



Veolia experience with using biochar: Łódź

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First tests for the use of biochar

Veolia Energia Łódź

- **Contexte:** Łódź is the third biggest city in Poland. Since 2005, Veolia is the owner of the Combined Heat and Power Plant Complex and a 860 km long district heating (Veolia Energia Łódź). The company provides heat to around 60% of city homes; to industrial plants, public utility institutions, shopping and service centres. It is composed of three major plants
- **Problem:** dominating fuel is coal with (858kt/y, followed by biomass (300kt/y)
- **Aim:** to transition as fast as possible from current coal-based boilers, while waiting for new technologies and solutions to come (a 10-15 years bridge), with the lowest impact on heat price and least transformation existing installations
 - *Part of “New Energy for Łódź” project for phasing out coal altogether*
- **First attempt with biochar in 2019** with a selected supplier for the fuel produced from forest biomass through pyrolysis, with parameters extremely close to those of coal



Testing process

Trial and error

- Before material testing - **an analysis conducted by the Polish Coal Transformation Institute**
 - *checking dusts behavior from the point of view of calorific value, volatile particles content, explosion and absorption of humidity potential*
- **Burning 435t of biochar** in bowl mills (gradually increasing quantity to 100%), with another batch of 520t in one existing boiler in the EC3 power plant
- **First difficulties detected** - the type of boiler used not adapted for grinding to dust, issue with bulk weight, parameters of fuel not adapted to existing coal feeders
- **Conclusion:** roll mills were needed (instead of bowl ones)
- Another test on a 60t batch was made on adapted boilers with success. **Yet, further testing with more material and for a longer period of time is needed**



Current major issues for deployment



- To produce 900k tons per year of biochar, 10% of available national biomass would have to be used. **Biochar back then was expensive**, even with quantities bought for testing. Price should be < coal +CO2 emissions allowances. The uncertainty over prices evolutions is a major element in decision-making



- **Biomass transformed through pyrolysis is considered as renewable energy source only if produced from sustainable biomass**
 - Availability of the resource (given the current revision of the rules)
 - Open question of energy used for pyrolysis



- **Availability of sustainable biomass:** 1t of biochar requires 2-3t of biomass that will need to be sustainable

Perspectives

What's next?



- **Further tests are being conducted** - use of ordinary pellets vs biochar- contract signed with Central Office of Boiler Construction to determine which changes exactly need to be made to existing boilers and at what costs to be able to use both fuels
 - *to be completed by the end of the year and depending on the results, modifications to be carried out during the 2027-2028 period*
- **Interest to acquire technology to produce biochar in Poland** to avoid imports (up to 1 million per year) - discussions with potential companies are ongoing
- **End result expected for Łódź** : gas 49% (2027), biochar 29%, biomass 12%, pre-RDF 9%, oil 1% for 2030

