# 1. Carbon Credit

A carbon credit is a tradable permit or certificate that provides the holder of the credit the right to emit one ton of carbon dioxide or an equivalent of another greenhouse gas. The main goal for the creation of carbon credits is the reduction of emissions of carbon dioxide and other greenhouse gases from industrial activities to reduce the effects of global warming.

# 2. Type of Carbon Credits

- **Voluntary emissions reduction (VER):** A carbon offset that is exchanged in the over-the-counter or voluntary market for credits.
- **Certified emissions reduction (CER):** Emission units (or Carbon credits) created through a regulatory framework with the purpose of offsetting a project's emission. The main difference between the two is that there is a third-party certifying body that regulates the CER as opposed to the VER.

Though both of these can be traded only the certified emissions reductions (CERs) are the only product that can be used as investments in carbon credits.
Our project is going to come under UNFCCC AMS-III.C Clause

# 3. Scope of the project

This methodology applies to project activities introducing new electric and/or hybrid vehicles that displace the use of fossil fuel vehicles in passenger and freight transportation. (As per UNFCCC AMS-III.C Clause)

## 4. Applicability of the project

The important parameters that need to be assessed for qualifying to claim carbon credits are (Though there are other parameters Micelio Fleet is compliant for them and below 3 points are where contradictions arise)

1. In cases where the project vehicles use a replaceable, chargeable battery there must be documented measures in place to ensure those vehicle owners have access to replacement batteries of comparable quality.
For this, we have to provide necessary evidence that we have access to extra replaceable batteries of the same quality.

2. The project proponent shall demonstrate that double counting of emission reductions will not occur e.g. via a contractual agreement with the end-user(s), maintenance of a comprehensive inventory of project vehicles or unique identification of the vehicles owned by end-user(s). The steps undertaken to avoid double counting shall be documented in the PDD.
In our case, Micelio has ownership of the vehicles. As per the above policy the clients cannot claim for carbon credits. Micelio can claim carbon credits and can guarantee end users that benefits from carbon credits can be provided to them. Before this, a check has to be made from the manufacturer end. Though the manufacturers cannot claim for carbon credits of E-Vehicles there are chances that claims might have been done. In this case, Micelio cannot claim carbon credits. For this, verification has to done from suppliers that they haven't claimed any carbon credits.

3. Project participants shall demonstrate that the project and baseline vehicles are comparable, using the following means: (a) Project and baseline vehicles belong to the same vehicle category, e.g. motorcycle, bus, taxi, truck, tricycle; (b) Project and baseline vehicle categories have comparable passenger/load capacity and power rating with a

variation of no more than 20 percent (comparing the baseline vehicle with the respective project vehicle of the same category).

This is the important part. The vehicles under Micelio should have a similar capacity and power output should not vary by more than 20% of a comparable vehicle of the same category.

For this, there are two cases. Either the company should show that they previously used an IC Vehicle and are now replacing with EV. If not, a market survey has to be done and baseline vehicle should be found, sufficient evidence should be provided for that.

## 2-Wheeler Example

| Baseline Two-Wheeler Power | Similar E- 2-Wheeler Required Power |
|---|---|
| Scooty Pep + (3.7KW) | 2.96 KW |
| Suzuki Access (6.42 KW) | 5.14 KW |
| Honda Activa (6.35 KW) | 5.08 KW |

## 3-Wheeler Example

| Baseline Three-Wheeler Power | Similar E- 3-Wheeler Required Power |
|---|---|
| Bajaj Maxima (6.99 KW) | 5.59 KW |
| Piaggio Ape (5.99 KW) | 4.79 KW |
| Mahindra Alfa (6.52 KW) | 5.22 KW |

