CONVERTING A TUK TUK MOTORCYCLE INTO A SOLAR CHARGING ONE IN GUATEMALA

In 2021, an innovative process promoted by the G-22 Environmental Association began in Guatemala to convert an internal combustion Tuk Tuk vehicle into an electric one with photovoltaic solar charging capacity. To carry out the design and development project work of a first solar Tuk Tuk prototype, the Association has launched a national call and created a multidisciplinary team in alliance with an important group of participants.

With this project in Guatemala, a group made by more than 200 people has demonstrated the results of teamwork when it is put at the service of innovation and creativity, solving problems that affect us globally at the local level. This is the case of the solar tuk-tuk, a motorcycle cab that has been converted into an electric vehicle with solar photovoltaic charging capacity: a social innovation that aims to solve socio-economic and environmental challenges.

This process has been supported by UNDP through the Accelerator Lab in Guatemala, which, aiming towards social innovation, has identified this project as a potential grassroot, innovative and impactful solution and has decided to work with this team in order to accelerate their approach of sustainable development.

The project is framed in a climate change mitigation strategy for especially vulnerable municipalities in the country, where the use of motorcycle taxis or tuk tuks is quite frequent. Hundreds of thousands tuk-tuk vehicles (rickshaw style taxis) have been imported to Guatemala and Central America from Asia, India, and Italy. They arrived to serve the purpose of small-scale transportation, even if, they have also generated problems associated to their use which the project decided to study offering a viable solution to look forward for tomorrow. Tuk tuks, in fact, had a very short life, their maintenance was very expensive and they generated a significant flow of greenhouse gases.

The objective of the project shared by all participants has been to generate a first prototype of a vehicle that, through solar energy, could be moved generating more economic and environmental profitability for the owners, users and the communities where they circulate. Associated with this, the objective was also to reduce noise pollution and greenhouse gas emissions that thousands of these vehicles currently produce nationwide

The team, composed by the G22 Association and directed by Guatemalan mobility expert Alfredo Maul, was formed by 50 actors: students, trainers, entrepreneurs, anthropologists, designers and videographers, among others, from universities and private companies in Guatemala, with whom they worked, based on participatory co-creation workshops, both virtual and in person.

The NTERCAP vocational training institution of Chiquimula joined the team implementing the first design and development prototype of the solar tuk tuk with three training courses. A team of nine supervised trainees students and their coordinators participated. These students in many cases came from villages and they were the ones who designed and worked on the project.

After 2 months of intense work in Chiquimula, the team managed to put the solar tuk tuk into operation, implementing a strategy that proposes new solutions for mobility and connectivity through renewable energies that seeks to be sustained over time.

This prototype integrates 3 technologies: electric, automotive and renewable. It involves the use of reverse engineering that can be adapted in order to use components available in the local market. Its added value at a global level is to be one of the few electric vehicles that increase its autonomy by means of photovoltaic solar energy. The motorcycle cab drivers that are part of the project have identified it as a viable solution that allows them to be more efficient, increase their income, and support their families. A simple idea that started very small has now grown and promises to have the capacity to be sustained and replicated over time. In addition to providing benefits for owners, users and communities, it also provides opportunities for reducing noise pollution and greenhouse gas emissions, among others.

In light of the above, the G-22 Environmental Association continues to research and advance in the development of more prototypes of solar-electric motorcycle cabs. They are currently working on five new models that will be used for new functionalities. In particular, in 2023 the Association has developed five more new prototypes of electric-solar motorcycle taxis that will be used for different uses of accumulated energy. One of them will be used in the agricultural sector (solar pumping), another will function as a controlled speed ambulance, the third will allow more than fifty cell phones to be charged at the same time in public spaces, the fourth will work as a printing centre outside of schools and universities, and the fifth as a vehicle to manage solid waste in urban areas. The five prototypes will be developed in the municipality of Esquipulas, Chiquimula.

The documents presenting the project emphasize that the solar tuk-tuk not only represents an innovation in terms of mobility and renewable energies, it also brings lessons for the team and for the community that agrees on the following aspects:

- It is the result of a united teamwork that generates great transformations: this process is a clear example of collective and multidisciplinary work focused on transformations from and at the local level. It is the result of collective intelligence that contributes to issues such as energy, mobility and air quality.

- It constitutes a local solution to global problems: it is part of the initiatives that are emerging from the territories in order to find solutions to problems we face worldwide. Based on technologies and methodologies proven to be effective in other places, it is "tropicalized" to respond to local realities, based on creativity.
- It is an example of grassroots social innovation: this concept means that the people who are closest to reality and who experience problems first-hand are the ones who have the greatest capacity to solve them, making them sustainable over time. The Accelerator Lab and initiatives such as the solar tuk-tuk manages to integrate people who become a social innovation ecosystem, with a combination of ingenuity, creativity and resilience, applying their knowledge to accelerate the path towards the fulfilment of the Sustainable Development Goals.

This project is yielding positive results both nationally and internationally. To date it has been selected and awarded in different contexts, including being the winner in the Sustainable Mobility category of the Green Awards 2023. In particular, the Tuk-tuk has received the following acknowledgements:

- Award for Best Audiovisual Content for the Documentary “Tuk Tuk Solar. AGEXPORT Guatemala Orange Economy Commission. November 2022
- Finalist in the prototype category of the “Technological Innovation Award” in Central America (PIT 2022) organized by the Technology University of Honduras UNITEC, together with Banco Ficohsa. December 2022
- Winner in the Sustainable Mobility category of the Latinoamerica Green Awards 2023. Also recognized in the Scalability category to continue investing in the development of the project.
- One of the 12 finalists for the Fundación MAPFRE Social Innovation Awards, which will take place in Madrid.

Currently the project is part of the support of the Pomona Impact Foundation's renewable energy program to help the team establish a viable business model to scale the initiative. It is also part of the Bridge for Billions and Banco Industrial program in supporting the team on the roadmap to scale the venture.

To know more

Asociacion g-22.org sitio web

Articulo en Prensa Libre.com

Documento en sdglocalaction.org

Articulo en soy502.com

Article in fortomorrow.org

Articulo en sdglocalaction.org

the UNDP Accelerator Labs

Tuk Tuk en Premios Verdes2023