Institute for Zero Energy Buildings (IZEB)

SOLAR DISTRICT HEATING

INNOVATIONS

LOCAL APPLICATIONS
The Institute for Zero Energy Buildings is founded by quad of recognized experts in the area of advanced building design and technologies.

The main goal of IZEB is to support, develop and implement in practice know how and innovations in the building industry concerning low energy, near zero energy or energy independent buildings and neighborhoods.

IZEB has patent portfolio in the area of façade design, energy storage and solar energy absorption.
INSTITUTE OF ZERO ENERGY BUILDINGS PROJECTS
www.lzeb.eu

Innovative solar roof, Doha, Qatar

1-st prize at 4th International Solar District Heating Conference

Water Flow Glass Demo Pavilion in Sofia

Zero energy district in Varna, Bulgaria

Monitoring and energy distribution systems

1-st in the Middle East Water Flow Façade, Doha, Qatar
SOLAR DISTRICT HEATING TECHNOLOGY
HORIZON 2020 PROJECTS

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“SDHp2m” - Solar District Heating and actions from Policy to Market “
Колекторно поле на слънчева топлофикация към малко градче в Дания
Създадена е специална технология топлинни слънчеви колектори, предназначени за индустриален добив на слънчева топлина.
Най-голямата слънчева топлоцентрала във Войенс, Дания
Ново поколение градска топлоцентрала. Фасадата е покрита с фотоволтаични панели, покриващи нуждите на циркулационните помпи.
Сезонният буфер преди да бъде залят с вода
Покритието на сезонния буфер представлява плувяща топлоизолация, като дъждовната вода се отвежда чрез специална дренажна система.
BIG Solar Graz: Solar district heating in Graz – 500,000 m² for 20% solar fraction
“Специализирани болници за рехабилитация-Национален комплекс” ЕАД

13 Болници:

- 3000 m2 слънчев абсорбер
- 5000 бр. Високоефективни осветителни тела
- над 300 кв. термопомпени агрегати
Първа българска соларна топлофикация – СБР Поморие (1300 m²)
СБР Поморие- Smart Grid и интелигентно управление

Мониторинг и управление в реално време на котли, термопомпи, колектори
СЕЗОНЕН БУФЕР С ПЛУВАЩО КОЛЕКТОРНО ПОЛЕ

плуваща върху водата твърда, високо температурна топлоизолация

колекторно поле, което абсорбира слънчевата радиация

воден обем, който се нагрява до 90 градуса през лятото

помпена инсталация и котел за дограване, използващ отпадна биомаса
производство: 1-5 GWh топлинна енергия годишно, 100% ВЕИ
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INNOVATIONS

LOCAL APPLICATIONS
Hladilnika District is former industrial zone, that is hot topic for investment projects now in Sofia
According to the Sofia Urban Plan Hladilnika District will have high density development with mixed use.
According to the Sofia Urban Plan the nearest DH is Sofia Iztok
Currently a new development plan for Hladilnika District is under development below the hat of the Chief Architect. More than 10 private investment projects* are announced in the area. The total build up area of these projects succeeded **650 000m²**
LOCAL HYBRID SOLAR DISTRICT HEATING

CONCEPT SCHEMATIC

Residence complex
- Roof solar collectors field
- Geothermal pilots and serpentines
- Air cooling units
- Local heat storage / buffer
- Heat pumps and local distribution center

Office building
- Roof solar collectors field
- Geothermal pilots and serpentines
- Air cooling units
- Local heat storage / buffer
- Heat pumps and local distribution center

Central Gas boiler: optional
Central AWHP plant
Central dispatcher

Hot water net
Cold water net
The local DH can supply the private investment developments with heat and cold energy.
FLOATING THERMAL COLLECTORS ON TOP OF SEASONAL WATER PIT STORAGES

Institute for Zero Energy Buildings, Bulgaria

Principle of the FLOATING CELL
The floating collectors (1) are forming solid floating platform on top of the existing water basin (3). Surrounding heat insulation panels (4) are separating the hot and treated water (2) from the water of the basin. The bottom linen is closing the volume of the treated water (5). No need of heat insulation from the bottom: the heat is stratified in a normal way in the upper part of the volume, reaching the bottom temperature same as the outside temperature. Distribution tubes (7) laid on the basin bed are transporting hot and return water from the floating cell to the power station (8), where the heat exchangers, circulation pumps and water treatment system are installed. If needed – the output energy can be preheated. From the power station the energy is transferred to the DH network.
FLOATING THERMAL COLLECTORS ON TOP OF SEASONAL WATER PIT STORAGES

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SCHEMATIC OF THE PROPOSED DEMONSTRATOR
LOCATION: SOFIA, KAZITCHENE LAKE
Thanks for the attention

Arch. Milan Rashevski

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