



Greenfluidics

Intelligent Solar Biopanel Outlook

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Index

About us	3
The Main Team	4
Organizational structure	5
Awards and mentions.....	5
International forums	6
Accelerators	6
Our Technology	7
Intelligent Solar Biopanel.....	7
Technology status	8
Towards smart cities acceleration	9
Reducing gaps for the fulfillment of the SDGs.....	9
Intellectual Property.....	10
Technology Value proposition	10
Business model	10
Market	10
Other potential markets	11
Financial status	12

About us

Greenfluidics™ S.A.S. de C.V. is a Mexican Biotechnology company founded in 2018 by visionary scientists in order to impact millions of people on Earth and trace the sustainability of space, all through technological innovations that promote the regeneration and environmental health of the sustainable cities, positioning itself as one of the Mexican biotechnology startups with the highest growth expectations due to its impact on technological innovation worldwide in recent years.

In this way, due to its technological development, Greenfluidics has positioned itself as one of the promises of business in Mexico by Forbes magazine in 2020, as well as has obtained +10 international recognitions, among which the global challenge LEAD2030 stands out recently by Deloitte for SDG 13, also the Nobel analogue in sustainability, the Flourish Prize in SDG 7 worldwide, as well as the best Latin American inventor of the year by MIT TechReview, and in 2019 as one of the 100 global solutions with great potential in CO2 mitigation by members of the G20 in Canada, being the only Mexican technology on this list.

Based country: Mexico

Beginnings as a project: July – 2017

Incorporation as a company: September – 2018

Webpage: <https://greenfluidics.com/>

Identity

To create, promote and bring sustainable technologies closer to cities in order to achieve a better quality of life on Earth. We transform the culture of energy, to achieve a balance between society and the environment.

Prospective

To be the leading company in the design and development of sustainable biotechnology products for green cities, through technological innovation and social responsibility in order to impact the lives of millions of people.

To our partners

Through our continuous transformation, we are developing capabilities to win in a world characterized by fast and constantly changes. This journey aims to strengthen our organization by developing new ways of working, struggling to be efficient by implementing the best capabilities by leveraging sustainable technology and ensuring the sustainable growth of our business.

We have created a solid foundation for a transnational technology company with great potential in developing biotechnology technologies that impact the energy transition and will be the future of sustainability in cities. Ensuring that our team works as a single unit to generate sustainable value for our investors, maintaining our flexibility to evolve with them.

The Main Team



Richard Unwin – Non-Executive Chairman

Highly experienced British businessman who has developed several very successful companies, including PV manufacturing, semiconductors recycling, and composites industry. In addition, he is consultant and advisor in several significant organizations, including the Swiss Foundation - Origyn. Significant export leadership. Fellow of CPTM (Commonwealth Partnership for Technology Management) Member of UK Institute of Directors, Association of Economic Representatives London, Fellow of Royal Commonwealth Society, MCC.



Adan Ramirez Sanchez – Chief Executive Officer (Co-founder)

With a background in Biotechnology, he has +4 years of experience in the design and development of New Energy Systems and High Technology Management. He is Mexican ambassador at One Young World, the international forum of young leaders based in London. Also, he has been named in 2020 as a Latin American Inventor under 35 years old by the MIT Technology Review, as well as one of the 100 of the most promising young leaders in the field of biotechnology in Latin America by AllBiotech, and as one of the 2021 TopTalents under 25 years old in Innovation in Germany and India.



Juan Arriaga Viveros – Chief Operating Officer (Co-founder)

Biotechnologist with experience in the development of new technologies, analysis of bioeconomic models and strategies for the circular economy. With training on Microfluidics in Spain and Online courses. Ambassador of Agenda 2030 in the UN MY WORLD Program and UNMGCY Youth Focus Group Ambassador. Analysis and discussions on Sustainability Standards for Food Systems. In addition, with 3 years of experience on industrial innovation consultant on Agroindustry.



