HELSINKI

www.2018DEdays.org

Simona Weisleder

Hamburg Institut

#18DEdays

MULTI CODED AREAS FOR SDH

Session: DHC Innovative Ideas for a Changing World

Simona Weisleder, Architect

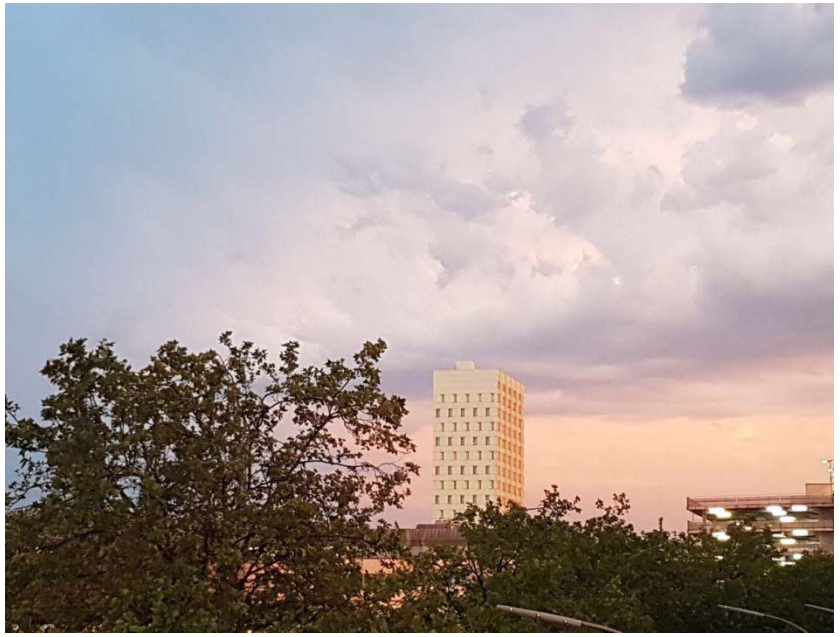
27. September 2018, Helsinki
Global District Energy Days

© Hamburg Institut

About us

HAMBURG INSTITUT is a privately owned consulting and research company focused on renewable energy issues.

- Founded in 2012
- 10 employees
- Interdisciplinary approach



We are experts for:

- ✓ Policy advice and strategies in energy policy & legislation
- ✓ Development of business models and products, specialized on green power markets
- ✓ Holistic concepts of the energy transition for cities and districts
- ✓ District and process heating strategies for municipalities and industry, specialized on large scale solar thermal heating
- ✓ Concepts for communication and dialogue
- ✓ Civic participation schemes and energy cooperatives

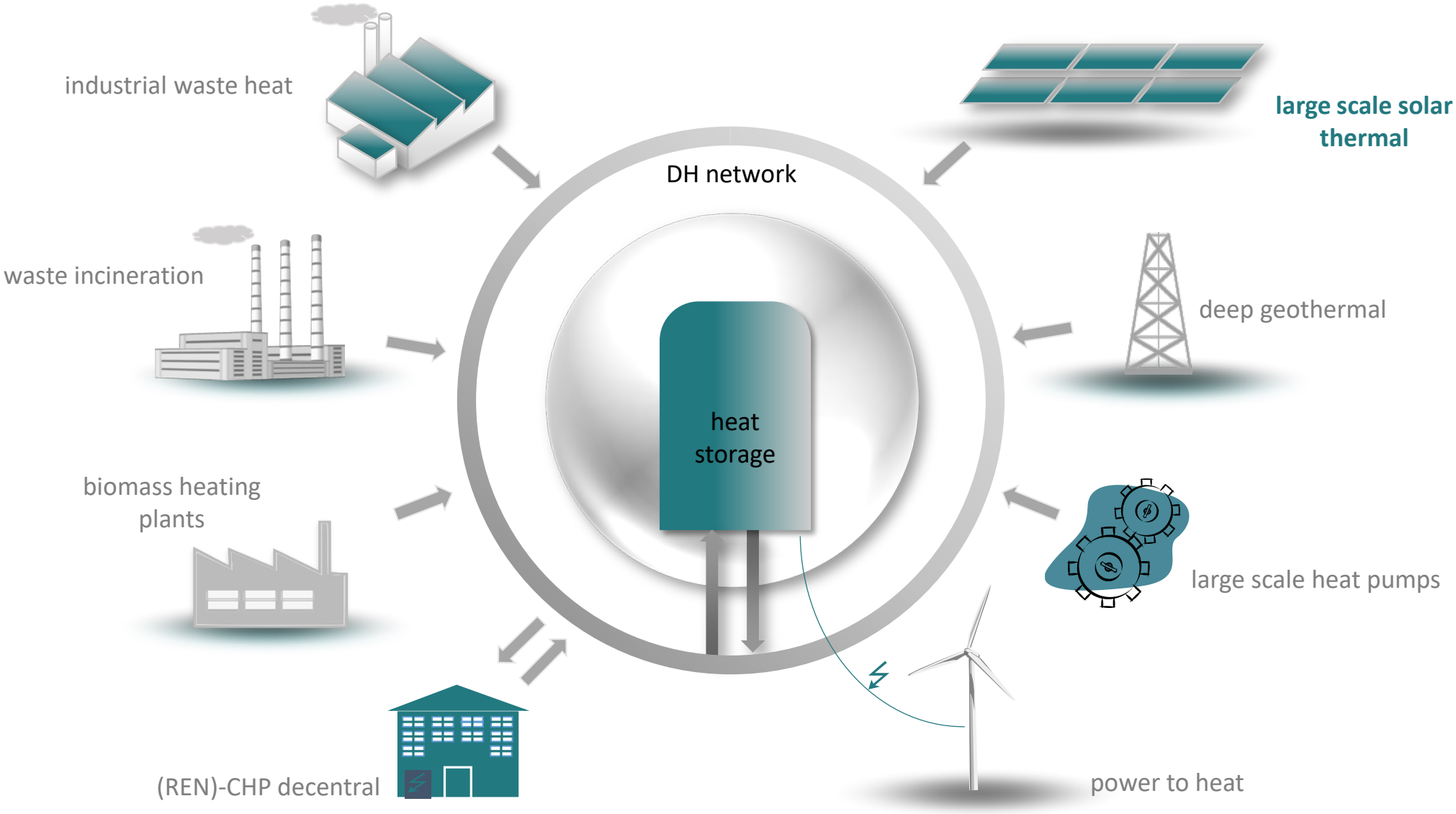
© Hamburg Institut

DH plays an important role in future smart cities and smart countryside!

