS:			5				
19.	What type of solar protection have the windows of your home?		Externe rolluiken	Binnenzonwering	Overstek of luifel			
	ANSWERS:				5			
20.	Is it possible to open the windows at night to cool down the house?		JA	GEEN				
	ANSWERS:		5					
21.	If not, which is the reason?		Buitengeluid	Muggen of andere insecten	Angst voor indringers / overvallen			
	ANSWERS:							
22.	Does the house have an active cooling system?		JA	GEEN				
	ANSWERS:			5				
23.	How would you evaluate the manageability of the cooling system of the house?		Zeer gemakkelijk	Gemakkelijk	noch gemakkelijk noch ingewikkeld	Gecompliceerd	Zeer ingewikkeld	
	ANSWERS:							
24.	How many hours a day do you keep the cooling system on?		Koeluren per dag					
	ANSWERS:							

	DOMESTICAL HOT WATER		**1**	**2**	**3**	**4**	**5**	**6**
25.a	How satisfied are you with the production of domestic hot water?		Zeer tevreden	tevreden	tevreden noch ontevreden	enigszins ontevreden	zeer ontevreden	
	ANSWERS:			3	1	1		
25.b	If you are not satisfied. Why?		Overzicht van antwoorden					
	ANSWERS:			Duurt lang voordat je beneden warm water hebt.				

	VENTILATION		**1**	**2**	**3**	**4**	**5**	**6**
26.	Have you noticed the improvement in air quality in your home by incorporating a mechanical ventilation system?		JA	GEEN				
	ANSWERS:		5					
27.	Does anyone smoke in the house?		JA	GEEN				
	ANSWERS:		1	4				
28.	How effective is ventilation in removing bad smells?		Zeer effectief	effectief	gedeeltelijk effectief	niet erg effectief	helemaal niet effectief	
	ANSWERS:		1	2	1	1		
29.	How would you evaluate the manageability of the ventilation system?		Zeer gemakkelijk	eenvoudig	noch gemakkelijk noch ingewikkeld	ingewikkeld	erg ingewikkeld	
	ANSWERS:		1	4				
30.a	What configuration of your ventilation system do you mainly use IN WINTER?		uit	1	2	3		
	ANSWERS:				5			
30.b	What configuration of your ventilation system do you mainly use IN SUMMER?		uit	1	2	3		
	ANSWERS:				4	1		
30.c	Do you change the configuration at any time?		JA	GEEN				
	ANSWERS:			5				
30.d	If yes. Why?		Overzicht van antwoorden					
	ANSWERS:							
31.a	How satisfied are you with the air quality of the house in winter?		Zeer tevreden	tevreden	tevreden noch ontevreden	enigszins ontevreden	zeer ontevreden	
	ANSWERS:			5				
31.b	If you are not satisfied. Why?		Overzicht van antwoorden					
	ANSWERS:							
32.	How do you evaluate the humidity of the air in winter?		Te veel vochtigheid	een beetje vocht	perfect	een beetje droog	erg droog	
	ANSWERS:						x	
33.a	Do you open the windows to ventilate in winter?		JA	GEEN				
	ANSWERS:		3	2				
33.b.	How long?		Openingstijd per dag					
	ANSWERS:		1 uur	3 uur			2 uur	
33.c	At what time of the day?		In de ...ochtend	...op de middag	...middag	...avond		
	ANSWERS:		3					
34.a	How satisfied are you with the air quality of the house in summer?		Zeer tevreden	tevreden	tevreden noch ontevreden	enigszins ontevreden	zeer ontevreden	
	ANSWERS:			3	2			
34.b	If you are not satisfied. Why?		Overzicht van antwoorden					
	ANSWERS:							
35.a	Do you open the windows to ventilate in summer?		JA	GEEN				
	ANSWERS:		x					
35.b	How long?		Openingstijden per dag					
	ANSWERS:		8	-	7	8	10	
35.c	At what time of the day?		In de ...ochtend	...op de middag	...middag	...avond		
	ANSWERS:		1			5		
	RENOVATION		**1**	**2**	**3**	**4**	**5**	**6**
	If the residents were already in the building before the renovation or during the renovation:							
36.a.	How did you find the restructuring process affecting your everyday life?		Zeer goed	goed	licht verontrustend	storend	Beoordeling niet mogelijk	
	ANSWERS:		1	2	2			
36.b.	If disturbing or slightly disturbing. What did you find disturbing?		Duur van de renovatiemaatregel	Geluidsniveau	Structurele ingrepen in je eigen leefruimte	Beperkingen op toegangswegen (voetpad of weg) voor voertuigen en materialen van de bouwplaats	Anderen	
	ANSWERS:				1	1		
36.c.	If very good, What did you find particularly positive?		Overzicht van antwoorden					
	ANSWERS:				Snelheid	Snelheid		
	SENSOR TECHNOLOGY		**1**	**2**	**3**	**4**	**5**	**6**
37.a.	How do you feel about the use of sensors in your home?		Storend	Enigszins verontrustend	Niet storend	Beoordeling niet mogelijk		
	ANSWERS:					5		
37.b.	If disturbing, why?		Gegevensbescherming / bewaking	Optiek / opvallendheid in de kamer	Andere			