Miguel Mayorga Rojas – Chief Data Officer (Co-founder)

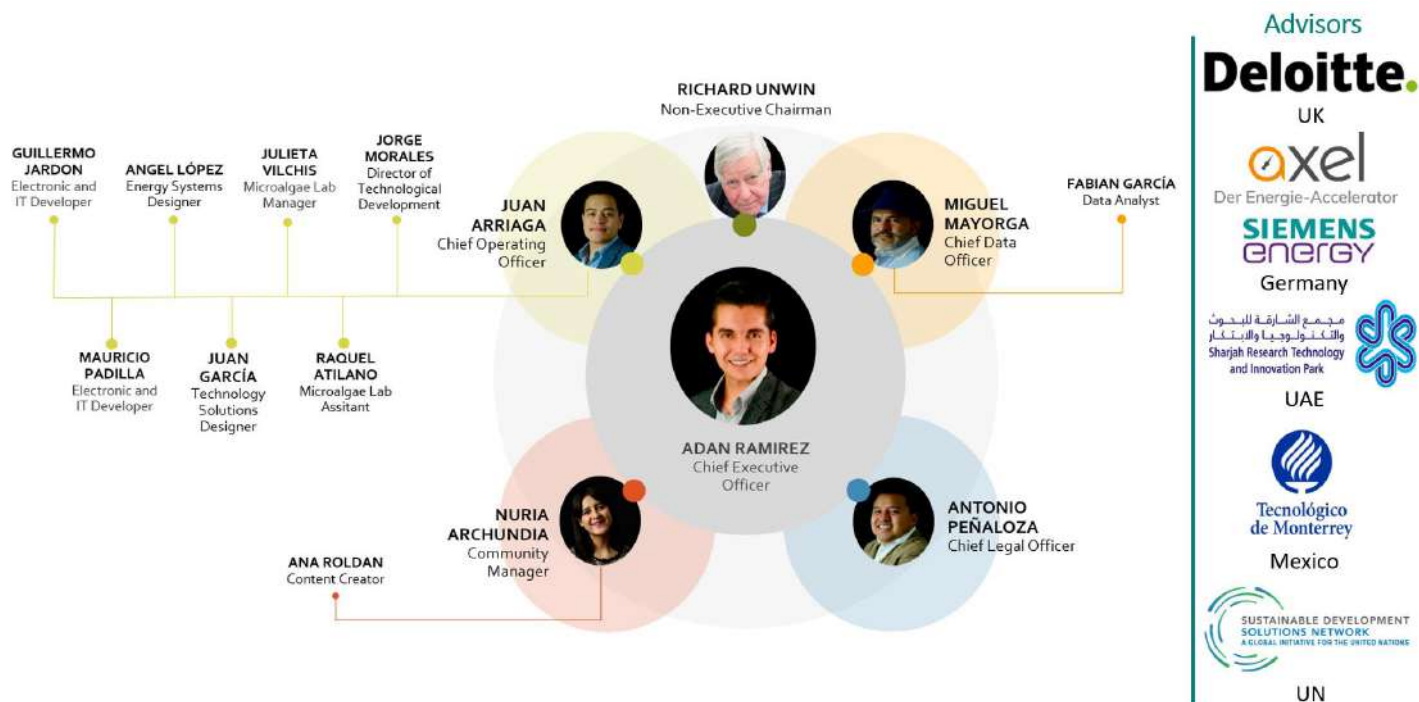
Statistical Physicist with scientific research publications in non-equilibrium phenomena in fluids, soft matter, nanoscience, metamaterials, data analysis, biomaterials, sustainability, composites, and tissue engineering. With 15 years of experience on industrial innovation consultant, is co-inventor of high-tech patent designs, as well as UNESCO awarded for the heritage management project of Tembleque's aqueduct. Visiting professor in international Universities of Europe and USA, with a networking that include Nobel laureates and astronauts. Co-founder of non-profit socio-environmental associations and technological startups.



