NATIONAL TECHNICAL UNIVERSITY OF UKRAINE "KPI"
INSTITUTE FOR ENERGY SAVING AND ENERGY MANAGEMENT
(IEE NTUU "KPI")

IEE's Activities on Sustainable Energy Development (incl. RES & Smart Grid Technologies)

IEE NTUU “KPI” : General Information

Institute for Energy Saving and Energy Management (IEE) within the National Technical University of Ukraine "Kiev Polytechnic Institute" was established in 1997 as a result of a Joint Order by the State Committee for Energy Conservation and the Ukrainian Ministry of Education (No. 137/45, dated 07/05/97) which defines the IEE as a basic energy management training institution in the country.

Now IEE is a leading educational, training, R&D and consulting institution in the field of sustainable energy development, energy efficiency and energy management in Ukraine.

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- **Acting Director of the Institute:**
- **PhD, Prof. Volodymyr Prokopenko**

Structure of IEE NTUU “KPI”:

Departments

1. Electric Power Supply Department
2. Heat Power Engineering and Energy Supply Department
3. Automation control of electrotechnical equipment Department
4. Electromechanical equipment of powerful installations Department
5. Geotechnical construction Department
6. Geotechnologies and engineering ecology Department

Centres

- Training Centre for Energy Management
- Sustainable Energy Development
- R&D Institute for Automation and Power Engineering "Energia“

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IEE NTUU "KPI" : R&D, Engineering and Consulting Activities

IEE NTUU "KPI" works in the next directions:

- **Sustainable Energy Development;**
- **Smart City;**
- **Smart Building;**
- **Renewable Energy Sources and Distributed Generation;**
- **Smart Grid Technology;**
- **Demand Side Management;**
- **Energy Market;**
- **Environmental and Energy Management System;**
- **Climate Change Problem.**

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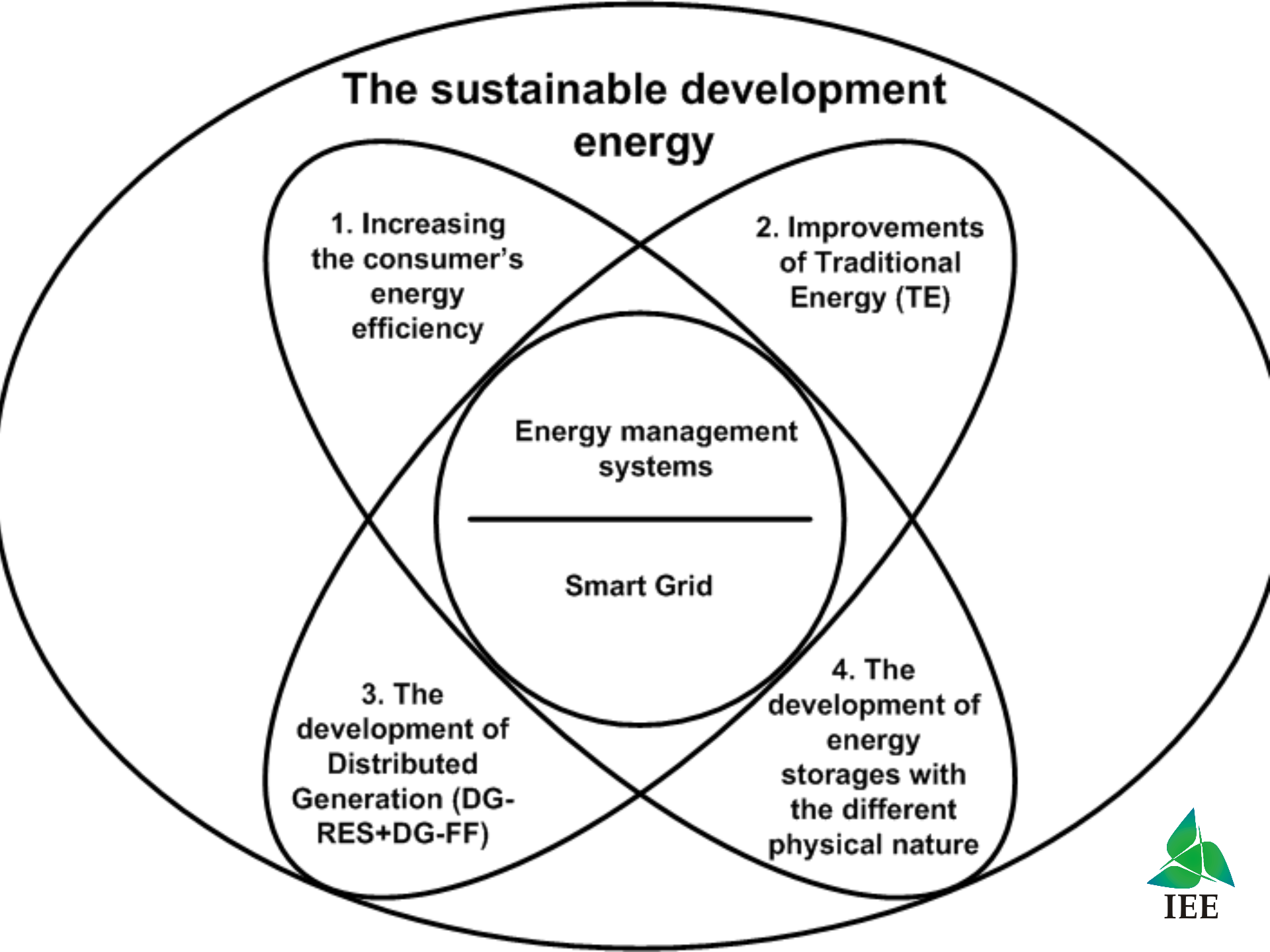
The sustainable development energy
1. Increasing the consumer's energy efficiency
2. Improvements of Traditional Energy (TE)
Energy management systems
Smart Grid
3. The development of Distributed Generation (DG-RES+DG-FF)
4. The development of energy storages with the different physical nature

