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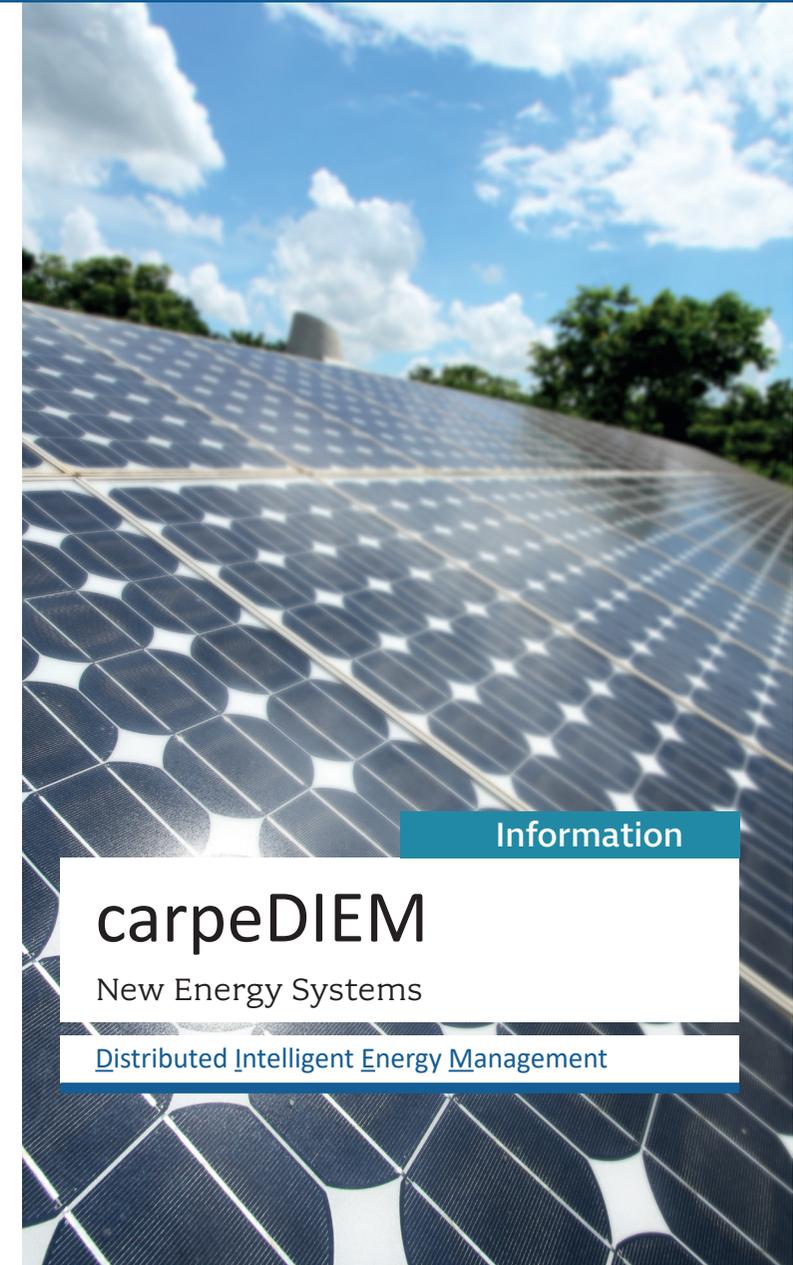


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For further information see:
project-carpediem.eu

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Information

carpeDIEM

New Energy Systems

[D](#)istributed [I](#)ntelligent [E](#)nergy [M](#)anagement

Challenges

In order to reach our climate goals of a drastic decrease in greenhouse gas emissions, the energy grid needs to move from a centralized to a decentralized supply infrastructure. Distributed renewable energy generation units will increase their share in the overall energy production portfolio. This calls for technologies to be developed in the next decades that deal with the two dimensional dynamics and the geographical distribution of these renewable energy generation units. Today, in Germany renewable energy sources deliver one third of the total net power consumption and in Denmark the share is already half.

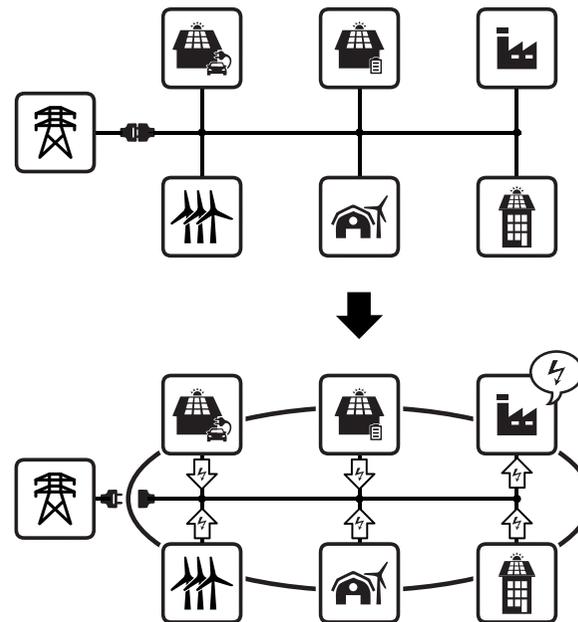
A large portion of the installed renewable energy capacity is currently supplying at low and medium voltage grid levels and producing energy in close proximity to the customer. During peak feed-in periods when the output power of local renewable generation units exceed the local demand, a great amount of power flows from lower grid layers to upper grid layers. During peak load times this flow is reversed recurrently and feeds loads at the lower grid layers. These reverse upward power flows drive transformer substations to their limits and result in voltage and frequency instabilities in the grid. Today feed-in from distributed generation units is regimented during peak periods. However, this absolute or partial shut-down is not an efficient way to integrate more energy from renewable energy resources into the energy mix.

Aim of the Project

In this project the region-specific energy consumption and production patterns will be analyzed and a distributed energy management (DIEM) system will be developed which optimizes the use of local available energy resources in virtual micro grids. On the basis of the surveyed patterns, simulation models will be set up to evaluate system configurations. The benefits of a DIEM system will be shown at demonstration sites. Outreach in the form of publications and events will foster a more intelligent use of energy and raise awareness for available technologies.

Distributed Energy Management

In the first instance, based on measurements from buildings, and building clusters within the Interreg5a region, simulations and models for the integration and effectiveness of sub-autarchic microgrids (SMG) will be evaluated. The aim of a SMG is to maximize the utilization of locally available generation units which are based on renewable energy resources. A SMG bundles together multiple local, energy generation units, local loads and storage capacities to work as a virtual sub-grid in parallel to the utility grid. The main purpose of a SMG is to operate a cluster of prosumers (a load with a co-located generation unit) and



From a traditional centralised to a decentralised energy supply system topology based on grid integrated micro-grids.

storage capacities within a topological layer of the utility grid to increase the level of self-consumption. In this way the load of the utility grid can be reduced.

Get informed

Gain for our Region

- More efficient use of locally available energy resources.
- Economic benefits resulting from a DIEM system.
- Environmental benefits resulting from a DIEM system.
- Public awareness of available technologies for efficient energy use.

Become a carpeDIEM partner

- Participate in motivating industry, economy, municipalities and the public towards a new energy paradigm.
- Follow current developments in distributed intelligent energy management and be part of the discussion.
- Join field trips, workshops and conferences.
- Become a demonstration site for intelligent energy usage.
- Get into contact with us.

GO GREEN