The de-carbonisation of existing DH and REN in new DH is the challenge.

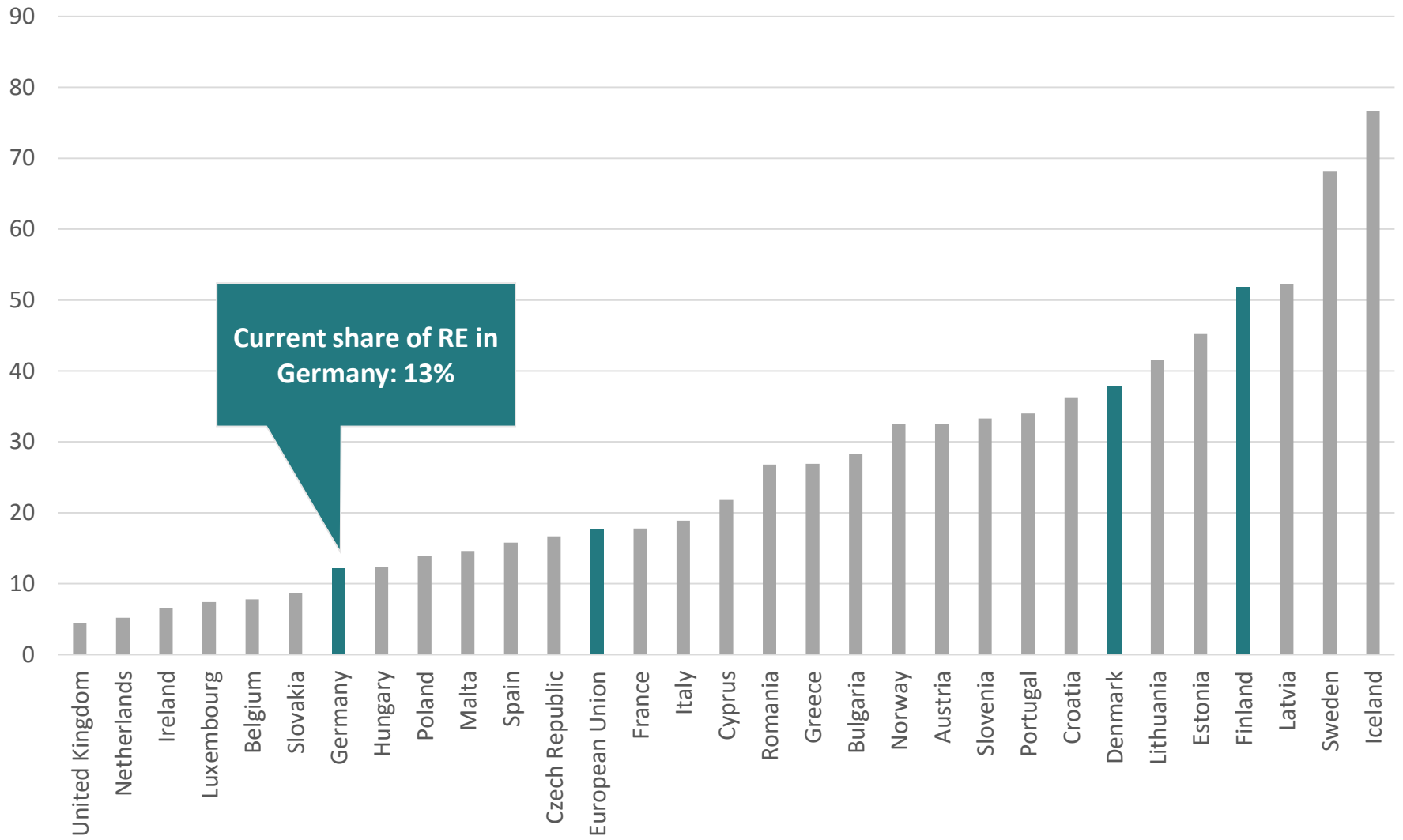
© Hamburg Institut

DH can cost-efficiently and flexibly integrate renewable energies and waste heat



© Hamburg Institut

Share of renewable energies in heating and cooling



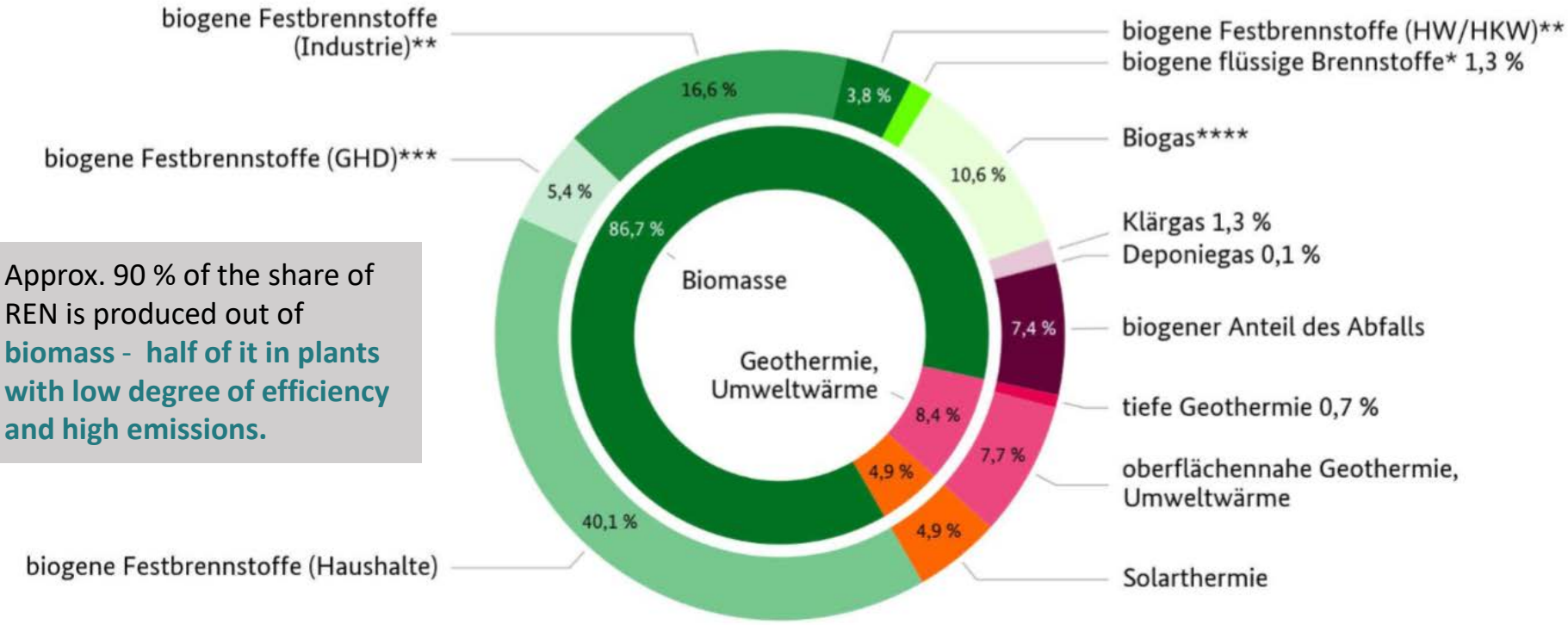
© Hamburg Institut

Source: : Eurostat 02/2016

Share of renewable energies in heating and cooling

Share of renewables in heating supply in Germany in 2017

Gesamt: 162,2 Mrd. Kilowattstunden



Approx. 90 % of the share of REN is produced out of **biomass - half of it in plants with low degree of efficiency and high emissions.**