Antonio Peñaloza Olúa – Chief Legal Officer (Co-founder)

With training in Law, he has experience in legal management of technological innovation and intellectual property, with knowledge on commercial law and tax law, as well as public accounting. In addition, he has served as an Analyst of Resolutions issued by the International Commission on Human Rights in Tirant Lo Blanch, also as Administrative Officer and magistrate assistant, both in a District Court in Mexico City.

Organizational structure



Awards and mentions

- Lead2030 Global Challenge Winner for SDG 13 supported by Deloitte, [One Young World 2022](#).
- 2021 Flourish Prize Honoree in Global Goal #7: Affordable and Clean Energy, [AIM2Flourish 2021](#).
- UP Innovation Awards 1st place winner, [Universidad Panamericana 2021](#).
- The 100 PRO, most promising startups in Mexico, [Pro Magazine 2020](#).
- National Winner INC Accelerator, [Instituto Tecnológico de Monterrey, INC Monterrey 2020](#).
- 50 World Youth Solutions for the SDGs, [Youth Solutions Report SDSN 2020](#).
- As one of the 98 inaugural members of the Youth Sustainable Energy Hub, [YSEH 2020](#).
- Berlin Science Week Technological Innovation Finalist, [Falling Walls 2020](#).
- Finalists EarthTech Ventures Innovations Platform, [Earth Tech Australia 2020](#).
- Semi-finalists Innovators for the Future, [The Futures Project Germany 2020](#).
- Best Latin American Inventor of the year, MIT Technology Review 2020., [MIT Technology Review 2020](#).
- 30 Business Promises, [Forbes México, 2020](#).
- BLIS Award 2019 "Looking for Leaders in Innovation and Sustainability", [Mexican Council of Science and Technology & UNAM, 2019](#).
- Entrepreneur Award from the National Chamber of the Transformation Industry, CANACINTRA 2019.
- 10 best Green Innovation companies in Mexico, [Facebook & Entrepreneur Magazine, 2019](#).
- 100 global solutions with a high potential impact on CO2 mitigation. G20 Mission Innovation 4th Ministerial Meeting, Canada 2019, [Mission Innovation Canada 2019](#).
- 10 best sustainable projects in the world, [Global Green Growth Institute 2018](#).

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- 5 Best Proposals in the World for the Energy Transition, Germany, [European Institute of Innovation & Technology, 2018](#).
 - National First Place in the Affordable and Clean Energy Challenge, [Foro Consultivo Científico y Tecnológico A.C. 2018](#).

International forums

- **Hong Kong** - Smart Biz Expo 2019, Greenfluidics as startup selected for exhibition, Hong Kong Trade Development Council, Hong Kong
- **Russia** - as part of the High Technology Management training program in 2019 at the Samara Aerospace University, reaching agreements for future collaboration to bring our technology to space.
- **England** - presented at the One Young World international summit in London in 2019, as a project sponsored by the Environmental Foundation of Audi AG
- **Germany** - Energy Transition Business Camp 2018, exhibition of Intelligent Solar Biopanel as new technology for energy transition in Karlsruhe through EIT Innoenergy & Axel Accelerator.

