Cable Cars reduce CO₂ in Medellin, Colombia

Project summary

The carbon offset project “Cable Cars Metro Medellin, Colombia” promotes the construction and operation of six cable car lines and their use as a means of mass transport in hilly areas in the city of Medellin, Colombia. All lines are connected to the local metro system. The cable cars complement and partly substitute the existing public transport in an innovative and environmentally friendly way. The new transport system aims at reducing greenhouse gas emissions produced by the current modes of transport such as buses, taxis, cars and motorbikes as well as at improving the air quality in the city.

Project benefits

The project is helping to reduce CO₂ while contributing to sustainable development in the region:

- The use of the cable cars leads to reduced usage of buses and other fossil-fuel powered means of transport, which results in fewer emissions.
- People living in poor suburban areas are now connected to the city centre.
- The travel time has decreased as the cable cars are not affected by traffic congestions.
- The integrated fare charged for the cable car is more economical and convenient than the separate tickets for the different modes of transport.
- The reduced number of accidents compared with different modes of transport increases security.
- It is expected that the local air quality will improve and thus respiratory diseases will be reduced.
- The project improves local living conditions by creating new facilities such as recreation facilities and green spaces along the lines.
Facts and figures on the carbon offset project

Project location
Colombia, Medellin

Project standard
CDM

Project type
Energy Efficiency

Emission reductions
121,029 t CO₂e (in the first seven years)

Situation without project
Use of old buses, cars or taxis

Project start
2010

The project country

With more than 45 million inhabitants, Colombia is the Latin American country with the third-largest population after Brazil and Mexico. Five cities have more than one million inhabitants. Medellin is the second-largest city in the country with a population of approximately 3.5 million. With regard to the economy, Colombia can look back on almost a decade of strong economic performance. Nevertheless, further economic expansion is impeded by insufficient infrastructures, unemployment and rising inequalities among the population. Even though the poverty situation has improved, there are still striking disparities regarding living standards, income and wealth among different socioeconomic and religious groups. Around 37 per cent of Colombians live below the poverty line and social services are unsatisfactory.

A further issue in Colombia is criminality. Theft, violence and drug trafficking are omnipresent. Robbery and other violent crimes are especially common in urban areas.

Apart from poverty and criminality, Colombia is also confronted with major environmental challenges such as air pollution, especially in large cities. It is mainly caused by emissions from buses and other fossil-fuel

<table>
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<tr>
<th>Indicator</th>
<th>Colombia</th>
<th>Switzerland</th>
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<tbody>
<tr>
<td>Total area (in km²)</td>
<td>1,138,748</td>
<td>41,285</td>
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<tr>
<td>Population</td>
<td>46,927,100 (2011)</td>
<td>7,952,600 (2011)</td>
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<tr>
<td>GDP in USD per capita (2010)</td>
<td>6,225</td>
<td>76,019</td>
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<tr>
<td>Share of population living below the national poverty lines (2010)</td>
<td>37.2 percent</td>
<td>6.9 percent</td>
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<td>Energy use per capita (kg of oil, 2009)</td>
<td>697</td>
<td>3,362</td>
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<td>CO₂ emissions per capita (in 2008)</td>
<td>1.5 t</td>
<td>5.3 t</td>
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Min. working time to buy 1 kg of rice in min. | Bogotá | Zurich |
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<tbody>
<tr>
<td>Min. working time to buy 1 kg of bread in min.</td>
<td>21</td>
<td>9</td>
</tr>
<tr>
<td>Min. working time to buy 1 kg of rice in min.</td>
<td>36</td>
<td>12</td>
</tr>
</tbody>
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Colombia vs. Switzerland (Source: World Development Indicators, web.worldbank.org; CIA World Factbook, web.cia.gov; Swiss Federal Statistical Office [2010])
powered means of transport. As in every country, the impact on the environment increases where economic expansion occurs. For example, coal production and consumption have risen rapidly over recent years. Carbon offset projects thus alleviate the problem.

The project city

The aforementioned issues also apply to the city of Medellin. As far as poverty is concerned, the poor areas are located in the hilly suburbs, where the cable car lines have now been constructed. People living in these places now have much easier and faster access to the city centre. Furthermore, criminality is a well-known problem in Medellin as well. However, a drastic drop in criminality was noticed due to the social impact plan that was realised for each cable car line, resulting in improved living standards for inhabitants. Beatriz Ortiz, a cleaning lady, affirmed: “I now feel much safer than before the construction of the Metrocable.” Finally, air pollution is a further important issue in the second-largest city of Colombia. However, it has been alleviated thanks to the clean cable car lines.

