

# IPID4all Doctorate Research Exchange with UAM - Azcapotzalco

## Feedback report

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*Energy recovery from organic part of Municipal Solid Waste in Mexico City*

*UAM - Azcapotzalco*  
*Energy Department, Area of sustainable technologies*  
  
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### Introduction

At the conference Symposium on Urban Mining in Bergamo (Italy) I got in touch with the Professor Dr. Alethia Vázquez Morillas from UAM University in Mexico City. The exchange allowed me to work closely with the professor who is working in area of waste management focusing on organic fraction in Mexico and get experience of waste research in developing countries.

Mexico City produces 12,893 tons of municipal solid waste (MSW) every day. To manage its waste, the city has 12 transfer stations, two selections plants and eight composting plants this infrastructure and the informal collection allows the recovery of 13% of the waste by composting, 14% by recycling and 0.7% by energy recovery. As the local landfill got closed in 2011, the city sends the rest of the waste to 5 landfills, located in neighbour states. The main component of municipal solid waste in Mexico City is organic waste (around 50%). According to the Solid waste law from 2011, the households should separate their waste into organic and inorganic fractions, that should be collected separately by the public collection service. This separation scheme was created to recover the organic fraction of the waste through composting. However, the treatment of organic fraction through Anaerobic Digestion (AD) is not possible due to the contamination the feedstock. In 2015 the government produced a new regulation, the NADF-024-AMBT-2013, which purpose is to establish a new way of separation at source. The regulation will be mandatory in July 2017. The new regulation proposes the separation of waste into five fractions: biodegradable, potentially recyclable, not recyclable, bulky waste, and hazardous waste. The undertaken research analyses the influence of the new separation scheme on the valorization of organic waste through AD.

### Research Undertaken

During the stay at UAM, I conducted field research and started to work on a joint paper with Dr. Vázquez. I took part in composition study of municipal solid waste from two transfer stations of Mexico City (Venustiano Carranza and Coyoacán). I also conducted the analysis of more precise plastic and organic waste composition.



Pic. 1 Taking the MSW sample at transfer station and waste composition analysis.

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I also took part at the experiment for the identification of calorific values of residues using the oxygen bomb calorimeter in the University Colegio Militar.



Fig. 4 Experiment with the oxygen bomb calorimeter

Together with Dr. Vázquez I visited waste treatment facilities in Mexico City and in the State of Mexico: Composting Plant Bordo Poniento (former landfill), San Juan de Aragón Sorting plant, PET Star recycling plant, Ixtapaluca Sanitary Landfill and Venustiano Carranza Transfer Station.



Fig.3 Bordo Poniento the largest composting plant in Mexico city.



Fig. 4 San Juan de Aragón Sorting plant



Fig. 5 Ixtapaluca Sanitary Landfill

I also made interviews with the experts. This includes an interview with the consultants and professors from main universities of Mexico City: UAM, UNAM and Polytechnico. who established further contacts in Mexico City. Hence, I conducted additional interviews with Institute of federal government, experts from GIZ and representative of C40 initiative.

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In addition, I met with the consultant from World Bank working on the Project PRORESOL for Mexico (Program for Municipal Solid Waste), which is designed to finance new Private Public Partnerships in waste management. All the interviews considered the influence of new source separation system on the recovery of organic fraction of municipal solid waste.

Thanks to the IPID4all scholarship, I had the opportunity to submit the abstract on waste management system in Mexico City to the ISWA 2016 conference in Baltimore. I am waiting for the response from the organizers.

## **Personal Experience**

The research stay at UAM was an interesting experience both personally and professionally. The University provides extensive work and study environment. I was offered the office space in the university which promoted my faster integration in research environment. I was welcomed the best way possible at the department. Thanks to the daily communication with the colleagues at the department I have significantly improved my Spanish skills.

It was my first experience in Latin America. In general, the time in Mexico gave me more understanding of the cultural differences between Europe and South America, which I would like to use further in my career in international development.

## **Conclusions**

The personal and professional experiences broadened my understanding for different perspectives on my research topic in developing countries. The work at UAM and the field research I conducted will become part of my PhD research and it will benefit the research at the University of Oldenburg.

I started to work on a joint research paper with Dr. Vázquez and we discussed an outline for joint research in the future. I strongly believe that the opportunity to work directly with her will facilitate our remote collaboration in the future.

## **Outlook**

Together with Dr. Vázquez, we drafted and further developed a research paper on the influence of new source separation system in Mexico City on the feasibility of AD project of organic fraction. Another paper, providing the overview of the structure of waste management system in Mexico City is planned as well.

Further visits or exchanges are considered for the future, though will depend mostly on funding opportunities. Conferences and other events are considered for joint contributions that could provide ground for future face-to-face meetings.

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