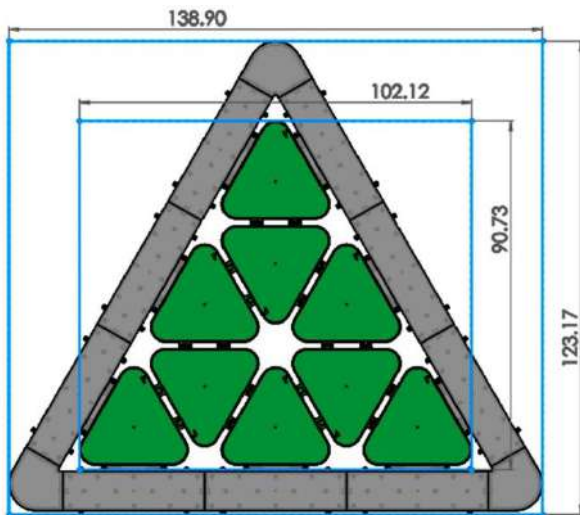
Accelerators

- [The Axel Accelerator](#) (member since July 2020) an accelerator located in Karlsruhe, Germany, which promotes companies that promote the energy transition in their country, connecting with key players and institutions that will seek to connect the Biopanel with the European market.
- [Sharjah Research Technology and Innovation Park](#) (member since August 2020) an accelerator of disruptive technologies located in Sharjah, United Arab Emirates, in order to connect the biopanel with the Middle East market for the transformation of its cities towards complete sustainability, connecting us with potential clients and investors in the such as the royal family, [Six Construct](#), [CCC](#), [WSP](#) and Siemens Middle East.
- [BRAiN Mexico](#) (member since December 2020) the Business, Research, Acceleration and Innovation, is an acceleration program for science-technology-based ventures, promoted by Tecnológico de Monterrey and Santander Bank.
- [Investment Readiness Accelerator Program SDSN](#) (member since December 2020) a program that was designed in collaboration with SDSN and Babele.co, with valuable insights from leading experts in the field, personalized 1-on-1 mentoring, and the opportunity to connect with impact investors from UN network.

Our Technology

Intelligent Solar Biopanel

The Intelligent Solar Biopanel is a unique technology in the world, which aims to provide energy efficiency and create a unique style while absorbing carbon dioxide, generating oxygen and producing clean and affordable energy, thanks to the use of microalgae and nanotechnology.



Design and size of the Intelligent Solar Biopanel

that flow in an adjacent system allow the capture of solar radiation and through a cooling and photovoltaic process generates electricity, which is stored in a battery.

The Biopanel is made up of an independent system of triangular microalgae containers connected by a structure to PV cells cooled system, which allows both systems to be held together and provide a unique avant-garde design.

The operation of Biopanel is based on two principles. On the one hand, the photosynthesis carried out by the microalgae that flow through the system allows the CO₂ to be fixed in the environment and liberates oxygen, at the same time that it provides thermal comfort by reducing the temperature inside the building.

On the other hand, the PV cells and nanofluids that flow in an adjacent system allow the capture of solar radiation and through a cooling and photovoltaic process generates electricity, which is stored in a battery.

Expected characteristics:

- Generates up to 328 KWh/m² per year.
- Provides energy efficiency in thermal comfort, saving up to 90 KWh/m² per year.
- It can reduce up to 200 Kg CO₂ per year/m².
- It is semi-transparent, which allows up to 60% of sunlight to pass through, and can be placed as part of windows, walls, or skylights in buildings.
- It can reuse gray water as a method of filtering and obtaining nutrients.
- It monitors environmental data that allows obtaining sustainability reports.
- It produces by-products such as microalgae biomass (organic fertilizer) and releases oxygen, improving air quality.



