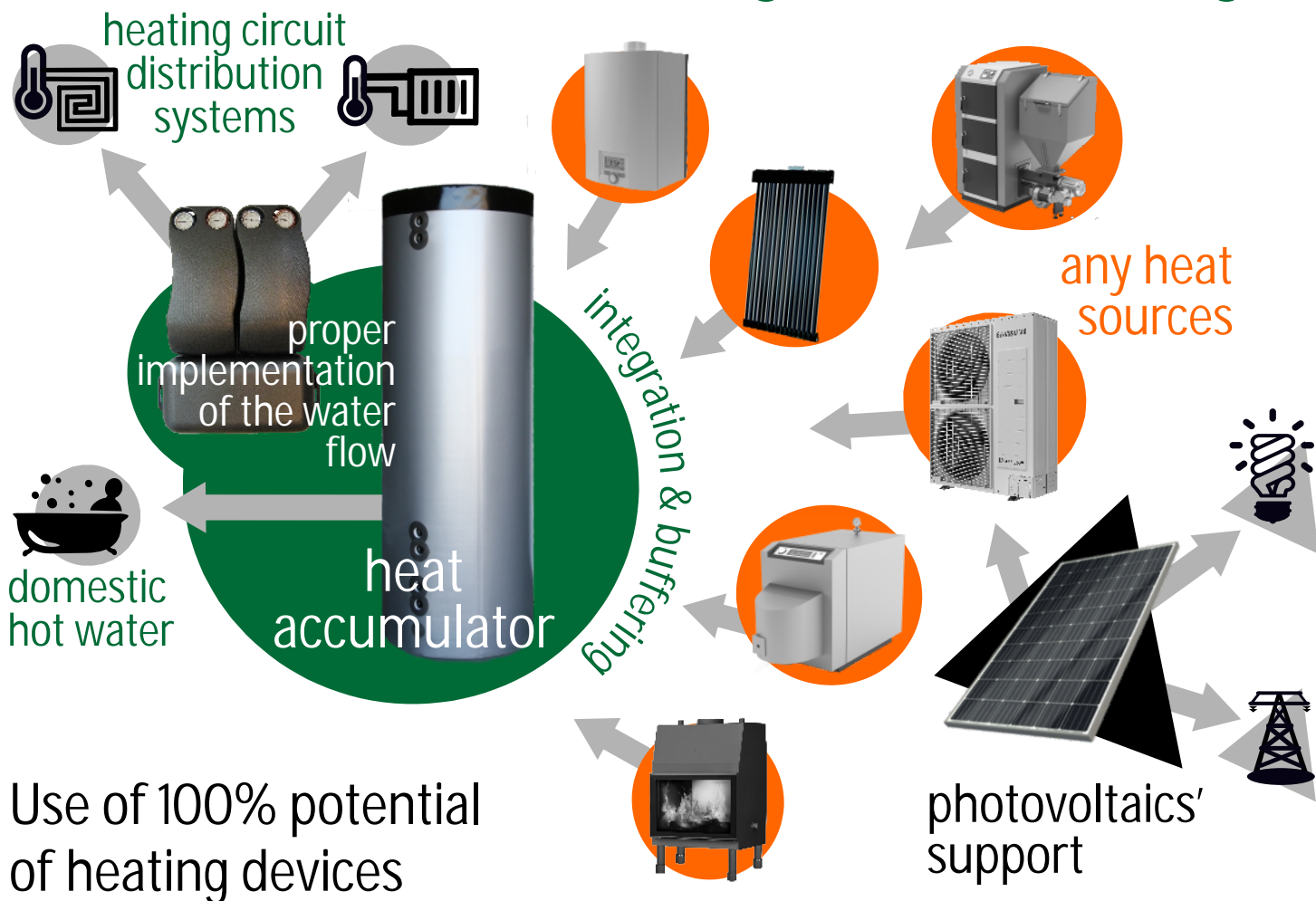


# Smart CO

second generation of  
Integrated Heating 








## The innovative heating concept

for new and modernised single-family housing development based on the second generation Integrator Smart CO

