SOLAR HEATING & COOLING PROGRAMME
INTERNATIONAL ENERGY AGENCY

IEA SHC Task 66:

Solar Energy Buildings

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

Industry Workshop No 2

"Solar thermal and/or PVT combined with heat pumps as an innovative energy supply solution"

29th September 2022, Kassel, Germany

in context with the EuroSun 2022 conference

14:00 – 17:30 h Building WISO B / Room 0109, Nora-Platiel-Straße 5, Kassel

Manager Task 66: Harald Drück, IGTE, University of Stuttgart, Germany
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Leader Subtask A of Task 66: Frank Späte, Technical University of Applied Sciences Amberg-Weiden
Email: f.spaete@oth-aw.de

Intro to Dr. Harald Drück

- Working at University of Stuttgart, Institute for Building Energetics, Thermotechnology and Energy Storage (IGTE), former ITW, for +25 years, as research coordinator, leader “sustainable buildings and smart city concepts” and head “solar testing”
- Main field of activities: solar thermal, heat storage, Smart Cities, solar and energy efficient buildings, ..
- Head of SWT (Solar- und Wärmetechnik / Solar- and Heat Technolgy Stuttgart)
- Board Member of Solar Heat Europe / ESTIF
- Chairman of the Global Solar Certification Network
- Adjunct Professor at Rajagiri School of Engineering & Technology (RSET), Rajagiri, Kochi, India
- .....

Introduction to Task 66

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 CO_2 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

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

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.

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.

Structure of IEA SHC Task 66 on Solar Energy Buildings

Subtask A: Boundary Conditions, KPIs, Definitions and Dissemination
Lead: **Frank Späte, (OTH-AW, Germany)**

Subtask B: Thermal stand alone Single Buildings and Building Blocks (New and Existing) – Not connected to a thermal grid
Lead: **Xinyu Zhang, (China Academy of Building Research, Beijing, China)**

Subtask C: Thermal grid connected Buildings and Building Blocks / Communities (New and Existing) – Connected to a thermal grid
Lead**: Elsabet Nielsen (DTU, Denmark)**

Subtask D: Current and future technologies and components
Lead: **Thomas Ramschak (AEE INTEC, Austria)**

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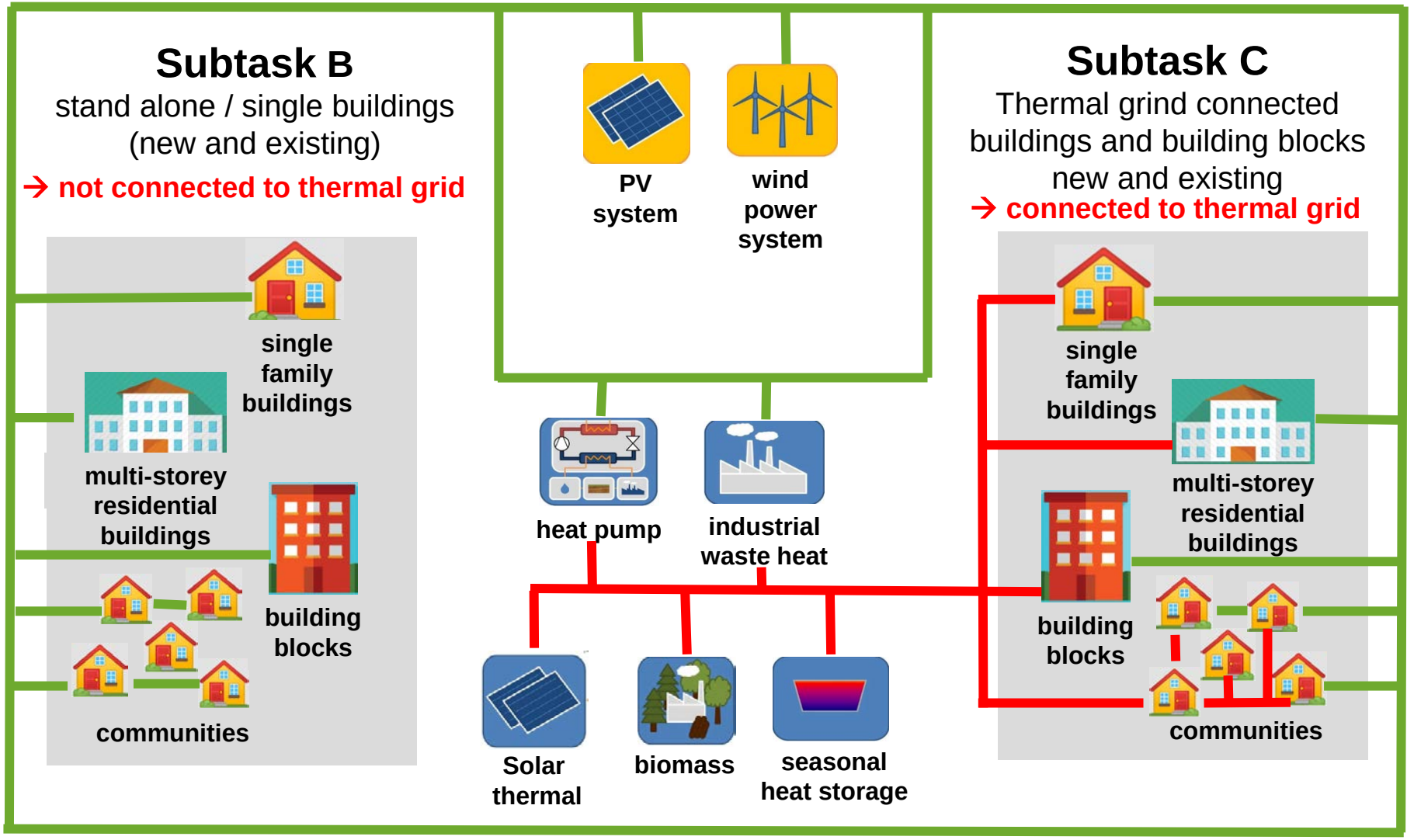
Difference between Subtask B and C