	ANSWERS:							
38.	Would you be interested in the data?		JA	GEEN	Beoordeling niet			
	ANSWERS:							
39.	Would you be interested in energy and comfort-related suggestions for improving your living situation?		JA	GEEN	Beoordeling niet mogelijk			
	ANSWERS:							
40.	Would you welcome more sensors in the building if you got the results?		JA	GEEN	Beoordeling niet mogelijk			
	ANSWERS:							
	INVESTMENT		**1**	**2**	**3**	**4**	**5**	**6**
41.	Were you involved in the decision-making process for the renovation?		JA	GEEN	Geen antwoord			
	ANSWERS:			5				
42.	Are you satisfied with the energetic goals?		JA	GEEN	Beoordeling niet			
	ANSWERS:				5			
43.	What was the motivation behind the renovation?		Betere energie-efficiëntie	Stijging van de waarde van het onroerend goed	Duurzaamheid	Comfortverbetering	Andere	
	ANSWERS:							
44.a.	Would you have liked to invest more?		JA	GEEN	Beoordeling niet			
	ANSWERS:				5			
44.b.	If the answer is no: Why did this fail?		Overzicht van antwoorden					
	ANSWERS:							

	Project Information		Germany	CS 37	Single Family Home retrofit Arheilgen	Darmstadt	Detached Single Family Home

	GENERAL QUESTIONS		1	2	3	4	5
1.a	How many people live in your home?		Inhabitants				
	ANSWERS:		4				
1.b	How many are children?		Inhabitants younger than 18 years				
	ANSWERS:		1				
2.	How many people are in the house on average during the day?		Monday-Friday	Weekend			
	ANSWERS:		2,5	3,5			
3.	What was the main reason for moving here?		I / We like the house	The area is attractive (infraestructures, child friendly …)	Appropiate home size	Economic reasons (goog cost-benefit ratio)	Comfort
	ANSWERS:		X	X	X		X
4.	Where is your house/appartment located within the building?		Ground Floor	Intermediate Floor	Top Floor or Attic		
	ANSWERS:		X				
5.	How important was it for you to move into a Passivhaus?		Very important	Quite important	Important	less important	not important
	ANSWERS:		X				
6.a	Have you been instructed on how to deal with your new home?		YES	NO			
	ANSWERS:		X				
6.b	If yes, in what way?		Sumary of answers		, in		
	ANSWERS:		Information through architect				
6.c	Was this information useful to you?		YES	NO			
	ANSWERS:		X				
6.d	What would you like to know more about? What information was insufficient?		Sumary of answers				
	ANSWERS:		How to achieve savings and what to take care of				
7.a	Do you have a contact person when you have questions about how to manage your home?		YES	NO			
	ANSWERS:		X				
7.b	If yes: Do you find this important and useful?		Sumary of answers				
	ANSWERS:		X				
8.	How do you dry the laundry?		electric dryer	inside the house (rope, line)	drying room outside the house	outside (rope, line)	
	ANSWERS:		X	X			
9.	How satisfied are you with your home?		Strongly satisfied	satisfied	neither satisfied or dissatisfied	somewhat dissatisfied	very dissatisfied
	ANSWERS:						
10.	Do you have any suggestion to improve the quality of the house?		Sumary of answers				
	ANSWERS:		No				