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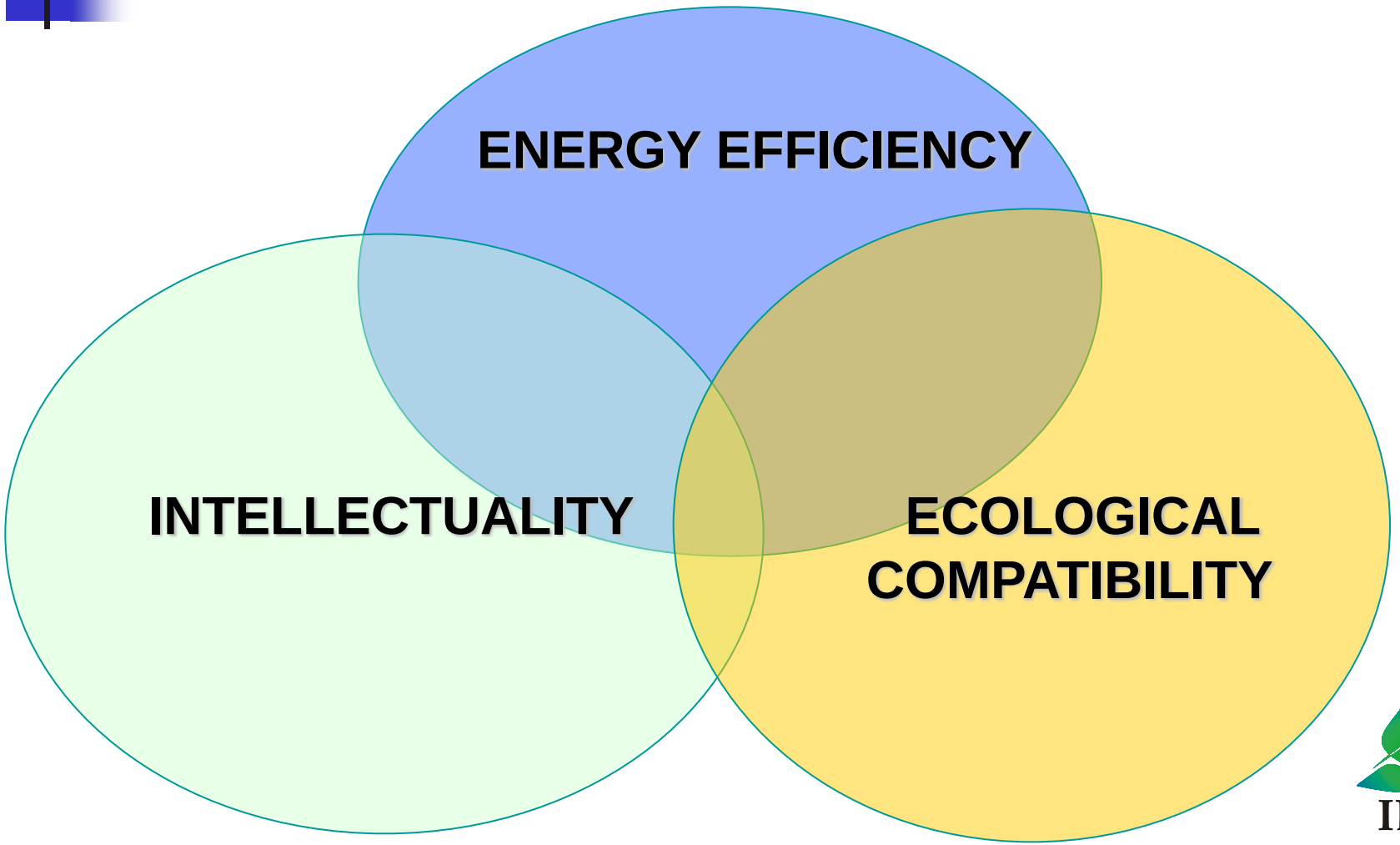
Design of the Eco – SmartBuildings include



