



**UANL**

UNIVERSIDAD AUTÓNOMA DE NUEVO LEÓN



Universidad Autónoma de Nuevo Leon

**ANNUAL**

**SUSTAINABILITY REPORT**

**2022**

YEAR 6, NUMBER 6  
JANUARY – DECEMBER 2023





## DIRECTORY

-  Dr. Med. Santos Guzmán López  
*Provost*
-  Dr. Juan Paura García  
*Secretary General*
-  Dr. Jaime Arturo Castillo Elizondo  
*Academic Secretary*
-  Dr. Sergio S. Fernández Delgadillo  
*Sustainability Department*
-  Dr. Carlos Ramírez Martínez  
*Project Development Department*
-  Dra. Evangelina Ramírez Lara  
*Environmental Management and Operational Safety Department*
-  M.C. Félix González Estrada  
*Infrastructure for Sustainability Department*



**Spanish  
version**



## SUSTAINABILITY DEPARTMENT

### Collaborators:

Evangelina Ramírez Lara  
 Félix González Estrada  
 Arturo M. Cárdenas Garza  
 Belem I. Hernandez Mireles  
 Celia G. Rodríguez Barrientos  
 Jesús Gerardo Martínez Mora  
 Karina A. Garza Villagrana  
 Laura Elizabeth García Campos  
 Libertad Castillo Colunga  
 Nidia Nayely Rivera Reyna  
 Orlando G. Villa Martínez  
 Paola D. Menchaca Candanoza

### Responsible Editors:

Sergio S. Fernández Delgadillo  
 Carlos Ramírez Martínez

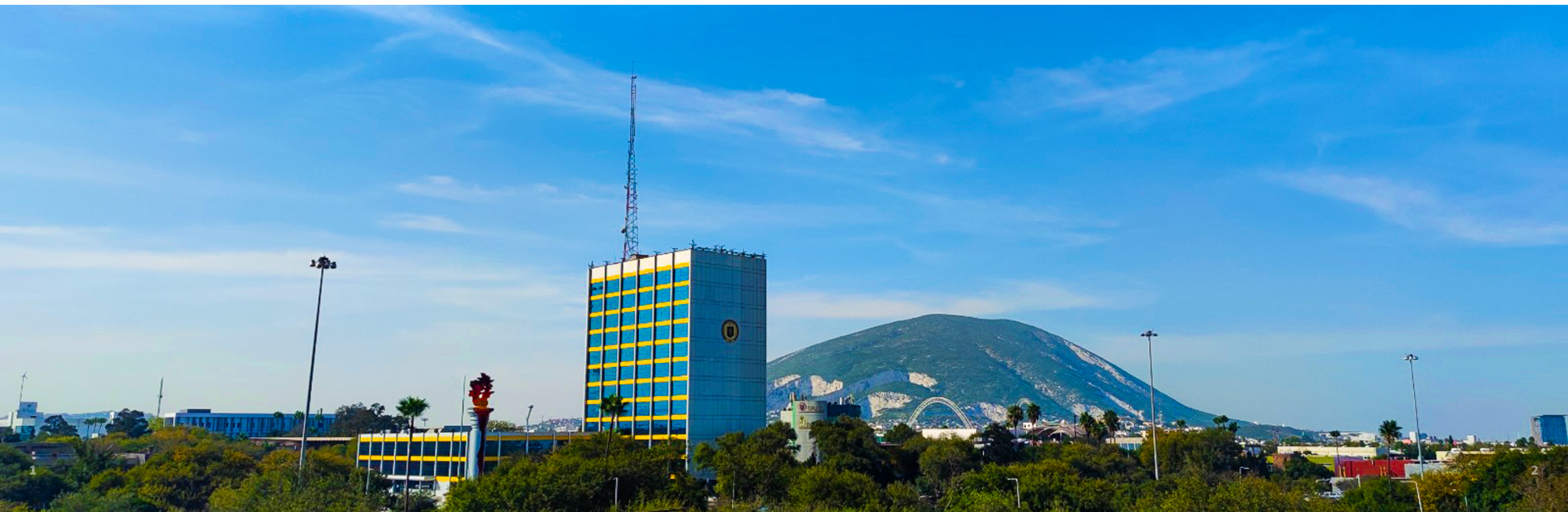
### Editorial coordination:

Carlos Ramírez Martínez

### Editorial Design:

Libertad Castillo Colunga  
 Edali Paola Arriaga Martínez

COPYRIGHT AND RELATED RIGHTS, Year 6, No. 6, January-December 2023, It is an annual Publication edited by the Universidad Autonoma de Nuevo Leon, Ciudad Universitaria. San Nicolas de los Garza, Nuevo Leon, Mexico. C.P. 66451. Tel. (81) 8329 4000, www.uanl.mx, sustentabilidad@uanl.mx Responsible Editors: Sergio Salvador Fernandez Delgadillo and Carlos Ramirez Martinez. Rights Reservation to Exclusive Use No. 04-2020-042416013800-203, ISSN: in process, both granted by the National Institute of Copyright. Responsible for the latest update of this Issue, Sustainability Department of the Universidad Autonoma de Nuevo Leon, Sergio Salvador Fernandez Delgadillo and Carlos Ramirez Martinez, Ave. Guerrero 156 North, Colonia Cuahutemoc, C.P. 66450 San Nicolas de los Garza, Last modified Octubre 2023.





# Content

- 06 Prologue
- 07 Who We Are
- 09 Numbers

## INDUSTRY, INNOVATION AND INFRASTRUCTURE

- 30 Sustainable Infrastructure
- 48 Campus green infrastructure
- 53 Sustainable Buildings

## CLEAN WATER AND SANITATION

- 58 Efficient Use of Water
- 63 Water consumption register

## CLIMATE ACTION

- 72 Climate Action Program
- 75 Natural Environment Recovery Campaigns in Urban Areas
- 79 Sustainable agricultural production
- 89 Conservation and sustainable use of biodiversity and natural resources

## RESPONSIBLE PRODUCTION AND CONSUMPTION

- 100 Waste Generation
- 113 Responsible Consumption

## AFFORDABLE AND NON-POLLUTING ENERGY

- 116 Efficient energy use
- 121 Energy Consumption register
- 133 Gas Consumption register

## SUSTAINABLE CITIES AND COMMUNITIES

- 142 Sustainable Mobility

## QUALITY EDUCATION

- 166 Education and Research
- 177 Innovation and entrepreneurship program
- 181 Student Participation

## PARTNERSHIPS TO ACHIEVE OBJECTIVES

- 190 Communication for sustainability
- 195 Guidelines
- 197 Acknowledgments



# Prologue

In this significant year, the Universidad Autonoma de Nuevo Leon (UANL) proudly celebrates its 90th anniversary, a trajectory that has been marked by an unwavering commitment to excellence and education as a means to transform lives and build a sustainable future.

Within this framework of celebration, I am pleased to present to the university community and society the Annual Sustainability Report, a testimony that is not only a recount of the actions we have taken in the area of sustainability, but primarily a commitment to continue moving towards a better future.

For nine decades, UANL has been a beacon of knowledge and development for Nuevo Leon, Mexico and the world. And now that humanity is facing major global challenges such as climate change, biodiversity loss and pollution, we reaffirm our commitment to be part of the solution.

I invite the university community and society to read this document, which shows the results we have achieved in terms of sustainability, such as the containment of the growth of the institutional carbon footprint, through the efficient use of energy and water, the growing student participation in actions for the care and conservation of the environment, the promotion of sustainable mobility on university campuses, the proper management and confinement of waste, the conservation of biodiversity on campus, the promotion of good consumption practices, the promotion of education and research in the field of sustainability, the promotion of education and research in the field of sustainability, the promotion of sustainable mobility on university campuses, the adequate management and confinement of waste, the conservation of biodiversity on campus, the promotion of good consumption practices, the promotion of education and research on sustainability issues, and the increase in climate change adaptation and mitigation actions that we carry out from a local and global perspective.

With the implementation of all these actions and others described in the report, it was possible to achieve in the last year significant progress in the process of transition to sustainability at UANL, in addition to continuing to strongly support compliance with the Sustainable Development Goals of the United Nations, which allowed us to continue to be recognized, for the sixth consecutive year, as the most sustainable university in Mexico and to improve our position in the Green Metric World University Ranking, entering a select group of the 15 most sustainable universities in the world, among the 1050 institutions of higher education that are included in the ranking.

As we move into the future, we reaffirm our commitment to building a more just, equitable and sustainable world, and I call on all university students to continue to support with enthusiasm and dedication the actions that the University of Nuevo Leon carries out in the field of sustainable development.



*DR. MED. SANTOS GUZMÁN LÓPEZ*  
Provost



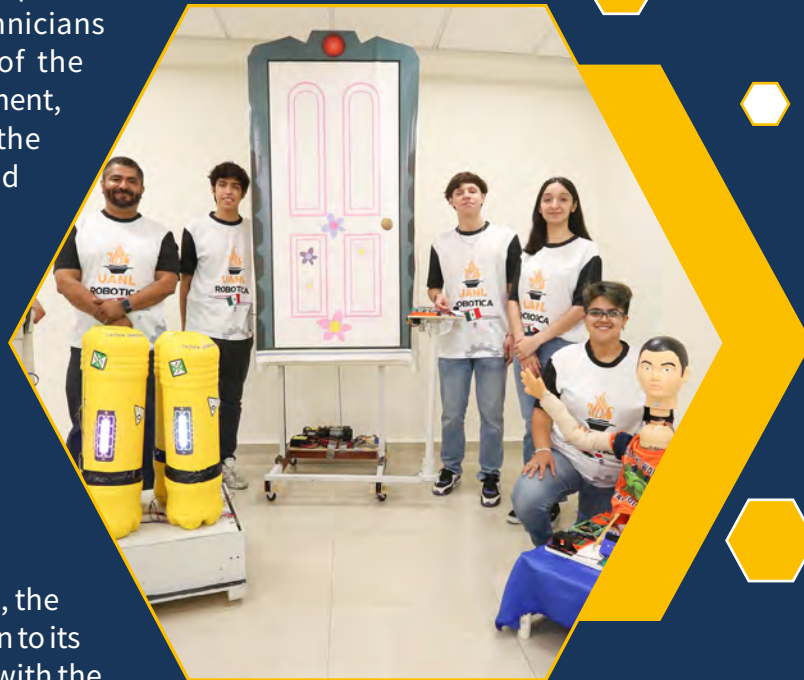
# Who we are

## MISSION

To train socially responsible, innovative, competitive and competent high school students, technicians and professionals, with full awareness of the regional, national and international environment, with principles and values, committed to the sustainable, scientific, technological and cultural development.

To generate timely, relevant and transcendent contributions to the advancement of science, technology, innovation and humanities, and to the improvement of the level of human development of the Nuevo Leon society and the country.

To spread and extend, as widely as possible, the benefits of culture, paying particular attention to its responsibility to maintain and increase ties with the general community.



## VISION

In 2030, the Universidad Autonoma de Nuevo Leon will be recognized worldwide for offering a comprehensive, inclusive and equitable quality education for life, being innovative in the generation and application of knowledge that transcends its social responsibility and contributions to the transformation of society.



## VALORES

Responsibility

Justice

Freedom

Equality

Truth



Solidarity

Tolerance

Honesty

Respect





# Numbers

## UANL COMMUNITY



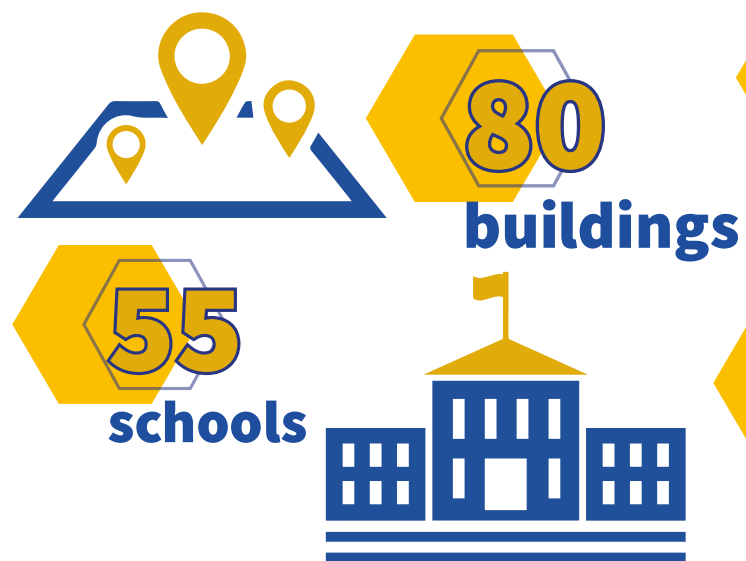
The UANL provides educational services to students who mainly come from the 51 municipalities of the state of Nuevo Leon and from the northeast region of the Mexican Republic.



There are 36 municipalities in the state of Nuevo Leon with UANL academic infrastructure.

