




Factsheet

Smart Flowers FAR



SINFONIA stands for "Smart INitiative of cities Fully cOMmitted to iNvest In Advanced large-scaled energy". This project has received funding from the European Union's Seventh Programme for research, technological development and demonstration under grant agreement No 609019

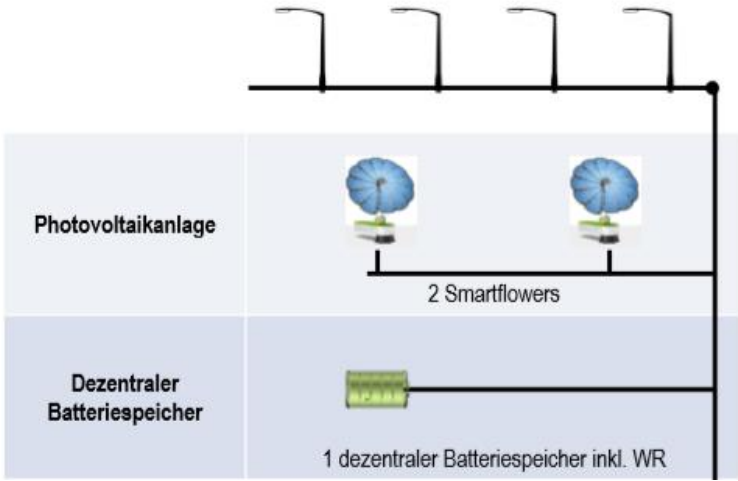
PROFILE

Name and address	Public lake – Leisure facility Rossau Archenweg 62 6020 Innsbruck Austria
Map	 <p><i>Source: Google Maps</i></p>
Type of installation	<p>The innovative solar system works automatically and effectively thanks to its exceptional design and perfectly matched components. The extraordinary design and the innovative control enable a maximization of the yields. Thanks to smart tracking technology, the Smartflower unfolds completely automatically in the morning and follows the sun throughout the day with a 2-axis control of the sun. This increases the yield by up to 40% compared to a rooftop system. Smart cleaning and smart cooling also prevent otherwise usual losses due to heat accumulation and soiling of up to 15%. The plant will thus produce 3,400 - 6,200 kWh / yr depending on the region - which covers the entire average electricity needs of a household in central Europe.</p>
Ownership	Innsbrucker Kommunalbetriebe AG



Capacity	Smart Flower – PV system 4.62 kWp Battery storage 8.0 kWh _{el}
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THE CONCEPT

Detailed characteristics of the device / infrastructure / service	<p>The project “Smart Flowers FAR” includes the following major components:</p> <ul style="list-style-type: none"> • Smart Flower – PV system, • battery storage, • LED-outdoor lightning
Concept	<p>The figure shows a simplified schematic representation of the project:</p>  <p>The diagram illustrates a power distribution system. At the top, a horizontal line represents a power line with four streetlights. Below this line, two Smartflowers (PV systems) are connected to the line. Below the Smartflowers, a decentralized battery storage unit (Batteriespeicher) is connected to the line. The components are labeled as follows:</p> <ul style="list-style-type: none"> Photovoltaikanlage 2 Smartflowers Dezentraler Batteriespeicher 1 dezentraler Batteriespeicher inkl. WR
Energy solutions	<p>As part of the "Smartflowers FAR" project, two innovative PV systems with a capacity of 2.31 kWp for each and a battery storage with a capacity of 8 kWh were set up near to the restaurant at the public lake Baggersee. Consumers are the nearby public lighting and the lighting of the adjacent parking area. In this concept renewable produced electricity is stored during daytime and is used for lighting at night. In the event of a shortage, the power requirement is covered by the public grid.</p>



Technologies considered in the design	<p><u>Smart Flowers – PV system:</u> To increase renewable electricity production on site, two Smartflower solar systems with 2.31 kWp each were installed. The Smartflower rotates with the help of a 2-axis tracking system and follows the course of the sun using GPS to optimize energy production.</p> <p><u>Battery storage:</u> As technology, a lithium-iron-phosphate battery was used. The modular battery system has a total capacity of 8 kWh and a lifetime of about 5,000 charging cycles.</p>
Performance targets	<p>expected amount of produced electricity: 6,250 kWh/a expected amount of reduced CO₂: 2,6 t/a</p>
Financing model	Direct investment of IKB 85%, national grant: 10 % and EC grant: 5%

IMPLEMENTATION

Contracting authority	IKB Innsbrucker Kommunalbetriebe AG
Project manager	Sophia Neuner (IKB)
Manufacturer / supplier	smartflower energy technology GmbH (Smart Flower) Solarworld (battery storage)
Other involved companies	
Cost breakdown	The total investment costs are in order of 26,000 €, Estimated payback time is: 21 a

Implementation planning	
1 - Design	01/2016
2 – Public procurement	02/2016
3 – Completion	05/2016



Work progress

Milestones



figure 1: Smart Flower close to public lake Baggersee



figure 2: lithium ion accumulator with 8 kWh capacity





figure 3: Smart Flower control unit with GPS tracking

MONITORING

Monitoring System	<p>The entire system has a web-based control system, which connects all components with each other. All measured values required for operation are recorded in the system. In order to assess the performance of the individual components, KPIs are calculated.</p>
Monitored variables and figures	<p>The following data is recorded for the Sinfonia project:</p> <ul style="list-style-type: none"> • energy output [kWh_{el}] • reduction of CO₂ [t/a]

LIFE CYCLE ANALYSIS

Estimated lifetime	<p>PV plants: 20 yrs</p> <p>Battery storage: 8 yrs</p>
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