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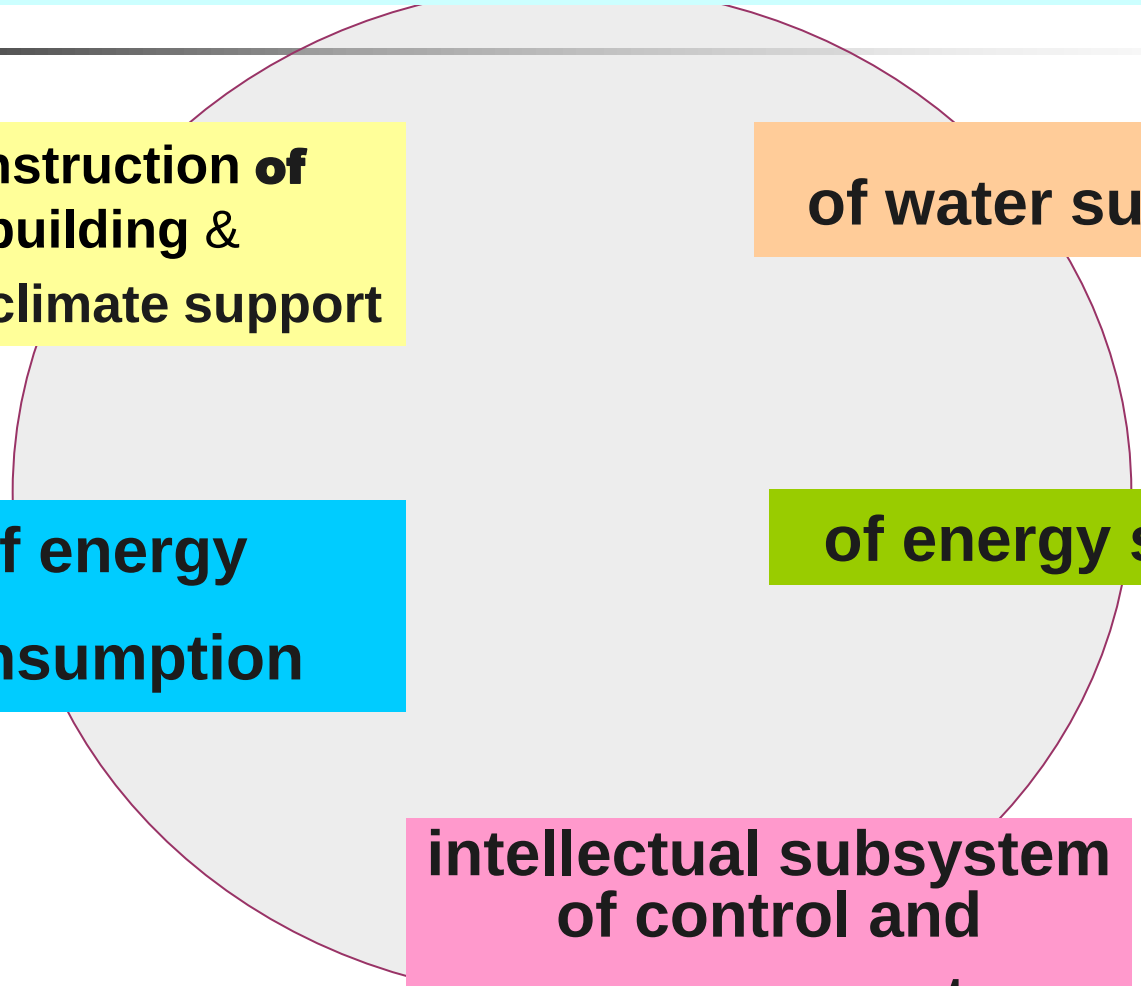
Eco – SmartBuildings are expected to integrate the 5 subsystems:



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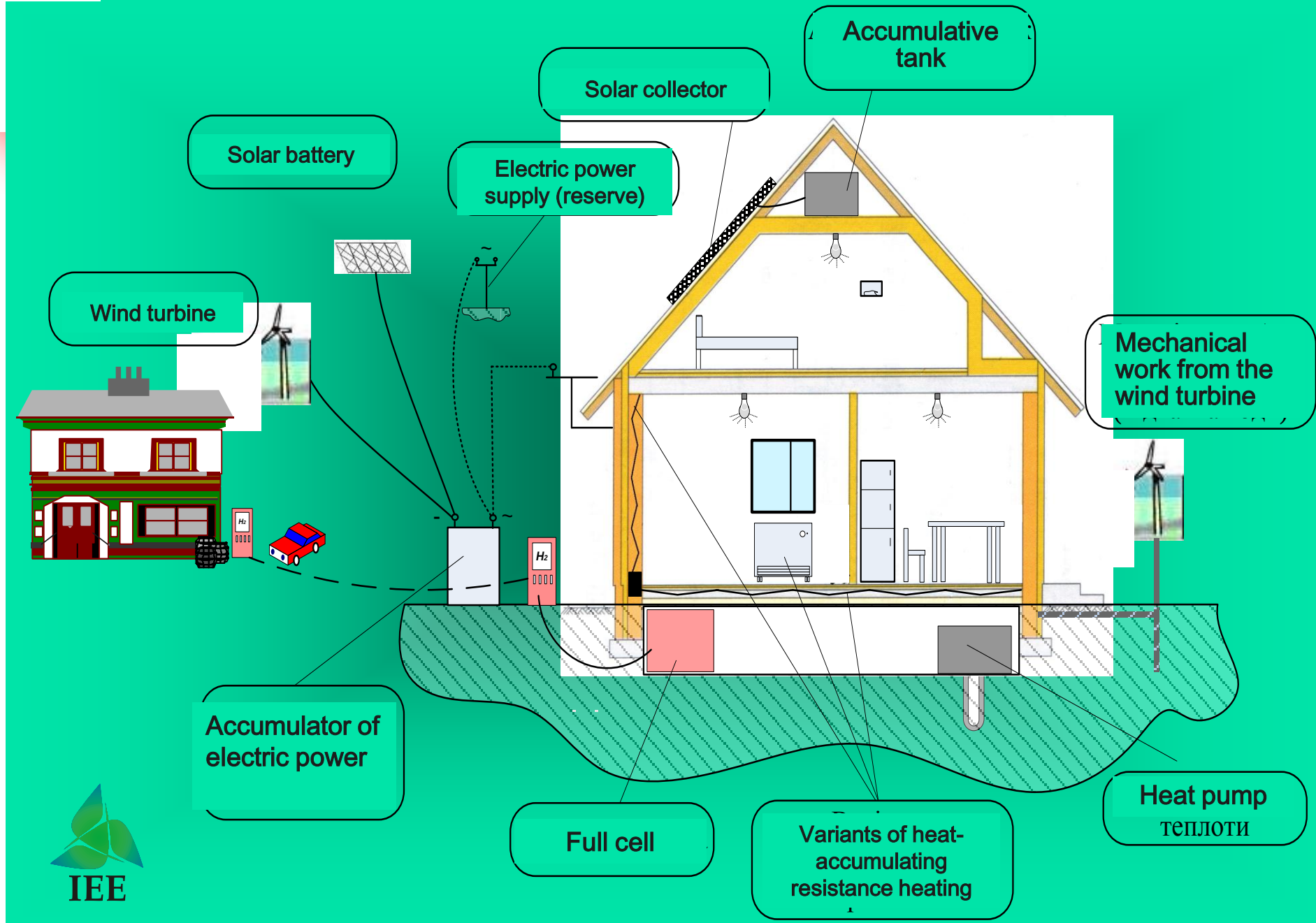
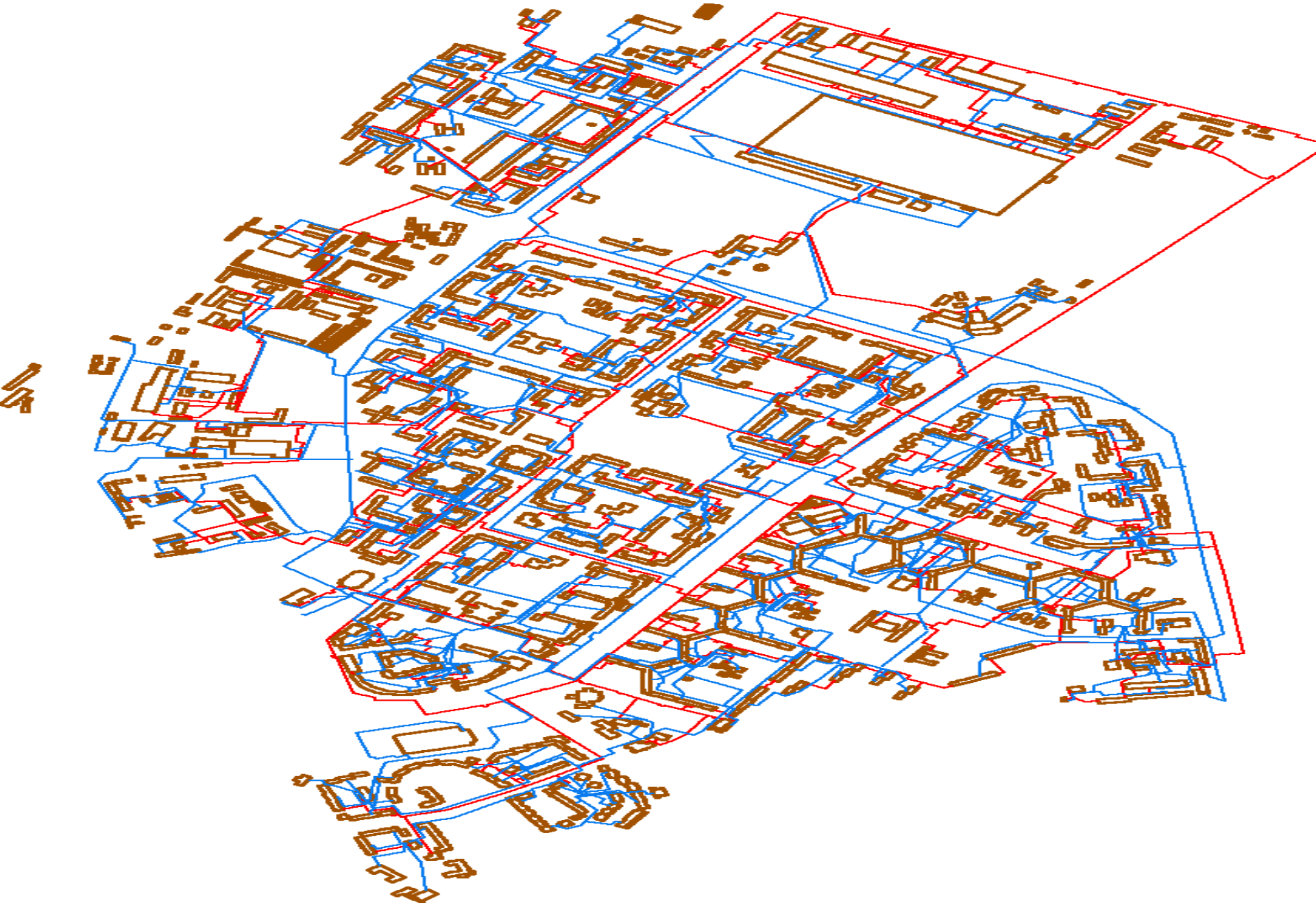
Eco – SmartBuildings project