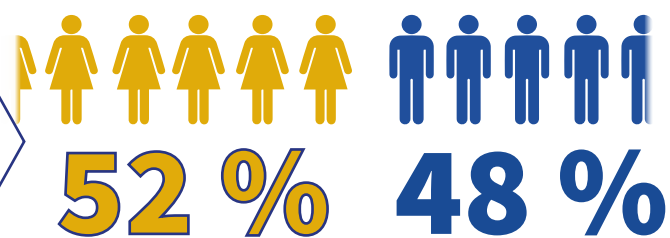


## EDUCATIONAL COVERAGE



**70 %** of the municipalities of the state of Nuevo Leon

## DISTRIBUTION OF ENROLLED STUDENTS BY GENDER

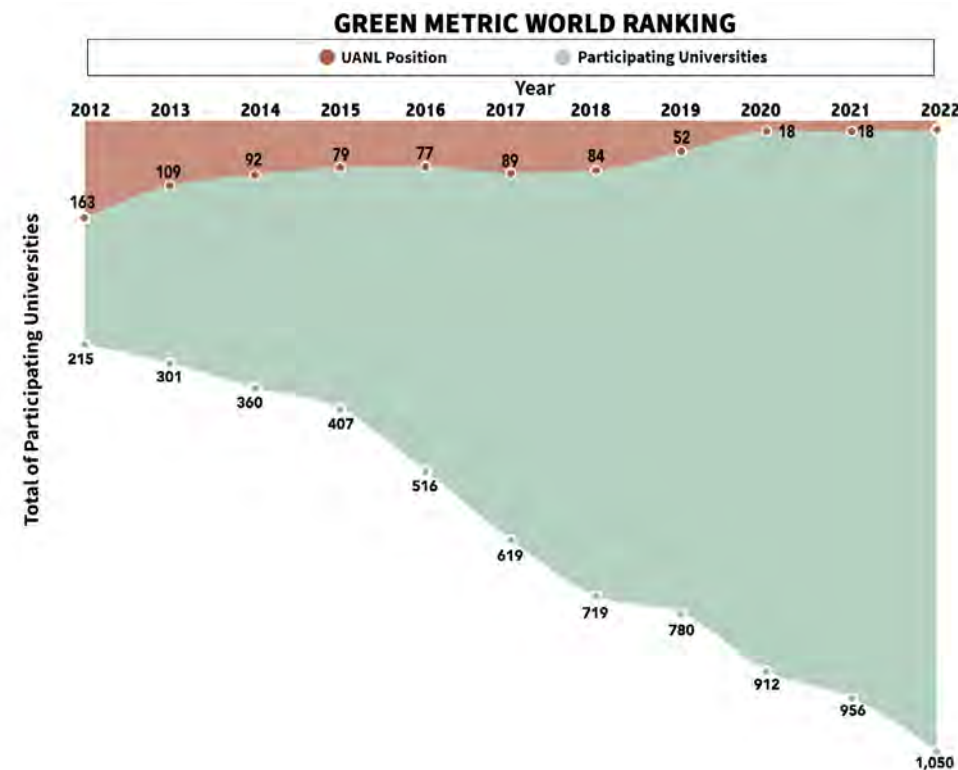


Specialized higher education institution

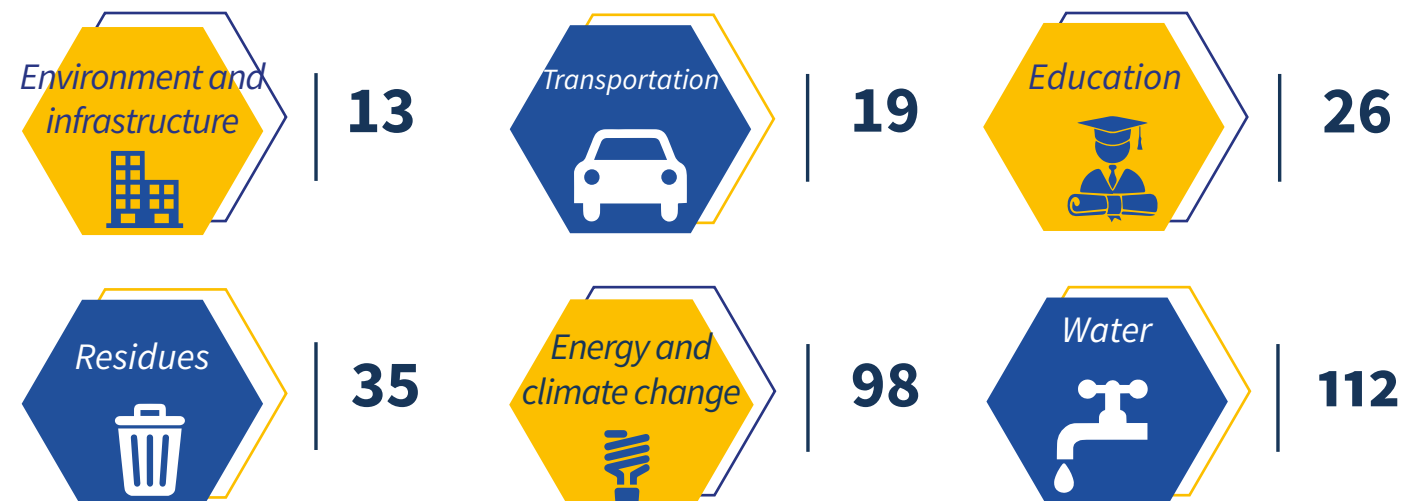


## GREEN METRIC UNIVERSITIES WORLD RANKING

- 1<sup>st</sup>** place at national level for the 6th year in a row
- 15<sup>o</sup>** place at international level
- 3<sup>o</sup>** place in North America



## POSITION OF THE UANL BY WORLD RANKING INDICATORS





## EDUCATIONAL QUALITY



**100 %** of the programs at the undergraduate and university higher technician levels are accredited in the National Registry of Quality Educational Programs (PNPEC).



**73** academic programs at the undergraduate level are accredited by national organizations.



**44** academic organizations with which we have collaboration agreements.



**66** internationally accredited educational programs.

Source: Academic Department and Report of activities carried out at the UANL corresponding to the year 2022.

## ACADEMIC BODIES (AB)

**AB:** groups of teachers who share one or several lines of creation and application of knowledge in disciplinary or multidisciplinary topics.



**90 %** of the AB are linked to sustainability issues



AB linked to sustainability issues

## ACKNOWLEDGMENT TO TEACHERS

**6,894** teachers at the UANL

**1,429** teachers are in the "Program for the Professional Development of Teachers" (PRODEP).

**1,116** teachers are in the National System of Researchers (SNI).

## QUALIFICATIONS OF THE ACADEMIC STAFF

Teachers	Academic degree	Middle higher level	Higher level	Total			
<b>Full time</b>	Degree	21	31 %	47	68	2 %	
	Master's degree	605	39 %	949	1,554	49 %	
	Specialization	8	4 %	174	182	6 %	
	Doctorate	66	5 %	1,279	1,345	43 %	
	<b>Subtotal</b>	<b>700</b>	<b>22 %</b>	<b>2,449</b>	<b>78 %</b>	<b>3,149</b>	<b>100 %</b>
<b>Half time</b>	Degree	5	15 %	29	34	15 %	
	Master's degree	74	43 %	99	173	78 %	
	Specialization	0	0 %	1	1	0 %	
	Doctorate	3	23 %	10	13	6 %	
	<b>Subtotal</b>	<b>82</b>	<b>37 %</b>	<b>139</b>	<b>63 %</b>	<b>221</b>	<b>100 %</b>
<b>Subject</b>	Degree	892	52 %	809	1,701	48 %	
	Master's degree	649	40 %	967	1,616	46 %	
	Specialization	7	21 %	27	34	1 %	
	Doctorate	19	11 %	154	173	5 %	
	<b>Subtotal</b>	<b>1,567</b>	<b>44 %</b>	<b>1,957</b>	<b>56 %</b>	<b>3,524</b>	<b>100 %</b>
<b>Total</b>		<b>2,349</b>	<b>34 %</b>	<b>4,545</b>	<b>66 %</b>	<b>6,894</b>	<b>100 %</b>

Source: Academic Department and Report of activities carried out at the UANL corresponding to the year 2022





## ACADEMIC PROGRAMS AT UNDERGRADUATE LEVEL AND UNIVERSITY HIGHER TECHNICIAN (TSU) BY GENERAL FIELDS OF ACADEMIC TRAINING

Campus No.	General field of academic training	No. of academic programs		
		Bachelor's	TSU	Total
1	Education	1	0	1
2	Arts and humanities	15	0	15
3	Social sciences and law	14	0	14
4	Management and business	9	0	9
5	Natural sciences, mathematics and statistics	10	0	10
6	Information technologies and communication	6	0	6
7	Engineering, manufacturing and building	16	0	16
8	Agronomy and veterinary	5	0	5
9	Health sciences	7	0	7
10	Services	2	0	2
<b>Total</b>		<b>85</b>	<b>0</b>	<b>85</b>

Source: Academic Secretary.

## TOTAL OF ACADEMIC PROGRAMS AT THE UNDERGRADUATE LEVEL ACCREDITED BY NATIONAL ORGANIZATIONS

CIEES: Inter-Institutional Committees for the Evaluation of Higher Education

COPAES: Council for Higher Education Accreditation A.C.

22

67

Source: Academic Department and Report of activities carried out at the UANL corresponding to the year 2022.



## ACADEMIC PROGRAMS AT A POSTGRADUATE LEVEL

	Degree			Totals
	Doctor's	Master's	Specialty	
International competence	3	3	11	17
Consolidated	14	17	12	43
In progress	15	19	13	47
Recently created	2	7	1	10
<b>Total</b>	<b>34</b>	<b>46</b>	<b>37</b>	<b>117</b>

Source: Academic Secretariat.

### MASTER'S DEGREE PROGRAMS

### SPECIALTIES

### DOCTOR'S DEGREE PROGRAMS





## EDUCATIONAL PROGRAMS IN ALTERNATIVE MODALITIES



Modality	Studies level			Totals
	High School	Bachelor's	Postgraduate	
Online mixed	1	0	0	1
Online	1	5	4	10
Open	1	0	0	1
Mixed	12	26	14	52
Mixed in community centers (Aula.edu)	2	0	0	2
<b>Total</b>	<b>17</b>	<b>31</b>	<b>18</b>	<b>66</b>

Source: Academic Department.

## ACADEMIC PROGRAMS (PE) AT UNDERGRADUATE LEVEL AND UNIVERSITY HIGHER TECHNICIAN (TSU)



Level	Evaluable PE	Not evaluable PE	Total
Bachelor's	72	14	86
University Higher Technician	1	0	1
<b>Total</b>	<b>73</b>	<b>14</b>	<b>87</b>

Source: Academic Secretariat.

## UNIVERSITY FOR THE ELDERLY PROGRAM

**106**  
students

Its goal is to offer an alternative option of training and education to people over 55 years of age so they can live a successful aging process.



**8** courses and workshops  
with **133** participants

Source: Coordination of Inclusive Education for People with Disabilities and the Elderly





## INCLUSION PROGRAM FOR STUDENTS WITH DISABILITIES

**4,490**

### students enrolled in the inclusion program

The purpose of this program is to sensitize the university population about attitude management towards people with disabilities, promote their integration and adaptation to university spaces and propose adjustments to the physical infrastructure to allow their free movement through the university buildings.



#### Objectives of the program:

- To promote the inclusion of students with disabilities in the field of mid-higher education and higher education of the UANL.
- To design education, training and updating programs for the teaching, administrative and service staff, in terms of educational care for students with disabilities.
- To plan and coordinate the required programs, strategies and actions in the academic and human resources fields, to provide comprehensive support to applicants and/or current students with disabilities at UANL.

## STUDENTS ENROLLED IN THE INCLUSION PROGRAM



Academic level	Quantity
Middle Higher	2,256
Superior	2,234
<b>Total</b>	<b>4,490</b>

Source: Coordination of Inclusive Education for People with Disabilities and the Elderly.

#### Functions:

- To provide guidance and support to applicants of the UANL in the process of assigning schools at the mid-higher level and the selection process at the higher level.
- To be a communication bridge between the schools and the students with specific educational needs and/or disabilities to support their school permanence.
- To provide training courses and workshops on educational inclusion for the teaching and administrative staff. To organize events are that promote inclusion and are aimed at the university community and the general public interested in the subject.





## TYPES OF DISABILITIES BY ACADEMIC LEVEL

Type of disability	Middle Higher Level	Higher Level
Hearing loss (hypoacusis)	20	8
Blindness	13	1
Hearing impairments	48	97
Visual impairments	1,454	1,698
Major depression order	10	15
Cognitive development	8	12
Motor development	28	91
Dyscalculia (severe math difficulties)	3	1
Severe intellectual disability	0	0
Moderate intellectual disability	13	0
Mild intellectual disability	28	2
Lower limb motor impairment	29	13
Upper limb motor impairment	16	4
Multiple motor disability	14	5
Mental disorders	2	20
Neurological disabilities	17	37
Dysgraphia (difficulties learning to write)	2	1
Dyslexia (difficulties to read)	37	15
Moderate severe visual impairment	38	11
Epilepsy	49	24
Multiple sclerosis	2	0
Schizophrenia	0	1
Post-traumatic stress disorder	0	0
Non-verbal learning problems	1	1
Asperger syndrome	118	23
Deafness	4	1
Stuttering	8	4
Eating disorder	6	3
Bipolar disorder	5	8
Anxiety disorder	85	54
Communication disorder (expression and understanding)	4	0
Autism spectrum disorder	52	10
Intermittent explosive disorder	1	0
Oppositional defiant disorder	0	0
Attention deficit disorder	119	31
Learning disorder	24	43
<b>Total</b>	<b>2,256</b>	<b>2,234</b>

Source: Coordination of Inclusive Education for People with Disabilities and the Elderly.