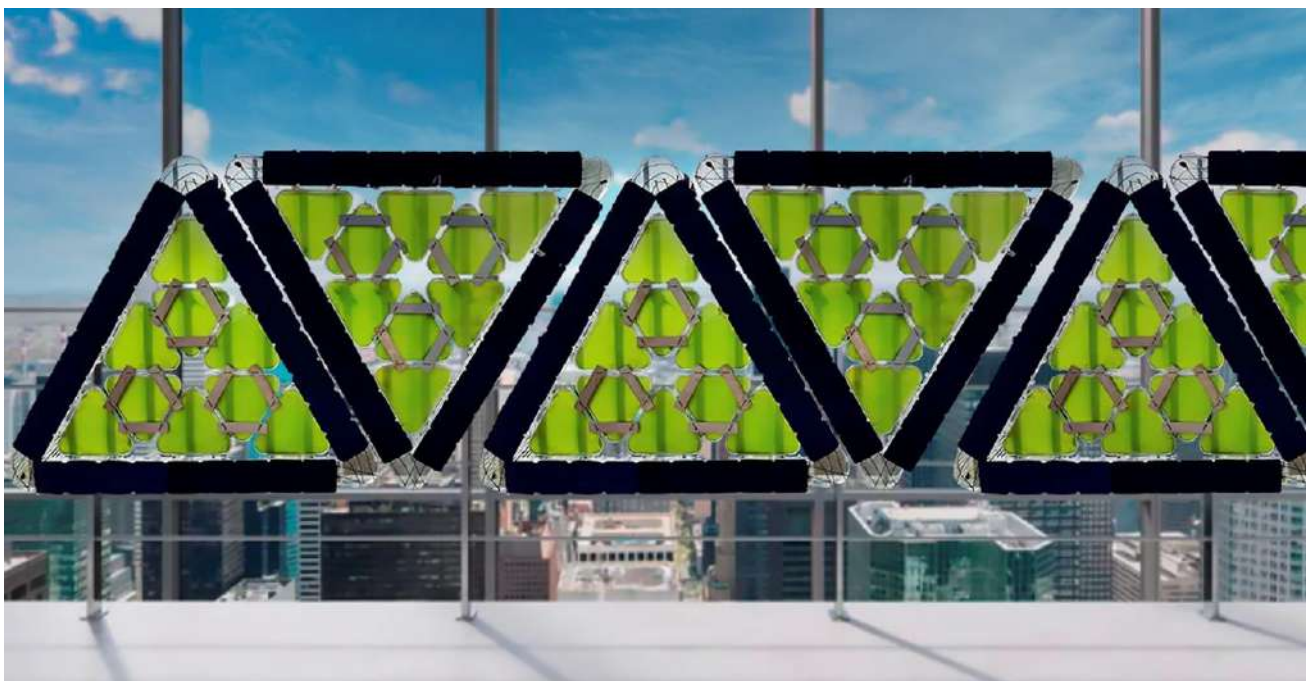
Render of the Intelligent Solar Biopanel as the windows of an office building.

Technology status

After four years of continuous development, we are currently in the technological demonstration phase of the Intelligent Solar Biopanel in which we continue working to obtain better results and scaling it up for larger pilot tests, such as shown in the following roadmap:



Our next step is a pilot test demonstration of our biopanel as part of a building, in order to demonstrate their function, design and performance. This will take place in the first half of 2022 with strategic allies, as well as possible stakeholders with whom we are in the process of negotiation.



Adaptation of the Intelligent Solar Biopanel as windows in a building

This test has an international relevance, as it will attract the attention of various media that have waited to see the first images of the biopanel, in addition the international expectation will attract the focus on this building by foreign companies that are interested in investing in this type of technology.

Towards smart cities acceleration

The automation and sensors of our biopanel will allow us to provide added value to buildings in a circular economy, through their digitization and the monitoring of environmental and structural data.



The benefits of metabolic digitization are:

- Traceability and certification of data.
- Obtaining reports of sustainability and environmental regeneration of the area.
- Creation of a metabolic index of the city.
- Smart metabolic data driven urban planning sustainable configurations.
- Obtaining environmental certifications and increasing the value of the site.
- Creation of cryptocurrencies based on environmental data obtained by biopanel.

Reducing gaps for the fulfillment of the SDGs

Through innovation in affordable and non-polluting energy systems, our technology seeks to reduce the negative per capita environmental impact of cities, paying special attention to air quality, considerably increasing the number of cities and human settlements that adopt and implement policies and integrated plans to promote compliance with the Sustainable Development Goals and their goals set for 2030, whether financial, social or environmental.