Energy supply district (The Crimea)



City District heating – integrating technologies for sustainable communities

City District heating modernization on base of combining:

- **Small-scale CHP (the old heat only units are replace by CHP),**
- **Heat Pumps (HP),**
- **Electric Storage Heaters (SHe),**
- **Storage Heaters (SHt),**
- **Solar (solar collectors, PV),**
- **Wind turbines;**
- **Biomass boilers** (wood wastes, wood pellets, peat, municipal solid waste, crops)

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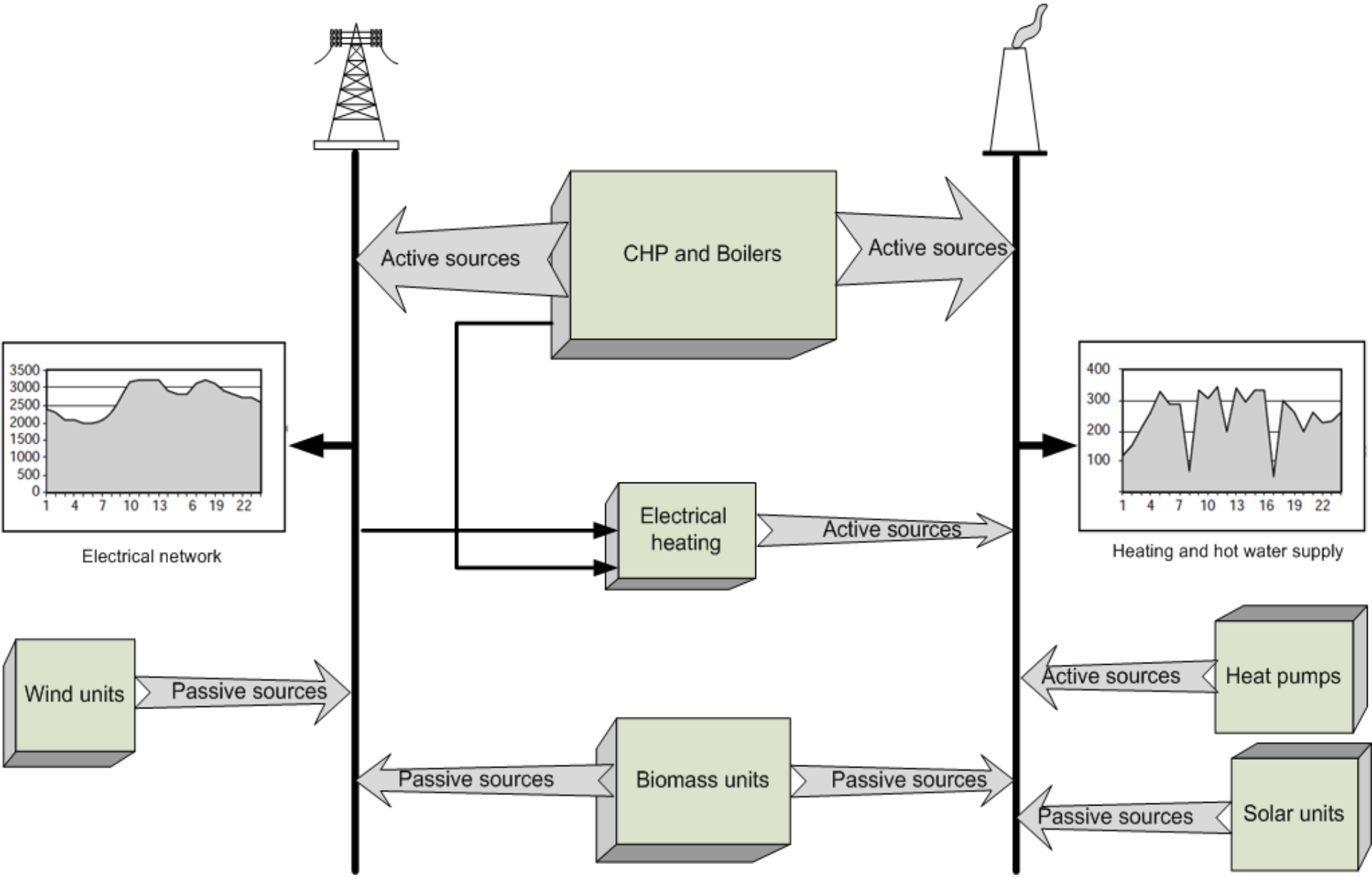
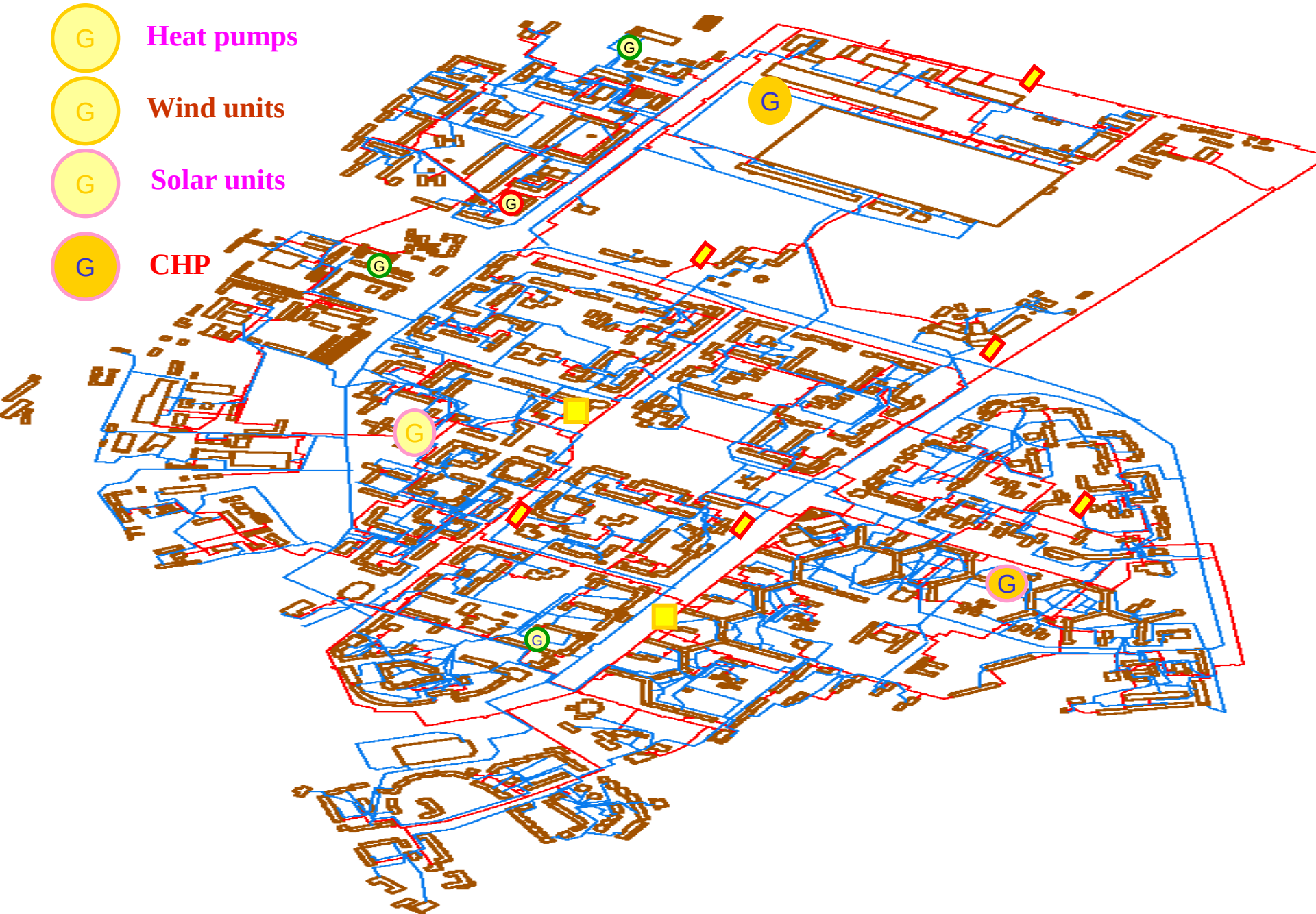

