



IEA SHC Task 66:

Solar Energy Buildings

Integrated solar energy supply concepts for climate-neutral buildings and communities for the "City of the Future"

Task Preparation Workshop, *March 30, 2021, Web*

An activity by:

Harald Drück, IGTE, University of Stuttgart, Germany
Christian Fink, AEE INTEC, Gleisdorf, Austria

Task 66 (Solar Energy Buildings) – Task Preparation Workshop

Agenda (1/2)

- Welcome and Introduction by Harald Drück (HD), IGTE Uni Stuttgart
 - Objectives of today's meeting
 - Presentation of Task 66 “Solar Energy Buildings” (SEB)
- Introduction of Participants
- Preparation of a COST-Proposal by Claudia Scholl-Haaf, IGTE
- Break (13:30 to 14:00)
- General introduction to subtasks by HD

Task 66 (Solar Energy Buildings) – Task Preparation Workshop

Agenda (2/2)

- **Subtask A:** Boundary Conditions, KPIs, Definitions and Dissemination
Frank Späte, (OTH-AW, Germany)
- **Subtask B:** New and existing single buildings N.N
- **Subtask C:** New and existing buildings blocks / communities
Elsabet Nielsen, Department of Civil Engineering, DTU, Denmark
- **Subtask D:** Current and future technologies and components
Thomas Ramschak, AEE - Institut für Nachhaltige Technologien, Austria
- **Discussion and next steps (HD)**
 - Modification of workplan needed?
 - COST-Action – how to proceed?
 - Communication: E-Mail, website, logo
 - 1. Task Meeting
 - National participation letter
- **Summary (HD)** (End of meeting approx. 17:00 hrs)

Task 66 (Solar Energy Buildings) – Task Preparation Workshop

Objectives of the meeting

- Meet your colleagues
 - Identify options for cooperation and generate synergies
 - Achieve common understanding of the structure and goals of Task 66
 - Review work program
 - Build Subtaks-Teams
 - Q&A
 - ...
-
- **Pave the way for a smooth and effective start of Task 66**

Task 66 (Solar Energy Buildings) – Task Preparation Workshop

Introduction of participants

Please introduce yourself in a verbal way (without presentation), talk about your expectation related to Task 66 and indicate the subtasks(s) you will participate

Pls switch on your video camera while talking



Presentation of Task 66 – Solar Energy Buildings

Motivation

- On global level: Operation of buildings accounts for around 40 % of primary energy consumption and approximately 25 % of greenhouse gas emissions
 - Europe: Buildings are responsible for 40 % of energy consumption and 36 % of CO₂ emissions
 - Additionally large amounts of energy are embodied in the building's construction materials
- **Goal: A significant reduction of non-renewable energy consumption of buildings**
- **In Europe:**
Energy performance of buildings directive (EPBD; Directive 2002/91/EU, from 16th December, 2002)
- **Latest version of the European Building Directive:**
- nearly zero energy buildings that meet specific energy requirements from **renewable energy** sources may be erected from 2021 onwards
 - A completely renewable, central energy supply for cities not be possible
 - **Decentralised solutions** will be needed in the city of the future interacting with existing grid infrastructures in the best possible way
- **Activity is perfectly in line with „Paris 1,5 K goal“, European Green Deal etc.**

Presentation of Task 66 – Solar Energy Buildings

Objectives (Background)

- In recent years, numerous technological advances have been made in the field of solar energy (thermal and electrical), in the field of other renewable energy technologies as well as in the field of building services.
- As a result, **both at the technology level and at the energy-system level** (e.g., through sector coupling), new approaches will be followed by **IEA SHC Task 66**
- Finally, for the broad applicability in the "city of the future" holistic renewable energy supply concepts for residential buildings should be available, which enable
 - a high energy grid interaction and flexibility potential
 - high surface efficiency of the conversion of solar radiation into heat and power on site or nearby the building
 - a high economic competitiveness
 - high user acceptance
 - a low overall environmental impact

