

# Factsheet

## Aspern Smart City Research (ASCR)

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| <b>Organisation</b>  | Aspern Smart City Research GmbH & Co KG (ASCR)<br>Christine-Touaillon-Strasse 11/Top 22<br>AT – 1220 Vienna<br><a href="http://www.ascr.at">www.ascr.at</a>   |
| <b>Established</b>   | 2013  |
| <b>Management</b>  | Dr. Matthias Gressel<br>DI Harald Loos  |
| <b>Shareholders</b>  | Siemens AG Österreich (49,1%)<br>Wiener Netze GmbH (25%)<br>Wiener Stadtwerke GmbH (19,95%)<br>Wirtschaftsagentur Wien (4,66%)<br>Wien 3420 Holding GmbH (1,29%)  |
| <b>Employees</b>   | Over 150 employees, with varying scientific backgrounds, from the shareholding companies are directly involved with ASCR research.  |
| <b>Business objectives</b>   | <p>The fundamental goal of ASCR is to find and develop solutions for the future of energy within urban environments, thereby increasing efficiency and sustainability of energy production. The research aims to benefit the city of Vienna and all of its citizens. It was the first and, to date, the only co-operational model of this size.</p> <p><b>Research Areas:</b></p> <ul style="list-style-type: none"> <li>• <b>Smart Building:</b> Buildings that optimize their energy demand</li> <li>• <b>Smart Grid:</b> The path to an intelligent power grid</li> <li>• <b>Smart User:</b> User-oriented technology</li> <li>• <b>Smart ICT:</b> Interconnected research through Information and Communication Technology</li> </ul> |
| <b>Current Program period<br/>ASCR NeXt Level.2028<br/>(2024-2028)</b> | The third phase of the research project is now being set up as a living lab, using already established innovations. By incorporating representative buildings and the urban infrastructure in the city of Vienna, we are striving to develop a holistic solution for the future of energy in urban areas. This process is being supported by and includes Wilhelminian style residential buildings, commercial buildings in inner-city areas, hospitals (Floridsdorf Clinic) and industrial buildings.  |

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|   | <p>Pilot projects in the various areas are initiated in an agile manner and scaled to the city using the latest technologies.</p> <p><b>Focus</b></p> <ul style="list-style-type: none"> <li> <p><b>Out with gas in existing buildings for both living and working: Blueprint for the future</b></p> <p>In addition to the switch to renewable energy sources, the focus is on energy and cost efficiency. The research project will produce a guide that will provide building owners and network operators with insights for safe, efficient transition.</p> </li> <li> <p><b>From smart to autonomous buildings</b></p> <p>The research focus here goes far beyond simple facility management. Fire protection, heating and cooling will become largely automated. The aim is for buildings to make decisions and define solutions to problems independently in certain areas and situations.</p> </li> <li> <p><b>Holistic district solutions</b></p> <p>The aim is to integrate electrical as well as local heating and cooling applications into a holistic solution. It is not only electricity grids, but also thermal distribution grids that will be appraised. Furthermore, it is necessary to develop concepts that will ensure the appropriate use of surplus electrical energy and waste heat in the summer.</p> </li> <li> <p><b>Digital environment for agile research into the electricity grid of the future</b></p> <p>Austria is striving to cover its electricity needs entirely from renewable sources by 2030. This represents a major challenge for the distribution grid infrastructure. Under the premise of continuing to ensure maximum security of supply, even in times of energy transition, ASCR is dedicated to the expansion and operation of a proven concept for a digitalized, electrical distribution grid testbed, a simulation of a digital grid and the development of a new user concept to make optimal use of customer flexibilities.</p> </li> <li> <p><b>More e-mobility with the lowest possible demand for grid power</b></p> <p>In this area, ASCR is developing concepts for smart garages and networked communication between users, cars, charging stations, building control systems and the electricity grid.</p> </li> </ul> <p><b>Financial Resources:</b><br/>36 million Euros</p> |
| <p><b>Second Program period<br/>ASCR 2023 (2019-2023)</b></p> | <p><b>Achievements and results:</b></p> <ul style="list-style-type: none"> <li>166 research questions answered</li> <li>20 example applications</li> </ul>  |