	WINTER COMFORT / HEATING		1	2	3	4	5
11.a	How satisfied are you with the comfort of the house in winter?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied
	ANSWERS:		X				
11.b	If you are not satisfied. Why?		Sumary of answers				
	ANSWERS:		Warm and comfortable, still fresh air				
11.c	Have you noticed an improvement in comfort in winter compared to the original house?		YES	NO			
	ANSWERS:		X				
12.a	What is the average temperature in the house / appartment in winter?		App. ºC (average for answers)	I don't know			
	ANSWERS:		22,5				
12.b	Is this temperature right for you?		YES	NO			
	ANSWERS:		X				
12.c	If not, what temperature would be ideal for you?		App. ºC (average for answers)				
	ANSWERS:						
13.	How would you evaluate the operation of the heating system of the house?		Very good	good	neither good or bad	bad	very bad
	ANSWERS:		X				
14.	How would you evaluate the manageability of the heating system of the house?		Very easy	Easy	neither easy nor complicated	Complicated	Very complicated
	ANSWERS:		X				
15.	How many hours a day do you keep the heating system on?		Heating hours per day				
	ANSWERS:						

	SUMMER COMFORT / COOLING		1	2	3	4	5
16.a	How satisfied are you with the confort of the house in summer?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied
	ANSWERS:			X			
16.b	If you are not satisfied. Why?		Sumary of answers				
	ANSWERS:		Shading still missing, air could be fresher thereby				
16.c	Have you noticed an improvement in comfort in summer compared to the original house?		YES	NO			
	ANSWERS:		X				
17.a	What is the average temperature in the house in summer?		App. ºC (average for answers)	I don't know			
	ANSWERS:		24				
17.b	Is this temperature right for you?		YES	NO			
	ANSWERS:		X				
17.c	If not, what temperature would be ideal for you?		App. ºC (average for answers)				
	ANSWERS:						
18.a	What do you do to avoid overheating in summer? OPEN WINDOWS		Open windows ...in the morning	...at sunset	…at night		
	ANSWERS:		X		X		
18.b	What do you do to avoid overheating in summer? SOLAR PROTECTION		YES	NO			
	ANSWERS:		X				
19.	What type of solar protection have the windows of your home?		External shutters	Interior blinds	Overhang or canopy		
	ANSWERS:		X				
20.	Is it possible to open the windows at night to cool down the house?		YES	NO			
	ANSWERS:			X			
21.	If not, which is the reason?		Outside noise	Mosquitoes or other insects	Fear of intruders / robbery		
	ANSWERS:		X				
22.	Does the house have an active cooling system?		YES	NO			
	ANSWERS:		X				
23.	How would you evaluate the manageability of the cooling system of the house?		Very easy	Easy	neither easy nor complicated	Complicated	Very complicated
	ANSWERS:		X				
24.	How many hours a day do you keep the cooling system on?		Cooling hours per day				
	ANSWERS:		2				

	DOMESTICAL HOT WATER		1	2	3	4	5
25.a	How satisfied are you with the production of domestic hot water?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied
	ANSWERS:			X			
25.b	If you are not satisfied. Why?		Sumary of answers				
	ANSWERS:		Pipes within the walls not yet insulated, thereby internal loads				

