

**Intelligent Renewable Energy Solutions in
Satakunta Region, Finland –
Cooperation Models for Enterprises and
Higher Education Units**

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Environmental Engineering

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'Mare Balticum'

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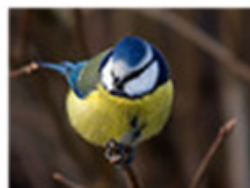


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CONTENT

- Satakunta Region in Finland
- Energy solutions in Satakunta
- Renewable energy – challenges in Finland
- SAMK's strategies and energy
- Solar energy projects
- Degree programme in Environmental Engineering

SATAKUNTA REGION



227 000 inhabitants, area 8 000 km²

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ENERGY SOLUTIONS IN SATAKUNTA REGION

- Nuclear power
- Coal power
- Hydropower
- Solar energy
- Wind energy - Increasing
- Bioenergy
- Geothermal heat
- Wave energy – possible in the future

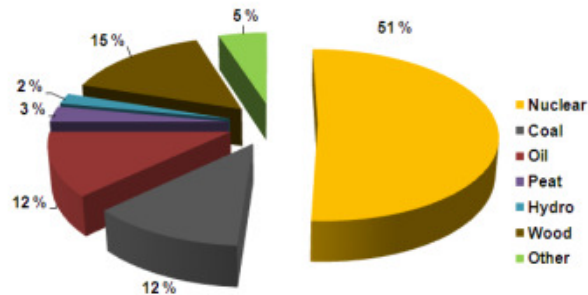


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ENERGY PRODUCTION IN SATAKUNTA

28 300 GWh in 2007



Source: Satakunnan energiatoimisto Prizztech Oy

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SOLAR ENERGY TECHNOLOGIES AND CHALLENGES IN FINLAND

- Mainly solar thermal (ST) and photovoltaic (PV) technologies
- ST: Warm water production (and heating)
- PV: electricity production
 - The largest demand for PV in the Finnish summer cottage market at the moment
- Finland has small inland solar energy market
 - Governmental politics for subsidies favours bigger solar energy projects. Individuals have no realistic possibilities to qualify for these subsidies
 - Limited opportunities for companies in terms of their own product and system development.

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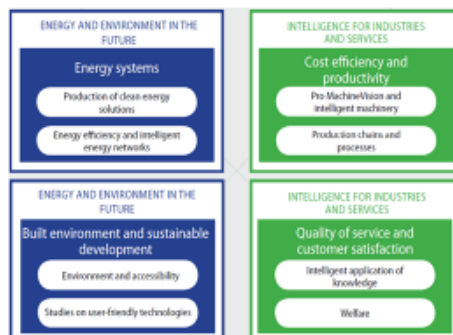
SAMK'S STRATEGIES

Strategy for 2010-12

Key priority areas are:

- Knowledge-intensive entrepreneurship during studies
- Environment and energy
- Innovative services and processes
- Automation and mechanical engineering

RDI Programme



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SOLAR ENERGY RDI ACTIVITIES IN SAMK

- **SolarForum** – promoting solar energy in Satakunta region: operation and business environment development project (2009-2012), funding: 380 000€
- **Business operations promoted by solar energy pilots** (2009-2011), funding: 260 300 €
- **ENNA** – Building an open innovation environment for development of energy, nanotechnology and functional materials (2009-2012), funding: 110 000€

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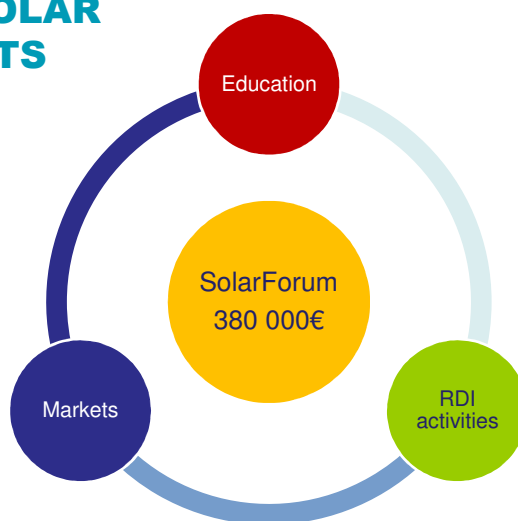
THE GOALS OF SOLAR ENERGY PROJECTS

The goal of SolarForum project is to activate the formation of new know-how based technology in the field of solar energy.

To

complete,
rationalize,
improve

the existing solar energy value chain in the region of Satakunta.



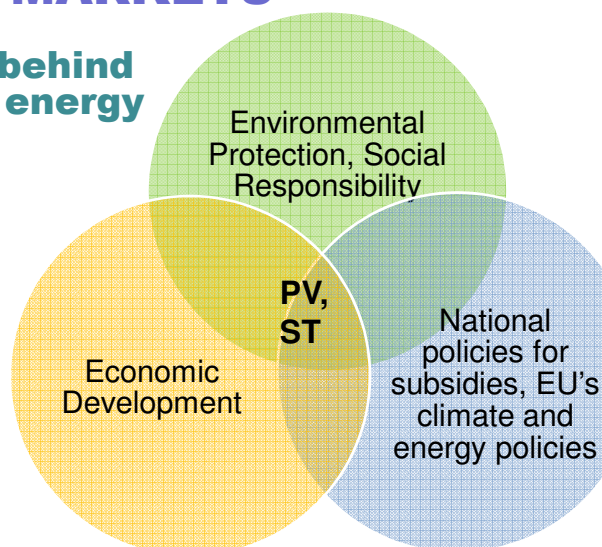
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KNOW THE MARKETS