## SERVICES OF THE UNIVERSITY HEALTH CENTER (CUS)

**235,726**

**annual check-ups and services provided at**



**6**

University clinics located in the municipalities of Ciudad Guadalupe, Apodaca, and Cienega de Flores.

**2**

dentistry and specialties modules located in the municipalities of Ciudad Guadalupe and Apodaca.

**1**

comprehensive care clinic for adolescents and youngsters in the municipality of Ciudad Guadalupe.

Source: University Health Center.

## SOCIAL ASSISTANCE, COMMUNITY SERVICES AND VOLUNTEERING PROGRAM

Community Services Provided	Number	Benefited population
Social	11,903	635,089
Legal	2,338	32,120
<b>Total</b>	<b>14,241</b>	<b>667,209</b>

Source: Academic Department and Report of activities carried out at the UANL corresponding to the year 2022.

**14,241**

**community services provided in 2022**



**667,209**

**people benefited from the social assistance programs**





In 2022 the UANL  
Per Capita Carbon  
Footprint was  
**0.32**  
metric tons\*

In 2022 the UANL Carbon  
Footprint was  
**73,477** metric tons\*

\*Calculated using the methodology proposed by Carbon Footprint TM (www.carbonfootprint.com)



**2.15 %**  
budget of the UANL  
annually allocated  
to topics related to  
sustainability

**UANL FUNDS AND BUDGET FOR SUSTAINABILITY**

- \$ 459,715,439.00 (USD)**  
UANL annual budget
- \$ 9,862,102.00 (USD)**  
budget allocated to investments in sustainability
- \$ 5,946,997.00 (USD)**  
research funds
- \$ 2,453,465.00 (USD)**  
funds allocated to sustainability research

**EFFICIENT USE OF WATER AND ENERGY PROGRAM**

**5.69 m<sup>3</sup>**  
per capita/ annual  
water consumption

**399 kWh**  
per capita/ annual  
energy consumption



## UANL CULTURE



**1,111**

**artistic and cultural events in 2022**



**246,386**

**participants onsite and online**



### Events in 2022

### Amount

### Assistants

Events in 2022	Amount	Assistants	
		In person	Virtual
Concerts	126	700	44,419
Announcements, contests and awards	164	950	5,760
Courses, workshops and seminars	97	3,604	44,360
Speeches, conferences and talks	179	669	17,312
Dance, ballet and poetry shows	81	0	58,642
Theater shows	74	11,500	9,101
Special events	61	2,600	10,381
Homages and tributes	21	715	0
Exhibitions exhibitions	46	1,562	19,723
Cinema	60	1,000	0
Book presentations	202	949	12,439
<b>Total</b>	<b>1,111</b>	<b>24,249</b>	<b>222,137</b>

Source: Academic Department and Report of activities carried out at the UANL corresponding to the year 2022.





# SPORTS



**#1** in students' sports in Mexico

**19** championships in the National Student University of Higher Education

**16** times in a row

## Auténticos Tigres

2022 Youth League Champions

2022 Major league Runner-up



UANL Tigres amputated Players four-time Mexican Soccer League Champions



**41** students in 10 adapted-sport disciplines



**32** students participated in international events



# 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



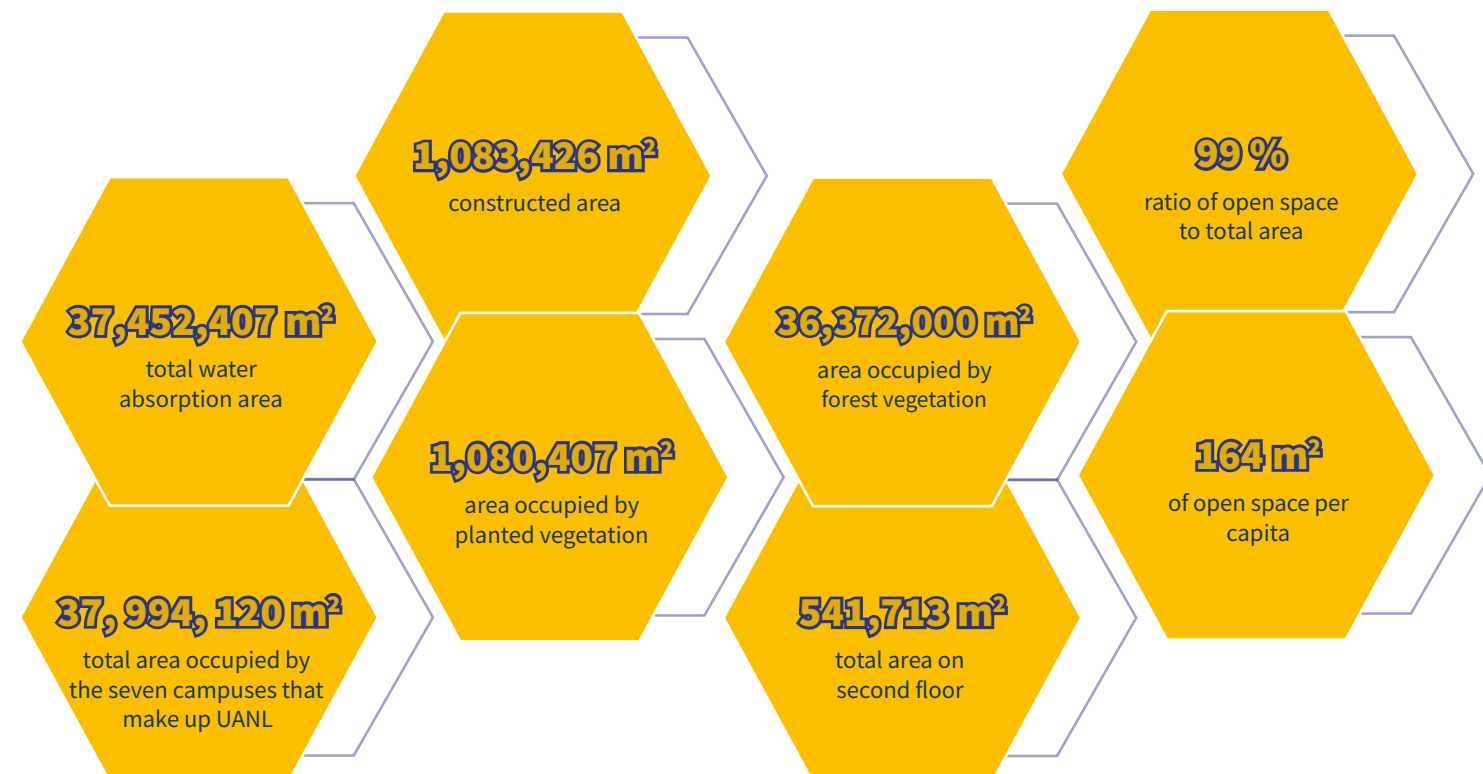
# SUSTAINABLE INFRASTRUCTURE

The Universidad Autonoma de Nuevo Leon (UANL) is regarded as the most significant university in the state of Nuevo Leon. It also stands as one of the largest universities in Latin America when considering its infrastructure and student population. Additionally, it holds the distinction of being the Higher Education institution with the most extensive educational offerings in northern Mexico.

The UANL encompasses seven university campuses, housing a total of 26 Schools and 29 High Schools that collectively constitute its educational system.

Five of the campuses are located in Monterrey and its metropolitan area: Ciudad Universitaria, Health Sciences, Mederos, Agricultural Sciences and Cadereyta Jimenez. In addition to Sabinas Hidalgo and Linares.

Due to the geographic location of the state of Nuevo Leon, most of the UANL infrastructure is located in climatic regions considered arid and semi-arid.







# 95 %

**of UANL buildings  
has high energy  
efficiency  
equipment**

UANL's institutional infrastructure policy is aimed at building modern and adequate infrastructure to provide educational services of the highest technical and human quality, with world-class quality standards in the areas of inclusion, safety and sustainability.

The proper functioning of the physical infrastructure of the UANL requires a construction and maintenance program based on the incorporation of environmental standards and best practices in the design, construction, equipment and operation of new buildings, expansions and real estate modifications, which consider the application of the following recommendations aimed at achieving high energy and environmental efficiency:

- ⬡ Spaces with features that improve the productivity, safety and well-being of the university community.
- ⬡ Provision of infrastructure and equipment to facilitate the reduction of greenhouse gas emissions.
- ⬡ Implementing various actions to achieve significant energy savings, including:
  - Promote self-generation of energy using renewable sources.
  - Lighting and air conditioning of study and work areas using energy-efficient technology.
  - Improve the thermal insulation of the infrastructure.
  - Take advantage of ventilation and natural light to reduce energy consumption.
  - Replacement of traditional lighting fixtures with high-efficiency LEDs.
  - Installation of low energy consumption LED screens.
  - Installation of motion detectors in classrooms and offices.
  - Water-saving equipment in service areas in administrative and educational buildings.
  - Design and installation of green roofs.
  - Increase the rainwater retentive surface.
  - Use solar thermal plants to heat water, among others.

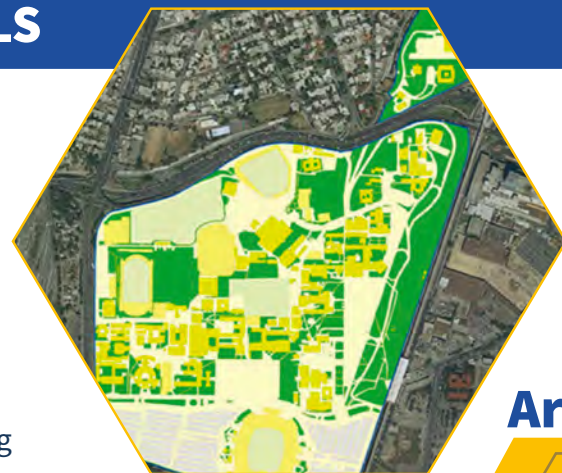
The implementation of all these actions has demanded a great institutional effort. However, it has been possible to achieve that 95% of UANL buildings currently use high efficiency air conditioning and lighting equipment. This achievement has led to significant economic savings and a reduction in greenhouse gas emissions (GHG).





## INSTITUTIONS AND SCHOOLS

- 📍 Rectorate Building
- 📍 School of Architecture
- 📍 School of Biological Sciences
- 📍 School of Physical and Mathematical Sciences
- 📍 School of Chemical Sciences
- 📍 School of Public Accounting and Management
- 📍 School of Law and Criminology
- 📍 School of Civil Engineering
- 📍 School of Mechanical and Electrical Engineering
- 📍 School of Philosophy and Arts
- 📍 School of Sports Organization
- 📍 School of Social Work and Human Development



Area:  
**95**  
hectareas

**San Nicolas de los Garza, Nuevo Leon, Mexico.**



## CIUDAD UNIVERSITARIA CAMPUS

University Campuses  
total area

**3,799**  
hectareas





# HEALTH SCIENCES CAMPUS



# INSTITUTIONS AND SCHOOLS



- School of Nursing
- School of Medicine
- School of Dentistry
- School of Psychology
- School of Public Health and Nutrition
- University Hospital



Monterrey, Nuevo Leon, Mexico.

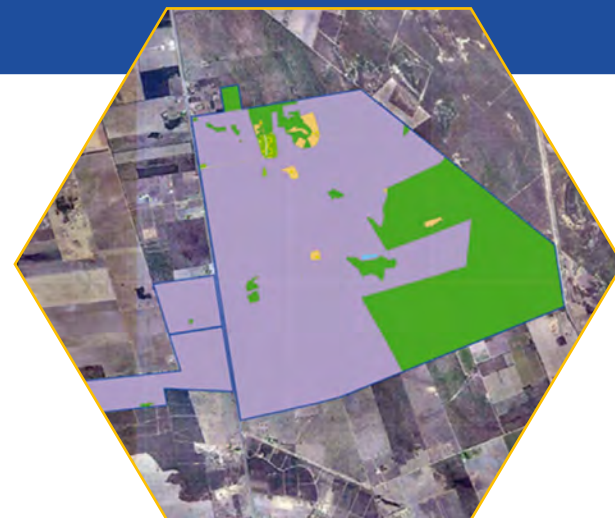
Area: **29** hectareas





## INSTITUTIONS AND SCHOOLS

- 📍 School of Forestry Sciences
- 📍 School of Earth Sciences
- 📍 Academic addition of the School of Public Accounting and Management
- 📍 Academic addition of the School of Law and Criminology
- 📍 Academic addition of the School of Philosophy and Arts
- 📍 Academic addition of the School of Mechanical and Electrical Engineering
- 📍 Academic addition of the School of Sport Organization
- 📍 Academic addition of the School of Nursing
- 📍 Center for Research in Agricultural Production
- 📍 Forest reserve area - Forest — School



Area:

**2,042**  
hectareas

**Linares, Nuevo Leon, Mexico.**



## LINARES CAMPUS





# CAMPUS MEDEROS



# INSTITUTIONS AND SCHOOLS



- School of Performing Arts
- School of Visual Arts
- School of Communication Sciences
- School of Political Science and International Relations
- School of Economics
- School of Music
- Institute of Social Research
- Center for Foreign Language Studies and Certification
- Center for Research, Innovation and Development of the Arts
- University Theater
- University Radio and Television Facilities



Monterrey, Nuevo Leon, Mexico.

