

## Israel – Ruta N Smart Cities Call For Proposals

### EXPRESSION OF INTEREST

#### 1. Project Participant

Company name: **Empresas Públicas de Medellín**

Website: [www.epm.com.co](http://www.epm.com.co)

Year established: 1955

Type of company:  R&D  Research institute  University  Other

Stage:  Seed  R&D  Initial revenues  Revenue growth

Ownership:  Public  Private  Governmental  Other

Number of employees: 6500

Number of R&D personnel: 17

Company contact information:

Address: Carrera 58 #42-125, Medellin, Colombia

Contact person:

Name: Juan Pablo Ortega Ipuz

Title: Innovation and Development Professional

Phone: +57(4) 3804474

Mobile: +(57)3006163461

Email: [juan.ortega@epm.com.co](mailto:juan.ortega@epm.com.co)

Company name: **Tronex S.A.S**

Website: [www.tronex.com](http://www.tronex.com)

Year established: 2000

Type of company:  R&D  Research institute  University  Other

Stage:  Seed  R&D  Initial revenues  Revenue growth

Ownership:  Public  Private  Governmental  Other

Number of employees: 700

Number of R&D personnel:

Company contact information:

Address: Carrera 67 # 1 sur 92 , Medellin, Colombia

Contact person:

Name: Jaime Andres Moreno

Title: Manager Tronex Industrial

Phone: +57(4) 4488090

Mobile: +(57)3006147332

Email: [jaimemoreno@tronex.com](mailto:jaimemoreno@tronex.com)

Company name: **INMOTION GROUP S.A.S**

Website: [www.igmovilidad.co](http://www.igmovilidad.co)

Year established: 2014

Type of company:  R&D  Research institute  University  Other

Stage:  Seed  R&D  Initial revenues  Revenue growth

Ownership:  Public  Private  Governmental  Other

Number of employees: 10  
Number of R&D personnel: 6  
Company contact information:  
Address: Carrera 49 # 7 sur - 50 BI 19 Floor 5 , Medellin, Colombia

Contact person:  
Name: Santiago Pérez Cardona  
Title: CEO / CTO - Co-founder  
Phone: +57(4) 2619500 ext 8752  
Mobile: +(57) 3004362490  
Email: [santiago@igmovilidad.co](mailto:santiago@igmovilidad.co)

## 2. Organization Background

### General Business Description & Area of Expertise

**Empresas Públicas de Medellín E.S.P.**, whose brand is EPM, is a public company located in the city of Medellín, Colombia, owned by the Municipality of Medellín. It was founded in 1955 as an independent public institution, and transformed into Industrial and Commercial State Company of the municipal order in 1997 by the City Council of Medellín.

It operates in the water and sewerage, electricity and gas sectors. It is legally empowered to also act in the telecommunications and solid waste management sectors. Its natural market is the city of Medellín, with 2,600,000 inhabitants, a city that is part of the Metropolitan Area of Aburrá Valley, a conglomerate of nine other suburban municipalities with a million additional inhabitants. The Department of Antioquia is formed, in addition to its capital Medellín and its metropolitan area, by 115 other towns and rural areas, with another 2 million inhabitants.

EPM is the parent company of a business group formed, besides itself, of another 44 companies, all joint stock companies in which it has majority stake and management control through presence on their respective boards of directors. According to Colombian law, a corporate group is a conglomerate with subordinate relationship by reason of ownership of the entities that comprise it, and with unity of purpose and direction.

**Tronex**, is a Company specialized in the manufacture, marketing and distribution of superior quality products for different markets of mass consumption, household, industrial and government. We offer the broadest portfolio of products and services in Colombia in portability and energy support. Tronex is in different economic sectors serving different clients and continue to venture strongly into the development of alternative energies.

Is the only independent cell-battery factory in Latin America, founded in the national territory after the Second World War and the only Battery Laboratory in the country certified under ISO 17025, which serves customers worldwide. For Tronex, innovation is a pillar, becoming a key element in corporate strategy, so continually explore new opportunities and technologies to offer personalized and specialized products and services that contribute to the improvement and sustainability of business. Additionally, Tronex seeks

alliances with leading suppliers in the world to exclusively represent their brands and strengthen our commercial relationships with our public and strategic partners.

Tronex manages different distribution channels at national and international level, for the commercialization of our portfolio of own brands and products of brands represented. It ventured into virtual commerce through our ConecTAT and TiendaTronex.com platforms.

The programs of corporate social responsibility are a key part of our company, that's why Tronex seek to generate impact in the community through initiatives such as RECOPILA, which aims to forge an awareness in the citizens that motivates them to protect the environment through this initiative of after consumption of cells and batteries; Tronex is also part of the LÚMINA program, a public policy for waste management of light bulbs and electrical & electronic equipment. Tronex supports the Mahavir K-mina (Artificial Limb Center) foundation, an initiative that manufactures and delivers free leg prostheses for children and adults.

At Tronex build core values: the value of loyalty to the company, mutual respect and commitment to the colleagues, the company and society. The core is the organizational culture with which it build unique and special relationships with the clients.

