PhD with Heat-Tech Center

II Edition - September 2015

PhD OFFER	
Topic:	**Impact of energy efficiency improvement on District Heating model (technical and commercial)**

Context

The main challenge of VEOLIA is to be able to serve tomorrow its Clients with a higher efficiency and to adapt as well to the important changes that will happen on the demand side (behaviour/prosumer, energy efficiency, price impact, demographic considerations).

In particular, Energy efficiency will get more and more important and different means will allow to meet following targets:

- Building energy Services with advanced control of heat consumption in buildings,
- Thermal modernization of aged buildings,
- Stimulation of customers behaviour to save energy,
- Regulations for construction of new building or refurbishment

Energy signature of buildings (energy consumption [GJ], heat power fluctuation [kW], level of temperature required in [C°]) will be fundamentally affected by these means, the District Heating model (technical and commercial) will also be deeply affected in the near future. General objective of the PhD is to help to better manage and anticipate this deep modification expected from historical District Heating Network with large market share such as in Polish cities.

Scientific objectives

Four objectives are identified :

- 1– Give a clear picture of the heat market trend over the last 5/10 years (depending on the data available) and understand the impact of thermo-modernisation and energy efficiency changes on the trend of heat delivered by District heating. Identify what were the leverages that can explain these trends.
- 2-Development of a library of models for buildings heat signature (energy consumption [GJ], heat power fluctuation [kW], level of temperature required in [C°]) depending on their main characteristics (market segment, age, thermal renovation, buildings which will be build in the future, etc);
- 3- Development of an aggregated model of a heat demand evaluation for district heating network which integrates buildings signature modification over the coming years, city extension, etc. The model will have to take into account some uncertainties (such as: future regulation, urban planning, etc) by defining different scenarios;
- 4- Assess impact of the heat demand evolution in terms of technical operation and business model depending on different strategies adopted by district heating operator (construction of small heat source plant for example, advanced control of the district heating).

Methodology approach/ Results expected

General result will be an innovative methodology and a tool to simulate and analyse the future of the existing District Heating Network in order to support Veolia District Heating strategic planning.
Work will start with a deep state of the art study regarding models and methodologies available in scientific community.
Results will be developed for the period 2015-2030 and will focus on the Polish energy market. Models will be developed based on real data from VEOLIA Polish District Heating Network. The case study is expected to be developed for the Warsaw City 2030 program.

Expectations from the student

- Analytical capacity and rigour
- Factuality
- Energy and business acumen
- Bigger picture thinker but shows attention to detail as well
- Project lead skills
- Good communication skills both oral and written
- Main technical background : Energetics with a speciality in energy for buildings
- Fluent in English
- Desired traits: creativity, ability to work in a team

CONTACT

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