Area:  
**194**  
hectareas





# INSTITUTIONS AND SCHOOLS

- School of Accounting and Public Administration
- School of Law and Criminology
- School of Nursing
- School of Psychology



**Sabinas Hidalgo,  
Nuevo Leon,  
Mexico.**



Area:

7

hectareas

# SABINAS HIDALGO CAMPUS





# AGRICULTURAL SCIENCES CAMPUS



# INSTITUTIONS AND SCHOOLS



- 📍 School of Agronomy (with annex in Marin)
- 📍 School de Medicina Veterinaria y Zootecnia (with annex in General Bravo, N.L.)
- 📍 Anexo de Investigacion Agropecuaria (General Bravo, N.L.)

Area:

**1,417**  
hectareas



**General Escobedo, Nuevo Leon, Mexico.**





# INSTITUTIONS AND SCHOOLS

- Academic addition of the School of Public Accounting and Management
- Academic addition of the School of Law and Criminology.
- Academic addition of the Faculty of Nursing.



**Cadereyta Jimenez, Nuevo Leon, Mexico.**

**Area:**  
**15**  
**hectareas**



# CADEREYTA CAMPUS







## TYPE OF VEGETATION ON CAMPUS

### Mederos:



- 🔹 Vegetation type: **piedmont scrub**
- 🔹 Surface area (ha): : **193.60**
- 🔹 Area with natural vegetation: **161.10**
- 🔹 Factor (C ha-1): **41.30**
- 🔹 Carbon stored (ton): **6,653.43**
- 🔹 CO<sub>2</sub> equivalent (ton): **24,418.09**

### Linares:

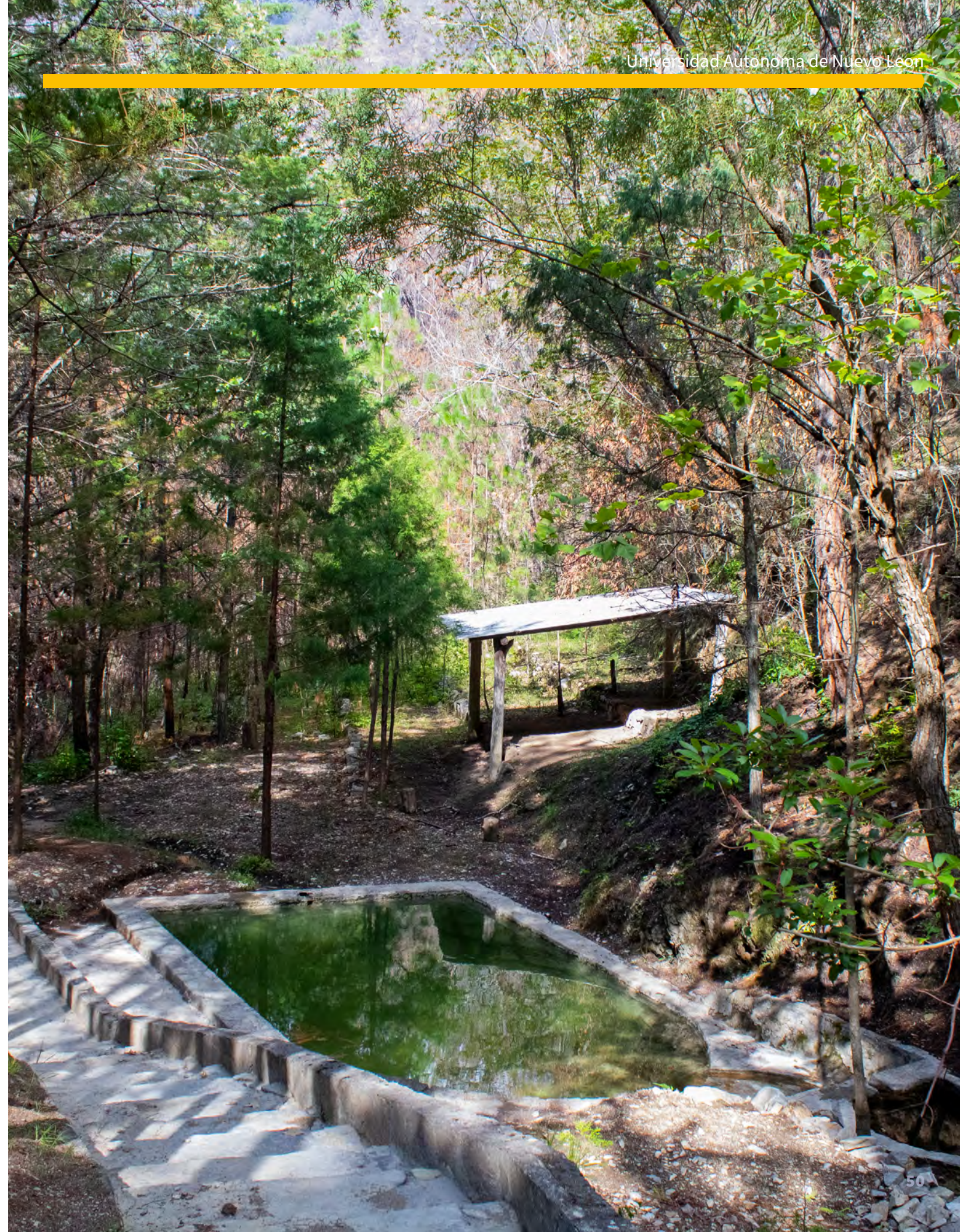
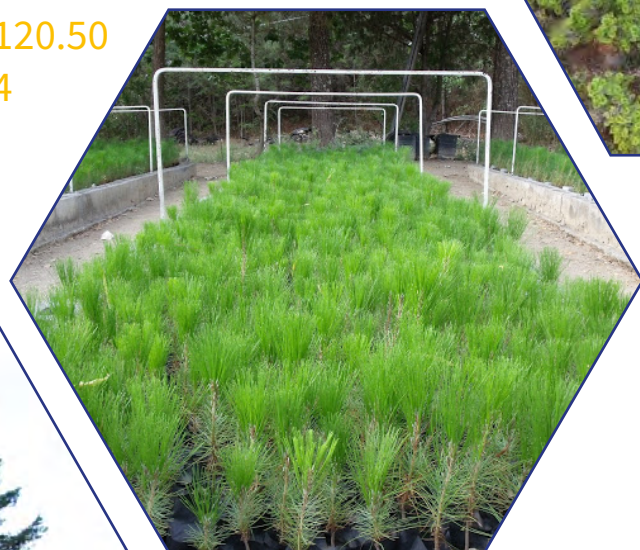


- 🔹 Vegetation type: **thornscrub**
- 🔹 Surface area (ha): **772.60**
- 🔹 Area with natural vegetation (ha): **680.00**
- 🔹 Factor (C ha-1): **34.50**
- 🔹 Carbon stored (ton): **23,460.00**
- 🔹 CO<sub>2</sub> equivalent (ton): **86,098.20**



# Iturbide

- Vegetation type: oak-Pine
- Surface (ha): 988.60
- Area with natural vegetation (ha): 989.00
- Factor (C ha-1): 34.50
- Carbono almacenado (ton): 34,120.50
- CO<sub>2</sub> equivalent (ton): 125,222.24







# Bravo

- Vegetation type: **thornscrub**
- Surface (ha): **630.00**
- Area with natural vegetation (ha): **600.00**
- Factor (C ha-1): **51.80**
- Carbon stored (ton): **31,080.00**
- CO<sub>2</sub> equivalent (ton): **114,063.60**



# Marin

- Vegetation type: **thornscrub**
- Surface (ha): **1,052.40**
- Area with natural vegetation (ha): **1,051.00**
- Factor (C ha-1): **51.80**
- Carbon stored (ton): **54,441.80**
- CO<sub>2</sub> equivalent (ton): **199,801.41**



## SUSTAINABLE BUILDINGS



Sustainable buildings play a crucial role in promoting environmental awareness, innovation and practical learning. Such buildings go beyond simple functionality, integrating concepts of energy efficiency, resource conservation and human health into their design and operation.

The benefits of these buildings promote a culture of sustainability among the student community, as well as the academic and administrative staff.

These buildings function as living laboratories where students can gain practical experience in learning about green technologies and sustainable practices. Furthermore, they contribute to lowering long-term operational expenses by diminishing the reliance on resources such as electricity and water, thereby allocating financial resources for other educational purposes.

The Universidad Autónoma de Nuevo Leon (UANL) promotes the construction and equipping of buildings with features that reduce energy, water, and material consumption required for their operation. This approach enables them to decrease the carbon footprint resulting from their operations.



During the period from 2006 to 2022, the construction and renovation of 10 buildings, totaling an area of 64,196 square meters, took place, necessitating an investment exceeding \$110,932,546.00 (USD).

Among the criteria used in the construction of Sustainable Buildings, those that avoid generating negative impacts were considered, such as those described below:

- ⬢ Damage to nature
- ⬢ Light and noise pollution
- ⬢ Inadequate waste management
- ⬢ Risks to human health

In terms of operation, this type of building favors the application of sustainable practices such as those described below:

- ⬢ Water saving and reuse
- ⬢ Efficient use of energy
- ⬢ Use of energy from renewable sources
- ⬢ Utilize natural ventilation to its fullest extent
- ⬢ Promote proper acoustics
- ⬢ Use of inclusive infrastructure
- ⬢ Achieving an adequate thermal sensation
- ⬢ Use of infrastructure that improves physical well-being



**64,196 m<sup>2</sup>**  
total built area



Another criterion for Sustainable Buildings was the proper management of construction materials:

- 🔸 Recycling of materials
- 🔸 Use eco-friendly materials
- 🔸 Non-toxic materials
- 🔸 Consumption of local materials
- 🔸 Non-polluting materials

Sustainable buildings are more than physical structures; they are tangible manifestations of UANL's commitment to a sustainable future.



*Sustainable building surface*

Center for Research and Development in Health Sciences (CIDICS)	15,592 m <sup>2</sup>
Center for Arts Research, Innovation and Development (CEIIDA)	8,335 m <sup>2</sup>
Internationalization Center	7,773 m <sup>2</sup>
Center for Innovation, Research and Development in Engineering and Technology (CIIDIT)	7,380 m <sup>2</sup>
Center of Research for Sustainable Development (CIDS)	5,913 m <sup>2</sup>
Center for Digital Education and Entrepreneurship	5,352 m <sup>2</sup>
Center for Research in Biotechnology and Nanotoxicology (CIBYN)	6,119 m <sup>2</sup>
Center for Research and Innovation in Aeronautical Engineering (CIIIA)	3,600 m <sup>2</sup>
Center for Innovation and Design (CID)	2,687 m <sup>2</sup>
Medical Services Clinic Ciudad Universitaria campus	1,445 m <sup>2</sup>
<b>Total</b>	<b>64,196 m<sup>2</sup></b>

Source: Construction and Maintenance Directorate.







# 6 CLEAN WATER AND SANITATION



## EFFICIENT USE OF WATER



The Universidad Autonoma de Nuevo Leon (UANL) has a high annual water consumption, due to the number of users, estimated at more than 230,000 people, and the high demand for the vital liquid, due to the high temperatures that prevail most of the year.

Due to this situation, the UANL promotes the permanent program of Efficient Use of Water, which plays a fundamental role in the preservation of this vital resource and in the promotion of a culture of sustainability.

The importance of implementing responsible water management practices at UANL not only contributes to the conservation of the environment, but also educates and sensitizes future generations about the importance of caring for natural resources.

Key features of efficient use of water on university campuses include awareness, adequate infrastructure, and the adoption of sustainable technologies. Awareness involves educating the university community about the importance of water and encouraging responsible habits, such as turning off faucets properly, reporting leaks, and using equipment in a conscientious manner.





The installation of sustainable infrastructures, such as smart irrigation systems supplied by treated wastewater, low-flow faucets, and high-efficiency water use equipment, have been essential to reduce water consumption on university campuses. Currently, most of the university's green areas receive irrigation assistance using treated wastewater.

In 2022, the UANL recorded a water consumption of 1,296,290 m<sup>3</sup> of water, which meant a decrease of 110,246 m<sup>3</sup>, with respect to the consumption recorded in 2021, which is equivalent to savings of 362,218 liters per day of the vital liquid, due to the implementation of the actions that are part of the Efficient Use of Water Program.



The benefits of efficient use of water on university campuses are significant and encompass several aspects. First, potable water consumption is reduced, thereby reducing the burden on local and regional water supplies. This helps preserve aquatic ecosystems and maintain a balance in the hydrological cycle. In addition, the adoption of sustainable practices generates long-term economic savings for the institution by reducing water bills and maintenance costs.

Responsible water use also has an educational and social impact. Students, by being part of an environment committed to sustainability, learn practices that they can take with them to their future homes and workplaces. The institution becomes a role model and can inspire other organizations and communities to adopt similar measures.