Proposal for an IEA SHC Task on: „Solar Energy Buildings“

Scope

- IEA SHC Task 66 will focus on the development of economic and ecologic energy supply concepts for buildings with high solar fractions of **at least 85% of the heat demand**, **100% of the cooling demand** and **at least 60% of the electricity requirements** for central European climate conditions
- Target: Households and e-mobility of multi-storey residential buildings, single buildings and building blocks or distinguished parts of a city (communities) for both, new buildings and the comprehensive refurbishment of existing buildings
- Key aspect:
 - focus on the overall energy supply of the building: This means heat, cold and power
 - synergetic consideration of the interaction with grid infrastructures (electricity and heat) in the sense of bidirectional flexibility

Presentation of Task 66 – Solar Energy Buildings

Objectives (1/2)

Objective 1:

Identifying and mapping of the relevant involved stakeholders (energy suppliers, housing developers, urban planning, industry, research, and governmental (local, regional, national)) and their needs and roles as well as supporting and inhibiting (legal) framework conditions.

Objective 2:

To give an overview on various technology options and the available technology portfolio, taking into account existing and emerging technologies with the potential to be successfully applied within the context of this Task. Furthermore, strategies will be elaborated how challenges in an economical context can be overcome.

Presentation of Task 66 – Solar Energy Buildings

Objectives (2/2)

Objective 3:

To exploit the new degrees of freedom and possibilities by **linking individual technologies** from the technology portfolio and to optimize the interaction of local generation, storage and consumption at the building and district level enabling interactions with the grid capitalizing on new technological opportunities and unlocking new revenue streams.

Objective 4:

To develop **optimized integrated and grid-interacting energy supply concepts for heat, cold, domestic electricity demand and e-mobility** with intelligent control concepts and promoting user oriented approaches.

Objective 5:

To give **recommendations to policy makers and energy related companies** on how they can influence the uptake of cost-effective solutions related to the planning and implementation of Solar Energy Buildings.

Proposal for an IEA SHC Task on: „Solar Energy Buildings“

Organisation

... based on results of 1. Task Definition Workshop
on March 25, 2020, Web



Presentation of Task 66 – Solar Energy Buildings

Structure of IEA SHC Task 66 on Solar Energy Buildings

Subtask A: Boundary Conditions, KPIs, Definitions and Dissemination

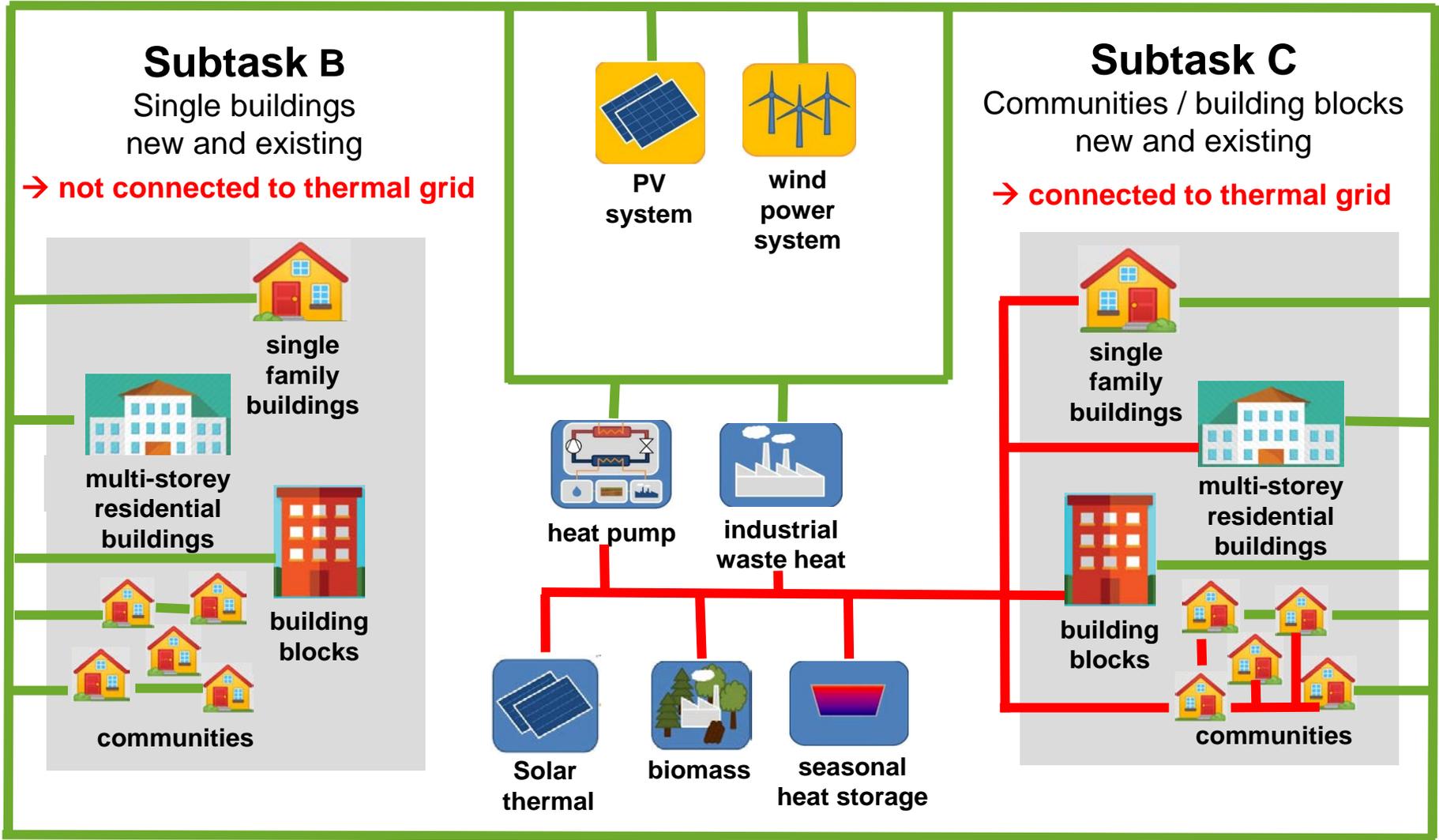
Subtask B: Single Buildings – New and Existing

