



## Possibilities for hydrogen backup solutions in rural Colombia

### Before departure

Our planning for the field study started already in the spring of 2023. With just a dream of doing a field study I started to look for different projects in several countries, reading travel reports from previous years and looking for a field study partner. Since I started studying at KTH and heard about the possibility to do a field study I have wanted to seize the opportunity. At the end of the summer the planning went into the next phase, and we managed to find a company in Colombia with an interesting project that we could be a part of. We also found a supervisor at KTH and did a project plan. After that we started to prepare us to travel to Colombia by checking for necessary vaccines and other relevant preparation.

### Upon arrival

Directly after arrival on the 19:th of Mars we got access to our apartment and made us feel at home. Later the same day, we went to the office to meet the people working at the company we did the project together with. The first days, we started to get to know the area, got ourselves local SIM-cards to our phones and other shores to make us prepared for the stay. Rather short after we arrived to Colombia there was a holiday which meant that offices and some stores were closed. Even though we wanted to get started for real with the project, this also got us time to feel more settled with the environment, the culture, the neighbourhood and all the routines.

More than two months went by, and my trips reached its end in the end of May. The actual field study was in progress more or less during our whole stay, with a visit to rural areas as late as just a bit more than a week before the flight home.

### Financials

The travel costs to Colombia were quite expensive, to start with. Apart from that, many of the expenses were manageable and some actually really low. We tried to prepare lunch boxes at home to bring to the office, but also wanted to be able to go to a fancy restaurant every now and then. The food in restaurants were generally quite cheap. The food in the supermarket on the other hand was not as cheap as we would have thought. It felt like it was more or less the same as in Sweden.

To ensure safety, we rarely went outside after dawn by foot. Instead, we took cabs but not the yellow ones that you could take on the street. This was a tip we heard from many people, that the yellow ones generally were not as safe as ordering cabs from a mobile app. We almost exclusively used Uber, which lead to some increased costs. Luckily, taking an Uber was even cheaper than in Sweden.

## Accommodation

To find accommodation was a tricky part. It was difficult to find apartments for longer rental that still had furniture, and apartments with furniture were often expensive for longer stays. After looking for tips in several Facebook-groups and from people being in Colombia before, we were able to find a suitable apartment through Airbnb. When asking Colombians, the price was tremendous compared, but as Swedes we found the price manageable and could even haggle over the price a bit. We got tips about good areas to live in from the company we worked with, but with hindsight we should have asked them to double check the exact address. Even though the area we lived in generally was rather safe, the specific road we lived next to was often a road many people we got to know avoided in the evenings. With another address we might had felt a bit safer going home to the apartment late.

We had the misfortune to be in Bogotá during a time when the availability of water was not given due to longer periods of dryer weather. Due to this, the water in our apartment was cut every now and then, and we did not always get a notice on beforehand. We could fill up buckets, but it made our everyday life a bit more difficult.

## Project

Our project addressed the issue of backup energy solutions in rural areas. We investigated in the possibilities to phase out existing diesel-based backup solutions for mobile communication towers in rural Colombia and replace them with hydrogen-based ones. We looked into the system design and what components that needs to be included, as well as what challenges that needs to be overcome in order to make reality of such systems.

The project was introduced by the engineering company ICREA and our project worked as a pre study for them to make these systems a reality in the future. Since our project was hosted by the company, we spent most of our days in Colombia at ICREA's office, learning from the engineers at the company. We also went to a lot of meetings and interviews, learning from experts in the area and talked with authorities and companies in Colombia for a better understanding of the context and the development of hydrogen in the country. When we were done with our project, we presented our findings for ICREA.



## **Country**

As someone that does not speak Spanish very well, I found the language barrier quite difficult. I could get around in the town and order food, but apart from that I had to rely on my thesis companion who speaks Spanish fluently. It would have been difficult to get around solely with English, which I did not thought on beforehand.

I have to say that it was a bit of a culture shock in the beginning. A lot of things, from the food to the meeting culture, was unlike what I have experienced in Sweden. At the same time that it was fun to getting to know the culture, the first couple of weeks were a bit overwhelming. But after some time, we managed to get used to most of the things and truly appreciate it.

Bogotá is generally not a typical destination for most European tourists visiting Colombia, rather a city for switching between international and national travel. Apart from some touristic blocks and points of interest, Bogotá offered a quite genuine experience with all the ups and downs that follows from that. Personally, laying on the beach does not attract me, which made Bogotá a good destination. Due to the high altitude, the weather in Bogotá is generally colder than the rest of Colombia, similar to Swedish summers.

## **Leisure and social activities**

We tried to make the most of every opportunity and tried to socialize as much as possible. Apart from getting to know people at the company we worked with, we went to different language cafés, dance lessons, dinner parties and other activities. We tried to stay active socially which led to us getting to know a lot of people. It was not super easy to get to know people just like that, but since we made an effort and stayed active made it pretty simple eventually. And the language cafés was really helpful! We also tried to make some kind of adventure every weekend. It didn't have to be anything huge, but we went to everything from hikes to concerts, football games and small trips to villages outside of Bogotá. We also tried to work out a lot with a gym in the block next to ours and nice running routes.

## **Sustainability**

It was difficult to travel sustainably during our visit. First of all, the travel to Colombia is only reasonable to do by plane. While being in Bogotá, we could to many of the shorter trips by foot, like to our office every morning and for visiting restaurants and malls. But for visits outside of Bogotá, we were dependent on car or bus.

Apart from that, we managed to live more or less in the same sustainable way as we do in Sweden. The biggest was that we needed to buy bottled water.

## **Other recommendations and observations**

For us, the cultural and linguistic barrier between us and our colleagues at the company we worked together with sometimes made the collaboration difficult. In some way, the Colombian way of working, hosting meetings and putting up the work was unlike the Swedish way we were used to. This created some misunderstandings. My recommendation is to settle a meeting in the early phase, maybe even before going to the country, and talk things like expectations, conditions and requirements. Especially important to not only address the project but also communication, social matters and things like that.



