



ProEcoPolyNet

ProEcoPolyNet Fact Sheet

Solar assisted cooling at buildings of the German government in Berlin

RTD Project Identification

RTD Contract No. 032 7277 A

Programme: supported by Federal Ministry of Economics and Technology

Description of technology

For the German information ministry (BPA) and the German ministry for Traffic, Building and Housing (BMVBW) solar assisted cooling concepts has been realised. The identical refrigerator configuration (thermodynamically closed systems with LiBr/H₂O absorption machines) in combination to the different collector fields and storage systems is of special interest to the measurement program, which is being carried out by the research institution IEMB.

Operating principle

BPA: The heat is generated by 348 m² (net absorber area 244 m²) horizontally assembled vacuum tube collectors with absorbers oriented with a tilt angle 30° /hour.

BMVBW: The heat is generated by 229 m² (net absorber area 209 m²) high efficient flat plate collectors.

Both facilities are thermodynamically closed systems with LiBr/H₂O absorption machines (Capacity: 2 x 46 kW, York WFC10).

The storage capacities in the solar circuits are 1.600 l (BPA) and 6.000 l (BMVBW). The generated cold can be added to the central cold distribution net. Therefore the efficiency of the solar systems is not influenced by a lack of cold demand. In both real estates the air conditioning systems are supplied with high

design temperatures of $\vartheta_V/\vartheta_R = 10/16^\circ\text{C}$ (BPA)

and $\vartheta_V/\vartheta_R = 12/18^\circ\text{C}$ (BMVBW) respectively.

Different backup systems are assigned for the hours without enough irradiation to supply the cold demand by 100% solar.

BPA: Both absorption machines can be supplied by district heating, using a cascade control strategy for the thermal backup system.

BMVBW: Because of the special situation under the roof of a historic building a

connection to the district heating or a gas boiler was not possible. The additional cold production is now done by compression machines and an ice storage (electrical backup system).

Technical characteristics of installation

- ▶ *Type:* Vacuum-tube collectors/ high efficient flat plate collectors, LiBr/H₂O Absorption Chillers
- ▶ *BPA:* design temperature for cooling grid 10/16°C
- ▶ *BMVBW:* design temperature for cooling grid 12/18°C
- ▶ *BPA:* heat/cold water storage 1.500 l / -
- ▶ *BMVBW:* heat/cold water storage 6.000 l / 500 l
- ▶ *BPA:* Cooling to heat ration (COP) >0,7
- ▶ *BPA:* collector efficiency 86%
- ▶ *BPA back-up system:* thermal, district heating
- ▶ *BMVBW back-up system:* electrical, compression machines and an ice storage
- ▶ *Floor area:* 2600 m² (BPA), 1600 m² cooled by the system,

Location and use

- ▶ *Public Buildings:* Federal Press/Information Department and Ministry for Traffic, Building and Housing, Berlin

State of Development/Market implementation

- ▶ *Demonstration project*

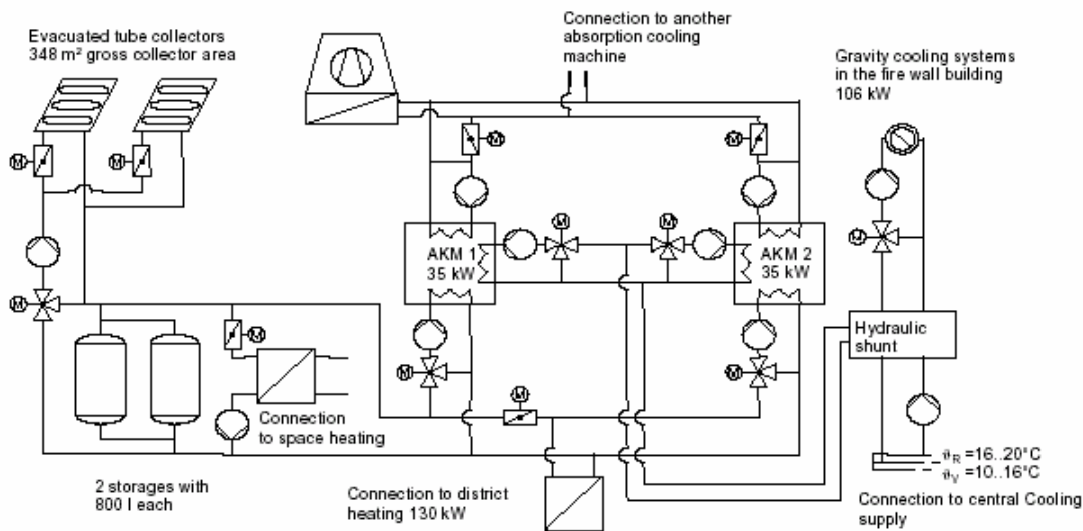
Benefits and obstacles

The facilities are working without larger technical problems until now. If future smaller absorption chillers are being developed costs will be further reduced and economic efficiency will be increased for full market implementation.

Contact and further information

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Date of release of this Best Practice Sheet:
 May 2007



ProEcoPolyNet is a **Network** for the **Promotion** of RTD results in the field of **Eco-building** technologies, small **Polygeneration** and renewable heating and cooling technologies for buildings. The Consortium consists of the following partners.



The ProEcoPolyNet project is supported by



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