Energy efficiency research and development activities

Background: Basic information

Different R&D measures are being undertaken by EPBiH power utility, to improve its energy efficiency and keep on the track of the European targets outlined in the EU strategic documents and laid down by new energy efficiency Directive 2012/27/EU. By modernization its existing power plants performed in last 10 years, EPBiH has improved net efficiency and reduced its CO_2 emission for 30% compared to 1990 levels. Plan till 2030 is further increasing the net efficiency up to 40.2%. EP BiH is being implemented Energy Management System (EMS) according to the standard EN ISO 50 001, decision made by Advisory Board of the company in April 2014. Many activities on this track have already been completed or are ongoing. With introducing Energy Management System, energy efficiency has been involved into all sectors of the company; from coalmines, generation and distribution, to the energy supply, to comply the business model with EU energy efficiency targets and legislation.
Among routine activities within EMS, specific R&D activities have been also devoted, most in the field of cogeneration (long-distance district heating systems), smart metering and electro automobiles.

Capacities and capabilities

Energy Management System of EPBiH covers all three main segments: power generation, distribution and energy end-use. Regarding power generation, replacing and expanding existing generation capacities by more efficient solutions, finding secure non-fossil fuel alternatives, including RES, biomass and CCT (Clean Coal Technologies), as well as expanding long-distance district heating systems is of paramount interest of EPBiH R&D energy efficiency policy. Energy efficiency within EMS EPBiH in Generation becomes an essential criterion for the authorization and engagement of generation capacities. At the moment efforts are undertaken to substantially increase the uptake of high-efficiency cogeneration, district heating and cooling. Annual production of heat energy, generated in cogeneration power units of TPP Tuzla and TPP Kakanj, is app. 400 GWh. The heat energy for heating is supplied over long-distance district heating systems to the consumers in the city of Tuzla and city of Lukavac (from TPP Tuzla) and city of Kakanj (from TPP Kakanj). A part of the heat energy (steam) is supplied from TPP Tuzla to the process industry in Tuzla region. The high-efficient co-generation scenario includes expansion cogeneration for the purpose of heating both in TPP Kakanj (new 200 MWt for long-distance distring heating of city of Zenica and new 400 MWt for long-distance distring heating of city of Sarajevo) as well as in TPP Tuzla (new 70 MWt for long-distance distring heating of city of Zivinice).
One of the main objectives for electricity distribution is the implementation of smart metering infrastructure and SCADA systems. Along with consideration of smart metering a prerequisite for the efficient functioning of electricity markets, we believe that it should be recognized and valued as a technology that allows the achievement of targets for energy efficiency in end use of electricity. Some activities have already been initiated on the realization of pilot projects testing systems for power quality monitoring. Further activities are to be planned and implemented and this research area is quite extensive. Implementation of new technologies in distribution system of EPB&H is also part of development requests and is stated in internal strategic plan documents. For example, analysis of possibilities for implementation of underground substations or electric vehicles, as well as adapting networks to renewable energy sources, are also interesting research topics. Also the emerging integration of distributed generation (small hydro, PV, wind, biomass) offer new “practical research” area in our distribution system. Upcoming research activities will be in area of smart city implementation and coordination activities with other parties in power and administrative sectors.
From the other side, EPBiH Supply Department will be required to secure documented energy savings among the customers, using means such as third-party energy services, dedicated instruments such as ‘white certificates’, public benefit charges or equivalent and speeding up the introduction of innovative tools such as ‘smart meters’ which should be consumer-oriented and user-friendly so that they provide real benefits for consumers.

All Research&Development activities in the field of energy efficiency are coordinated in Department for Strategic Development of EPB&H in full cooperation with other organizational units of EPB&H, according to our organizational policy.

Expected benefits and contribution to the European research community

Primary benefit is a further awareness of implementation of energy efficient solutions in generation, distribution and energy end-use sectors, as well as building infrastructure and development new technologies not only for EPBH but for other stakeholders in developing electricity market in BiH and EU. Cross-border cooperation that could be realized might provide a good basis for the exchange the best practices and future collaboration.

References and published papers

[1] EMS documents of EPBiH (Energy efficiency policies, plans, reports..), 2011-2014.

[2] Kazagic A., Merzic A., Redzic A., Music M., Power Utility Generation Portfolio Optimization as Function of Specific RES and Decarbonisation Targets - EPBiH Case Study, VIII International Conference on Sustainable Development of Energy, Water and Environmental Systems – 8. SDEWES Dubrovnik 2013., 25-29. September, 2013.

[3] Kazagić A., Musić M., Energy efficiency measures in power utilities on the track of an efficient and low-carbon Europe in 2030 - Case study of EPBiH, The 4th International Symposium on Sustainable Development (ISSD2013), Sarajevo, May 2013.

[4] Kazagić A., Kadić N., Energy Managmnet System of JP Elektroprivreda BiH, III Symposium on Energy sector in B&H „Energy efficiency and Renewable energy sources“ with international participation, Neum, 28-30. September 2011.

[5] E. Bećirović, M. Musić, S. Penava „Implementation of AMR/AMM system: results and plans - Elektroprivreda BiH“, CIRED 2011, The 21th International Conference and Exhibition on Electricity Distribution proceedings, Frankfurt, Germany, June, 2011.