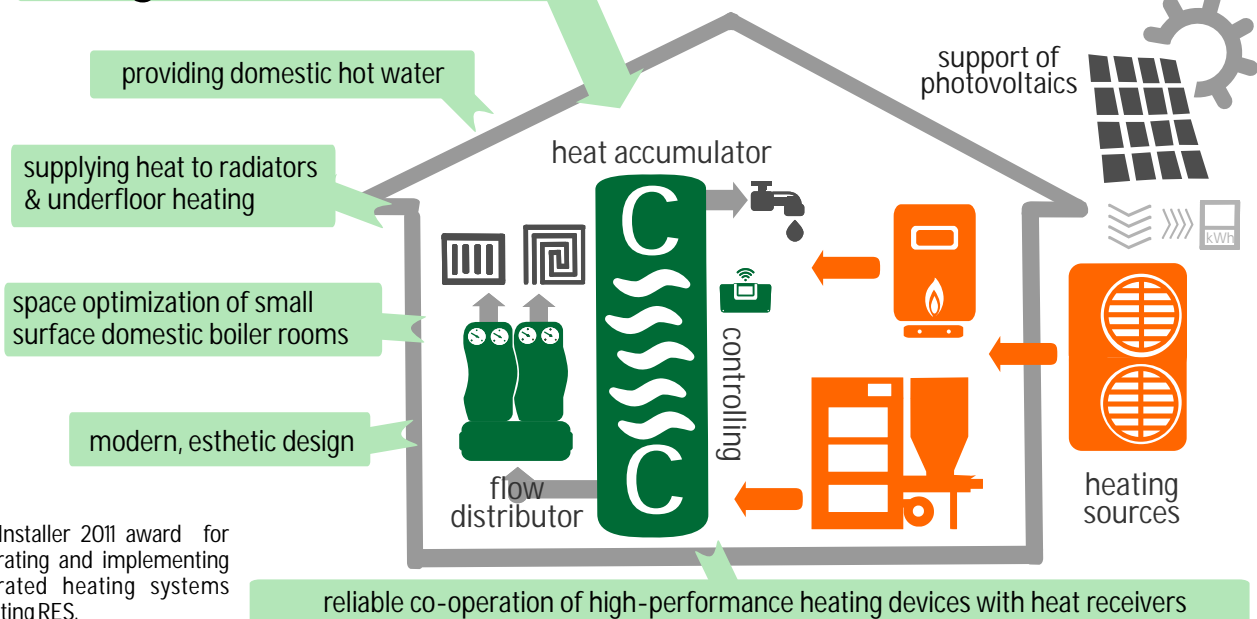


household members' satisfaction

-  quality & thrift guarantee
-  total installation's effectiveness
-  exploiting the potential of RES
-  usage comfort
-  compact design



# Effective & economical heating via Integrator Smart CO



Gold Installer 2011 award for elaborating and implementing integrated heating systems exploiting RES.

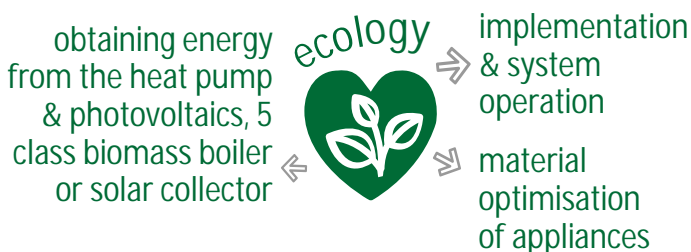
reliable co-operation of high-performance heating devices with heat receivers

## Quality & thrift of the heating system

### Ecological sources integration Makroterm company's specialisation

In 2012 the solutions for sources integration developed by Makroterm was appreciated by Ministry of the Environment within the realisation Energy Security and Environment strategy – the company became a laureate of Green Technology Accelerator GreenEvo competition in the field of heat sources integration.

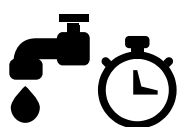
LAUREATE OF THE INNOVATION PROGRAM  
**GREENEVO**  
TECHNOLOGY ACCELERATOR



### Comfort of use the whole system



high quality of components, remote control system - also outside the home



flow-type domestic hot water production providing high quantity of water (Legionella-free) in the short term

### Heating system's thrift



multisourcing ► selection of the most economical heat source at the specific operational conditions



multi-functionality of Combo Smart CO reducing cost of DHW treatment and circulation pumps operation



economic preparation large amounts of domestic hot water



reducing losses in the distribution of domestic hot water



system modularity & minimisation of applied devices diminishing cost & assembly time

### Additional economic benefits



cost-free electricity from the sun obtained through the use of photovoltaics supporting installation's operation ► cheaper heating & DHW supply



outside the heating period there's possible to use current from photovoltaics in order to cool the building, store in the power grid or for other energy needs



application of RES such as heat pump, solar collectors or 5 class biomass boiler ► significant reduction of the installation maintenance costs