The increase of the share of REN in the heating sector can <u>not</u> be based on bio-energy. Potentials are mainly **solar thermal**, geothermic and environmental heat.

© Hamburg Institut

Source: : BMWi auf Basis AGEEStat, Stand: Feb. 2018, Angaben vorläufig

Solar District Heating

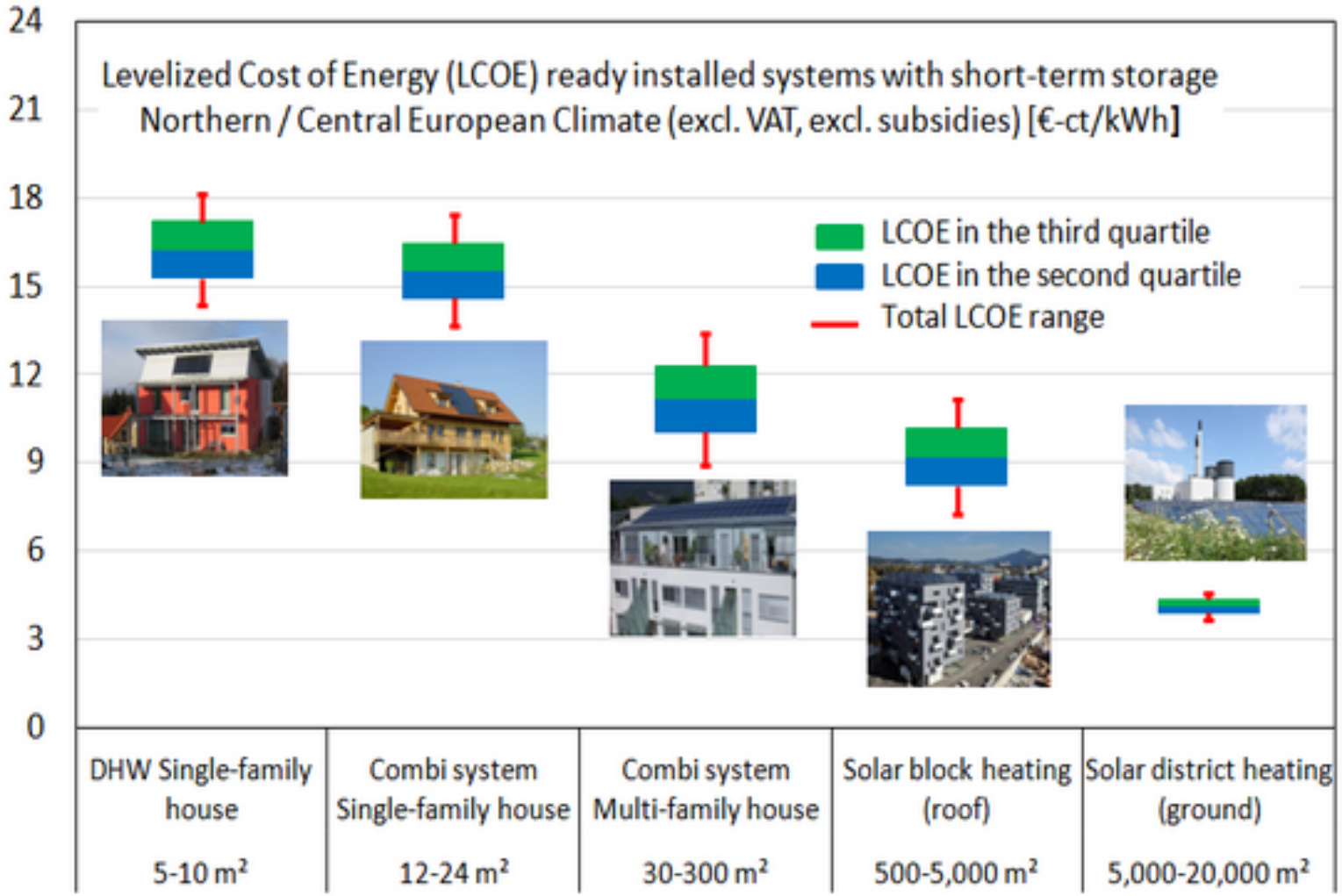
- Free from risk and pollutants
- Available everywhere
- Technologically mature and proven in practice for many years
- Local climate protection and added value
- Very cost-efficient in large-scale plants, competitive with fossil heat
- Stable costs for providers and consumers