	VENTILATION		**1**	**2**	**3**	**4**	**5**
26.	Have you noticed the improvement in air quality in your home by incorporating a mechanical ventilation system?		YES	NO			
	ANSWERS:		X				
27.	Does anyone smoke in the house?		YES	NO			
	ANSWERS:		X				
28.	How effective is ventilation in removing bad smells?		Very effective	effective	partially effective	not very effective	not at all effective
	ANSWERS:		X				
29.	How would you evaluate the manageability of the ventilation system?		Very easy	easy	neither easy nor complicated	complicated	very complicated
	ANSWERS:		X				
30.a	What configuration of your ventilation system do you mainly use IN WINTER?		off	1	2	3	
	ANSWERS:				X		
30.b	What configuration of your ventilation system do you mainly use IN SUMMER?		off	1	2	3	
	ANSWERS:				X		
30.c	Do you change the configuration at any time?		YES	NO			
	ANSWERS:			X			
30.d	If yes. Why?		Sumary of answers				
	ANSWERS:						
31.a	How satisfied are you with the air quality of the house in winter?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied
	ANSWERS:		X				
31.b	If you are not satisfied. Why?		Sumary of answers				
	ANSWERS:		Very good air quality				
32.	How do you evaluate the humidity of the air in winter?		Too much humidity	a little humidity	perfect	a little dry	very dry
	ANSWERS:				X		
33.a	Do you open the windows to ventilate in winter?		YES	NO			
	ANSWERS:		X				
33.b.	How long?		Opening time per day				
	ANSWERS:		0,5				
33.c	At what time of the day?		In the ...morning	…at noon	…afternoon	…evening	
	ANSWERS:		X				
34.a	How satisfied are you with the air quality of the house in summer?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied
	ANSWERS:			X			
34.b	If you are not satisfied. Why?		Sumary of answers				
	ANSWERS:						
35.a	Do you open the windows to ventilate in summer?		YES	NO			
	ANSWERS:		X				
35.b	How long?		Opening hours per day				
	ANSWERS:		4				
35.c	At what time of the day?		In the ...morning	…at noon	…afternoon	…evening	
	ANSWERS:		X				
	RENOVATION		**1**	**2**	**3**	**4**	**5**
	If the residents were already in the building before the renovation or during the renovation:						
36.a.	How did you find the restructuring process affecting your everyday life?		Very good	good	slightly disturbing	disturbing	Assessment not possible
	ANSWERS:			X			
36.b.	If disturbing or slightly disturbing. What did you find disturbing?		Duration of the renovation measure	Noise level	Structural interventions in your own living space	Restrictions on access routes (footpath or road) by construction site vehicles and materials	Others
	ANSWERS:						
36.c.	If very good, What did you find particularly positive?		Sumary of answers				
	ANSWERS:		renovation partially carried out in DIY				
	SENSOR TECHNOLOGY		**1**	**2**	**3**	**4**	**5**
37.a.	How do you feel about the use of sensors in your home?		Disturbing	Someqhat disturbing	Not disturbing	Assessment not possible	
	ANSWERS:				X		
37.b.	If disturbing, why?		Data protection / surveillance	Optics / conspicuousness in the room	Other		
	ANSWERS:						
38.	Would you be interested in the data?		YES	NO	Assessment not possible		
	ANSWERS:		X				
39.	Would you be interested in energy and comfort-related suggestions for improving your living situation?		YES	NO	Assessment not possible		
	ANSWERS:				X		
40.	Would you welcome more sensors in the building if you got the results?		YES	NO	Assessment not possible		
	ANSWERS:				X		
	INVESTMENT		**1**	**2**	**3**	**4**	**5**
41.	Were you involved in the decision-making process for the renovation?		YES	NO	No answer		
	ANSWERS:		X				
42.	Are you satisfied with the energetic goals?		YES	NO	Assessment not possible		
	ANSWERS:		X				
43.	What was the motivation behind the renovation?		Better Energy efficiency	Increase in the value of the property	Sustainability	Comfort improvement	Other
	ANSWERS:		X			X	
44.a.	Would you have liked to invest more?		YES	NO	Assessment not possible		
	ANSWERS:				X		
44.b.	If the answer is no: Why did this fail?		Sumary of answers				
	ANSWERS:						

	Project Information		Country	CS / OP code	Project Name	City	Building typology	quantity of appartments in the building	Quantity of questionnaires answered
			Greece	CS2/CS3/CS4	(PHM)Papagos/Holargos/ Marousi	Athens	Residential	3	3