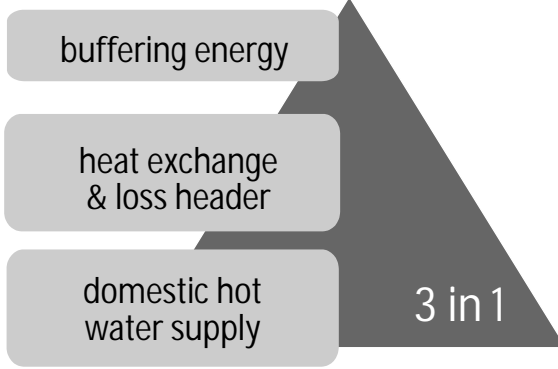
## Combo Smart CO - heat accumulator

Efficient buffer tank with DHW function & multisource integration



Compact multifunctional device to buffer & exchange energy

- integration of various heat sources
- maintenance of heating cycles & DHW



Continuous flow supplying DHW = reduced energy consumption

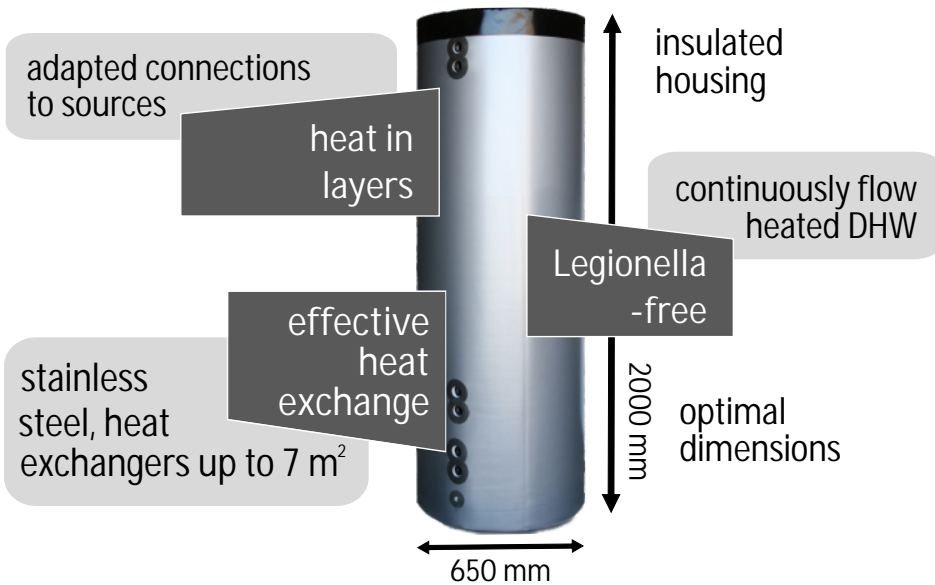
- exclusion the use of water heater in order to eliminate Legionella bacteria
- quicker preparation large amounts of DHW

Taking over the tank DHW function by Combo Smart CO

- elimination the need of additional domestic hot water tank
- elimination the need of additional piping & DHW tank insulation
- elimination the need of circulation pump to DHW tank
- elimination of energy usage for operation of the DHW circulation

Compatibility with modern heating appliances RES

- possible heat collection from RES



## Duo Smart CO - flow distributor

Set of pump groups with manifold  
Organisation & control of the circulations + space optimisation



- integration of 2 or 3 circulations
- esthetic qualities & easy assembling
- space saving: spacing 90 mm

Manifold Smart CO: combining power supplies and returns in a single row with the division into circuits



Ultra-compact flow distribution

- integration of power supplies & returns into one manifold
- lower than 28% spacing for piping of circuits

> lower consumption of raw materials needed for accurate separation of circuits as a result - material ecology



2 pump groups Smart CO dosing correct amount of heat for the heating circuits

# T-Smart CO controller - wherever you are...

Operations management of DHW supply installation and heating the entire house using a colour touch panel & Internet



colour touch panel 4,3'