## 5. Eligibility for CER and VER Markets

- To be eligible to Compliance Emission Rights the project should be registered within 6 months from the date of commission. However Voluntary Emission Rights has a time scale of 2 years.
- The difference between the two is that Compliance markets are created and regulated by mandatory international, regional, and sub-national carbon reduction schemes such as the Clean Development Mechanism regulated by the Kyoto Protocol, the European Union's Emissions Trading Scheme (EU-ETS), and the California Carbon Market.
- Voluntary offset markets function outside of the compliance markets and enable companies and individuals to purchase carbon offsets on a voluntary basis. For example, individuals who seek to offset their $CO_2$ emissions and companies who would like to become climate neutral can buy an equivalent in terms of carbon credits to "neutralize" their carbon footprint.
- Since Micelio is yet to procure 3 Wheelers, it would be feasible to register all the vehicles (including 2 and 3 wheelers) at once as two separate projects would lead to higher costs. Considering the time frame Micelio can register under VER.

## 6. Necessary Capital for Project Commission and Revenue from Carbon Credits

### 6.1 Initial Set-Up Cost

The project can be registered with UNFCCC, by appointing a consultant like KPMG, EVI, General Carbon, Environment first for registration of the project. After verification of the project from Doe (URS, SGS) the project can start earning carbon credits. The initial set-up for this can be a minimum Rs. 7,00,000/-. Moreover, there is a fixed fee for trading and UNFCCC registration fee. For example, UNFCCC charges USD 0.10 per carbon credit for project registration and ICE CER Futures has a charge of 0.01 Euro/ Rs. 0.78/- per unit

traded. Moreover, there is a carbon credit tax of 10% on the overall income from carbon credits.

## 6.2 Income from Carbon Credits

The carbon offset by replacing IC vehicle with EC is 11.63gm/km for 2-wheeler and 18.93gm/km for 3-wheeler

*Though emissions per km are higher than above values in IC vehicles the offset value is lower because the power used for charging batteries is through conventional sources and not renewable energy sources. The amount of carbon gases emitted in the production of electricity is also accounted while calculating carbon credits.

| Vehicle Type | Carbon Emissions IC (gm/km) | Carbon Emissions EV (gm/km) | Offset in Emissions (gm/km) |
|---|---|---|---|
| Two-Wheeler | 45.89 | 34.26 | 11.63 |
| Three-Wheeler | 76.49 | 57.56 | 18.93 |

Now the following scenario is possible with our fleet

| Total Vehicles (Two Wheelers) | Distance Travelled Per Year (Estimate) | Total Emission Offset | Value of One Credit (ICE CER Futures Mar '19) | Total Value Per Year |
|---|---|---|---|---|
| 15 | 2,00,000 KM | 2.32 Credits | 0.23Euro/Rs. 17.99 | Rs. 41.84 |

ICE CER Credit Price: https://www.barchart.com/futures/quotes/CQH19

With these numbers, it is clear that the small fleet size is not profitable. However, the project can be feasible with an increase in fleet size. Moreover, recharging batteries with renewable energy source is also qualified under UNFCCC for earning carbon credits.

If we increase the fleet to say, 1000 Vehicles with 500 Two-Wheelers and 500 Three-Wheelers then the value of Carbon Credits will be

| Vehicles | Distance Travelled Per Year (Estimate) | Total Emission Offset | Value of One Credit (ICE CER Futures Mar '19) | Total Value Per Year |
|---|---|---|---|---|
| Two-Wheelers (500) | 75,00,000 KM | 87.225 Credits | 0.23 Euro/Rs. 17.99 | Rs. 1569.18 |
| Three-Wheelers (500) | 75,00,000 KM | 141.975 Credits | 0.23 Euro/Rs 17.99 | Rs. 2554.13 |

Total: Rs. 4123.30

*This is not the final profit. This is an estimate of only the possible revenue and final profit depends on the project commission cost, stock market brokerage charges and tax deductions.

## 7. Conclusion

- Considering the initial project costs and current market value of carbon credits, the project is not feasible even for a fleet size of 1000 vehicles.
- The most crucial factor is the power rating of the vehicle. Only if we can procure an E-Vehicle which gives 80% output power of comparable IC vehicle the project can be commissioned.

- Carbon credits can be earned through the utilization of a renewable energy source. For this, the batteries must be charged with a dedicated supply line from a renewable source of energy.