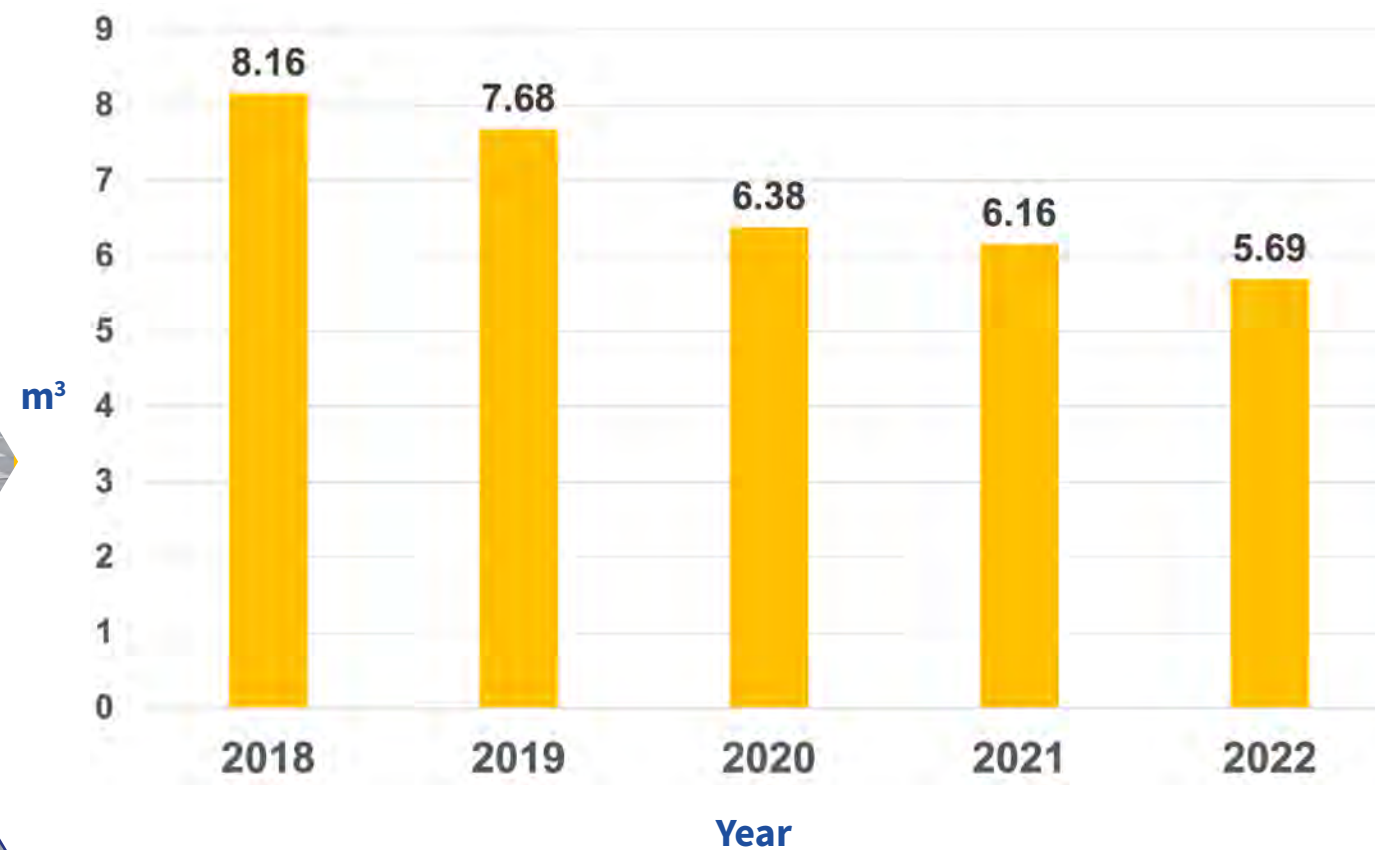




In 2022, a total of **1,296,290 m<sup>3</sup>** of water was consumed, which meant a decrease of **110,246 m<sup>3</sup>** with respect to the water consumption 2021.

During 2022, a daily saving of **362,218** liters of water was recorded.

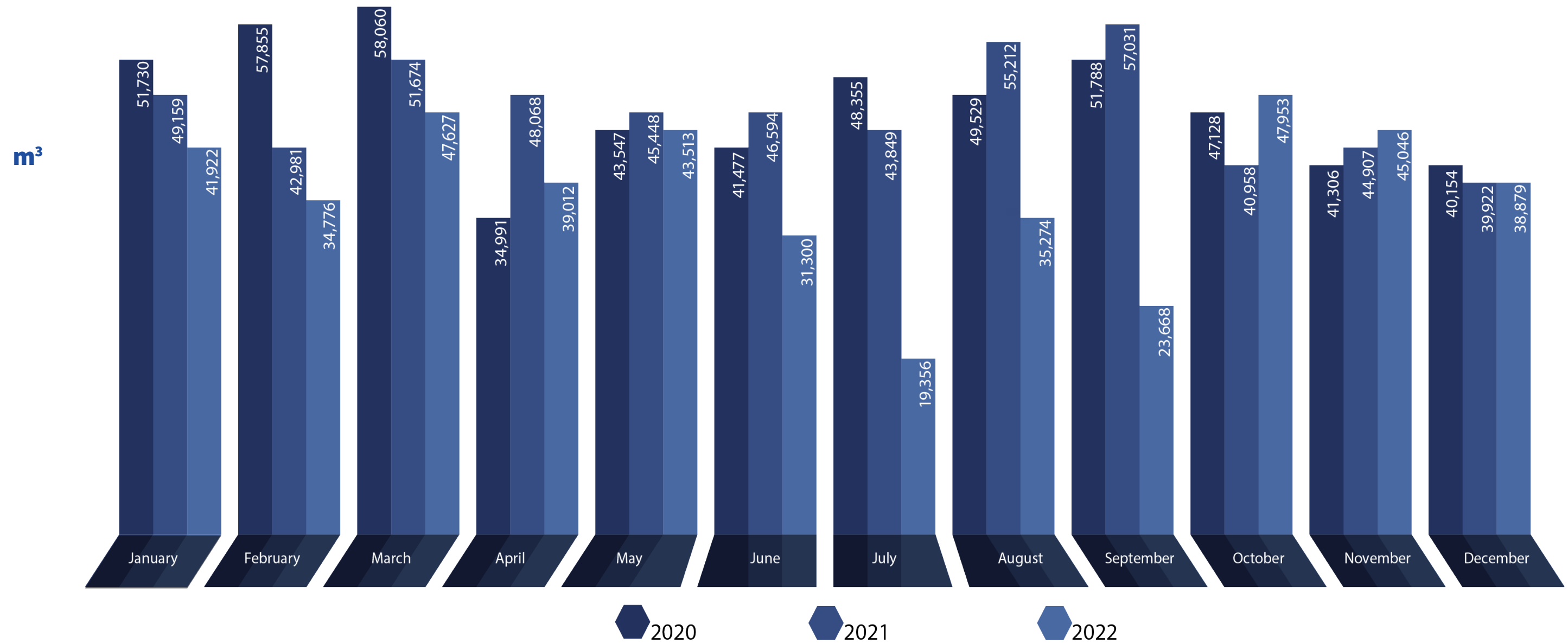
**CUBIC METERS PER CAPITA PER YEAR**





# MONTHLY WATER CONSUMPTION m<sup>3</sup>

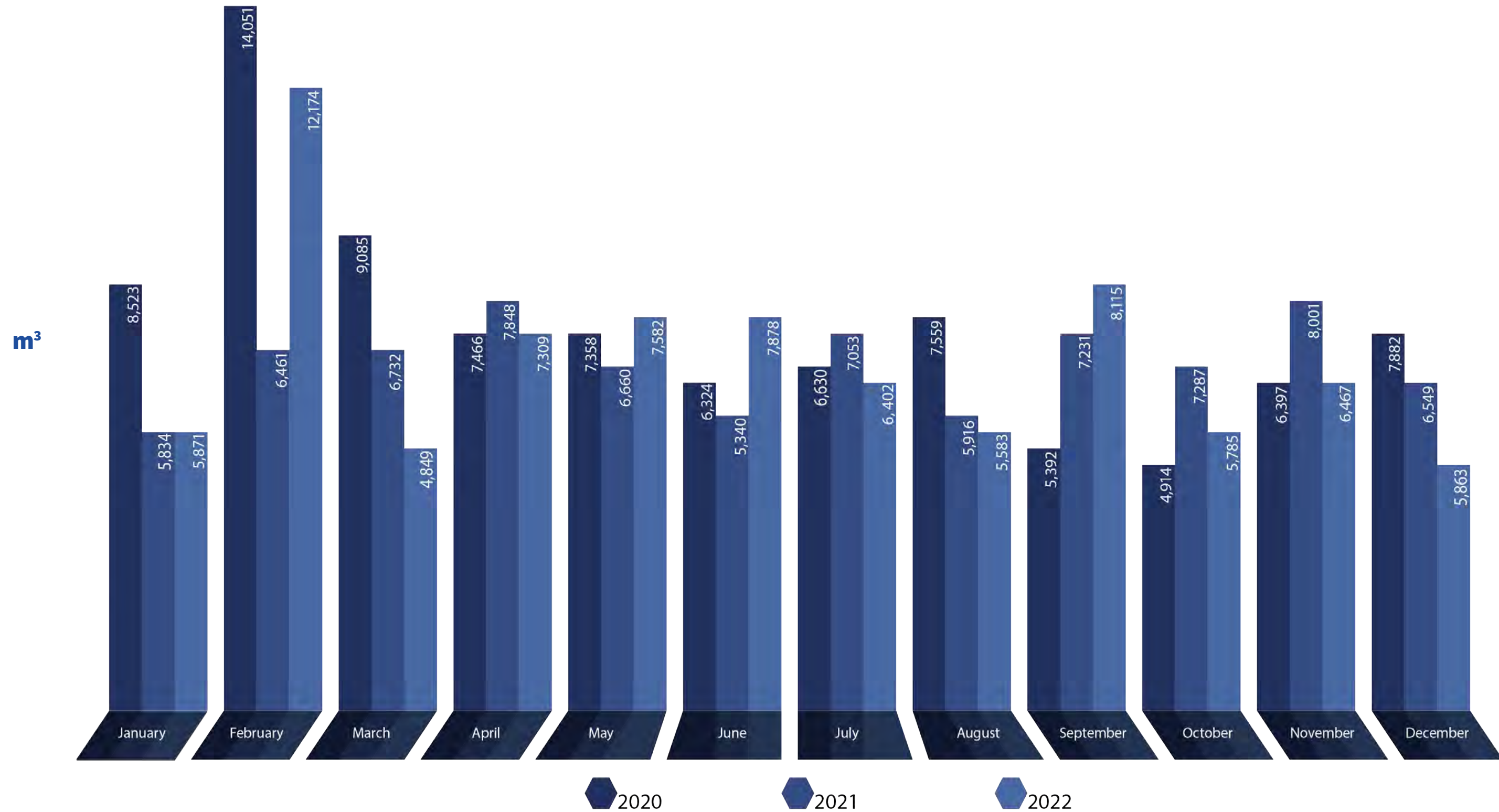
## Ciudad Universitaria Campus





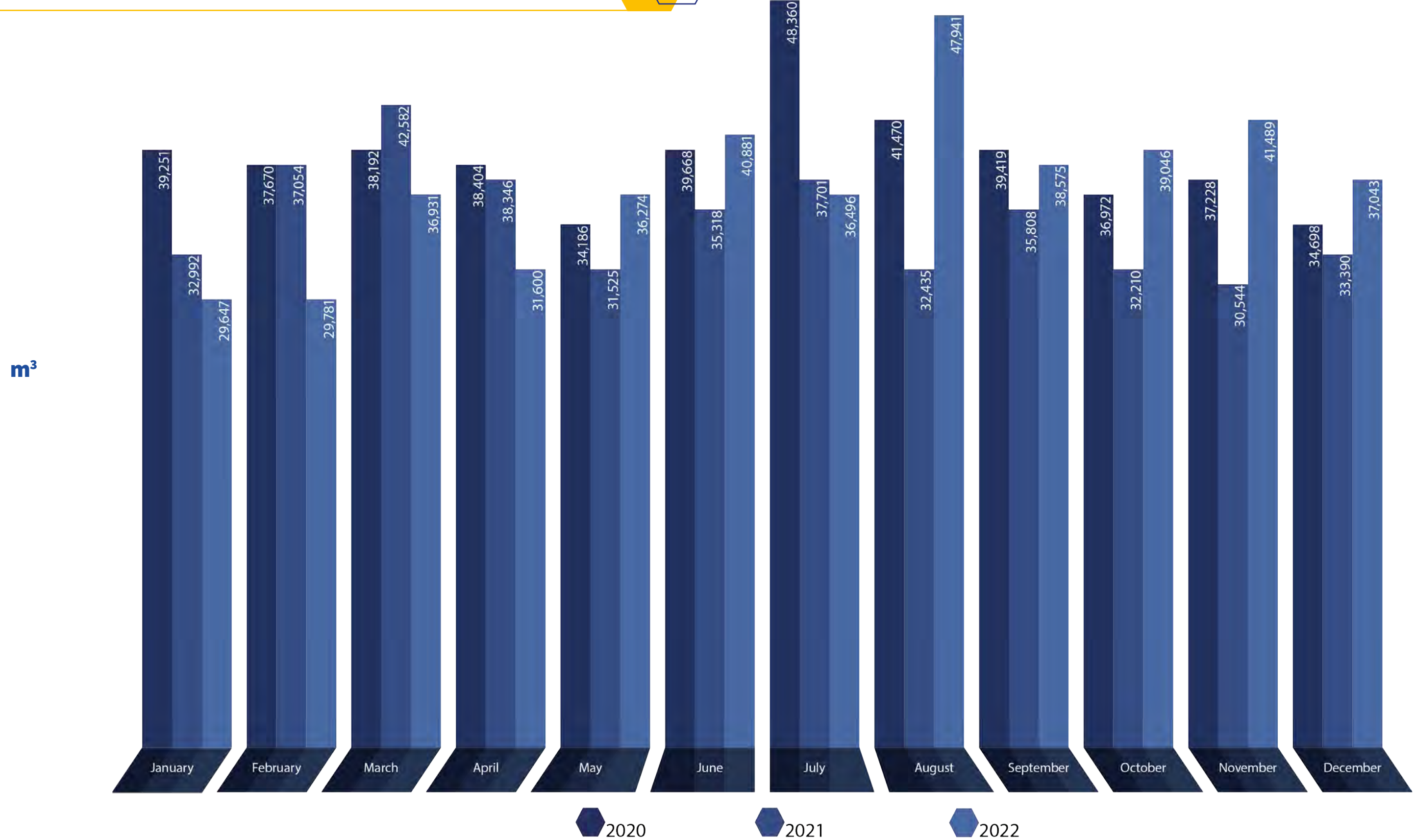
# MONTHLY WATER CONSUMPTION m<sup>3</sup>

