

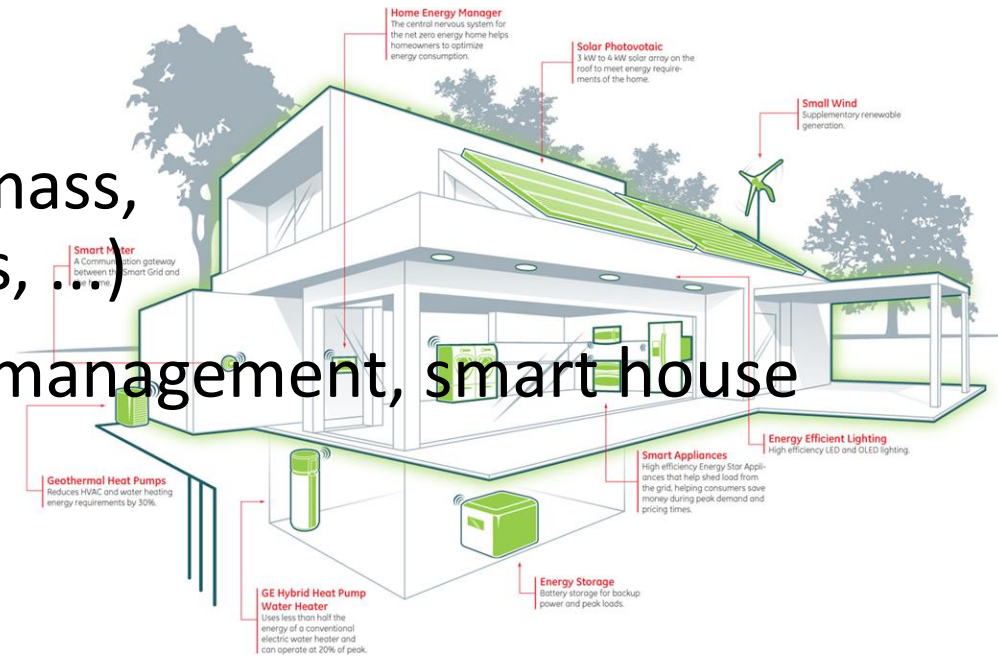
Application of Renewable Energy Resources in Buildings



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Application of Renewable Energy Resources in Buildings

- Renewable Energy Resources (Solar, Biomass, Wind, Hydropower, Geothermal, Biofuels, ...)
- Utilization – heating, cooling, lighting, e-management, smart house
- Buildings – comparison world vs.Serbia
- Construction and adaptation
- Integration of RES in buildings
- Green construction and energy efficiency
- RES model in buildings



Renewable Energy Resources (RES)

Main characteristics:

Environment and user friendly

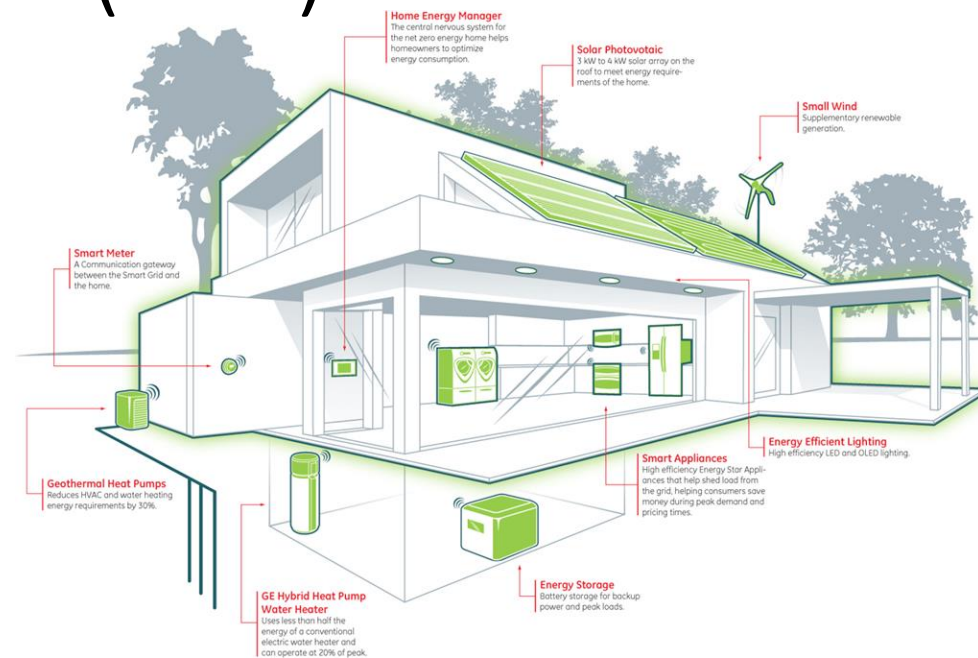
Consistances

Part of design in buildings

Main prospect:

New needs, new ideas, new supply, responsibility,

Technology transfer, design model, integration, efficiency



Renewable Energy Resources in Building

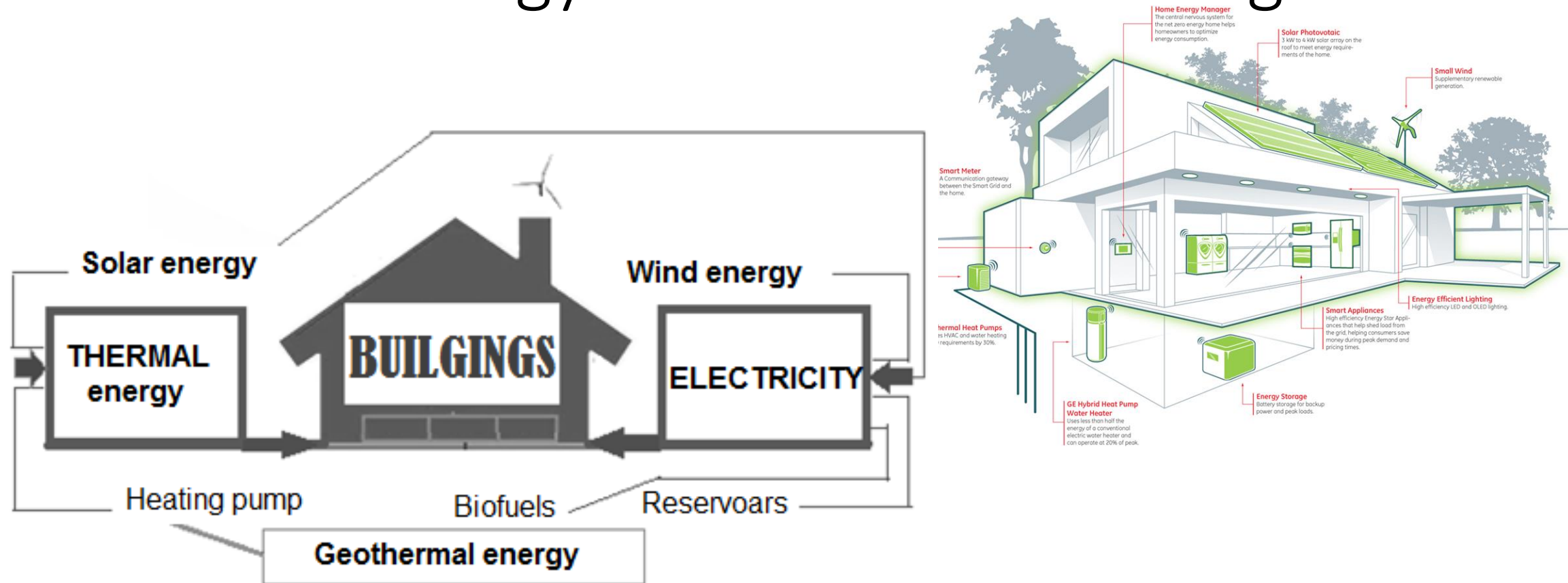


Figure 1. Integration of different forms of RES in buildings

Integration of RES in one system

Barriers:

Cost spending

Autsource Design modeling

Time and Environment modeling

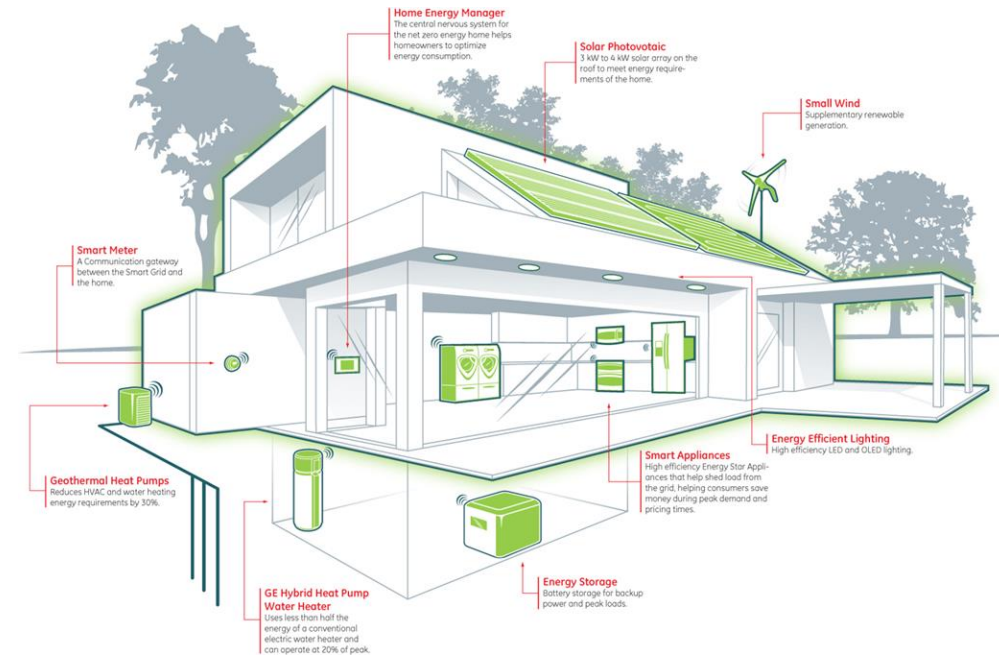
Technology cost, design and modeling

Advantages:

One Technology button

System connection and powering supplies

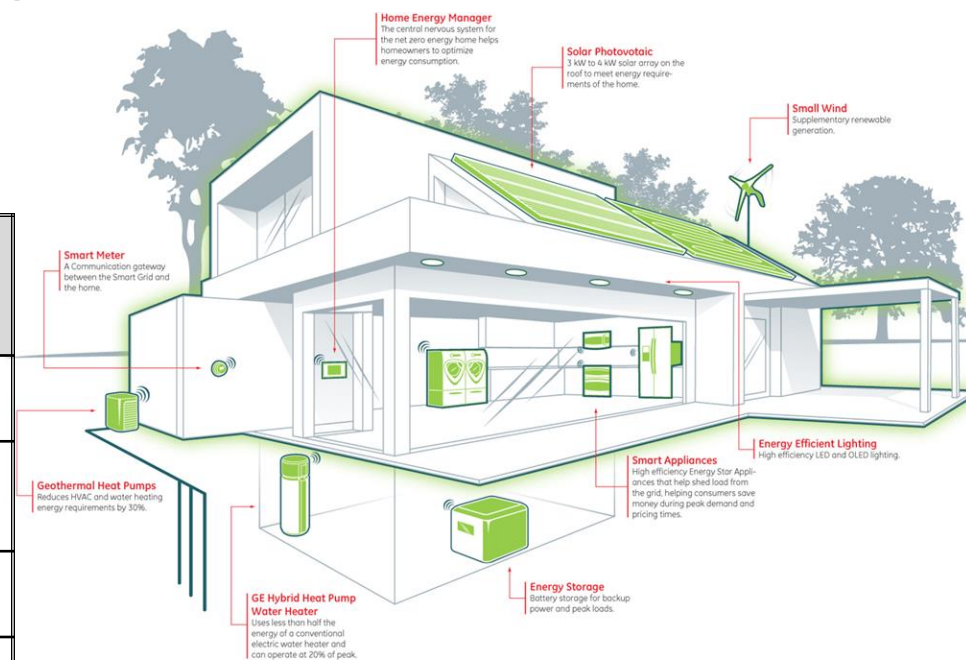
Efficiency mode and smart house from distance