Active sources
CHP and Boilers
Active sources
3500
3000
2500
2000
1500
1000
500
0
1 4 7 10 13 6 19 22
Electrical network
400
300
200
100
1 4 7 10 13 16 19 22
Heating and hot water supply
Electrical heating
Active sources
Wind units
Passive sources
Active sources
Heat pumps
Passive sources
Biomass units
Passive sources
Passive sources
Solar units

Allocation of DG sources (The Crimea)



Eco- Smart Sity

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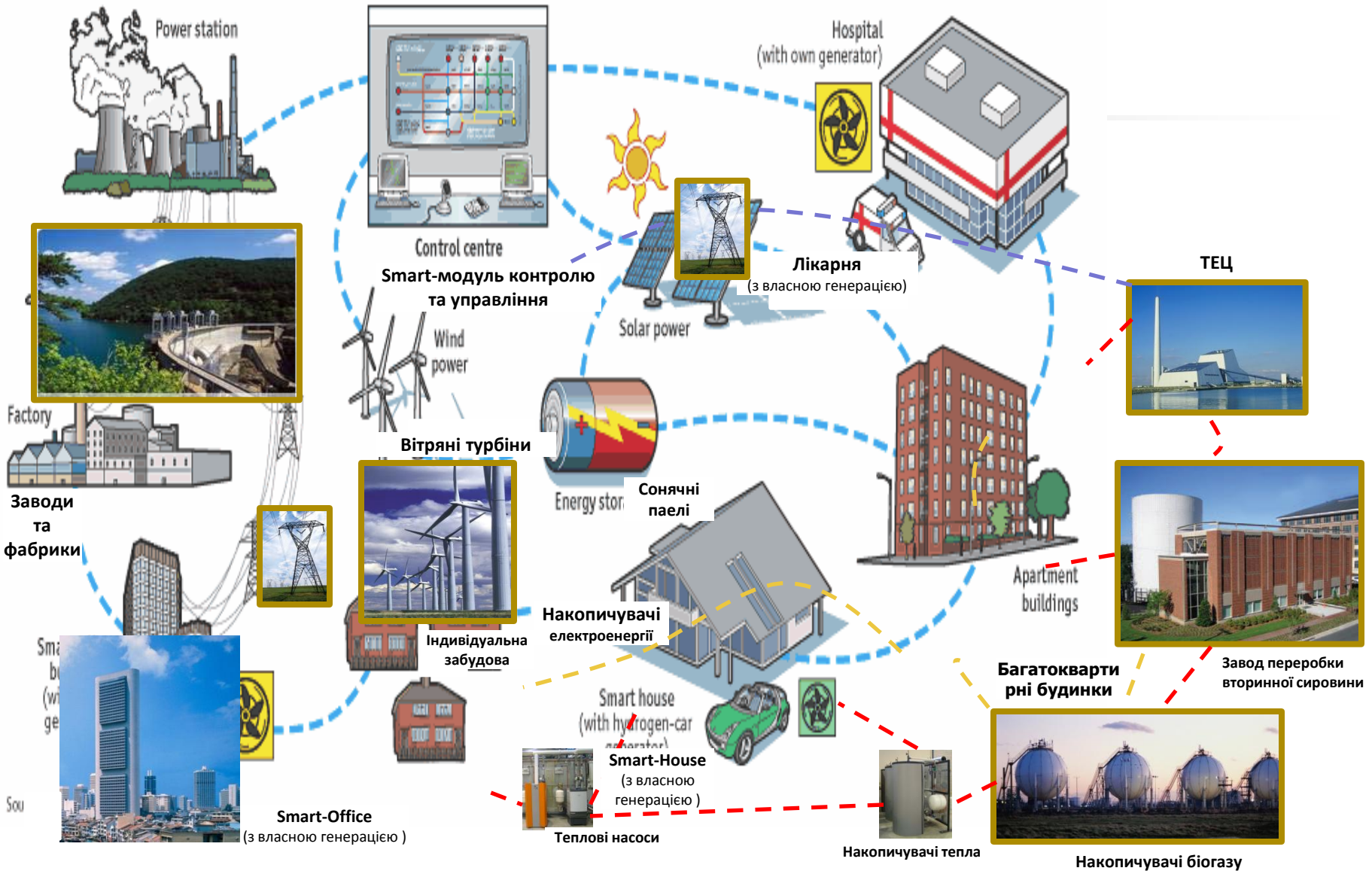


Boarding house “Energetik”, Nikolaevka village, AR “The Crimea”

