



Energieversorgungskonzepte mit Optimierte Komponenten und Verfahren für Geschloßwohnbauten basierend auf hohem Netzinteraktions- und Flexibilisierungspotenzial, maximaler Flächeneffizienz der Umwandlungs-technologien vor Ort sowie hoher ökonomischer Konkurrenzfähigkeit vor.

In der Sol4City Projektreihe (Phase 1 und Phase 2) mit einer Gesamtlaufzeit von 4 Jahre werden gezielt die Kompetenzen von führenden Forschungsinstituten und Industriepartnern aus Österreich und Deutschland zu einem bilateralen, kooperativen Konsortium gebündelt.

Die Sol4City Projektreihe (Phase 1 und Phase 2) wurde nach Rücksprache mit der Förderstelle als zweiphasiges Vorhaben eingereicht. In der 5. Ausschreibung der Stadt der Zukunft wurde die Förderung für die Phase 1 (die ersten 2 Jahre) genehmigt. In der 8. Ausschreibung der Stadt der Zukunft wird für die Phase 2 angesucht, wobei die deutschen Projektpartner über eine eigene Finanzierung verfügen und in Deutschland die gesamte Projektlaufzeit von 4 Jahren bereits genehmigt ist.

## **Abstract**

Fighting the climate change on a global scale is seen as an enormous task and asks for a quick change of current paradigms. Cities cover about 3 % of the earths land surface but almost 72 % of all greenhouse gasses are emitted within their borders. Following the ongoing urbanization trend 85 % of all Europeans will live in cities until 2050. Therefore, cities and their emissions have to be a main focus in the current climate crisis. European missions like „100 climate-neutral cities by 2030" target this topic and help cities to reach climate neutrality by the year 2030 in supporting systematical Transformation. These innovative cities are seen as role models to be followed by other municipalities.

A completely renewable, central energy supply for cities might not be possible due to a lack of space for renewable energy production. For this reason, decentralized solutions will be needed in the city of the future that interact with existing network infrastructures in the best possible way. Numerous research projects have shown that 100 % solar coverage of the power and heat requirements for individual buildings (mostly single-family homes) is basically feasible. However, these demonstrators were all not nearly competitive with conventional supply solutions in economic terms and were characterized much more by a high degree of self-sufficiency. In this project, the focus is on the development of economical energy supply concepts for high solar cover ratios of at least 85% of the heat demand, 100% of the cooling demand and at least 60% of the electricity requirements for households and e-mobility of multi-storey residential buildings in new buildings and comprehensive refurbishment of existing buildings. A central component of the concept development is the synergetic consideration of the interaction with network infrastructures (electricity and heat) in the sense of bidirectional flexibility. The core of the project will be based on the combined use of available technologies (activation of thermal masses, PV and battery technologies, micro heat pumps) and especially in the context of the overall system new components and processes to be developed (area efficient and flexible PVT hybrid collector; "Charge Boost" sorption collector for seasonal heat storage with cooling function; adapted vacuum thermal insulation; interactive and predictive system control strategies).

At the end of the second project phase, integrated energy supply concepts for multi-storey residential buildings based on high network interaction and flexibility potential, maximum surface efficiency of conversion technologies on site and high economic competitiveness are available for the broad applicability in the "City of the Future".

For the Sol4City project series (phase 1 and phase 2), the competences of leading research institutes and industrial partners from Austria and Germany will be bundled into a bilateral, cooperative consortium. The proposed Sol4City project series (phase 1 and phase 2) will be submitted as a two-phase project after consultation with the funding agency. In the 5th call of the „City of the future" program, funding for phase 1 (first 2 years) was granted. In the 8th call of the „City of the future" program, funding for phase 2 (years 3 and 4) is applied for, whereby the German project partners have their own financing,

which was already granted for both project phases.

### **Projektkoordinator**

- AEE - Institut für Nachhaltige Technologien (kurz: AEE INTEC)

### **Projektpartner**

- Universität Linz
- GREENoneTEC Solarindustrie GmbH
- Kreisel Electric GmbH
- Sonnenkraft Energy GmbH
- Kreisel Electric GmbH & Co KG
- Sonnenkraft GmbH