

Oscar Yepez Ceron

Colombia ➤ Ireland

Increasing the efficiency of downstream processes that valorise dairy side streams



What's your project about?

The aim of my project is to **improve** the **efficiency** and **performance** of the **anaerobic digestion process** by mitigating the **challenges** posed by calcium carbonate **precipitation** that can lead to various **problems**, including the formation of **heavy sludge**, **scaling** on reactor walls and pipes, and **reduction** of biogas production. Through **experimental** tests on a **pilot scale** and the use of **software tools**, it is intended to **improve** the **sustainable** and reliable production of **biogas**, contributing to a more efficient and **environmentally friendly** wastewater treatment in the dairy industry.

Project Partners



UCD's School of **Chemical and Bioprocess Engineering** stands as a prominent hub for **engineering education and research** in Ireland. With a rich history spanning **over 60 years**, the school has consistently produced graduates who possess a strong foundation in **technical, environmental, ethical, and social** aspects of **engineering**. My supervisor is **Professor Kaan Dereli**



**University College
Dublin**



Carbery



Carbery Group was founded in 1965 and is a **renowned dairy** company located in the West of Ireland, specializing in the production **nutritional ingredients, flavours**, natural **cheeses**, and **bioethanol**. With **global** presence, Carbery operates facilities not only in Ireland but also in the **UK, China, and Brazil**. One of the notable attributes of Carbery is its **strong commitment** to **sustainability** and the promotion of **renewable energy** sources. My supervisor is **James Browne**.



Oscar Yepez Ceron

Colombia ➤ Ireland

Increasing the efficiency of downstream processes that valorise dairy side streams



What are you most excited about your project?

This project particularly **excites** me because it **combines** two approaches to **optimize renewable energy** production from **biogas** via **anaerobic digestion**. We're conducting **pilot-scale** experiments to gain **real-world data**, while also utilizing **mathematical simulation** as a powerful **optimization** tool. This complementary approach allows for a **more comprehensive understanding** and the potential for significant **improvements**

What do you find the most challenging in your project?

One of the main **challenges** in optimizing **biogas** production from dairy wastewater through anaerobic digestion is the **high calcium content**. This calcium **precipitates** as unwanted salts within the **reactors**, making the process **difficult** and requiring **frequent** and **expensive maintenance**. This is a known process but research is **limited**. Our project aims to **address** this **gap** by investigating methods to **control** and **prevent** these calcium precipitations, which will ultimately lead to a **more efficient** and **cost-effective biogas** production process.

What brought you to the Bioeconomy?

The **bioeconomy** offers a **promising** path to address **challenges** related to **global warming** by providing **renewable energy** sources such as **biogas**, reducing our **dependence** on **fossil fuels** and greenhouse gas **emissions**, implementing **more sustainable** and **green** practices in **industries**.

What does the Bioeconomy mean for you?

For me, the **bioeconomy** represents a **transformative approach** to harnessing the **potential** of **renewable** biological resources and **sustainable** processes.

Oscar Yepez Ceron

Colombia ➤ Ireland

Increasing the efficiency of downstream processes that valorise dairy side streams



What did little Óscar want to be when he'd grow up?

I always wanted to be a doctor, however I found that I would enjoy being an engineer more.



Something you love? And something you hate?

I love making people happy, Japanese food and football. I don't like humiliation and cooked liver.

Any hobbies outside of Science?

Sports, the gym, gastronomy, watching anime, electronic music and dancing



Short CV

- 2012-2017** ★ B. Sc. in Chemical Engineering-Universidad Nacional de **Colombia**
- 2019-2021** ★ MSc. of Engineering - Chemical Engineering. Universidad Nacional de **Colombia**
- 2018-2022** ● Operational Director of Drinking Water Plant-Public services company, EMSERP E.S.P. **Colombia**
- 2022** ★ Operational director of the biomethane production pilot plant-Universidad Nacional de **Colombia**