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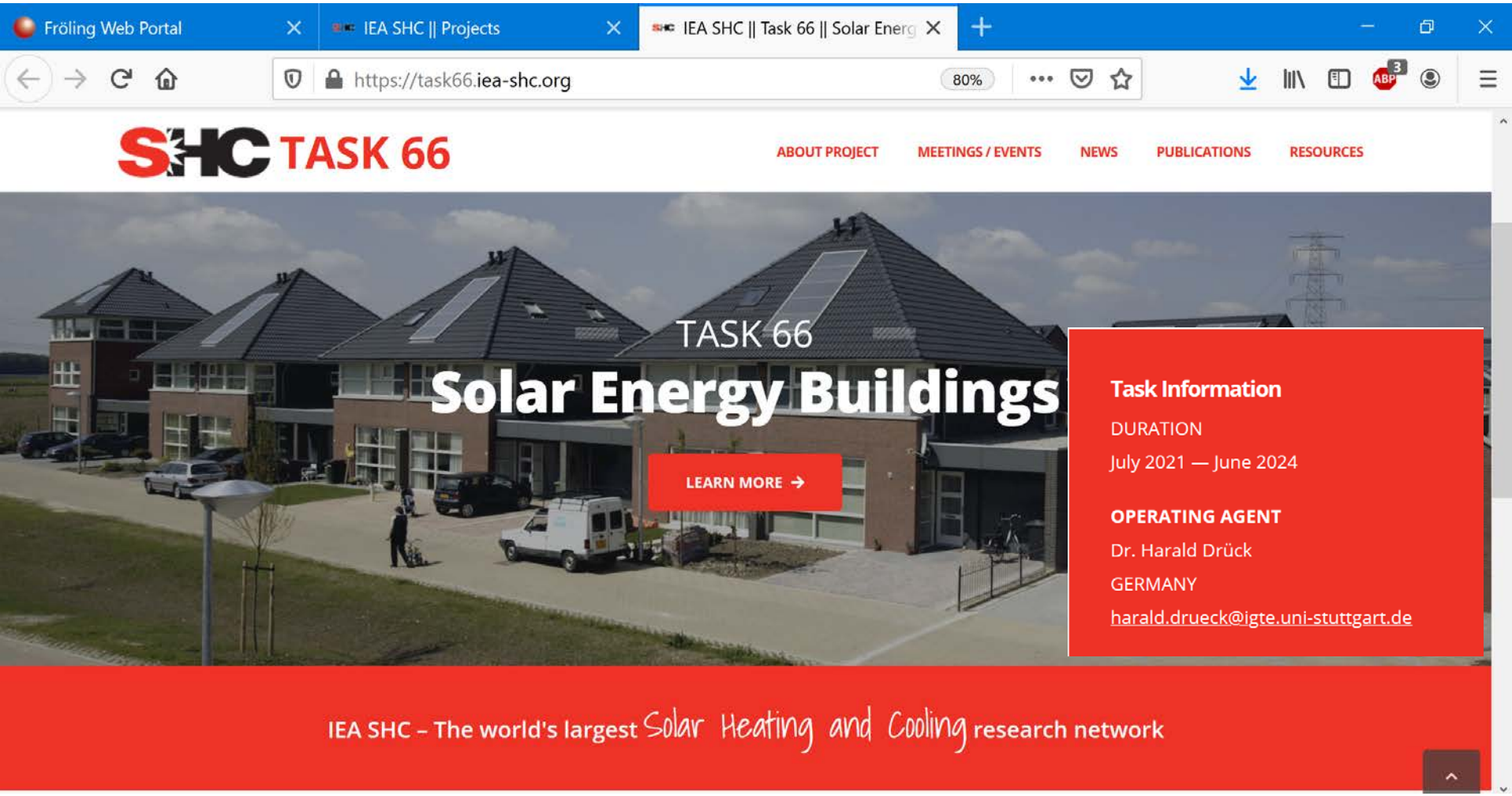