- 4 funded projects
- International recognition and application of innovations achieved to date and solutions on the market
- **Buildings as prosumers**  
With numerous measuring points and sensors, the ASCR buildings being researched provide valuable real-time data. They are resilient prosumers, i.e. energy producers and consumers that can coordinate their respective energy production and consumption with the energy grid.
- **Intelligent sensor technology and smart grid lab for grids**  
Twelve grid stations, five grid storage systems, 24 transformers and 500 installed smart meters enable Vienna's grids to research and further strengthen the existing electricity grid infrastructure in aspern Seestadt.
- **New technologies for the energy supply using the example of hybrid controllers.**  
Wien Energie's power plant supplies over 17,400 households with energy from wind and sun. The controller optimizes the use of grid resources and intelligently and independently controls Wien Energie's PV and wind farms in Trumau.
- **Digitalization as a lever for energy transition**  
ASCR achieved great success with an office building in aspern Seestadt, TZ 2, thanks to the creation of a digital building twin using Building Information Modelling. Based on the digital twin data, smart maintenance - predictive maintenance – has been advanced and utilised to inform the planning phase prior to the erection of a further building.

#### Focus

- Expansion of the research environment: inclusion of further buildings both inside and outside aspern Urban Lakeside, Vienna.
- Research focus "Digital building twin" - "Building Information Modelling", thermal groundwater use, complex photovoltaic systems. Further connectivity of buildings, grids and markets.
- Extensive research into the use of heat exhaust, to further aid the cooling of the interior of buildings.
- Questions o smart charging of electric vehicles as well as their usage for energy storage

#### Research Projects:

- Self-Assessment Towards Optimization of Building Energy (SATO)
- Power System Cognification (PoSyCo)
- Adapt-&-Play holistic, cost-effective, and user-friendly innovations with high replicability to upgrade smartness of existing buildings with legacy equipment (PHOENIX)

#### Financial Resources:

45 million Euros

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| <p><b>Initial Program period (2013-2018)</b></p> | <p><b>Achievements and Results</b></p> <ul style="list-style-type: none"> <li>• <b>60 research questions answered</b></li> <li>• <b>15 prototypical solutions</b> in relation to intelligent buildings and grid infrastructure</li> <li>• <b>11 patents</b> pending.</li> <li>• 3 research environments with state-of-the-art building technology (<b>BEMS</b>); established, evaluated, optimized             <ul style="list-style-type: none"> <li>○ Residential building: 111 participating units</li> <li>○ Education campus: 900 people (primary school, kindergarten)</li> <li>○ Student dormitories: 313 bed spaces</li> </ul> </li> <li>• Realized concept of a <b>virtual Powerplant (DEMS)</b> as a system that allows for the flexibility of buildings to be utilised</li> <li>• Transformation of the local passive distributive power grid into an intelligent power grid with <b>active grid management</b>, including the necessary adaptations to/of connected buildings (<b>Smart Grid ready</b>)</li> <li>• Insights gained from integrating power storage systems into common use</li> <li>• <b>New analytic methods</b> and <b>data visualisation options</b> for energy suppliers, grid- and building operators</li> </ul> <p><b>Awards</b></p> <ul style="list-style-type: none"> <li>• World Smart City Project Award, 2016</li> <li>• Smart Energy Systems Awards, 2018</li> </ul> <p><b>Sponsorship projects</b></p> <ul style="list-style-type: none"> <li>• Smart Cities Demo Aspern (short SCDA)</li> <li>• Integrated Network Information System (short iNIS)</li> <li>• Flexible AC Distribution Systems (short FACDS)</li> </ul> <p><b>Financial Resources:</b><br/>38,5 million Euros</p> |
| <p><b>Contact</b></p>                            | <p>Ing. Mag. (FH) Nicole Kreuzer<br/>Aspern Smart City Research GmbH &amp; Co KG<br/>+43 664 623 9030<br/><a href="mailto:nicole.kreuzer@ascr.at">nicole.kreuzer@ascr.at</a></p>   |