

NUR – New Urban Resources

Renewable Energies for Bethlehem

Partners presentation

SiTI – Higher Institute on Territorial Systems for Innovation

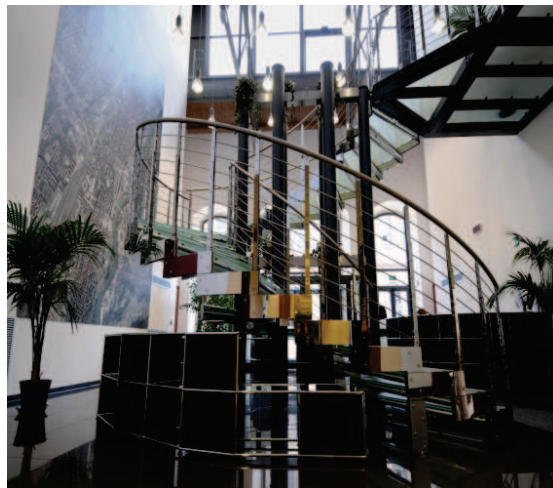
Turin, 18th–19th April, 2018
Kick Off Meeting

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SiTI - *Higher Institute on Territorial Systems for Innovation* - is focused upon operational applications of academic research, through the *integration of different competences*: our objective is to provide solutions to public and private Stakeholders when dealing with systemic challenges posed by the new energy paradigm.



THREE INTERDISCIPLINARY RESEARCH FIELDS

Environmental Protection, Security and Energy



Environmental Heritage & Urban Redevelopment



Logistics and Transport



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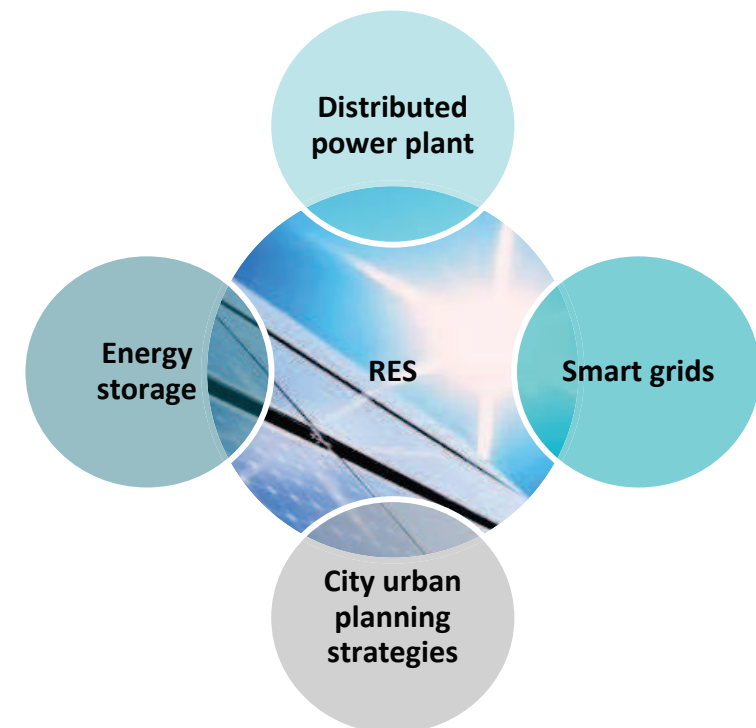
ENVIRONMENTAL PROTECTION, SECURITY & ENERGY

Research Focus

- A new energy vision based on distributed resources, polygeneration systems and demand aggregation
- Technical and economic feasibility assessments
- Evaluation of impacts by renewables on energy infrastructures
- Innovative business models

Main Skills in the Energy field

- Technical and economic **feasibility assessment** to design and manage polygeneration systems to provide electric and thermal energy to urban districts
- Optimal exploitation of the available resources by defining proper **energy generation profiles** according to final users needs
- GIS tools to assess the **potential of RES generation** (woody biomass, photovoltaic, solar thermal, etc.) in a given area, including a preliminary economic evaluation
- Evaluation of the current **energy performance of buildings** and assessment of the impacts of retrofit actions to reduce consumptions
- Extension of the approach to the city (or a selected district) with a paradigm based on **distributed resources** and **demand aggregation**
- Economic analysis to support the definition of proper **business plans**



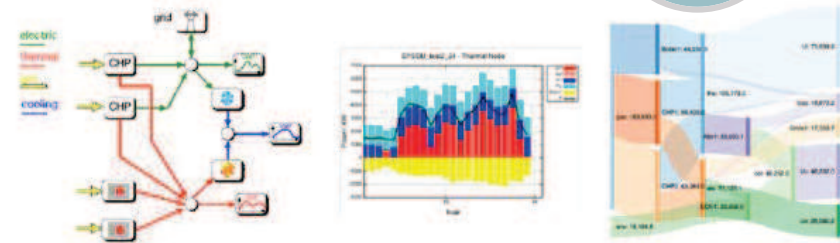
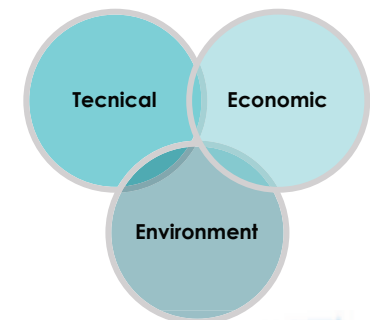
WP and activities in NUR Project

- SiTI will be actively involved in each of the four NUR work packages
 - Technical analysis of the impact of RES generation plants in the City of Bethlehem
 - Support to plant design and installation
 - Data analysis
 - Support to applied research activities for implementing a smart building approach

- Identification of the energy supply chain at local and national level
- Preparation of a draft of the strategic energy plan at urban level

- Support to “learning on the job” activities
- Definition of models to support new business opportunities

- Preparation of dissemination materials
- Contacts with potential investors



Role in NUR Project

- SiTI will
 - In cooperation with AI Engineering, provide the technical expertise to analyse data and support the design and installation of systems
 - In cooperation with PoliTO, support the scientific coordination of the activities
 - Identify the strategies to support the exploitation of the available resources in the Bethlehem area
 - Support the CiTTA' di Torino in the overall project management



Implementation of a **smart grid approach** in the City of Hebron to promote the use of Renewable Sources

- Assessment of the impact of distributed generation from Renewable Sources and battery energy system on the local distribution grid
- Identification of retrofit actions for buildings to reduce loads
- Implementation of a pilot site to collect real data on the field
- Definition of business models to raise interest among international investors



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BuildHeat (www.buildheat.eu)

Attenuating heating & cooling consumption



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°680658.

Project coordinated by



Established Heating & Cooling Technologies for Innovative Systemic Retrofit



Integration of a heat pump plus solar thermal system with thermal energy storages located in each dwelling



ICT infrastructure connecting and monitoring all the decentralised units



Single dwelling mechanical ventilation with air-to-air heat pump, equipped with small PV field and storage tank for DHW



Flexible solution of multi-functional façade including insulation and active elements

Innovative financial mechanisms will be designed during the project, exploring investment synergies among private and public funds. BuildHeat proposes a risk mitigation approach generating value for investors: the aggregation of consumers and buildings into clusters or districts creates local ecosystems that are attractive for investors

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Revamping of a generation plant for district heating and cooling according to a *polygeneration* paradigm



Feasibility study to substitute the current plant managed by AEG Coop to feed the district heating and cooling network located in the Parco Dora Baltea – Ivrea (TO)

- Scenarios definition
- Cost-Benefit analysis of each scenarios using the optimization tool XEMS-13
- Identification of possible expansion scenarios of the current network