Subtask C: Communities / Building Blocks – New and Existing

Subtask D: Current and future technologies and components

Proposal for an IEA SHC Task on: „Solar Energy Buildings“

Difference between Subtask B and C



Presentation of Task 66 – Solar Energy Buildings

Definitions

Separation between (single) buildings and building blocks or communities is based on the aspect whether the buildings

are connected to a thermal grid or not

Justification:

- In general most of the buildings will be connected to an electricity grid
- With regard to the interexchange ability of energy the only difference is the aspect if the buildings are connected to a thermal grid or not

Presentation of Task 66 – Solar Energy Buildings

Subtask A

Boundary Conditions, KPIs, Definitions and Dissemination

Lead: Frank Späte, (OTH-AW, Germany)

Key Activities:

A1: Define performance assessment methodology for SEBs including KPIs

A2: Assessment of SEB's

A3: Organize Industry Workshops

A4: Preparation of guidelines for policy makers, municipalities, and energy related companies

Presentation of Task 66 – Solar Energy Buildings

Subtask A - cont'd

Boundary Conditions, KPIs, Definitions and Dissemination

Expressions of interest related to participation:

- Tillmann Gauer, Technische Universität Kaiserslautern, Germany
- Emilia Motoasca, KU Leuven, Belgium
- Frank Späte, OTH-AW, Germany
- Jyotirmay Mathur, MNIT, India
- Markus Peter, SIZ energie+, Germany (possibly)
- Nermeen Abdelnour, zafh.net, HFT Stuttgart, Germany
- Florian Lichtblau, Lichtblau Architekten BDA, Germany
- Thomas Ramschak, AEE INTEC, Austria
- Dominik Bestenlehner, IGTE, Uni Stuttgart, Germany
- Fabian Ochs, Uni Innsbruck, Austria

Presentation of Task 66 – Solar Energy Buildings

Subtask B

Single Buildings – New and Existing

Lead: N.N

Key Activities:

B1: Summary of demonstration cases

B2: Planning and implementation methodology

B3: Modeling, simulation and optimization tools

Presentation of Task 66 – Solar Energy Buildings

Subtask B – cont'd Single Buildings – New and Existing

Expressions of interest related to participation:

- Gerhard Mengedoht, THU, Germany
- Luca Baldini, Empa, Switzerland
- Markus Peter, SIZ energie+, Germany
- Joanna Clarke, Swansea, UK
- Nermeen Abdelnour, zafh.net, HFT Stuttgart, Germany
- Michel Haller, SPF Institut für Solartechnik, Switzerland
- Florian Lichtblau, Lichtblau Architekten BDA, Germany
- Thomas Ramschak, AEE INTEC
- Sebastian Muschik, Technische Hochschule Ingolstadt, Germany
- Dr. Christoph Müller, hc-solar innovative solar solutions, Germany
- Altin Maraj, Polytechnic University of Tirana, Albania
- Fabian Ochs, Uni Innsbruck, Austria

Presentation of Task 66 – Solar Energy Buildings

Subtask C

Communities / Buildings Blocks – New and Existing

Lead: Lead: Elsabet Nielsen (DTU, Denmark) (tbc)

Key Activities:

C1: Summary of demonstration cases

C2: Planning and implementation methodology

C3: Modeling, simulation and optimization tools

Presentation of Task 66 – Solar Energy Buildings

Subtask C – cont'd Communities / Buildings Blocks – New and Existing

Expressions of interest related to participation:

- Marc Deissenroth, HTW Saar, Germany
- Elsabet Nielsen, DTU, Denmark
- Yong Chen, IRENA, Germany
- Fabian Ochs, Uni Innsbruck, Austria

Presentation of Task 66 – Solar Energy Buildings

Subtask D

Current and future technologies and components

Lead: Thomas Ramschak (AEE INTEC, Austria)

Key Activities:

- D1: Documentation and analysis of current and future technologies
- D2: Classification and techno-economic technology assessment
- D3: Development SEB solution sets and guidelines

Presentation of Task 66 – Solar Energy Buildings

Subtask D – cont'd

Current and future technologies and components

Expressions of interest related to participation

- Emilia Motoasca, KU Leuven, Belgium
- Henner Kerskes, IGTE University of Stuttgart, Germany
- Elsabet Nielsen, DTU, Denmark
- Yong Chen, IRENA, Germany
- Michel Haller, SPF Institut für Solartechnik, Switzerland
- Varghese Panthalookaran, RSET, Kochi, India
- Rebecca Yang, RMIT University Melbourne, Australia
- Christoph Müller, hc-solar innovative solar solutions, Germany
- Thomas Ramschak, AEE INTEC, Austria
- Richard Lewis, Swansea, UK

IEA SHC Task 66: „Solar Energy Buildings“

Work **already** done

- Concept paper presented to the IEA SHC ExCo in November 2019 in Santiago de Chile by Werner Weiss
 - Task definition phase started
- Task Definition Workshop performed on March 25, 2020 (virtual, approx. 50 participants)
- Update on latest developments presented at IEA SHC ExCo Meeting on June 3, 2020
- Preparation of
 - Task Work Plan
 - Annex
 - Information Plan
- Presentation of proposed Task to IEA SHC ExCo Meeting on Nov 4, 2020
- **Approved**



Source: https://de.123rf.com/photo_41763157_cartoon-kinder-ingenieur-techniker-und-arbeits-arbeiter-auf-einer-baustelle-geb%C3%A4ude-durch-den-vektor-e.html

IEA SHC Task 66: „Solar Energy Buildings“

Fröling Web Portal | IEA SHC || Projects | IEA SHC || Task 66 || Solar Energ

https://task66.iea-shc.org

SHC TASK 66

ABOUT PROJECT | MEETINGS / EVENTS | NEWS | PUBLICATIONS | RESOURCES

TASK 66
Solar Energy Buildings

[LEARN MORE →](#)

Task Information

DURATION
July 2021 — June 2024

OPERATING AGENT
Dr. Harald Drück
GERMANY
harald.drueck@igte.uni-stuttgart.de

IEA SHC – The world's largest *Solar Heating and Cooling* research network

IEA SHC Task 66: „Solar Energy Buildings“

Documents already available (Supporting Documents)



SOLAR ENERGY BUILDINGS

Integrated solar energy supply concepts for climate-neutral buildings and communities for the "City of the Future"