Energy efficiency in Buildings

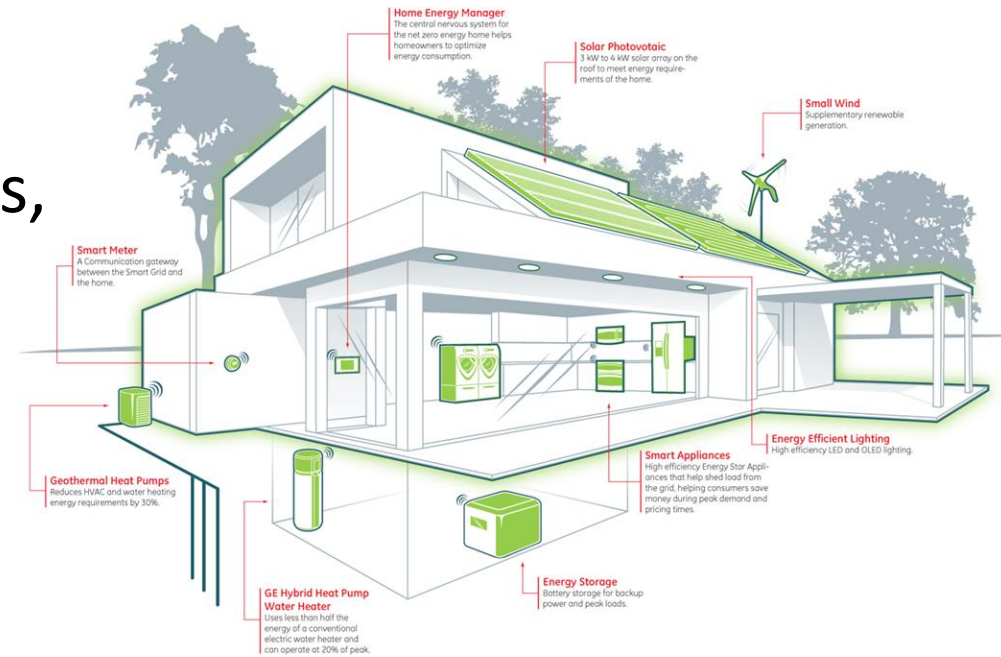
Table 1. Energy efficiency classes of buildings

Classes	Heating Indicator [kWh/m ² year]	Energy efficiency level
A	0-30	BEST ENERGY EFFICIENCY
B	31-50	HIGH ENERGY EFFICIENCY
C	51-70	ENERGY EFFICIENT BUILDING
D	71-120	AVERAGE ENERGY EFFICIENT BUILDING
E	121-160	UNSATISFACTORY ENERGY EFFICIENCY
F	161-200	VERY ENERGY EFFICIENT BUILDING
G	201+	COMPLETELY ENERGY EFFICIENT BUILDING



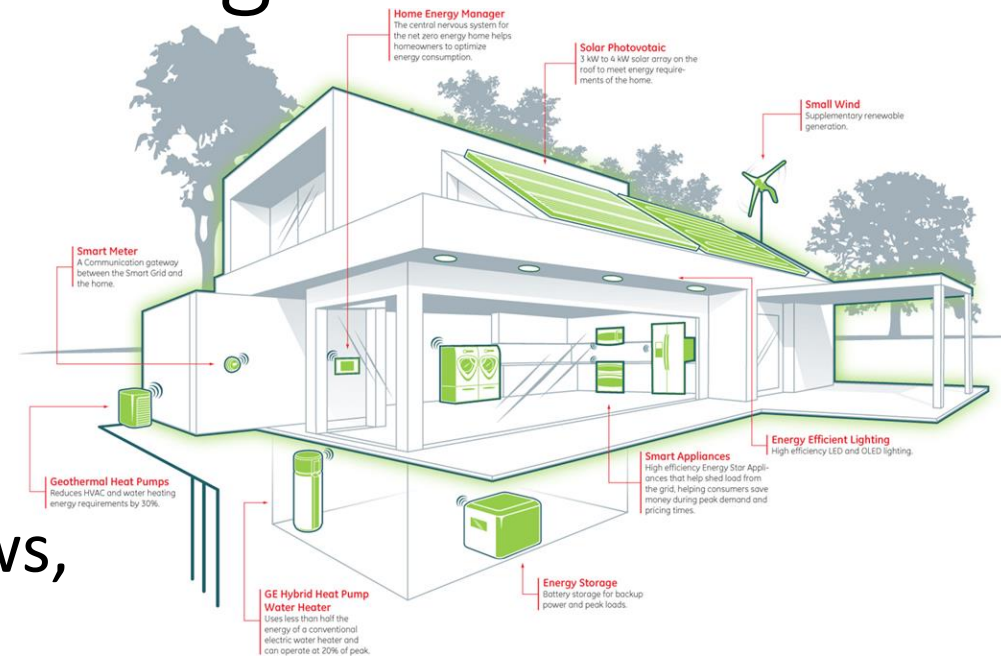
Individual and Colective Settlement with RES in Buildings