Driving forces behind the renewable energy technologies

PV = PhotoVoltaics
ST = Solar Thermal



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SOLARFORUM

LUVATA **SATMATIC** **CimSolar**
SWITCH ON CO-OPERATION

SERMATECH Oy **AKVATERM** **LUPON**
Member of Sermatech Group

Porin Termolaite Oy **bitec** **PURSO**

Lemminkäinen **posek** **samk**

Einkaino-, liikenne- ja ympäristökeskus **Leverage from the EU** **European Union European Regional Development Fund**

Solar Forum 380 000 €

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Visions for the future... targeted RDI activities

Building integration





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SOLARFORUM CASE

Solar Energy solutions in the new public swimming complex in Pori

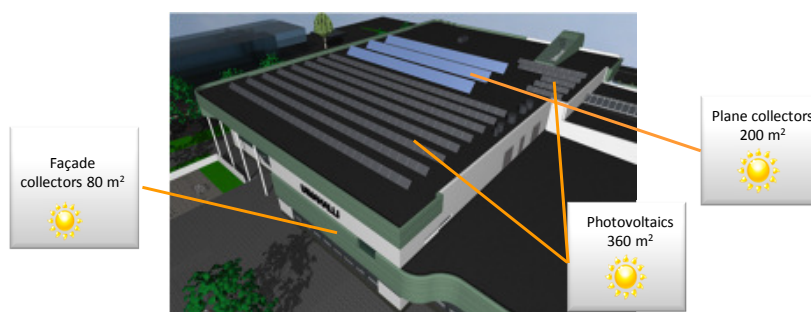


Design, development and measuring of solar energy solutions as well as surveillance systems in close cooperation between private companies (SolarForum) and Pori city council

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80 m² of Luvata's Nordic Solar fully façade-integrated solar thermal system, 200 m² of plane collectors on the roof
- annual production of solar energy = 120 000 kWh

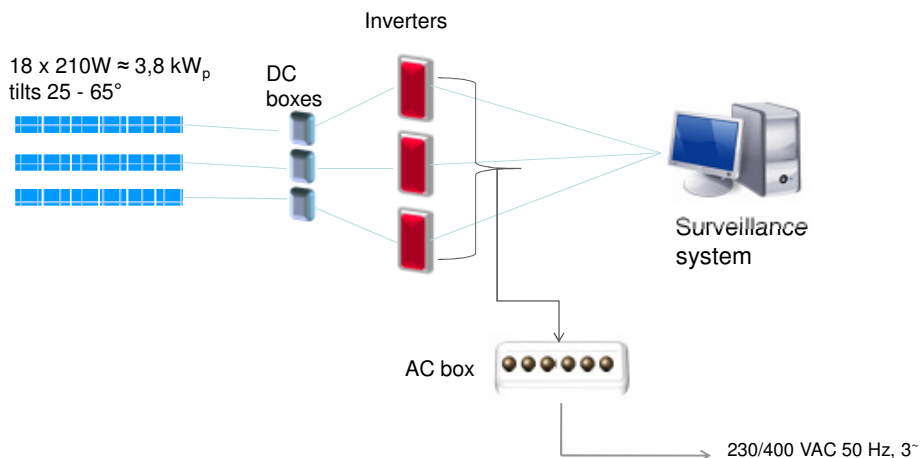


360 m² **mc-Si** PV panels
- peak power of 50,4 kW_p
- annual production of solar energy = 45 000 kWh

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PV TESTSYSTEM FOR SOLAR ENERGY EDUCATION



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DESIGN COMPETITION FOR STUDENTS

Combining education and a development project



Real-life designing task

- Lemminkäinen Talo Oy, a construction company launched a competition to design a solar system for a new estate under construction in Pori
- The winning design will be used as a basis for detailed planning of the multi-storey block of flats

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BACHELOR'S DEGREE PROGRAMME IN ENVIRONMENTAL ENGINEERING

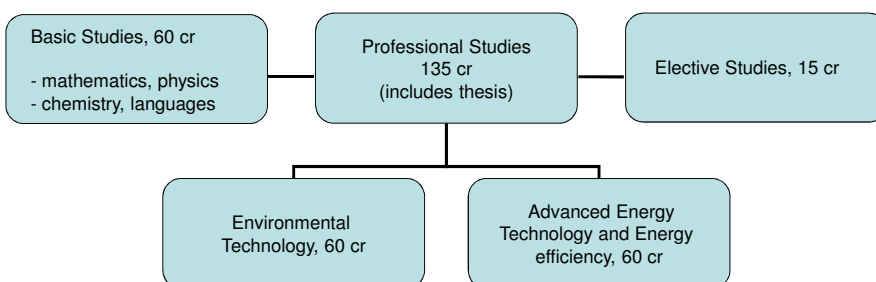
- A unique combination of environmental management and advanced energy production
- Topics include:
 - Sustainable development
 - Environmental technology
 - Advanced energy production technologies
 - Energy efficiency
- A full-time 4-year programme leading to a Bachelor's Degree in Engineering
- Our graduates will have the necessary skills and competences to work in governmental organizations, private companies and industrial projects.

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STRUCTURE OF THE PROGRAMME

- Environmental Engineering bachelor degree programme (four years)
 - Key focus areas: environmental technology, advanced energy technology and energy efficiency.
 - New programme started in August 2010.



+ 30 cr practical training

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EDUCATIONAL METHOD

Activated teaching in order to

- ensure growth of creative know-how
- improve communication and interpersonal skills
- increase cross-scientific way of thinking and conceptualisation of larger entities
- advance understanding of the two-way relation between technology and society

An optimal combination of theory and practice

- Degree Programme in Environmental Engineering
- Test systems
- Solar energy RDI projects

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