Work Plan

Version 2.0; December 22, 2020

Note: This Version is based on the results of the results of the 88th IEA SHC Executive Committee Meeting and the ballot performed after this meeting

Prepared by: Harald Drück, IGTE University of Stuttgart, Germany
Email: harald.drueck@igte.uni-stuttgart.de
Christian Fink, AEE INTEC, Gleisdorf, Austria
Email: c.fink@aee.at

Work Plan [December 22, 2020]



TASK 66

SOLAR ENERGY BUILDINGS

Integrated solar energy supply concepts for climate-neutral buildings and communities for the "City of the Future"

ANNEX PLAN

December 2020

This Annex text was prepared by Harald Drück, IGTE University of Stuttgart, Germany

Task 66 – Solar Energy Buildings

Essence of the Annex

Duration: 3 Years

From July 2021 to June 2024

Task sharing requirements – relevant for national participation letter

- Participating country:
min. 3 person month per year → 9 person month in total
- Subtask leaders:
min. 2.5 person month per year → 7,5 person month in total

Cooperation especially with

- EBC (Energy in Buildings and Communities)
- ECES (Energy Conservation and Energy Storage)

Task 66 – Solar Energy Buildings

A common activity of

Harald Drück

Institute for Building Energetics, Thermotechnology and Energy Storage (IGTE), University of Stuttgart - Stuttgart, Germany

Email: harald.drueck@igte.uni-stuttgart.de

Christian Fink, Thomas Ramschak, Walter Becke

AEE INTEC – Institute for Sustainable Technologies, Gleisdorf, Austria

Email: c.fink@aee.at

Questions and Discussion



Task 66 – Solar Energy Buildings

A common activity of

Harald Drück

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Task 66 (Solar Energy Buildings) – Task Preparation Workshop



Task Preparation Workshop
IEA SHC Task 66 "Solar Energy Buildings"
Integrated solar energy supply concepts for climate-neutral buildings and districts for the "City of the Future"
30. March 2021, 11:30 – 17:00 CET (UTC +1)

Note:
Due to the Corona disease the meeting will take place as a web-meeting only.

To join the meeting from your computer, tablet or smartphone click on the following link:
<https://unistuttgart.webex.com/unistuttgart/j.php?MTID=m6b1c8681da0fb440e973dd5fb77eefc1>

For further information related to Task 66 (Solar Energy Buildings) please look at:
<https://task66.iea-shc.org/>

Agenda

11:30	Login and introduction to web meeting tool for subtask leaders
11:45	Login and check functionality of web meeting tool for all participants
<hr/>	
12:00	Welcome and introduction by Harald Drück (IGTE) Objectives of today's meeting Presentation of Task 66 "Solar Energy Buildings" (SEB)
12:20	Introduction of participants Please introduce yourself in a verbal way (without presentation), talk about your expectation related to Task 66 and indicate the subtasks(s) you will participate
13:00	Preparation of a COST – Proposal? Claudia Scholl-Haaf (IGTE) (COST: European Cooperation in Science and Technology)
13:30	Break



14:00	General Introduction to subtasks by Harald Drück (IGTE)
14:15	Subtask A: Boundary Conditions, KPIs, Definitions and Dissemination Frank Späte, (OTH-AW, Germany) and Jyotirmay Mathur, (MNIT, India)
14:45	Subtask B: New and existing single buildings N. N.
15:15	Subtask C: New and existing buildings blocks / communities Elsabet Nielsen, Department of Civil Engineering, Technical University of Denmark
15:45	Subtask D: Current and future technologies and components Thomas Ramschak, AEE - Institut für Nachhaltige Technologien, Austria
16:15	Discussion and next steps (HD) - Modifications of work plan needed? - COST – Action – how to proceed? - Communication: E-Mail, Task 66 website, etc. - 1. Task Meeting (Date and place)
16:45	Summary (HD)
17:00	End of meeting

We would be very happy if you participate at our Task 66 Preparation Workshop.
If you would like to do so, please send an email confirming your participation not later than March 28, 2021 to Claudia Scholl-Haaf: claudia.haaf@igte.uni-stuttgart.de