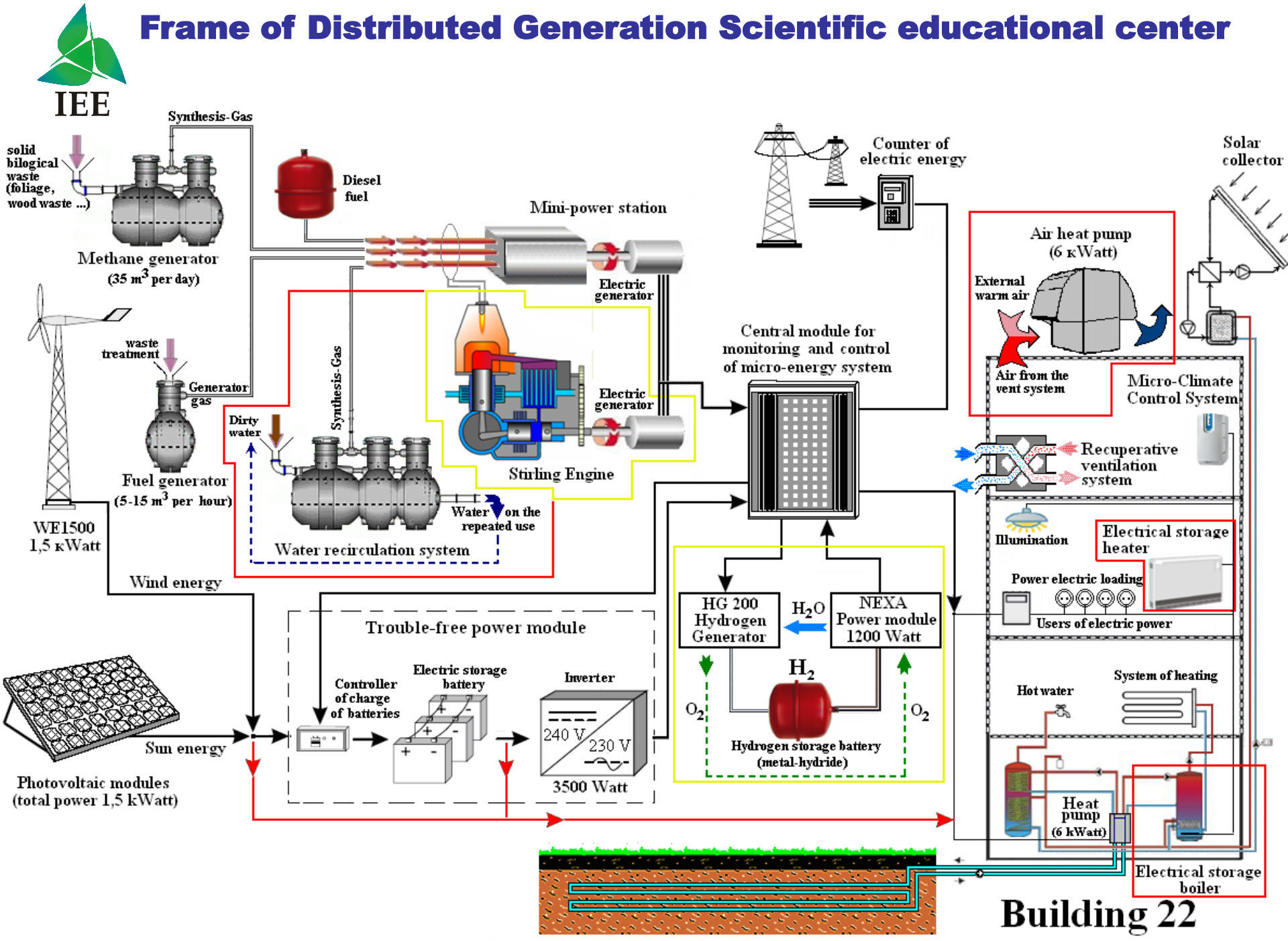
Heating supply

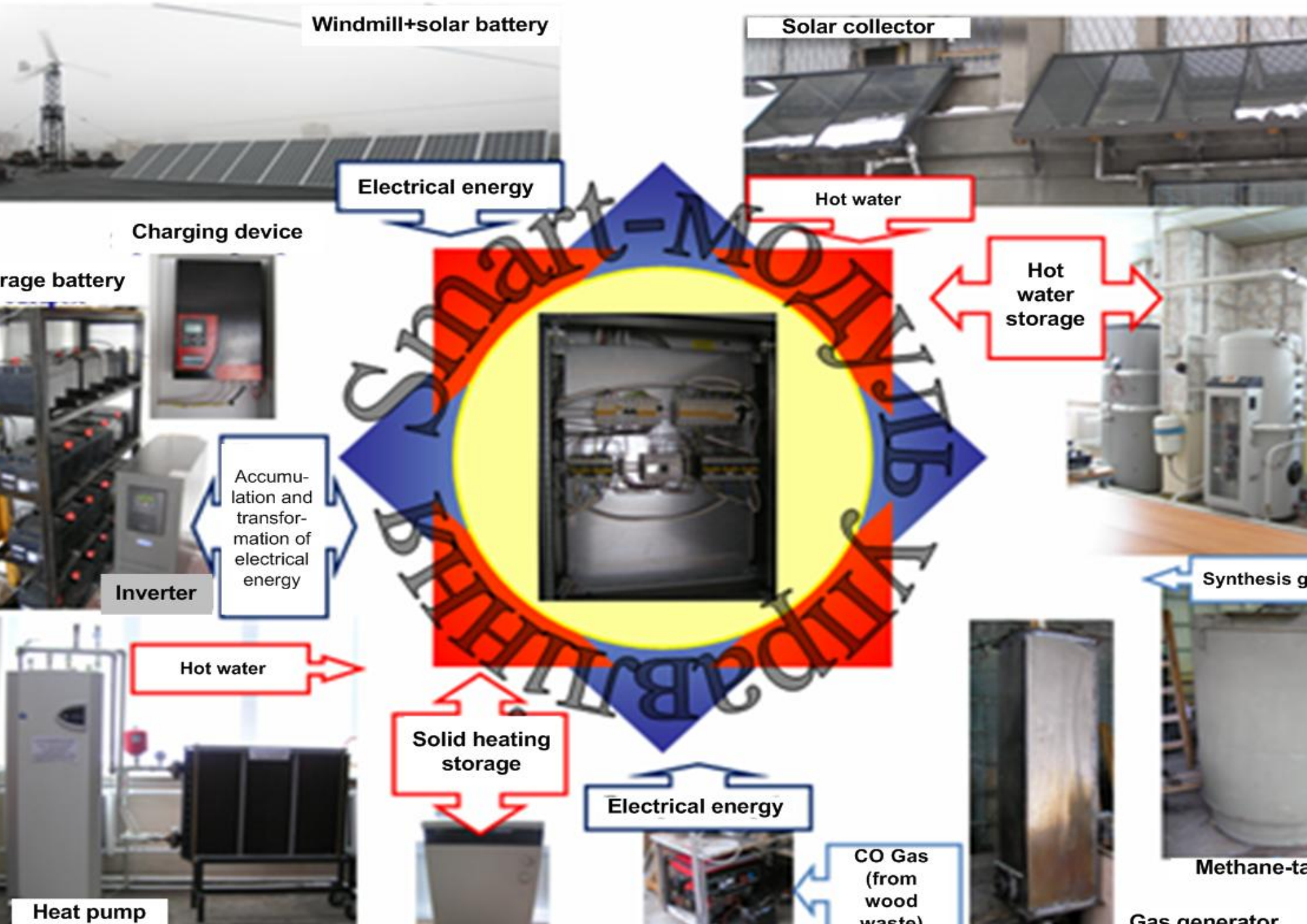
- heat pumps;
- solar collectors;
- thermal storage electric heating (TSEH) and HWS.

Power supply:

- WEU 100 кWt ;
- Solar power station 2,1 MWt with a glance of “green tariff”

Frame of Distributed Generation Scientific educational center




Windmill+solar battery
Solar collector
Electrical energy
Hot water
Charging device
rage battery
Hot water storage
Accumu-lation and transfor-mation of electrical energy
Inverter
Synthesis g
Hot water
Solid heating storage
Electrical energy
CO Gas (from wood waste)
Methane-ta
Heat pump
Gas generator
Smart-Модуль
Управління

Thank you for attention!

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