**INMOTION GROUP** is a mobility think lab, that aims to transform the transportation of citizens, companies, and cities with hi-tech solutions. At the very heart of our mission, we are a company builder. This means we envision, create concepts and prototype them, and then find a matching partner with whom we scale the resulting products to market.

We have created scooters, race motorcycles, cargo bikes, batteries, electric motors, bike sharing ecosystems and several other transportation solutions. Our company was born 7 years ago, founded by four researchers working in diverse scientific fields.

During the first 4 years we focused our work in R&D. In the last 3 years we've consolidated our team, strategy, value chain, done market trials and deployed successfully our solutions. We've also been granted 3 industrial designs, we have 2 patents pending, and we've earned over 10 awards and recognitions within the entrepreneurial ecosystem and have already closed a seed funding from a strategic Canadian investor.

As part of our trajectory, we are currently solidifying 4 strategic business units in partnership with some of the leading Colombian organizations in renewable energy, IoT and research; these cover the whole spectrum of mobility, each focusing on different approaches:

One for corporate bike sharing systems, another one focused on corporate mobility optimization with data science & analytics, a hardware and software incubator, and a final one devoted to the deployment of a citywide network of bike, motorcycle and car charging stations.

## **Technology Description (Main Products/Services) and IP**

### **EPM**

The services that we provide to our users are: electricity, gas distribution water and sewerage systems. EPM has also been prominent in these four public utility areas and is now progressing on a series of projects that will consolidate its leading position.

### **Water**

EPM supports the well-being of the inhabitants of Medellín and its metropolitan area through the comprehensive management of the water cycle: the supply of excellent water quality and the collection and treatment of wastewater.

EPM provides these services with certified quality throughout all phases of the process. EPM services ten municipalities in the Aburrá Valley: Medellín, Bello, Envigado, Itagüí, La Estrella, Sabaneta, Copacabana, Girardota, Caldas and Barbosa, servicing a total of 974,781 clients.

### **Energy**

EPM holds a significant position in Colombia's electricity sector, with a 21.11% share of the demand serviced across the country. For more than five decades, it has constructed the backbone of Colombia's hydroelectric system. After many years of experience in developing this type of project, it is progressing in the search for other sources of energy as a way of contributing to the environmental sustainability of the planet. In turn, this opens up other opportunities for the company's national and international growth.

### **Natural Gas**

EPM has provided piped natural gas since 1996, the year in which its pilot phase began. In 1998, this gave rise to its natural gas service mass distribution program, through a domestic network of pipelines that services residential, commercial and industrial sectors in the Aburrá Valley. Today, it has fully expanded across ten municipalities in the Aburrá Valley, including Medellín, and in other locations in Antioquia, offering a secure, economic and environmentally friendly energy alternative.

### **Tronex S.A.S**

#### **Massive Consumer Products**

Sale and distribution of specialty solutions through high quality products with our own brands, exclusive brands for some of our clients and brands represented. Characterized by quality service.

### **Tronex Logistics Solutions**

High quality solutions for logistics processes that require capture, registration and availability of "in the field" information. We offer industrial batteries and traction loaders for forklifts, trains, lifts and other electric vehicles.

### **Tronex Industrial**

We offer one of the most complete portfolios in Latin America, reliable, efficient and durable energy storage, which includes solutions aimed to satisfying the specific needs of different market segments

### **Targeted Customers**

In 2017:

#### **EPM**

Water – 1´186.434 customers

Energy - 2´368.457 customers

Natural Gas – 1´132.329 customers

### **Sales (over the last 3 years)- if applicable**

#### **EPM**

2017: USD2,47 billions

2016 USD2,83 billions

2015 USD2,28 billions

### **3. General Information**

Project Title: Two wheels vehicles energy storage system

Technology Sector:

**Electric Mobility, Autonomous Mobility, Smart Mobility, €  
Vehicle Technology.**

Digital city €

Information city €

Cognitive Smart City €

**Energy, street lighting, smart buildings, distributed energy €  
resources (DER), data analytics, and smart transportation.**

Environment €

Public safety €

Submission Date: 31/01/2019

Summary:

The project will provide and evaluate energy storage alternatives for two wheels vehicles such as motorcycles and bicycles, through the standardization of battery systems, seeking to reduce the costs of battery supply, improving security levels and configure economically and technically feasible solutions and businesses through the development of technologies to assemble, control, monitor and discard the batteries, closing the cycle through an organized circular economy model.



Project Start Date: 01/10/2019

Project End Date: 01/10/2020

#### **4. Budget:**

Total Project Budget: USD500.000

Requested IIA grant (% of budget): 50%

EPM, Tronex and Inmotion Group except to find partner(s) in Israel that support the project with:

- Mapping of the state of the art of the technology and its subsystems .1
- Market strategy and alternatives of implementation .2
- Electronics and software development .3
- Equipments design and installation of a group of stations as a pilot project .4

EPM, Tronex and Inmotion Group will provide in kind financing for the project with all its capabilities in local market understanding, electric mobility, batteries, electronics, customer support, etc.