Contact persons for questions regarding the content:
Dr. Harald Drück
Phone: +49 (0)711-685-63553
Email: harald.drueck@igte.uni-stuttgart.de

Christian Fink
Phone: +43 (0)3112 5886-214
Email: c.fink@aee.at

Contact person for organisational questions:
Claudia Scholl-Haaf
Phone: +49 (0)711-685-63611
Email: claudia.haaf@igte.uni-stuttgart.de

Note: This activity is jointly organised by IGTE, University of Stuttgart, Germany and AEE INTEC, Gleisdorf, Austria

Gefördert durch:



aufgrund eines Beschlusses des Deutschen Bundestages

**Break
... until 14:00 hrs (CET)**



Task 66 (Solar Energy Buildings) – Task Preparation Workshop



by Claudia Scholl-Haaf

“Task 66 Manager”

IGTE University of Stuttgart

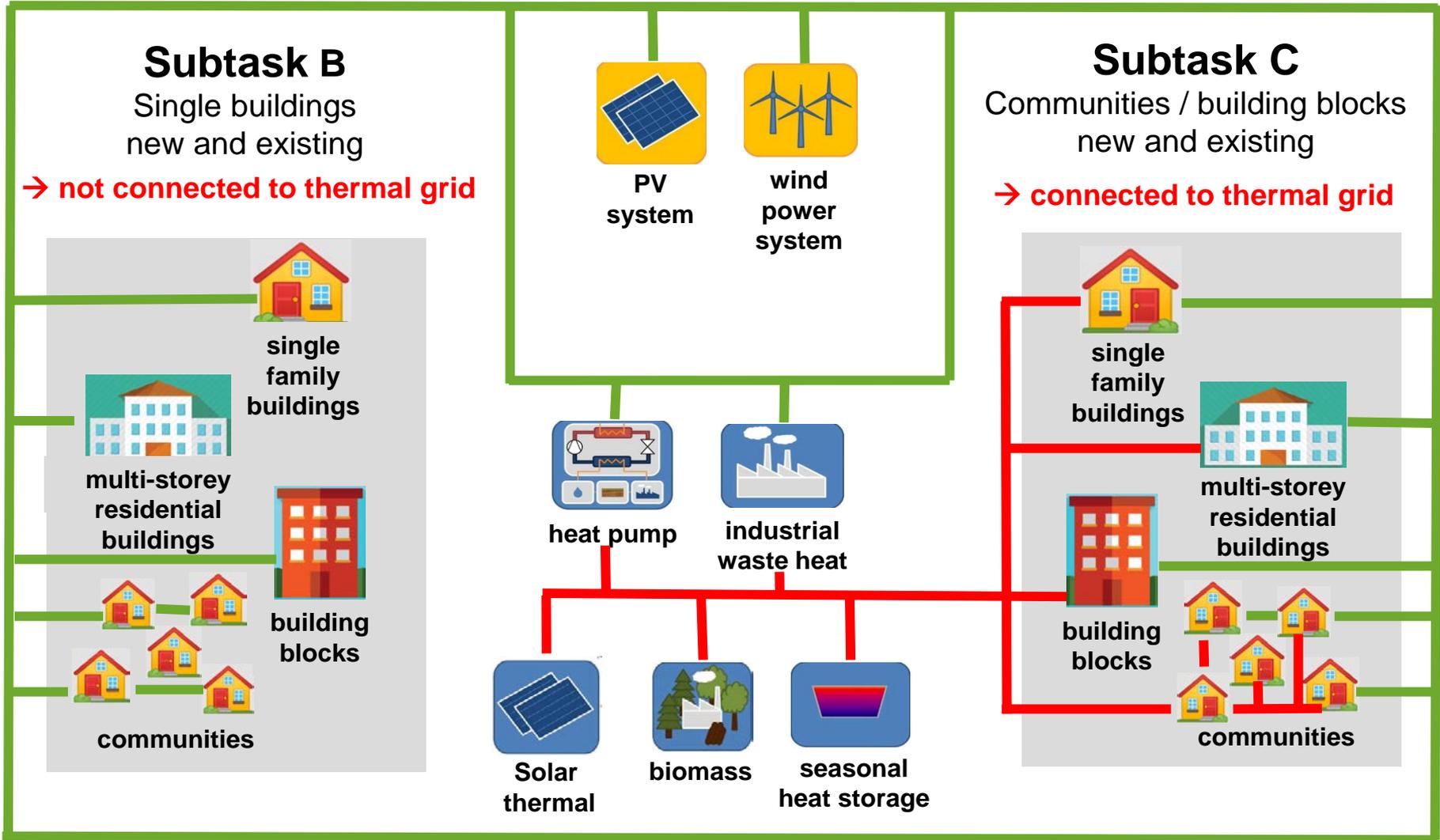
Task 66 (Solar Energy Buildings) – Task Preparation Workshop