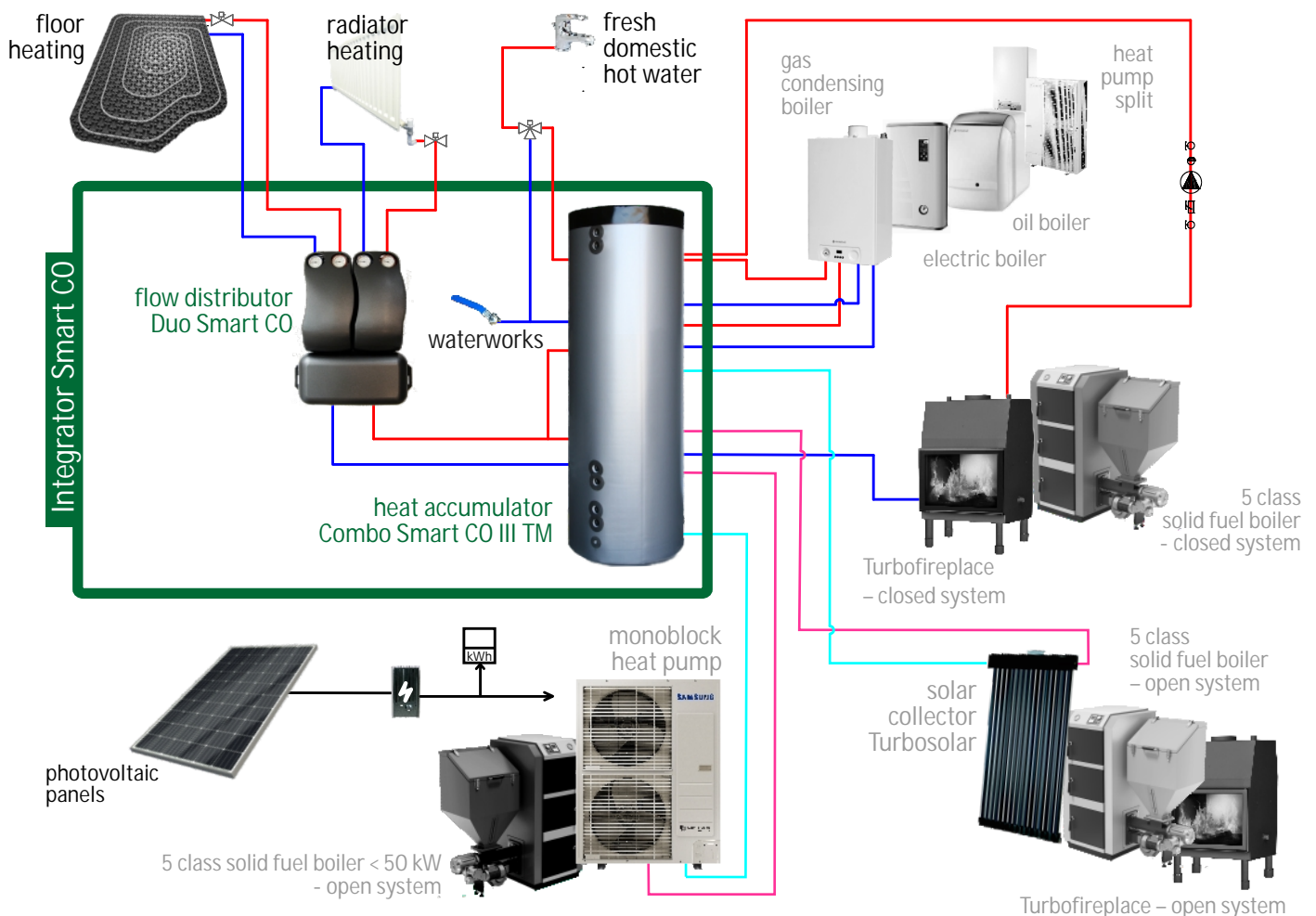


- with 2 room controllers
- dedicated Smart CO functions
- antiscalent protection of the installation communication
- weather & weekly regulation
- solar collectors control option



## Smart CO – possibilities of energy sources integration

Multisourcing of the system enables diversification of heat sources. There is possibility to integrate sources operating in both open and closed system. At a later date there is possible to add other heat sources. Selection of the most economic source at the specific operational conditions is safe from an energy standpoint.



MAKROTERM is a Polish family-owned company specialising in manufacturing and implementation of innovative tailored solutions in a heating & cooling branch by exploitation of renewable energy sources. Our company has been founded in the early 90s and actually we are one of the biggest businesses in Poland producing water jacket fireplace inserts, vacuum solar collectors, heat/cool buffers, manifolds, integrators, integrated systems, expansion tanks and more facilities for heating & cooling installations. Our company implements solutions to boost energy efficiency, provide and produce innovative heating and cooling systems for industry, commercial building & detached houses.

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