**Main target
SDGs**



**Secondary
SDGs**



Intellectual Property

The intellectual property that protects this technology are:

- PCT International Patent "BIOPANEL FOR ELECTRICAL ENERGY GENERATION BASED ON PHOTOSYNTHESIS AND NANOFLUIDS" Publication No. WO2020/226481A2
- Industrial design granted "Industrial model of biopanel for the generation of electric power" with application number MX/F/2019/001227

Technology Value proposition

Our value proposition is aimed at real estate developers, to whom we offer to increase the value of their properties by achieving environmental and wellness certifications, helping to create a healthier environment for its occupants.

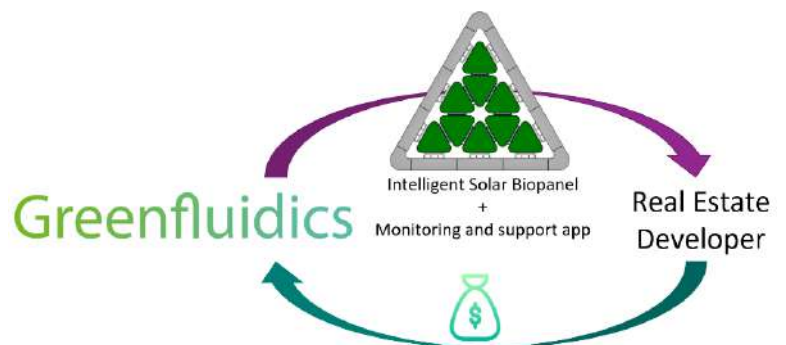
We could help to grant the follow benefits:

- We increased the value of the building by more than 10%.
- We help save more than 30% in energy costs associated with thermal comfort.
- We help to comply with environmental certifications.
- We promote well-being and health to the occupants.

Business model

Our business model is aimed at Real Estate Developers, which is why it is a B2B business through direct sales, with the opportunity to be flexible with B2G for institutional projects.

The way it works is as follows:



Market

The market opportunity that we have found is energy efficient buildings, with customers such as real estate developers, of which the region with the greatest impact and interest in us so far has been Germany, Middle East and Switzerland.

The market opportunity grows with the imposition of the New Green Deal in the European Union, where strict policies are established to mitigate climate change and reduce environmental pollution, with the transition to sustainable cities being an important point, establishing an economic recovery plan from several countries, which due to the current pandemic, seeks to promote sustainability in several countries, having an estimated annual growth up to 11%.

Therefore, our market is established as follows:

- TAM of energy efficient buildings:
30 billion dollars.
- SAM entry:
600 million dollars.
- SOM projected in 5 years at least of:
30 million dollars.

Potential market regions identified

- Germany
- Saudi Arabia
- United Arab Emirates (Abu Dhabi, Dubai, Sharjah)
- Switzerland
- United States (California, Chicago, Florida)
- Australia (Perth)
- Canada (Vancouver)
- Hong Kong
- Singapore



Render of the Intelligent Solar Biopanel as a building façade

Other potential markets

- Agroindustry (organic fertilizers or precision agriculture)
- Cement industry
- Oil & gas (New energy sources)
- Aerospace industry (Life Support System)

Financial status

The Greenfluidics Biopanel is still under development since 2017, and as we previously showed we have advanced to the technological demonstration stage, for which throughout these years we have been able to sustain ourselves economically through competitions, government subsidies and a first investment of friends and family of 150,000 USD, with which we have managed to mature our technology from TRL 3 to TRL 7.

Total money raised so far:

250,000 USD (includes investment from friends and family, grants and contests).

With what we have achieved:

- R + D + i of our technology from TRL 0 to TRL 7.
- Intellectual and industrial property (trademarks, patents, industrial models).
- Manufacture of industrialized molds.
- Facilities and equipment (biotechnology laboratory, materials laboratory, energy systems test laboratories and data analysis laboratory).

In this way, in order to advance in technological development and achieve a final product that allows us to launch it on the market at the end of 2022, a technological demonstration will be carried out, which allows us to show the technological, environmental and social benefits to our first early adopters, and thus attract the seed investment we need or the realization of a joint venture to continue with the development of our product.