https://task66.iea-shc.org/

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Program 1/3

14:00 – 14:10	**Welcome, Introduction and Presentation of Task 66** ✓ Dr. Harald Drück, Task Manager of Task 66 Institute for Building Energetics, Thermotechnology and Energy Storage (IGTE), University of Stuttgart, Germany
14:10 – 14:30	**PVT heat pump collector as innovative energy supply solution** Andreas Siegemund, Managing Partner Consolar Solare Energiesysteme, Germany
14:30 – 14:50	**VirtuPVT: evacuated-tube technology for commercial and industrial applications** Maria Zagorulko, Development and Operations Engineer Naked Energy Ltd., UK
14:50 – 15:10	**Design and optimization of CCHP for microgrids and solar energy buildings** Dr. Arun Kumar Vaiyapuri, Project Manager / R&D and Renewable Energy STEAG Energy Services (India) Pvt. Ltd., India

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Program 2/3

15:10 – 15:30 **Manufacturing of innovative pvt-collectors (tbc)**
Robbert van Diemen, Managing Director at HRsolar Group
HRsolar Group / Qsilence, Netherlands

15:30 – 16:00 *Coffee Break*

16:00 – 16:20 **Intelligent heat pump solutions in combination with photovoltaics**
Markus Hainzer Key Account Manager
iDM Energiesysteme GmbH, Austria

Presentation of latest Task 66 Subtasks results

16:20 – 16:30 **Introduction: Task66 Video**
Moderation: Dr. Harald Drück

16:30 – 16:45 **Highlights of the activities in Subtask A**
Boundary Conditions, KPIs, Definitions and Dissemination
Prof. Frank Späte, Leader Subtask A of Task 66
OTH Amberg-Weiden, Germany

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Program 3/3

16:45 – 17:00	**Highlights of the activities in Subtask B** *Thermal stand alone Buildings and Building Blocks / Communities* *represented by:* Elsabet Nomonde Noma Nielsen, Leader Subtask C of Task 66, Technical University of Denmark (DTU), Denmark
16:45 – 17:00	**Highlights of the activities in Subtask C** *Thermal grid connected Buildings and Building Blocks / Communities* Elsabet Nomonde Noma Nielsen, Leader Subtask C of Task 66 Technical University of Denmark (DTU), Denmark
17:00 – 17:15	**Highlights of the activities in Subtask D** *Current and future technologies and components* Thomas Ramschak, Leader Subtask D of Task 66 AEE - Institut für Nachhaltige Technologien, Austria
17:15 – 17:30	**Discussion and Closing:** Dr. Harald Drück, Task Manager Task 66, IGTE, University of Stuttgart, Germany

18:30 - ?? Happy hour – free drinks and networking and ….

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Thank you for your attention

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