## Mederos Campus





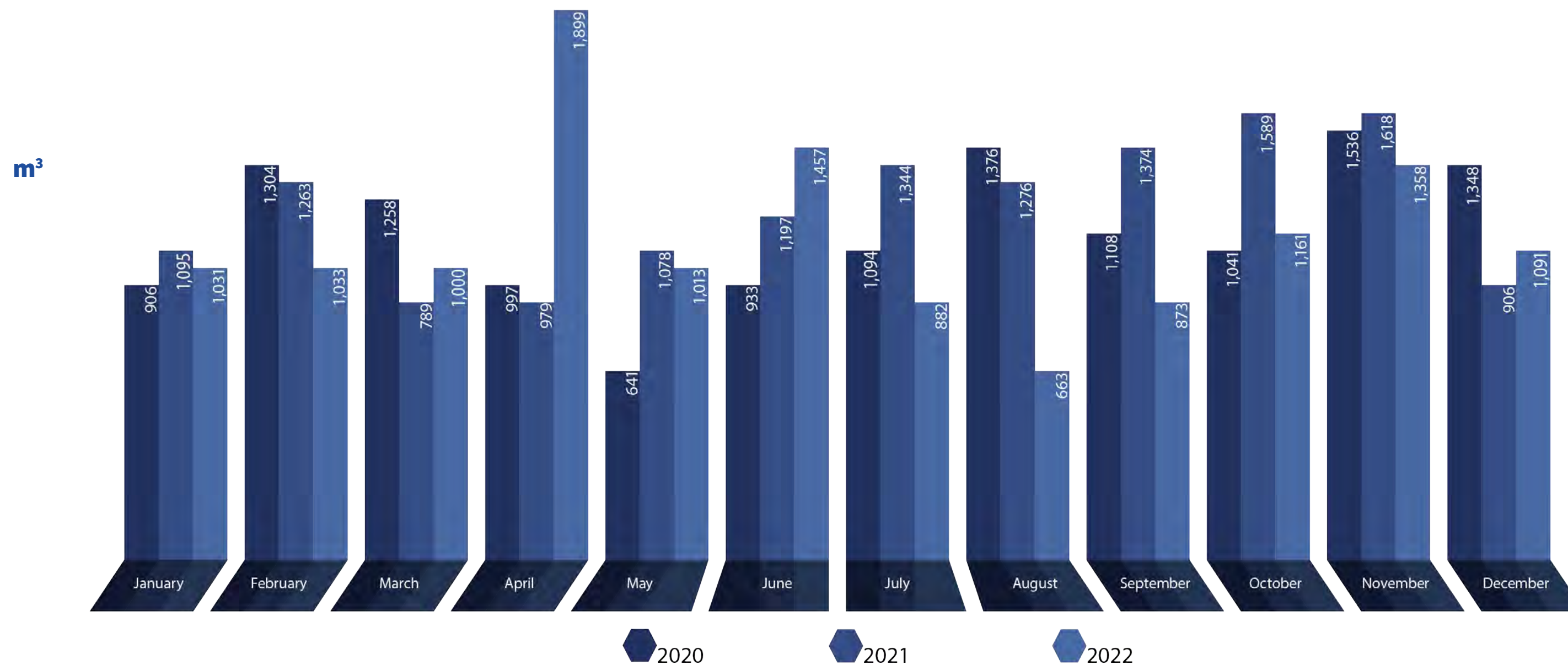
**MONTHLY WATER CONSUMPTION m<sup>3</sup>**  
**Health Sciences Campus**





# MONTHLY WATER CONSUMPTION m<sup>3</sup>

## Agricultural Sciences Campus







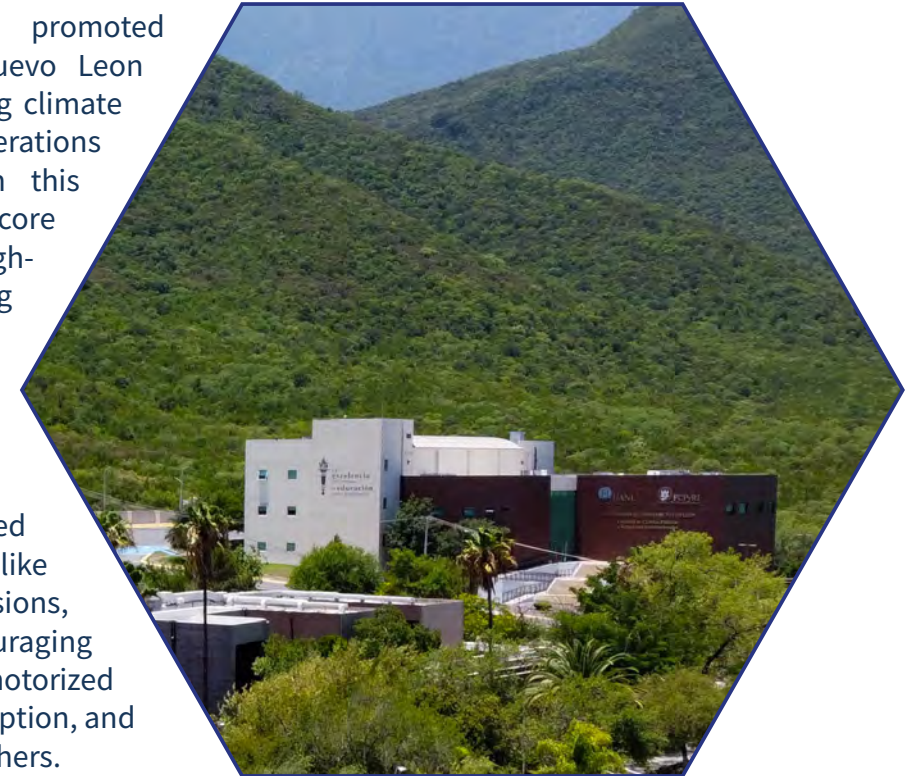
# 13 CLIMATE ACTION



## CLIMATE ACTION PROGRAM

The Climate Action Program (PAC) promoted by the Universidad Autonoma de Nuevo Leon (UANL) plays a crucial role in combating climate change and nurturing future generations committed to sustainability. Through this program, UANL showcases that its core objectives extend beyond training high-quality human resources, conducting pioneering research and technological development. It also aims to lead in promoting responsible environmental practices and preservation.

The climate action programs promoted by UANL include mitigation measures like reducing greenhouse gas (GHG) emissions, efficient water and energy use, encouraging public transportation and non-motorized mobility, promoting responsible consumption, and advancing a circular economy, among others.



# 98 %

of the UNAL territory is covered by vegetation





The second component of the PAC comprises climate change adaptation measures, including sustainable building construction, the transition to sustainable mobility on university campuses, promotion of research and innovation projects related to climate change and sustainability, and conservation efforts for natural areas protected by UANL.



Ninety-eight percent of the territory occupied by UANL facilities, which spans over 3,600 hectares, is covered by well-preserved vegetation. This extensive green cover serves as a carbon sink, capable of sequestering approximately 550 thousand tons of CO<sub>2</sub> equivalent.

With its significant capacity to absorb greenhouse gases and its commitment to various actions aimed at mitigating and adapting to climate change, UANL has achieved a highly favorable Carbon Balance, amounting to approximately 480 tons of CO<sub>2</sub> equivalent.

UANL has a carbon sink of approximately

**550 thousand tons of CO<sub>2</sub> equivalent**



**480 thousand tons of CO<sub>2</sub> equivalent**

In 2022, UANL registered a positive carbon balance of approximately



The UANL PAC also extends its impact to the communities surrounding the university campuses. Through its openness to hosting events, talks, and workshops focused on sustainability, it actively promotes environmental education within society. These spaces serve as hubs for dialogue and awareness, capable of influencing the formulation of policies at both local and national levels.

A crucial aspect of the PAC-UANL is its significant contribution to the achievement of the United Nations Sustainable Development Goals, particularly Goal 13 (Climate Action). It plays a pivotal role in preparing the next generation of leaders, professionals, and citizens, instilling in them a profound understanding of the challenges posed by climate issues. In doing so, it establishes the groundwork for a more sustainable and resilient future.



Carbon balance

	Kg CO <sub>2</sub> (equivalent)	Balance
Electricity consumed	76,405,496	76,405,496
University buses (TigreBus)	313,185	76,718,681
Motor vehicles	2,042,000	78,760,681
Motorcycles	34,000	78,794,681
CO <sub>2</sub> storage in vegetation	-549,603,540	-470,808,859
Waste recycling	-1,581,207	-472,390,066
Digital education	-6,834,112	-479,224,178

Source: Project Development Directorate of the Ministry of Sustainability.

Reduction of greenhouse gas emissions GHG program – Mexico

Campus	Vegetation Type	Surface (ha)	Vegetation (ha)	Factor (C ha1)	Stored carbon (ton)	CO <sub>2</sub> equivalent (ton)
Mederos	Submontane scrub	193.60	161.10	41.30	6,653.43	24,418.09
Linares	Thorny thicket	772.60	680.00	34.50	23,460.00	86,098.20
Iturbide	Pine-Oak	988.60	989.00	34.50	34,120.50	125,222.24
Marin	Thorny thicket	1,052.40	1,051.00	51.80	54,441.80	199,801.41
Bravo	Thorny thicket	630.00	600.00	51.80	31,080.00	114,063.60
<b>Total</b>		<b>3,637.20</b>	<b>3,481.10</b>	<b>213.90</b>	<b>149,755.73</b>	<b>549,603.54</b>

Source: Project Development Directorate of the Ministry of Sustainability.



## NATURAL ENVIRONMENT RECOVERY CAMPAIGNS IN URBAN AREAS

The growth of cities has become a threat to the natural environments found in or around urban areas. These are fragmented ecosystems, parks, green corridors and wetlands, which in most cases are public spaces with positive effects on people's physical and mental health. They also provide various environmental benefits such as improving air quality, recharging groundwater, promoting pollination, mitigating the effects of droughts and floods, conserving biodiversity, and reducing the effects caused by heat islands, among others.



In this context, the Universidad Autonoma de Nuevo Leon, through the Project Development Office of the Sustainability Department, promotes the "Campaigns for the Recovery of Natural Environments in Urban Areas", with the objective of recovering public spaces with ecological importance to improve the environmental quality of urban areas, which can also be used as areas of social coexistence and recreation.

During the period 2016 to 2022, a total of 19 campaigns were held in 8 natural environments located in 5 municipalities of the city of Monterrey and its metropolitan area, with the participation of more than 3,500 volunteers.

The realization of the Campaign has been the result of teamwork carried out by different social actors who participated voluntarily in its realization, among which are the student, academic and administrative community of the UANL, public (municipal and state) and private institutions, as well as civil society organizations.



**19** events  
with over  
**3,500**  
participants





**5 municipalities**



**8 natural areas**



**19 events**



Actions carried out during the Campaigns:

- Removal of improperly dumped municipal solid waste.
- Carry out actions to prevent the growth of invasive species populations in the intervened areas.
- Environmental education workshops in order to show volunteers the structure and functioning of the natural environments intervened, as well as the benefits derived from the implementation of the workshops.

The Campaigns are regarded as dynamic learning laboratories where all participants, drawing from their respective disciplines of study and/or areas of expertise, contribute their knowledge and experience to enhance the state of the natural environments under

intervention. Additionally, they foster awareness about the significance of such actions in enhancing the quality of life in urban areas.

Over time, the Natural Environment Recovery Campaigns in Urban Areas have been replicated by numerous educational institutions, both public and private, as well as civil society organizations across the state of Nuevo Leon. This replication has successfully achieved an additional objective, as it has been embraced by society as a commendable environmental conservation practice.