	GENERAL QUESTIONS		1	2	3	4	5	6	7
1.a	How many people live in your home?		Inhabitants						
	ANSWERS:		2,666666667						
1.b	How many are children?		Inhabitants younger than 18 years						
	ANSWERS:								
2.	How many people are in the house on average during the day?		Monday-Friday	Weekend					
	ANSWERS:		1,666666667	2,666666667					
3.	What was the main reason for moving here?		I / We like the house	The area is attractive (infraestructures, child friendly …)	Appropiate home size	Economic reasons (goog cost-benefit ratio)	Comfort	Energy eficiency	Other
	ANSWERS:		1						2 Owned the house
4.	Where is your house/appartment located within the building?		Ground Floor	Intermediate Floor	Top Floor or Attic	Detached SFH with Pilotis	First Floor apartment with pilotis	Multifamily house 3 floors	
	ANSWERS:					1	1	1	
5.	How important was it for you to move into a Passivhaus?		Very important	Quite important	Important	less important	not important		
	ANSWERS:		3						
6.a	Have you been instructed on how to deal with your new home?		YES	NO					
	ANSWERS:		3						
6.b	If yes, in what way?		Sumary of answers						
	ANSWERS:		HPHI User manual						
6.c	Was this information useful to you?		YES	NO					
	ANSWERS:		3						
6.d	What would you like to know more about? What information was insufficient?		Sumary of answers						
	ANSWERS:		For the use of the Ventilation						
7.a	Do you have a contact person when you have questions about how to manage your home?		Sumary of answers						
	ANSWERS:		HPHI						
7.b	If yes: Do you find this important and useful?		YES	NO					
	ANSWERS:		3						
8.	How do you dry the laundry?		electric dryer	inside the house (rope, line)	drying room outside the house	outside (rope, line)			
	ANSWERS:					3			
9.	How satisfied are you with your home?		Strongly satisfied	satisfied	neither satisfied or dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:		3						
10.	Do you have any suggestion to improve the quality of the house?		Sumary of answers						
	ANSWERS:		NO						

	WINTER COMFORT / HEATING		1	2	3	4	5	6	7
11.a	How satisfied are you with the confort of the house in winter?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:		3						
11.b	If you are not satisfied. Why?		Sumary of answers						
	ANSWERS:		0						
11.c	Have you noticed an improvement in comfort in winter compared to the original house?		YES	NO					
	ANSWERS:		3						
12.a	What is the average temperature in the house / appartment in winter?		App. ºC (average for answers)	I don't know					
	ANSWERS:		22						
12.b	Is this temperature right for you?		YES	NO					
	ANSWERS:		3						
12.c	If not, what temperature would be ideal for you?		App. ºC (average for answers)						
	ANSWERS:								
13.	How would you evaluate the operation of the heating system of the house?		Very good	good	neither good or bad	bad	very bad		
	ANSWERS:		2	1					
14.	How would you evaluate the manageability of the heating system of the house?		Very easy	Easy	neither easy nor complicated	Complicated	Very complicated		
	ANSWERS:		3						
15.	How many hours a day do you keep the heating system on?		Heating hours per day						
	ANSWERS:		4,666666667						

	SUMMER COMFORT / COOLING		1	2	3	4	5	6	7
16.a	How satisfied are you with the confort of the house in summer?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:		3						
16.b	If you are not satisfied. Why?		Sumary of answers						
	ANSWERS:								
16.c	Have you noticed an improvement in comfort in summer compared to the original house?		YES	NO					
	ANSWERS:		3						
17.a	What is the average temperature in the house in summer?		App. ºC (average for answers)	I don't know					
	ANSWERS:		23,66666667						
17.b	Is this temperature right for you?		YES	NO					
	ANSWERS:		3						
17.c	If not, what temperature would be ideal for you?		App. ºC (average for answers)						
	ANSWERS:								
18.a	What do you do to avoid overheating in summer? OPEN WINDOWS		Open windows ...in the morning	...at sunset	…at night	nothing			
	ANSWERS:				2	1			
18.b	What do you do to avoid overheating in summer? SOLAR PROTECTION		YES	NO					
	ANSWERS:		3						
19.	What type of solar protection have the windows of your home?		External shutters	Interior blinds	Overhang or canopy				
	ANSWERS:		1		2				
20.	Is it possible to open the windows at night to cool down the house?		YES	NO					
	ANSWERS:		3						
21.	If not, which is the reason?		Outside noise	Mosquitoes or other insects	Fear of intruders / robbery				
	ANSWERS:								
22.	Does the house have an active cooling system?		YES	NO					
	ANSWERS:		3						
23.	How would you evaluate the manageability of the cooling system of the house?		Very easy	Easy	neither easy nor complicated	Complicated	Very complicated		
	ANSWERS:		3						
24.	How many hours a day do you keep the cooling system on?		Cooling hours per day						
	ANSWERS:		7,333333333						

	DOMESTICAL HOT WATER		1	2	3	4	5	6	7
25.a	How satisfied are you with the production of domestic hot water?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:		3						

25.b	If you are not satisfied. Why?		Sumary of answers						
	ANSWERS:								