General Introduction to Subtasks

- **Subtask A:** Boundary Conditions, KPIs, Definitions and Dissemination
Frank Späte, (OTH-AW, Germany)
- **Subtask B:** New and existing single buildings N.N
- **Subtask C:** New and existing buildings blocks / communities
Elsabet Nielsen, Department of Civil Engineering, DTU, Denmark
- **Subtask D:** Current and future technologies and components
Thomas Ramschak, AEE - Institut für Nachhaltige Technologien, Austria

Presentation of Task 66 – Solar Energy Buildings

Difference between Subtask B and C



— electrical grid

— thermal grid

Presentation of Task 66 – Solar Energy Buildings

Key Aspects of Subtask Meetings

- Information about subtask
- Presentation and discussion of work plan (including deliverables) and if necessary identification of points for modifications
- Definition of the starting point of subtask work
- Identification of participants
- Identification of important Topics for the Task Kick-Off meeting

Presentation of Task 66 – Solar Energy Buildings

Subtask A

Boundary Conditions, KPIs, Definitions and Dissemination

Lead: Frank Späte, (OTH-AW, Germany)

Presentation of Task 66 – Solar Energy Buildings

Subtask B

Single Buildings – New and Existing

Lead: N.N

Key Activities:

B1: Summary of demonstration cases

B2: Planning and implementation methodology

B3: Modeling, simulation and optimization tools

Presentation of Task 66 – Solar Energy Buildings

Subtask B – cont'd Single Buildings – New and Existing

Deliverables:

No.	Deliverable	Month
D.B1	Summary of demonstration cases (case studies)	14
D.B2	Description of processes and tools currently used to design new Solar Energy Buildings	18
D.B3	Description of processes and tools currently used to convert existing buildings into Solar Energy Buildings	18
D.B4	Catalogue describing optimized solutions of Solar Energy Buildings	36

Presentation of Task 66 – Solar Energy Buildings

Subtask B – cont'd Single Buildings – New and Existing

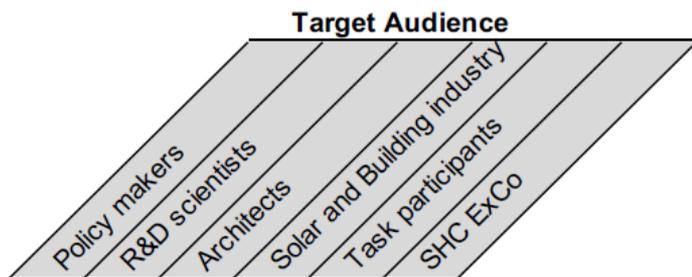
Time Table:

IEA SHC Task - Solar Energy Buildings		Year 0,5 : 2021 Breakdown by quarter		Year 0,5 - 1,5 : 2022 Breakdown by quarter				Year 1,5 - 2,5 : 2023 Breakdown by quarter				Year 2,5 - 3 -: 2024 Breakdown by quarter	
		3	4	1	2	3	4	1	2	3	4	1	2
Subtask B: New and existing single buildings													
B.1.	Summary of demonstration cases (case studies)					D.B1							
B.2.	Description of processes and tools currently used to design new Solar Energy Buildings						D.B2						
B.3.	Description of processes + tools used to convert existing buildings into Solar Energy Buildings												D.B3
B.4.	Catalogue describing optimized solutions of Solar Energy Buildings												D.B4