*Natural environment recovery campaigns in urban zones  
2016 to 2022*

Municipality	Site	Campaigns held
Escobedo	Wetland located in Jardines del Canada	3
Monterrey	Protected Natural Area "Rio la Silla"	6
	Protected Natural Area "Parque Lago"	2
	Forest reserve area of the UANL Mederos Campus, School of Communication Sciences.	1
Santa Catarina	Ecological Park "La Huasteca"	4
San Pedro Garza García	"Santa Catarina" River	1
	"El Capitan" Creek	1
Linares	"Efraim Hernandez Xolocotzi" Botanical Garden	1
<b>Total</b>		<b>19</b>



## PROMOTION OF SUSTAINABLE AGRICULTURAL AND LIVESTOCK PRODUCTION

### CENTER FOR RESEARCH IN AGRICULTURAL PRODUCTION

The Center for Research in Agricultural Production (CIPA) at the Universidad Autonoma de Nuevo Leon (UANL) is a highly significant academic institution that plays a crucial role in promoting research, development, and education in the agricultural field. This initiative benefits not only the academic community but also society at large by fostering innovation and sustainability within this fundamental sector of the economy and food production.

CIPA boasts modern and technologically advanced facilities that enable us to conduct high-quality research in various areas. These range from genetic improvement in crops and livestock to the implementation of sustainable practices in agricultural production.

Furthermore, the UANL actively collaborates with local farmers and ranchers, offering technical advice and knowledge transfer. This contribution significantly enhances the development of the agricultural industry in the region. Additionally, the UANL plays a pivotal role in the training of future professionals in agriculture and livestock, ensuring that students acquire practical experience and cutting-edge knowledge.



Some of CIPA's most significant recent achievements include the following:



#### Ecological farming:

Grain and fodder production system: The establishment of crops without agricultural work that removes the soil, management of residues from the previous harvest and weed control with herbicide application. This reduces soil erosion and gradually increases the percentage of organic matter.

#### Diversification of production (vineyards):

Since 2011, UANL has embarked on the establishment of vineyards (*Vitis vinifera* L.) as an alternative crop with low water requirements, making it ideal for semi-arid regions. They have utilized various wine grape varieties, including Cabernet Sauvignon, Merlot, Malbec, Shiraz, Chardonnay, and Chenin Blanc, in their efforts to identify a profitable crop that can make a significant economic contribution to the region. In 2019, the Tempranillo and Chenin Blanc varieties were introduced, and currently, there are four hectares under cultivation.

#### Environmental management units

In 2008, CIPA established the Environmental Management Unit known as the 'White-tailed Deer Genetic Improvement Center.' This center is registered (PVSNL-UMA-EX0296-NL) and recognized by environmental authorities. The development of this project aims to promote the production of Texan white-tailed deer of high genetic quality. This is achieved through the selection and controlled crossbreeding of parents for research and teaching purposes, with the ultimate goal of supporting the conservation and enhancement of Texan white-tailed deer populations in the northeastern part of the country.





### Advances in research on livestock varieties that generate fewer greenhouse gases (GHG):

In regards to feed efficiency, CIPA has developed livestock production methods, such as the Feed Efficiency Evaluation program. These methods have not only reduced production costs but have also mitigated the environmental risks associated with livestock production. This is because improving feed efficiency results in reduced feed consumption, subsequently decreasing the production of organic waste and methane emissions into the atmosphere. Through the selection of replacement sires based on the determination of Residual Feed Intake (RFI), which has proven to be a valuable tool for identifying specimens with superior production characteristics compared to their contemporaries, CIPA contributes to genetic improvement in the herd. Economic traits with medium to high heritability are of utmost importance, and by selecting for these traits, genetic enhancement within the herd is achieved.



### Wine Production UANL

Residual feed intake is regarded as a measure of feed efficiency as it remains independent of the rate of gain and mature body size. Therefore, the utilization of feeding technologies facilitates the measurement of RFI, enabling efficient and cost-effective progress in cattle feeding.

The UANL created a collection center in 2022 where regional producers can entrust their products to fulfill the requirements of winemaking. It is also a state-of-the-art space where researchers and students can engage in research and training to produce high-quality wines.

Due to the high energy consumption associated with wine production equipment, solar panels have been installed to generate renewable and environmentally friendly energy. This initiative has resulted in substantial savings in UANL's energy costs.





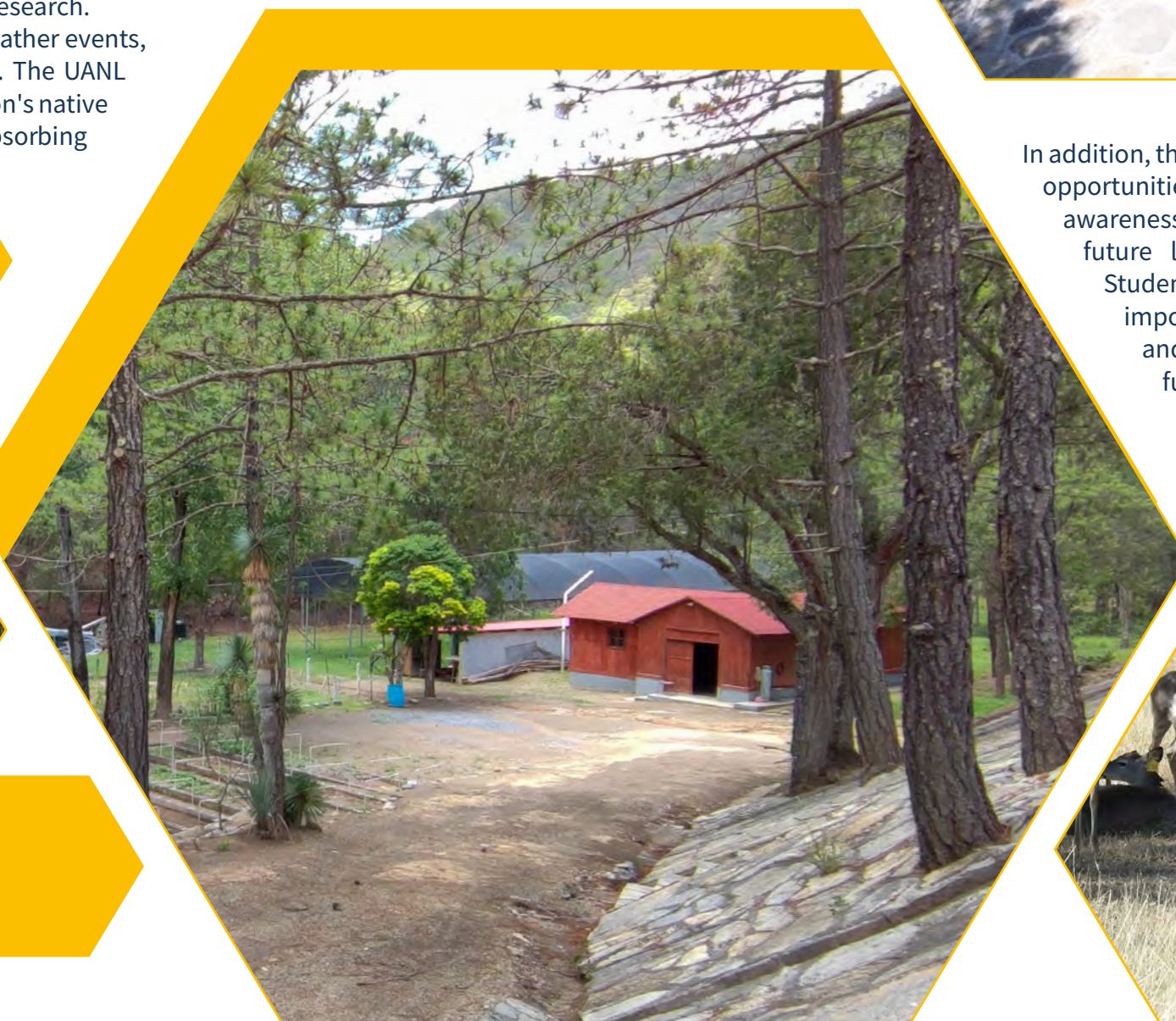
## FOREST SCHOOL

The Forest-School (BE) of the Universidad Autonoma de Nuevo Leon (UANL) has been a part of the university's heritage since 1985 and falls under the management of the Center for Research in Agricultural Production (CIPA). It is situated in the municipality of Iturbide, Nuevo Leon, with geographic coordinates at 24°42'24.64" N and 99°51'40.86" W. The elevation within the area varies, ranging from 1,280 meters above sea level at its lowest point to 1,890 meters above sea level at its highest. The total area spans 1,077 hectares, and the predominant vegetation types include oak, oak-pine, pine, pine-oak, cedar, and scrub-chaparral.

The BE plays a crucial role as a climate change adaptation action in the region. This innovative project not only promotes biodiversity conservation, but also serves as a valuable educational resource and a natural laboratory for environmental and climate change research. In a world affected by rising temperatures and extreme weather events, forests play an essential role in mitigating these impacts. The UANL Forest-School helps maintain an important part of the region's native forests, which contributes to local climate regulation by absorbing carbon dioxide and releasing oxygen.



In addition, this space offers unique opportunities for environmental awareness and the formation of future leaders in sustainability. Students can learn about the importance of forest ecosystems and how to protect them, which is fundamental to face the challenges of climate change.

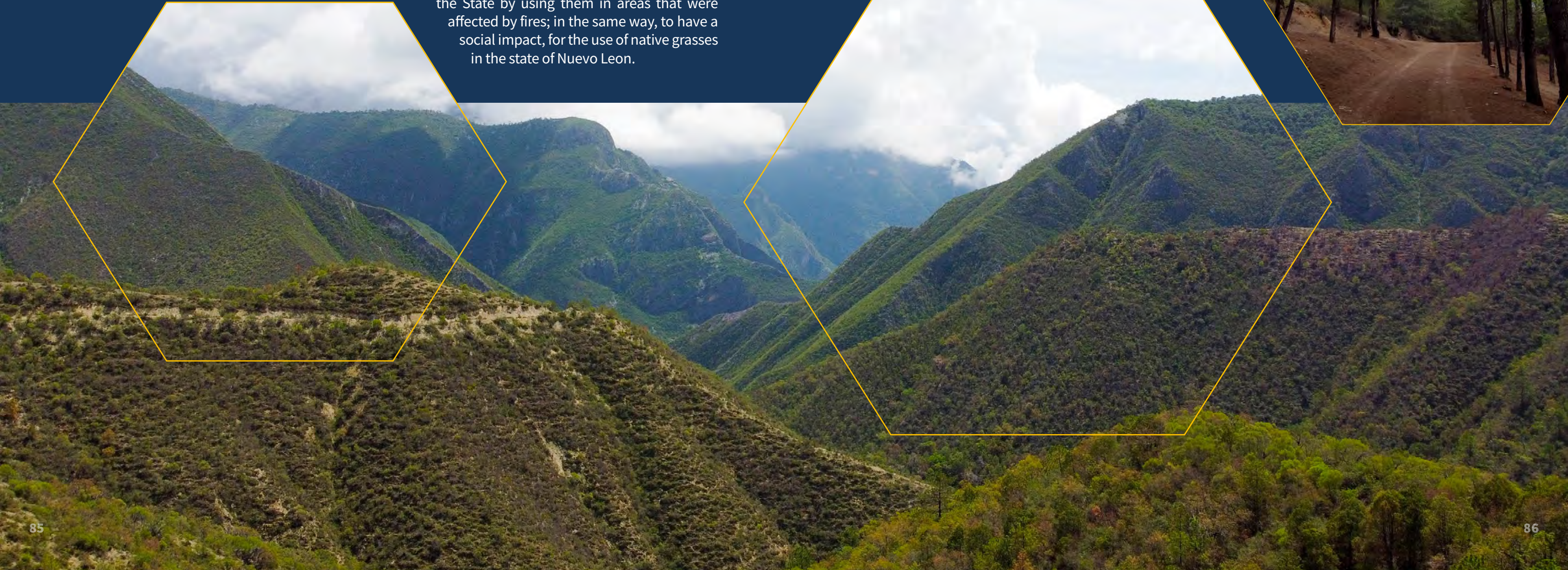






### Seed production for reforestation of areas affected by fires in Nuevo Leon:

The Universidad Autonoma de Nuevo Leon (UANL) and the Fondo Ambiental Metropolitano de Monterrey (FAMM) joined forces to establish the cultivation of Navajita (*Bouteloua gracilis* H. B. K.) and Banderilla (*Bouteloua curtipendula*, Michx.), in the facilities of the Center for Research in Agricultural Production (CIPA) of the UANL, which are considered native grasses of northern Mexico, through an irrigation system, with the purpose of the availability of seeds of these species, to meet the needs of the State by using them in areas that were affected by fires; in the same way, to have a social impact, for the use of native grasses in the state of Nuevo Leon.





## FOREST SCHOOL

Located in the municipality of Iturbide, Nuevo Leon.



