Energetic Countryside From Maize Corn

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Egypt’s needs of energy and food are ascendingly increasing with the increase of its population. This study aims to provide a clean and ecofriendly source of energy for mobile cars, and a cheaper soil fertilizer rich in ammonia. Ash is also extracted to be used as part of cement production. The current project concept is based on an integrating system starting from corn straws to corn stalks. Straws are heated in an inert conditioned in a device known as the “Torre faction” at a temperature of 400° C. This device is fully filled with straws without leaving spaces to allow the presence of oxygen. The result is the production of biochar fertilizer that is rich in nutrients for soil enrichment, and consequently increasing its fertility significantly. Residual ash from heating up biochar at high temperature until consumption, can be used to be a pozzolanic material, which looks like a cement component or concrete that also could be of use. Corn stalks can be used in the production of bioethanol easily, after sequence of about four processes: pretreatment, glycolysis, fermentation, and collection. The results show the efficiency of bioethanol after analyzing its density, viscosity, flash point and others, which prove that it can be used in car motors. Ash enrichment with SiO2 showed that it can be partially used as a cement replacement of about 15%. This will save around USD 25/ton. Finally, biochar had a positive effect on agricultural soil compared to ordinary soils.

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