SDH plant in Snedstedt in Denmark, 6.500 m²

© Hamburg Institut

Source: : Hamburg Institut

Large scale plants offers low heat costs



LOW HEAT COSTS

© Hamburg Institut

Source: : Internationale Energie Agentur IEA Task 52 Solar Thermal in Energy Supply Systems in Urban Environments, 2016

SDH in Denmark

Front runners in Denmark

- **150.000 m² Silkeborg (DK)**
- 70.000 m² Vojens (DK)
- 45.000 m² Gram (DK)
- 38.000 m² Dronninglund (DK)
- 33.000 m² Marstal (DK)
- ..
- 8.000 m² Senftenberg (D)

- **20 - 50 % of the annual heat demand of the municipal district heating grids**

© Hamburg Institut

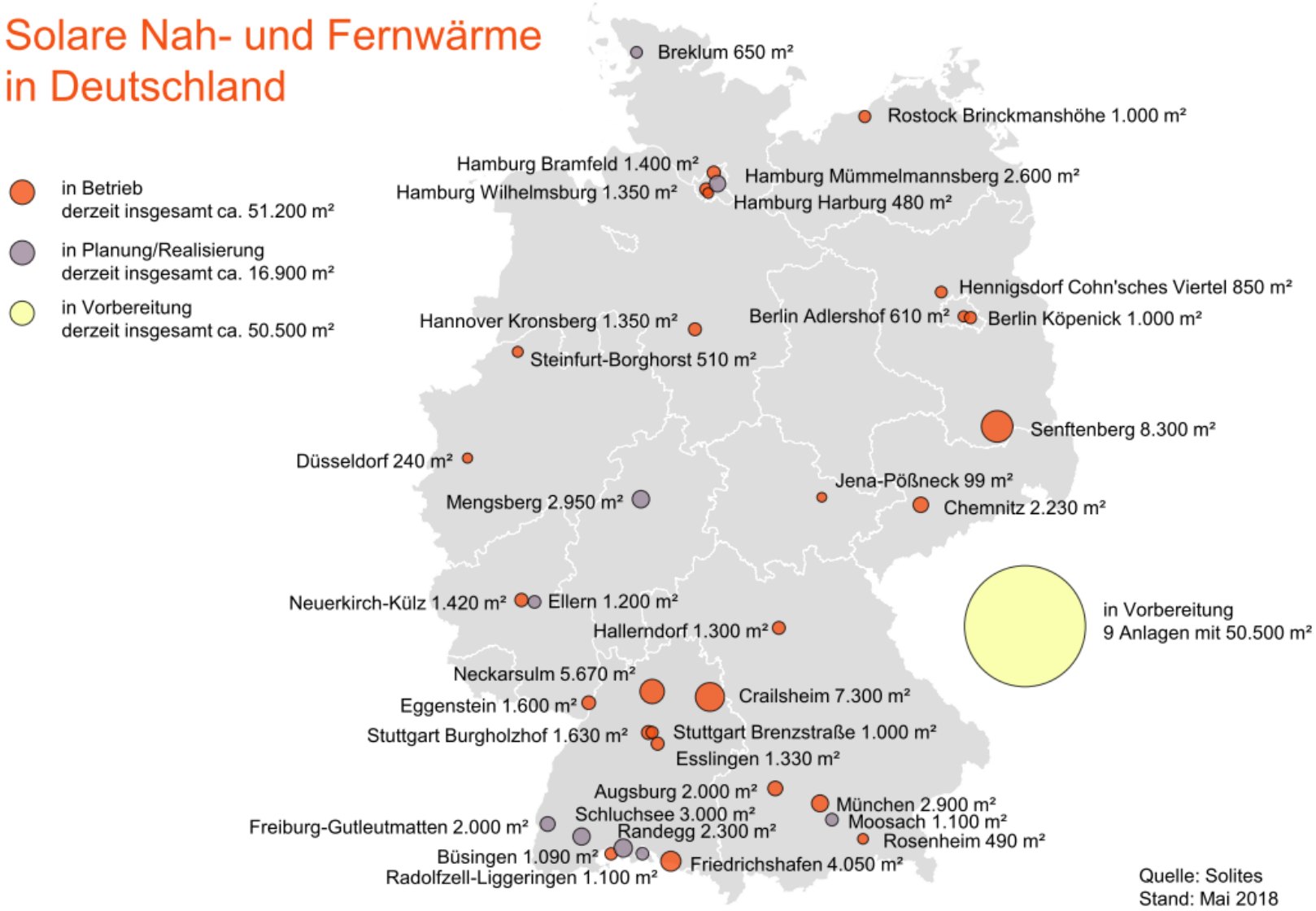
Source: Arcon-Sunmark. July 2017

Why is the implementation of SDH in other countries e.g. Germany so difficult?

How can we overcome barriers with the approach of multi coded areas and innovative ideas?