	VENTILATION		**1**	**2**	**3**	**4**	**5**	**6**	**7**
26.	Have you noticed the improvement in air quality in your home by incorporating a mechanical ventilation system?		YES	NO					
	ANSWERS:		3	0					
27.	Does anyone smoke in the house?		YES	NO					
	ANSWERS:		0	3					
28.	How effective is ventilation in removing bad smells?		Very effective	effective	partially effective	not very effective	not at all effective		
	ANSWERS:		3						
29.	How would you evaluate the manageability of the ventilation system?		Very easy	easy	neither easy nor complicated	complicated	very complicated		
	ANSWERS:		3						
30.a	What configuration of your ventilation system do you mainly use IN WINTER?		off	1	2	3			
	ANSWERS:				3				
30.b	What configuration of your ventilation system do you mainly use IN SUMMER?		off	1	2	3			
	ANSWERS:				3				
30.c	Do you change the configuration at any time?		YES	NO					
	ANSWERS:		0	3					
30.d	If yes. Why?		Sumary of answers						
	ANSWERS:								
31.a	How satisfied are you with the air quality of the house in winter?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:		3						
31.b	If you are not satisfied. Why?		Sumary of answers						
	ANSWERS:								
32.	How do you evaluate the humidity of the air in winter?		Too much humidity	a little humidity	perfect	a little dry	very dry		
	ANSWERS:				3				
33.a	Do you open the windows to ventilate in winter?		YES	NO					
	ANSWERS:			3					
33.b.	How long?		Opening time per day						
	ANSWERS:								
33.c	At what time of the day?		In the ...morning	…at noon	…afternoon	…evening			
	ANSWERS:								
34.a	How satisfied are you with the air quality of the house in summer?		Strongly satisfied	satisfied	neither satisfied nor dissatisfied	somewhat dissatisfied	very dissatisfied		
	ANSWERS:		3						
34.b	If you are not satisfied. Why?		Sumary of answers						
	ANSWERS:								
35.a	Do you open the windows to ventilate in summer?		YES	NO					
	ANSWERS:			3					
35.b	How long?		Opening hours per day						
	ANSWERS:								
35.c	At what time of the day?		In the ...morning	…at noon	…afternoon	…evening			
	ANSWERS:								
	RENOVATION		**1**	**2**	**3**	**4**	**5**	**6**	**7**
	If the residents were already in the building before the renovation or during the renovation:								
36.a.	How did you find the restructuring process affecting your everyday life?		Very good	good	slightly disturbing	disturbing	Assessment not possible		
	ANSWERS:				2	1			
36.b.	If disturbing or slightly disturbing. What did you find disturbing?		Duration of the renovation measure	Noise level	Structural interventions in your own living space	Restrictions on access routes (footpath or road) by construction site vehicles and materials	Others		
	ANSWERS:		2			1			
36.c.	If very good, What did you find particularly positive?		Sumary of answers						
	ANSWERS:								
	SENSOR TECHNOLOGY		**1**	**2**	**3**	**4**	**5**	**6**	**7**
37.a.	How do you feel about the use of sensors in your home?		Disturbing	Somewhat disturbing	Not disturbing	Assessment not possible			
	ANSWERS:				3				
37.b.	If disturbing, why?		Data protection / surveillance	Optics / conspicuousness in the room	Other				
	ANSWERS:								
38.	Would you be interested in the data?		YES	NO	Assessment not possible				
	ANSWERS:		3						
39.	Would you be interested in energy and comfort-related suggestions for improving your living situation?		YES	NO	Assessment not possible				
	ANSWERS:		3						
40.	Would you welcome more sensors in the building if you got the results?		YES	NO	Assessment not possible				
	ANSWERS:		3						
	INVESTMENT		**1**	**2**	**3**	**4**	**5**	**6**	**7**
41.	Were you involved in the decision-making process for the renovation?		YES	NO	No answer				
	ANSWERS:		3						
42.	Are you satisfied with the energetic goals?		YES	NO	Assessment not possible				
	ANSWERS:		3						
43.	What was the motivation behind the renovation?		Better Energy efficiency	Increase in the value of the property	Sustainability	Comfort improvement	Other		
	ANSWERS:		3						
44.a.	Would you have liked to invest more?		YES	NO	Assessment not possible				
	ANSWERS:				3				
44.b.	If the answer is no: Why did this fail?		Sumary of answers						
	ANSWERS:								