Implementation

Before the project started, the initiative faced huge barriers: the cable cars in Medellin were the first of their kind all in the world and hence it was a risk to invest in a project of such a size. Furthermore, construction took much longer than expected, which made the project less attractive for investors. Additionally, cost overruns occurred during the implementation. However, the problem was alleviated in part thanks to carbon financing, and construction finally started in 2003. In 2004, the first line went into operation. Since
April 2012, three out of the planned six lines have been in operation. The remaining lines are scheduled for 2014. All cable car services are operated by “Empresa de Transporte Masivo del Valle de Aburrá Ltda” (ETMVA). Grütter Consulting, a specialist for transport projects under the Clean Development Mechanism (CDM), and the National Cleaner Production Centre – Centro Nacional de Producción mas Limpia (CNPML) – took the initiative in developing a specific CDM methodology for cable cars and brought about CDM registration for the project under the United Nations Framework Convention on Climate Change (UNFCCC). myclimate performed a due diligence review for the project and contributes to activities by purchasing and marketing all carbon credits generated by the project. The carbon offset project was validated by TÜV Süd and registered under the UN Clean Development Mechanism (CDM) in April 2010. In 2012, the first Certified Emission Reductions (CERs) shall be issued after the first Monitoring Report is verified by the external Colombian auditor ICONTEC.

The Cable Car Lines

To a certain extent, the cable cars provide a substitute for the conventional means of transports, basically small and medium-sized buses, cars and taxis. The cable cars have lower emissions per passenger-kilometre than the conventional, fossil-fuel powered means of transport, thus reducing greenhouse gas emissions. They also brought along changes such as the integrated ticket. Passengers can now use one ticket for the entire duration of their journey in one direction, even if they have to change the mode of transport (e.g. from the cable car to the metro). Each cable car line consists of 90-120 mono-cabins with a seating capacity of eight persons and a maximum capacity of ten persons. Even before the construction of the cable cars, EMTVA operated a metro train system with the two lines A and B, which crossed the city centre. The six cable car lines complement the existing metro and connect the poorer areas in the hilly region around Medellin with the city centre. Due to this uneven topography, the vertical rise of the lines amounts to approximately 300-400 metres. The cable car lines J, K and L have been finalized between 2.1 and 4.5 kilometres. Per hour, 3,000 passengers can be transported in each direction and on each line.

Indeed, the Medellinians make use of and appreciate their new means of transport. A cabin attendant, Julian David Correa, mentioned: “I go to work by cable car myself. In the past, I had to change the mode of transport and therefore pay several times. Now, it is cheaper and saves me time that I can spend with my family.”
Accompanying measures

Apart from the cable cars themselves, allowing fast, affordable and safe transport, the public also benefits from the project because of additional elements that have been implemented. These include the construction of the public library upon a hill (accessible by cable car) as well as the installation of two computer rooms in cable car stations, allowing people to learn how to deal with new technologies. A monitoring person from the computer room said: “Our IT offer in the cable car station Vallejuela benefits the district in many aspects: housewives no longer fear computers and kids learn to take care of objects.” Furthermore, sporting facilities were built along the cable car lines. Generally speaking, to a large extent, the project benefits the less fortunate, namely the poor population in the suburbs. Juan Alvaro Gonzalez from the planning department mentioned that many inhabitants of the city were surprised about the government’s investment in their district. As a result, the people’s trust in the public sector was reinforced.

Monitoring Methodology

The Clean Development Mechanism (CDM) baseline and monitoring methodology of the United Nations Framework Convention on Climate Change (UNFCCC) defines how the monitoring has to be performed. The Planning Department of ETMVA is in charge of managing all data in relation to the CDM project, including responsibility for data collection, quality assurance, reports and data storage. Some data is collected on the spot with the help of measuring equipment. To measure the electricity consumption of the cable cars, the Operations Supervisor generates a Daily Operations Report, which contains the electricity consumption for the whole system and for every station. To determine the passenger numbers, an electronic ticketing system with turnstiles has been implemented.

In addition, representative surveys and studies are conducted by a team from CNPML, delivering further monitoring figures that help to calculate the annually achieved greenhouse gas emission reductions. Thanks to these surveys and studies, data like average trip distances, the share of modes of transport used and occupation rates can be statistically investigated for the project and the baseline situation.

In general, all myclimate carbon offset projects are registered under the Gold Standard. In this sense, this project is an exception since it is only registered under UN CDM. This is because the Gold Standard does not have any methodology for such transport projects. However, as explained above, this exceptional CDM project also contributes to sustainable development in the host country.
## Testimonials of people working on the project

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<tr>
<th>Name</th>
<th>Position</th>
<th>Quote</th>
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<tbody>
<tr>
<td>Miguel Alfonso Melo Ruales</td>
<td>Planning Director, Metrocable</td>
<td>&quot;The Metrocable links sustainable urban development with social integration by providing the disadvantaged population with clean, fast and secure access to work, services and public life.”</td>
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<td>Juan Sebastián Estrada</td>
<td>Department for Carbon Offset Projects, Centro Nacional de Producción Más Limpia</td>
<td>&quot;The Metrocable not only overcomes geographic, but also social boundaries: new public rooms for social interaction unite districts that used to be separate.&quot;</td>
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<tr>
<td>Julián David Correa</td>
<td>Cabin Attendant, Metrocable</td>
<td>&quot;The people in the districts identify with the Metrocable. They want to keep the cabins and the stations clean.”</td>
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<tr>
<td>Harol Juliao</td>
<td>Monitor in the public computer room, Foundation Conconcreto</td>
<td>&quot;Young and old people from the district just love their computer room. Every day, between 130 and 170 people visit us. They discover new possibilities on the Internet and learn how to deal with new technologies.”</td>
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