© Hamburg Institut

SDH in Germany



© Hamburg Institut

Source: : Solites, May 2018

Status quo

1. There is **no consciousness** that renewable DH needs AREA.
2. There is **no top-down regional planning** (like in wind energy) to identify suitable land areas for SDH from a regional planning perspective.
3. Land areas are only identified on a bottom-up and **case-by-case approach.**
4. **Landscape planners** are very unwilling to accept ground mounted SDH.
5. **Nature conservation** can be a serious issue and must be dealt carefully.
6. In general there is a **lack of willingness** to „sacrifice“ agricultural land to solar energy

© Hamburg Institut

Finding the space for SDH is the most challenging for realising big and competitive plants…

There is an enormous competition with housing, nature, agriculture, landscape, industry…

© Hamburg Institut

Options for SDH on multi coded areas

1. large scale roof areas
2. large infrastructure installations
3. polluted or contaminated or industrial areas
4. areas along traffic routes
5. nature preservation and water protection areas
6. agricultural production

© Hamburg Institut

1. Area: Development of large scale roof areas for SDH

SDH on the Energy Bunker – Hamburg Wilhelmsburg / Germany

© Hamburg Institut

Source: IBA Hamburg

1. Area: Development of large scale roof areas for SDH

SDH on an exhibition hall : Wels/ Austria

… Graz

© Hamburg Institut

Source: Ritter XL Solar + SOLID

2. Area: Development of large infrastructure installations for SDH

Solar on a parking deck: Graz/ Austria

© Hamburg Institut

Source: SOLID

2. Area: Development of large infrastructure installations for SDH

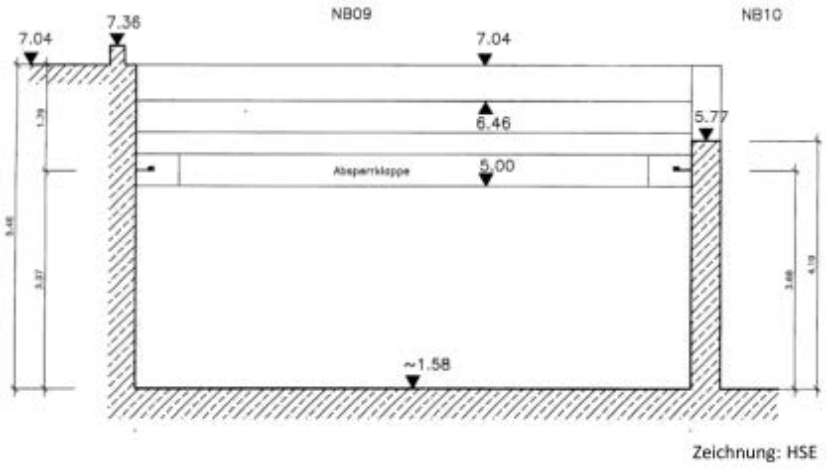
Solar on a tuna fabric in Thailand

© Hamburg Institut

Source: Arcon-Sunmark

2. Area: Development of large infrastructure installations for SDH