Requested Medellin Partner Support: Support with local, state and national level organizations in charge of mobility, air quality and other topics related with the project scope

## **5. Project Outline:**

### **Project Description**

The technology of electric mobility of two wheels today finds in the storage of energy its great restriction, due to the cost of the batteries, its autonomy and its lack of standardization, which hinders its access to the market.

The initiative seeks to provide and evaluate possible energy storage alternatives for this segment, where it is possible to promote the adoption of electric mobility of two wheels through the standardization of battery systems, thus seeking to reduce the costs of battery supply to improve security levels and configure economically and technically feasible solutions and businesses through the development of technologies to assemble, control, monitor and discard the product, closing the cycle through an organized circular economy.

Three Colombian companies then seek to develop a custom-made solution to be carried out in the city of Medellín initially and then replicated in other cities, where the user of two-wheeled vehicles will find more rapid and accessible energy availability through a most economic, competitive and secure solution for your mobility.

Unlike a swapping program, the project seeks to be the owner of the packs (batteries), thus seeking to form an economy for those users, where the user buys the product without batteries and will find in these points the sale of energy, that is to say that the user pays to consume that energy with a monthly fee for electric mobility that would be charged to the public services associated with his residence address.

### **Market Potential and Commercialization Plan**

The automotive fleet in Colombia is estimated at 12.3 million vehicles, of which 43% (5,332 million) corresponds to vehicles and 57% (6,970 million) corresponds to motorcycles, motorcycles, ATVs and motorcycles.

If you consider that the replacement of a traditional battery should be done on average every three years, you can think of a potential annual market of 1.77 million batteries for cars and 2.32 million batteries for 2-wheel vehicles. If you consider an average

market price of COP 300,000 for traditional car batteries and COP 100,000 for traditional motorcycle batteries, the total annual volume of the market amounts to COP 763,000 million, COP 232,000 million for two wheels

On average motorcycle batteries are 3000 watts, the charging time from 0% to 100% is 10 hours. For bicycles the batteries are 350 watts, the charging time from 0% to 100% is 4.5 hours.

The average user travels in the city 20 km a day. With one recharge of the battery per day, it is enough to cover 20 Kms on average. The cost of energy to recharge is around \$ 300 (0.1 USD) x recharge, meaning that assuming that this user travels daily that kilometers would have a monthly cost for energy consumption of \$ 9,000 (3 USD) on bicycles.

If we consider that the value of a lithium pack costs 300 USD and that at 2 years the user must replace it, we would then have the value of the cost of use of that battery would be =  $300 \text{ usd} / 2 \text{ years} = 150 \text{ usd} \times \text{year} + (0.1 \times 365 \text{ days a year}) + 40\% \text{ profit margin} = 311 \text{ USD} / \text{year}$ , meaning that the business receives 311 USD per user per year linked to the system.

The marketing plan consists of charging the user \$ 80,000 (26 USD) per month for energy consumption for electric mobility, these charges will be made through the utility bill that each user has associated with their home address, in this way the user at each recharging point could replace his battery as many times as he needs paying for the consumption and not for the battery supply.

Each year batteries that require replacement are replaced in the totems, providing the optimum level of service for the user of electric mobility and making the appropriate disposition of the circular economy of the model.

### **Expected Outcome of Project**

EPM: -Create greater demand for energy -Generate new income from participation in a new business

TRONEX: - Expand the business: Assembly, manufacturing, hazardous waste management, recycling and final disposal

INMOTION - R&D in IoT, data science, Machine learning, Artificial Intelligence and Deep Learning, though applied market solutions deployed city-wide that harvest and optimize mobility for all its inhabitants.

USERS - Cheaper, competitive and secure solution for their mobility - Quicker and more accessible energy availability

CITIES - Accelerate the transition of emerging cities towards accessible sustainable mobility models and help diminish impact of the continuously increasing air quality, life-threatening conditions and transportation scenarios.

### **Short Profile of the Key Staff who will be Undertaking the Work**

Cesar Antonio Monsalve Rico, Innovation Professional

Jorge Ignacio Velez Perez, Innovation Professional

Juan Pablo Ortega Ipuz, Innovation Professional



Santiago Pérez Cardona, CEO - CTO INMOTION GROUP

Jaime Andres Moreno Betancur, Manager Tronex Industrial

Natalia Alvarez Uribe, Innovation Professional Tronex S.A.S

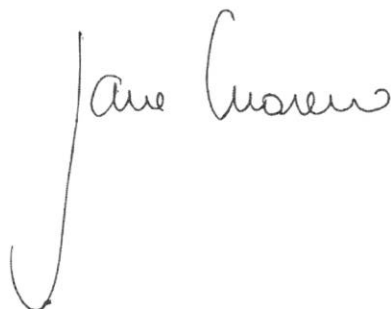
Presented by:



Santiago Acosta Maya

Innovation Manager

EPM



Jaime Andres Moreno Betancur

Manager Tronex Industrial

Tronex



Santiago Pérez Cardona

CEO - CTO

INMOTION GROUP