ZeroWaste BYG: Redesigning construction materials towards zero waste society

The ZeroWaste research group (www.zerowaste.byg.dtu.dk) at the Department of Civil Engineering was established in 2012 and covers the broad range of expertise required for turning waste materials into attractive, new materials. Members of the group have developed methods for removal of heavy metals and phosphorous from waste incineration, sewage sludge and other bio ashes [1], providing the basis to make these ash types an attractive, new material for the building sector. The amount of waste increases and it is both difficult and expensive to handle many waste types as e.g. different ashes. At the same time there are fewer natural resources and the general consumption increases. We wish to utilize alternative and new ash types as raw material in concrete, similarly to what was previously seen with fly ash from coal combustion and microsilica, which were both transformed from problematic waste to valuable raw material. The physical-chemical characteristics of fly ash, such as large uniformity coefficient, clay-sized particles and rich in some metal elements and salts, show the possibility of being a raw material also for bricks and lightweight aggregates. In the future we expect increasing political pressure to change the status of different ashes from waste to raw material and that export for disposal will be no longer be allowed. We wish to influence the consequences from this new situation. In principle some of the ashes can be used already, but the huge variation in ash characteristics and lack of knowledge in the construction industry on the qualities some of the ashes can give the concrete and clay materials means that they are not used today.