PILOT PROJECT IDEA: SDH on sewage water treatment basins in Hamburg/ Germany



© Hamburg Institut

Source: HSE

3. Area: Development of polluted or contaminated or industrial areas for SDH

SDH on an industrial remaining area: Chemnitz/ Germany

… Graz

© Hamburg Institut

Source: Greenonetec + SOLID

3. Area: Development of polluted or contaminated or industrial areas for SDH

SDH on a recultivated dump site: Senftenberg/ Germany

STADTWERKE SENFTENBERG GmbH

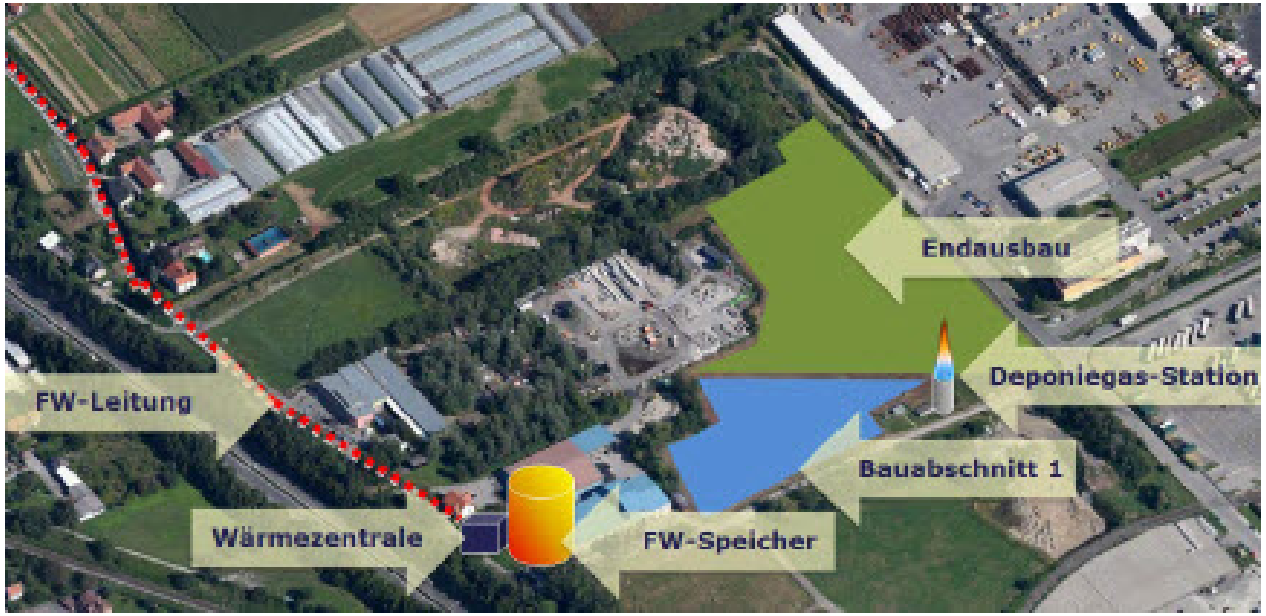
Gas · Strom Fernwärme

© Hamburg Institut

Source: Ritter XL Solar

3. Area: Development of polluted or contaminated or industrial areas for SDH

SDH on a former dump site: HELIOS project in Graz/ Austria



© Hamburg Institut

Source: ENERGIE GRAZ, Hamburg Institut

3. Area: Development of polluted or contaminated or industrial areas for SDH

PILOT PROJECT IDEA: SDH on harbour sludge dump sites Hamburg/ Germany

Harbour sludge dump site in the east
land area: approx. 80 hectare

Harbour sludge dump site in the south
land area: approx. 45 hectare

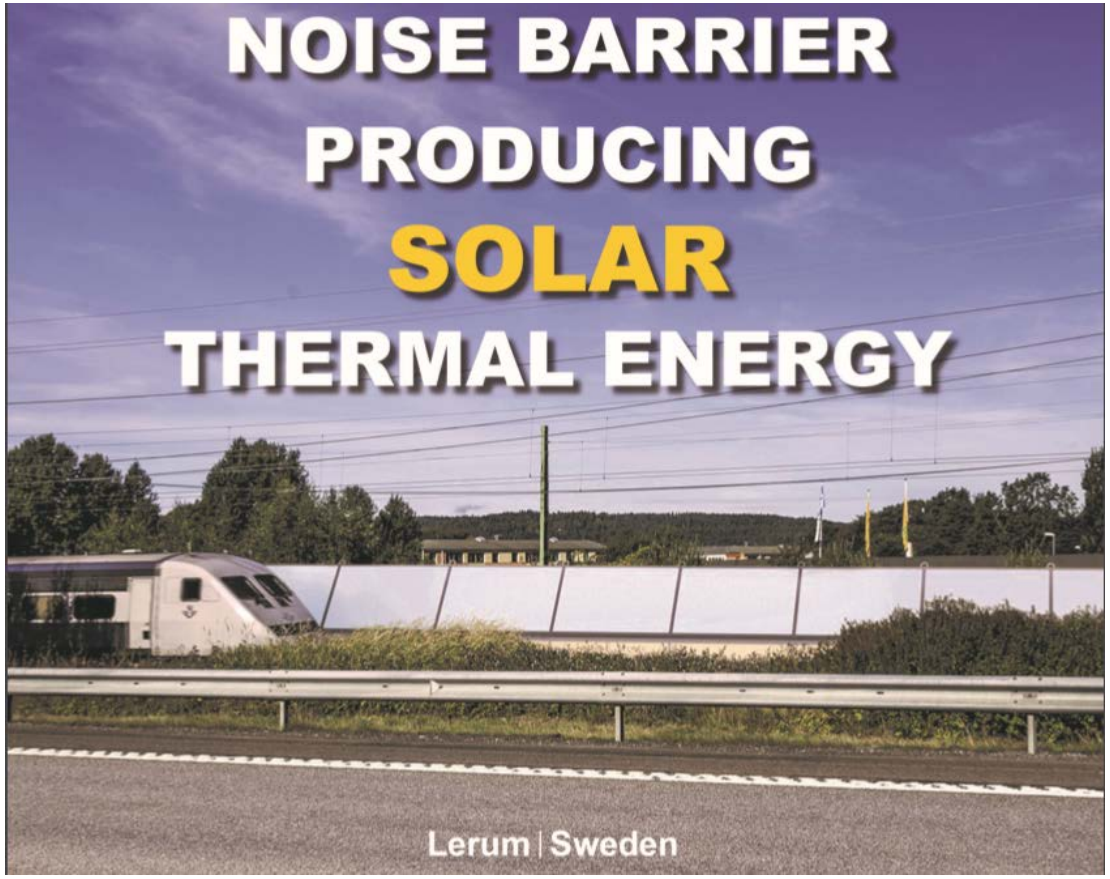
Harbour sludge dump site in the west
land area: approx. 100 hectare

© Hamburg Institut

Source: HPA

4. Area: Development of areas along traffic routes for SDH

SDH on a noise barrier: NOISUM project in Lerum/ Sweden



© Hamburg Institut

Source: https://noisun.wordpress.com/in-english/the-project/

4. Area: Development of areas along traffic routes for SDH

SDH as landscape element: Almere/ Netherlands

© Hamburg Institut

Source: NUON

4. Area: Development of areas along traffic routes for SDH

SDH along traffic routes: model PV in Germany

© Hamburg Institut

Source: IBC Solar + Labor3

5. Area: Development of nature preservation and water protection areas for SDH

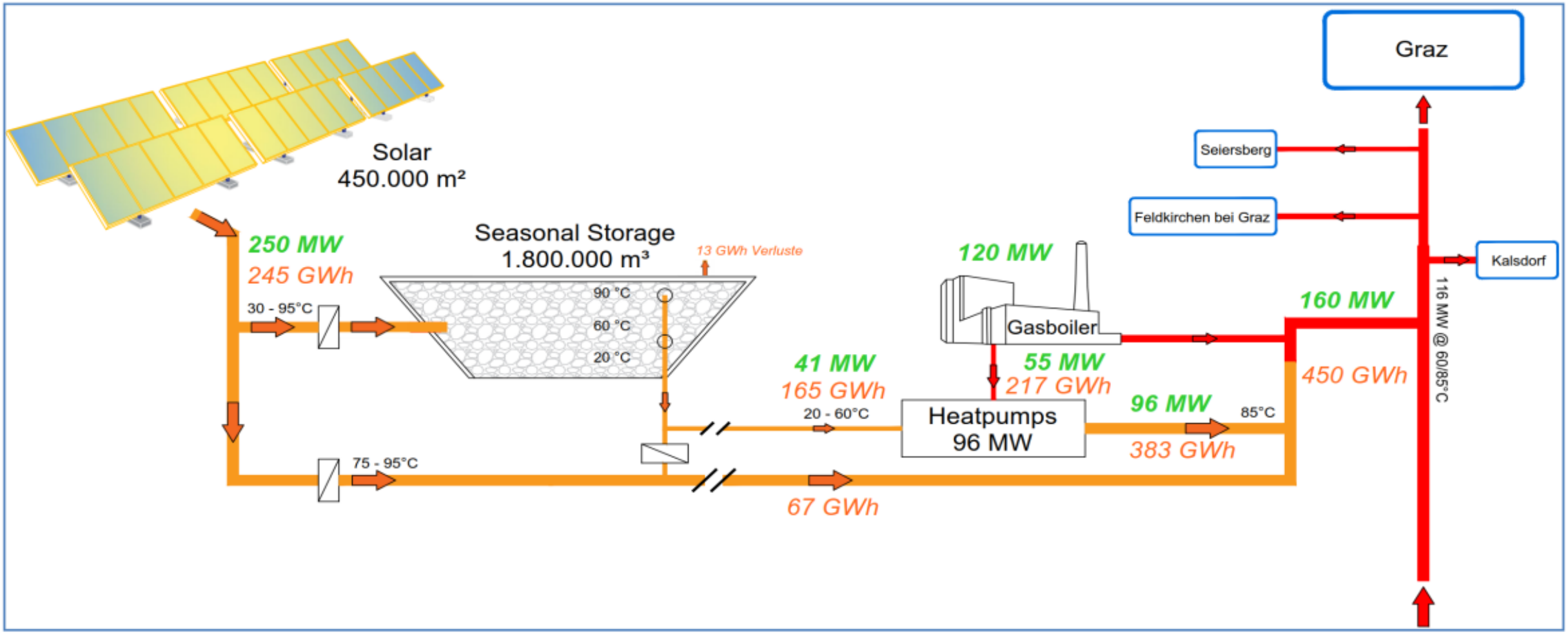
SDH on flood protection areas: Châteaubriant/ France