Presentation of Task 66 – Solar Energy Buildings

Subtask B – cont'd Single Buildings – New and Existing

Information Plan:



	Policy makers	R&D scientists	Architects	Solar and Building industry	Task participants	SHC ExCo				
	x	x	x	x	x		B1	Summary of demonstration cases (case studies)	SHC website (digital), Print	14
	x		x	x	x		B2	Description of processes and tools currently used to design new Solar Energy Buildings	SHC website (digital)	18
	x		x	x	x		B3	Description of processes and tools currently used to convert existing buildings into Solar Energy Buildings	SHC website (digital)	18
x	x	x	x	x	x		B4	Catalogue describing optimized solutions of Solar Energy Buildings	SHC website (digital), Print	36

Presentation of Task 66 – Solar Energy Buildings

Subtask B – cont'd Single Buildings – New and Existing

Expressions of interest related to participation:

- Gerhard Mengedoht, THU, Germany
- Luca Baldini, Empa, Switzerland
- Markus Peter, SIZ energie+, Germany
- Joanna Clarke, Swansea, UK
- Nermeen Abdelnour, zafh.net, HFT Stuttgart, Germany
- Michel Haller, SPF Institut für Solartechnik, Switzerland
- Florian Lichtblau, Lichtblau Architekten BDA, Germany
- Thomas Ramschak, AEE INTEC
- Sebastian Muschik, Technische Hochschule Ingolstadt, Germany
- Dr. Christoph Müller, hc-solar innovative solar solutions, Germany
- Altin Maraj, Polytechnic University of Tirana, Albania
- Fabian Ochs, Uni Innsbruck, Austria

Presentation of Task 66 – Solar Energy Buildings

Subtask C and D

→ see separate presentations of Subtask Leaders

Task 66 „Solar Energy Buildings“

Questions and Discussion



Task 66 (Solar Energy Buildings) – Task Preparation Workshop

Next Steps (1/3)

- **Modification of workplan needed?**
yes → Subtask leaders send modified Workplan in track changes mode to HD until April 9, 2021
- **Naming of Subtask B and C**
Sub B: Thermal stand alone Solar Energy Buildings and Building Blocks
alternative : Solar Energy Buildings and Building Blocks
- Sub C; Thermal grid connected Solar Energy Buildings and Building Blocks
- **Or: Combine Subtask B and C?**

- **Final decision will be made after Easter**
- **Info will be send out to all potentially interested Task 66 participants**
- **You will be asked to indicate your interest concerning the participation in specific subtask(s)**

Task 66 (Solar Energy Buildings) – Task Preparation Workshop

Next Steps (2/3)

➤ **COST-Action – how to proceed?**

yes / no → reply at latest until May 7, 2021 to claudia.haaf@igte.uni-stuttgart.de

➤ **Communication: E-Mail, website, logo**

E-Mail

Do we need a mailing list for Task 66, something like task66@... → yes

Do we need mailing lists for the Subtaks → no

Mailing “rules”

Subject: Task66: abc..xyz – for information relevant for the complete task

Task 66X: abc..xyz for information relevant for subtask X (X=A,B,C,D)

Logo: Do we need one?

Any good ideas?

Data exchange planform:

- For making documents available -→ <https://task66//iea-shc.org>

- For working on documents together → to be organized by HD

Task 66 (Solar Energy Buildings) – Task Preparation Workshop

Next Steps (3/3)

➤ “Nice” pictures

If you have some to share, please send them to Claudia
(claudia.haaf@igte.uni-stuttgart.de)

together with

- the permission to use them

- information what is shown (*e.g. solar multifamily house with PV and ST in Berlin, Germany*)

- information how they should be referenced

➤ 1. Task Meeting

When: 1 and 2, July 2021 (at afternoon in Europe)

Where: Internet

➤ National participation letter

Agree within your country who will take care of this and let me know.

I'll then send you the template.

➤ AOB?

none

Thanks!

www.iea-shc.org



Harald Drück, IGTE, University of Stuttgart - Stuttgart, Germany
Email: harald.drueck@igte.uni-stuttgart.de

Christian Fink, Thomas Ramschak, AEE INTEC, Gleisdorf, Austria
Email: c.fink@aee.at