

## Physics of the urban production of algae in photo-bio reactors for the utilization in vertical farms



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### ***Reviews***

*Basically no words to clarify. Of course, it is perform, still an amazing and interesting literature. Its been printed in an exceptionally basic way which is only soon after i finished reading through this ebook where actually altered me, change the way i really believe.*

***(Newton Runolfsson)***

## PHYSICS OF THE URBAN PRODUCTION OF ALGAE IN PHOTO-BIO REACTORS FOR THE UTILIZATION IN VERTICAL FARMS

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GRIN Verlag Dez 2012, 2012. Taschenbuch. Book Condition: Neu. 210x148x8 mm. This item is printed on demand - Print on Demand Neuware - Diploma Thesis from the year 2012 in the subject Physics - Biophysics, grade: 1,0, University of Vienna (Physik), language: English, abstract: Today's agricultural food production highly depends on the availability of non-renewable resources like crude oil, natural gas and phosphor rocks. Tomorrow's food security can only be ensured by reducing this dependency. There are open questions concerning the methods that can be used for the production of renewable sources in order to achieve this goal. Is it technically and economically feasible, for instance, to produce micro-algal fertilizer in photo-bio reactors to recycle N and P from waste water streams? Is this furthermore possible by avoiding the combustion of non-renewable energies to become energy self-sufficient? Relevant examples from literature will be used to investigate the microalgal potential to extract nutrients from urban waste water streams for the re-injection into the food chain of the population. The production of algae and heat will be described in a bio-physical way to calculate the mass- and energy flux in photo-bio reactors, attached to walls of buildings in Vienna. It will be suggested to decompose the generated bio material through anaerobic digestion to increase the N- and P share on one hand and to produce methane as an energy carrier on the other hand. The calculation model will be used to estimate the costs of producing a micro-algal fertilizer in Vienna. Furthermore a possible utilization of the generated fertilizer in vertical farms will be discussed. About 271t micro algae per year could be produced on a 100m 100m wall in Vienna. The combustion of the produced biogas could meet the entire heat and electrical-energy demand of the production process. By demonstrating the...



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