© Hamburg Institut

Source: TECSOL + MCM Architecture

5. Area: Development of nature preservation and water protection areas for SDH

PILOT PROJECT IDEA: SDH in water protection areas BIG SOLAR Graz, Austria

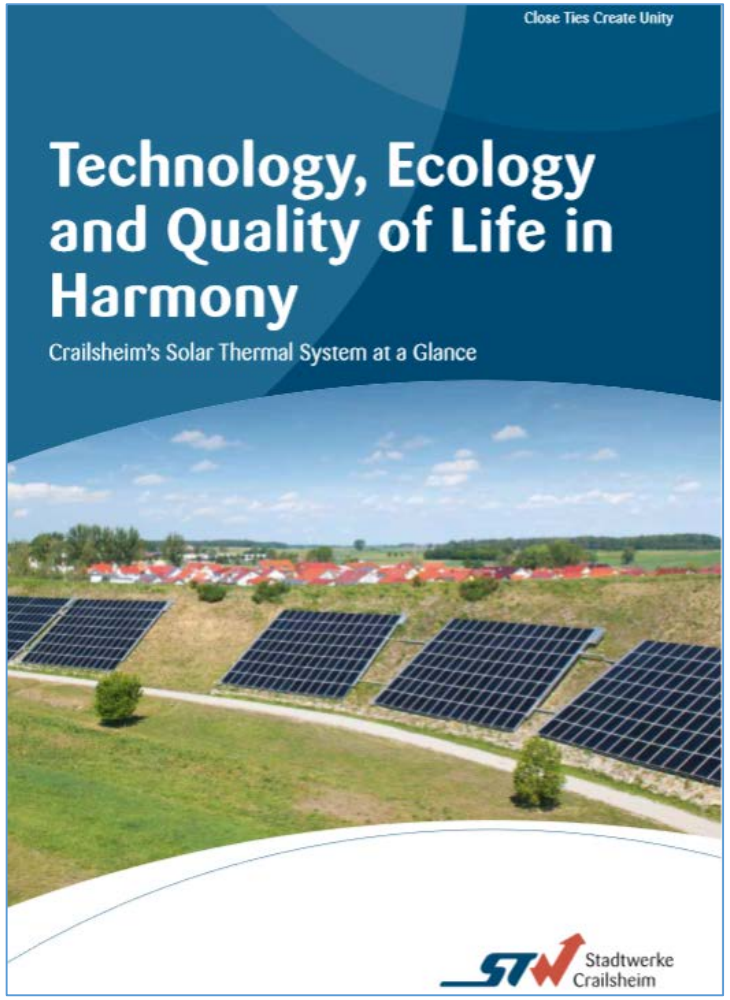


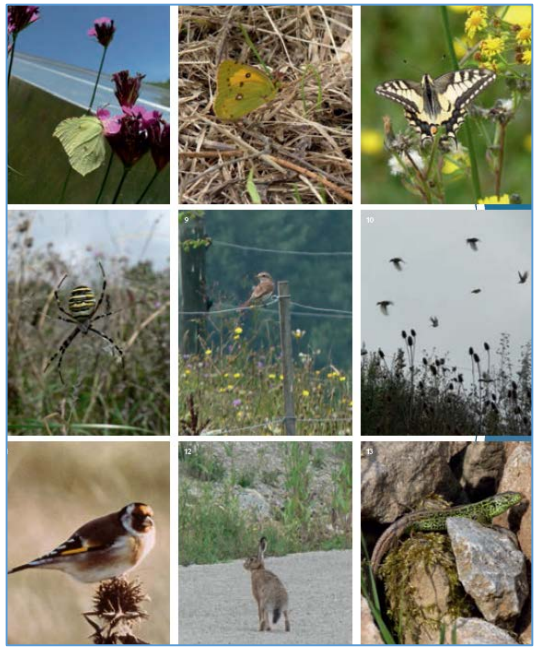
© Hamburg Institut

Source: SOLID

5. Area: Development of nature preservation and water protection areas for SDH

SDH and nature preservation: Crailsheim/ Germany





© Hamburg Institut

Source: http://solar-district-heating.eu/Portals/0/NewFolder/BroschüreCrailsheimEN.pdf