- Replacement of light bulbs in households, industry, public institutions,
- Switching from heating to electricity,
- Improving building insulation
- Window and door replacement,
- Electronic energy management,
- Application of construction standards,
- Change of heating consumption calculation (from lump sum to consumption).



RES Application Model in Buildings

- Sustainability of building materials (construction, interior, roof),
- Sustainable construction environment (adapted to the site, without landslides),
- Good ventilation and ventilation (windows, solar lighting and fan),
- Efficient heating and cooling (panels, cells, heat pumps, water),
- Savings (insulation, facade, solar roof-no tile).



Model of RES in Buildings

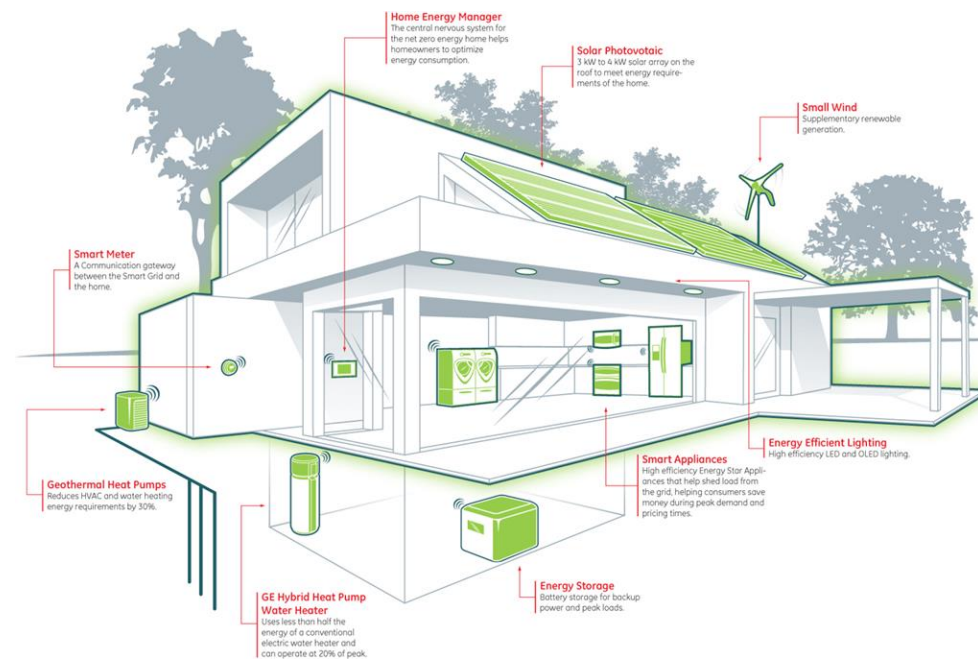
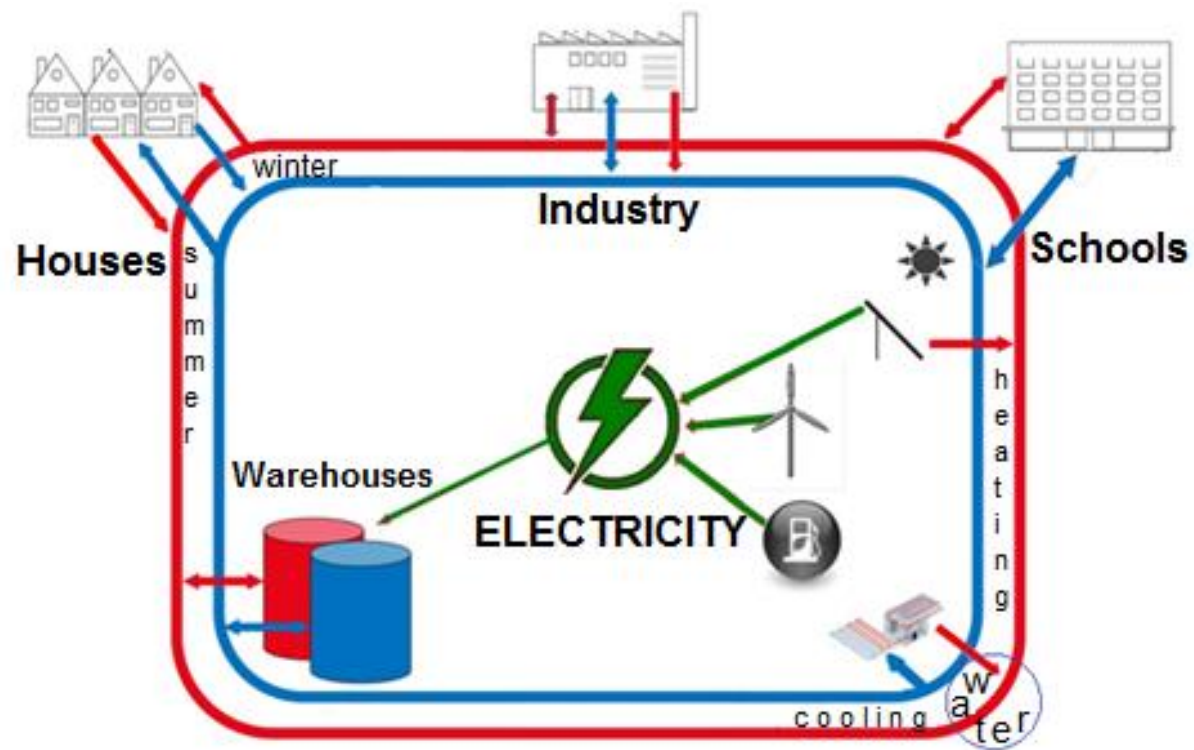
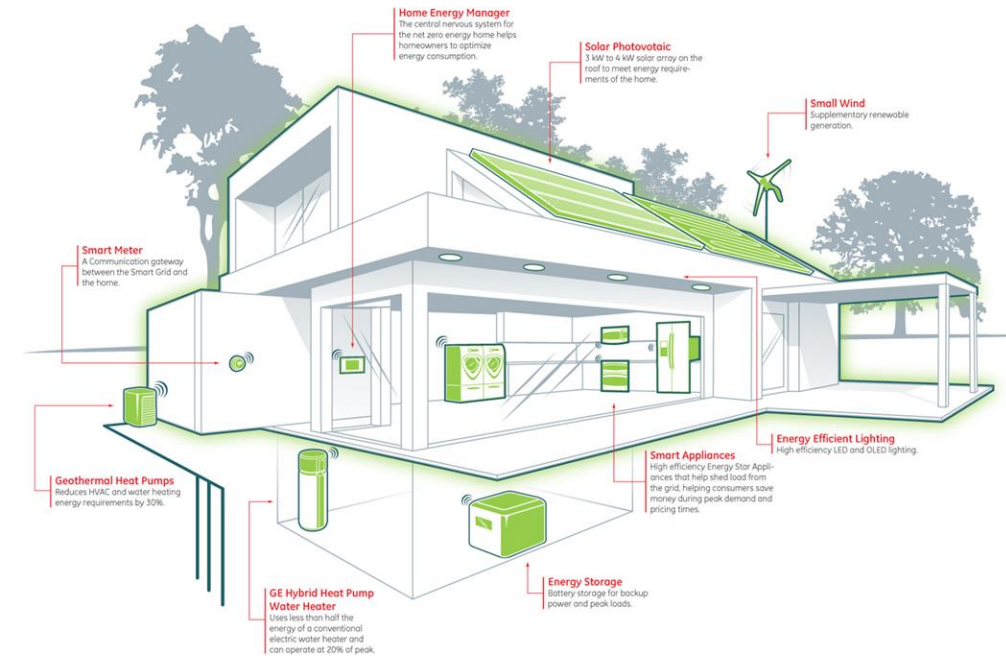


Figure 2. Combined model of thermal and electric power supply

Thanks!

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