6. Area: Development of agricultural production areas for SDH

PILOT PROJECT IDEA: SDH and agriculture – model AGROPHOTOVOLTAICS

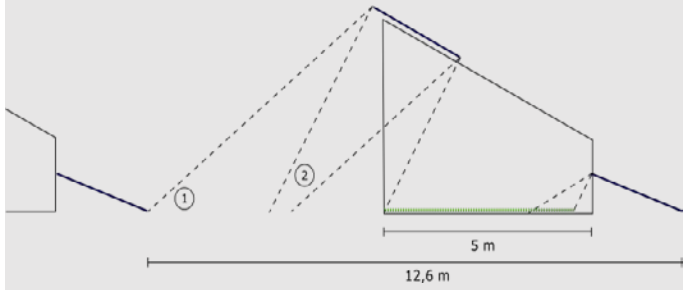
© Hamburg Institut

Source: www.agrophotovoltaik.de

6. Area: Development of agricultural production areas for SDH

PILOT PROJECT IDEA: Solar neighbourhood green houses

Solar Energy



Healthy Food

Community Building

© Hamburg Institut

Source: Hamburg Institut, Hof vom Deich, Gartendeck

6. Area: Development of agricultural production areas for SDH

PILOT PROJECT IDEA: Solar neighbourhood green houses

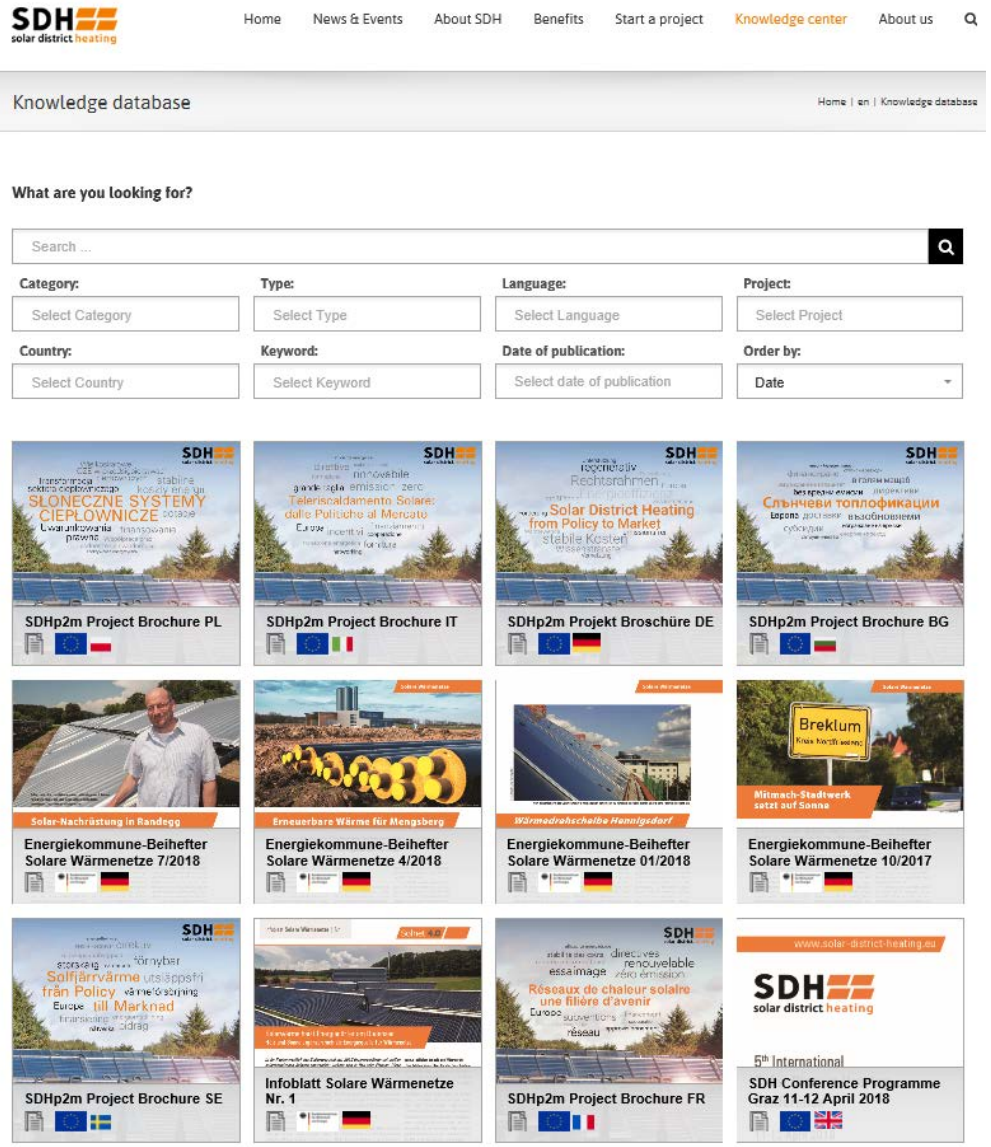
© Hamburg Institut

There is a large and divers potential for multi coded areas for SDH!

Innovative ideas are welcome!

© Hamburg Institut

www.solar-district-heating.eu



© Hamburg Institut

Die neue regenerative Energielandschaft verrät uns eine gewisse Blindheit gegenüber uns selbst. Denn die Windräder, Solarpaneele und Maisfelder sind nichts Fremdes, Feindliches, Böses, sondern sie haben etwas mit unserem Lebensstil zu tun. Sie sind ein produktiver Beitrag zu Versorgungsdienstleistungen, sie sind Teil unserer kulturlandschaftsprägenden Landwirtschaft.

Aber wir sind uns als Gesellschaft noch nicht einig über den Wert und den Preis dieser Dienst-leistung. Wir befinden uns in einem Suchprozess nach neuen Visisonen für eine postfossile Zukunft in Zeiten des Klimawandels.

(Prof. Dr. Friedrich von Borries und Benjamin Kasten, Welche Landschaften sind schön? Über die Wahrnehmung von Energielandschaften gestern und heute, DGGL 2013)

The new regenerative energy landscape reveals a certain blindness we have. Wind turbines, solar panels and corn fields are nothing unfamiliar, hostile, or evil, but rather a part of our lifestyle. They are a productive contribution to supply services, and are a part of our cultivated landscape defining agriculture.

However, **we, as a society, are not in agreement yet on the value and price of these services. We are currently in search of new visions for a post-fossil future in times of climate change.**

© Hamburg Institut

Source: Prof. Dr. Friedrich von Borries and Benjamin Kasten, 2013

Thank you for your attention!

Simona Weisleder

HIC Hamburg Institut Consulting GmbH
Paul-Nevermann-Platz 5
D-22765 Hamburg
Tel.: +49 (40) 391 069 89 - 31
weisleder@hamburg-institut.com
www.hamburg-institut.com

This speech is in the framework of the project: SDH policy to market

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 691624