**1,077**  
hectares  
total area

The predominant vegetation are oak, oak-oak, ash-cedar, pine, pine-oak, cedar and scrub-chaparral



## CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY AND NATURAL RESOURCES

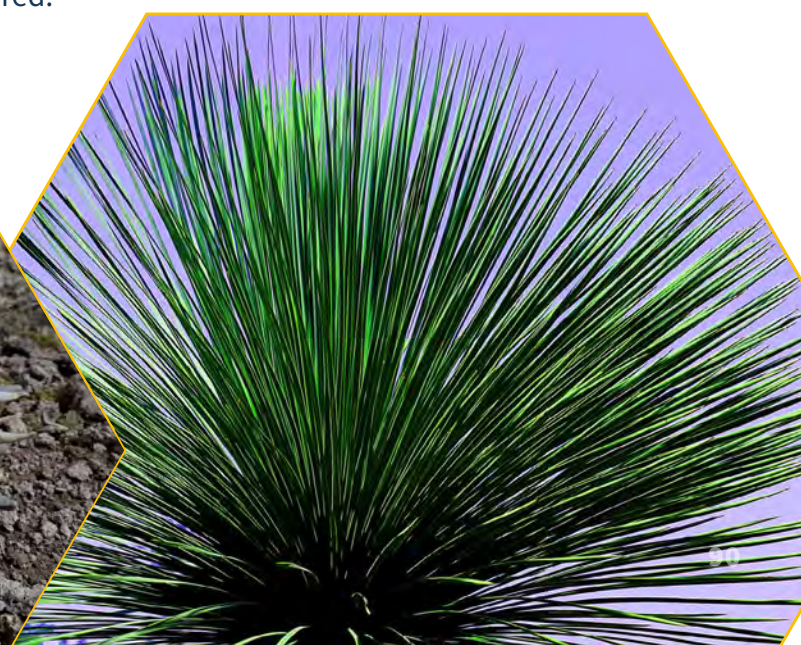
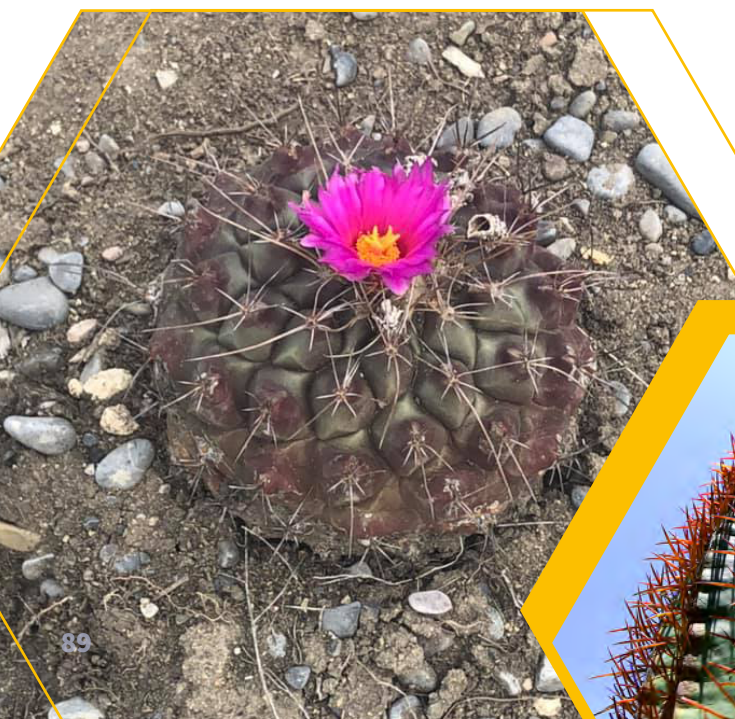
### “EFRAIM HERNANDEZ XOLOCOTZI” BOTANICAL GARDEN

The "Efraim Hernandez Xolocotzi" Botanical Garden (JB-EHX), managed by the Universidad Autonoma de Nuevo Leon, is a natural treasure housing a unique wealth of biodiversity in the region. Due to its design and characteristics, it can be considered a green oasis, which is not only a refuge for the conservation of endangered and endemic plants, but also an educational space of enormous importance. Through its botanical collection, scientific research and outreach programs, the garden plays a fundamental role in promoting environmental awareness and understanding of local ecosystems.

The Botanical Garden is in charge of the School of Forestry Sciences and is located in the Linares Campus of the UANL in the municipality of Linares. It covers an area of 10 hectares and currently has a collection of more than 60,000 plants of 75 species, mainly cacti and succulents, of which 24 species are at risk of extinction (NOM-059-SEMARNAT-2010). It is registered as a Wildlife Conservation Management Unit (PVSNL-UMA-IN-1270-NL), which officially accredits it for plant reproduction and exchange with other botanical gardens, as well as for receiving confiscated and rescued plants.

At JB-EHX, studies are conducted on the biology and ecology of plant species in the region, addressing phenology, pollinators, predators and endemism. This research is mainly carried out by undergraduate and graduate thesis students from the School of Forestry Sciences and other institutions of higher education in the country. In terms of teaching, the JB-EHX is a support space for courses in Botany, Ecology, Conservation, and those related to the management of natural resources. Likewise, the JB-EHX serves for the analysis of the practical implications of the establishment and management of a botanical garden as a UMA (Management Unit for the Conservation of Wildlife).

Since 2018, the Garden has initiated an environmental education project in collaboration with Regional Unit No. 7 of the Education Department of the State of Nuevo Leon government. This project encompasses four municipalities and involves a total of 1,798 teachers serving 28,720 students across 571 educational establishments, including preschools, elementary, secondary, and special education schools. By 2022, over 5,000 students and 200 teachers from elementary and middle schools in the Linares region had been registered.







The Efraim Hernandez Xolocotzi Botanical Garden is a space of great social relevance as a source of knowledge that contributes to the rational use of biodiversity and to the formation of citizens committed to the care of nature.

10

hectare extension

Over 60 thousand plants of

75 species





## UANL ETHNOBIOLOGICAL GARDEN AT THE MARIN UNIT

The Ethnobiological Garden (JEB) of the UANL based at the Marin Unit was established in 2019 with the support of the National Council of Science and Technology (CONAHCYT). This space represents the fusion between biodiversity and the cultural richness of the region. It houses a wide range of traditionally used plant species, in addition to fostering the conservation of native flora and promoting environmental education. It also serves as a platform for research and innovation in ethnobotany, contributing to sustainable development and the preservation of cultural heritage.

The garden is located in the Marin Unit of the School of Agronomy of the UANL, 25°52'26.9"N y100°02'47.6"W, at 375 meters above sea level. It consists of 4 main areas:

1. Conservatorium, is a 3-hectare space located next to the "La Juventud" dam, it has a bird watching point and a palapa (gazebo) for reception and talks to school groups.
2. Collectarium, consisting of 1,870 m<sup>2</sup> in 3 terraces that include collections of diverse plants.
3. Germplasm bank, a collection of native seeds of ethnobotanical importance, which come from the plants present in the garden and from collections in natural areas of the region.
4. Nursery, a garden center section for the propagation of plants native to the region.

As part of its educational outreach, the JEB has organized workshops and talks at elementary schools and educational centers in the region. The aim is to share the knowledge generated by the JEB team with students of various grade levels. For instance, at the CECyTE Marin Unit, talks were conducted on the ethnobiologically significant species of Nuevo Leon. In the municipality of Aramberri in the south of the state, workshops titled 'The Flora of the Region: Do You Know the Growth of Lechuguilla?' were held for elementary school students. Additionally, in the municipality of Garcia, workshop titled 'From Seed to Plant: UANL Ethnobiological Garden' were presented to 4th, 5th, and 6th grade students, with support from the UANL Magic Beginnings in Science program. Furthermore, thematic fairs will be organized as part of ExpoSur, an event hosted by the FA-UANL. Through the JEB's Environmental Education program, the dissemination of science and information on the ethnobiological resources of the region reaches diverse segments of the population.



### Exploitation of the native micro diversity of Nuevo Leon to obtain high value-added products

The "Biomolecular Innovation in Agricultural Research" project, initiated in 2011 and developed within the School of Agronomy at UANL, has led to the establishment of the Natural Sciences Laboratory within this department. This project is dedicated to the exploration and utilization of the native microdiversity found in Nuevo Leon. Its primary objective is to identify strains with significant biotechnological potential, which have undergone rigorous validation in the biotransformation of agro-industrial waste, following the concept of lignocellulose biorefinery.

These isolates, along with the enzymes and metabolites they produce, offer significant improvements in various processes, including bioremediation of synthetic dyes, modification of the functional properties of dough and bakery products, enhancement of production parameters in rabbit and chicken meat production through enzyme supplementation, and the development of bio-transformed food. Additionally, researchers have obtained nanoparticles with high potential for applications in animal feed and for the bioremediation of effluents.





On the other hand, cultivating these organisms in agro-industrial residues has not only yielded enzymes of industrial significance but has also produced metabolites with antifungal properties used in seedling production and the development of fruit coatings. This approach presents an organic alternative for agriculture and post-harvest strategies. Currently, researchers are exploring the potential of native basidiomycetes for the production of enzymes, antioxidants, antifungal and antimicrobial metabolites, as well as the generation of biofuels and biomaterials, such as prebiotic fibers. They utilize agro-industrial waste from the region as raw materials and incorporate life cycle analysis and energy balance considerations, thereby contributing to the sustainability of processes and environmental conservation.



The project has made significant contributions, including the training of 22 human resources at the undergraduate, master's, and doctoral levels. It has also resulted in the publication of 37 scientific articles and book chapters, active participation in national and international congresses, the acquisition of a patent, and the receipt of two research awards. Moreover, the project has facilitated the establishment of the social initiative "Magic Beginnings in Science." Its primary aim is to promote scientific awareness among the children of Nuevo Leon, while also emphasizing the importance of natural resources, their conservation, and responsible utilization.





## GERMPLASM BANK

Germplasm banks are established facilities designed for sample storage, typically orthodox seeds. However, they can also serve as repositories for samples stored through in vitro tissue or in vivo methods. Their primary objective is the ex situ conservation of germplasm, making them valuable tools for preserving genetic characteristics that are at risk of extinction. Additionally, these banks play a crucial role in safeguarding genetic diversity, which is essential for the development of new plant varieties through genetic improvement. This is particularly important for plant species of significance in food and commerce, allowing them to better address challenges posed by climate change, such as resistance to drought and high temperatures, which are among the most critical factors affecting agricultural production.

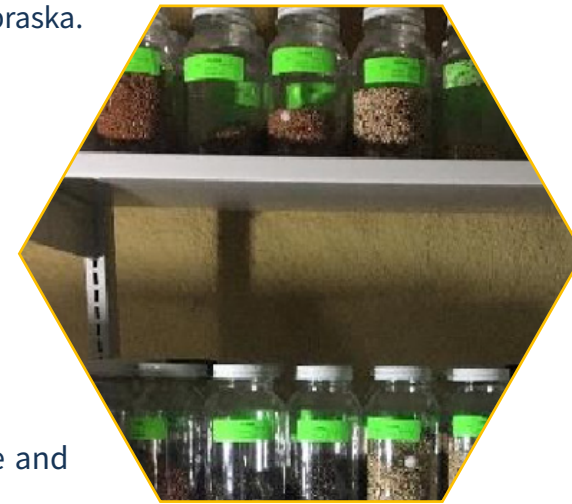
The School of Agronomy of the UANL developed in the 80's a project called "Unidad de Recursos Geneticos" (Genetic Resources Unit) in the Unidad Marin, located in the municipality of the same name, whose purpose was the conservation of germplasm through seeds of different species of agricultural and livestock importance, such as corn, beans, sorghum, oats, wheat and different types of forage grasses, among others. Since then, it has existed for the safeguard, conservation, utilization and improvement of seed collections of the mentioned crops.

The germplasm bank stores native seeds of plant species, primarily sourced from the state of Nuevo Leon. These seeds have been collected with the assistance of the university itself (PAICYT) and funding acquired through projects sponsored by CONAHCYT as well as external

organizations like the collaborative project with the University of Nebraska.

The germplasm bank is made up as follows:

- a). Work area for seed analysis. 5 x 4 x 2.6 m (52 m<sup>3</sup>)
- b). Office of 5 x 4 x 2.6 m (52 m<sup>3</sup>)
- c). Office for technician of 4 x 2.5 x 2.6 m (26 m<sup>3</sup>)
- d). Warehouse 4 x 6 x 2.6 m (62.4 m<sup>3</sup>)
- e). Cold room 1.6 x 4.1 x 2.65 m (65 m<sup>3</sup> occupied approximately 30 m<sup>3</sup>). There is a compressor to maintain the temperature between 0-50C and a RH of 20-35 %.
- f). Cold room 2.7 x 6 x 2.6 m (109 m<sup>3</sup>)
- g). Working area. 6 x 3 x 3 m (54 m<sup>3</sup>). It has a table and shelves.



The number of accessions currently in the cold room is approximately 3,000 samples, which mostly include seeds resulting from the genetic improvement of grain sorghum, sweet sorghum, and corn. Particularly in the case of corn, it comprises a group of about 60 native corn varieties from the state of Nuevo Leon, and recently, a collection of seeds from native species (cacti, herbaceous, and shrub species) has been incorporated as part of the Ethnobiological Gardens project funded by CONAHCYT.

This collection has identified valuable traits in crops, such as the development of sorghum varieties with high sugar content in their stalks for fermentation and biofuel production, as well as native corn varieties with high anthocyanin content—an element that promotes human health as an antioxidant.

Recognizing the significance of conserving genetic resources to address future food challenges, it is strongly recommended that the germplasm bank be maintained under suitable conditions to ensure its proper functioning.







# 12 RESPONSIBLE CONSUMPTION AND PRODUCTION



## WASTE

### Institutional Program for the Handling and Integral Management of Waste

With the purpose of adequately managing the different types of waste generated at the UANL within the current legal framework, the Sustainability Department (SS) through the Environmental Management and Operational Safety Head Office (DGASO) promotes its correct classification, identification, labeling, storage and final disposal through the institutional program for the management and integral management of waste, which is applied in academic and central offices.



### Municipal Solid Waste (MSW)

In accordance with the General Law for the Prevention and Integral Management of Waste, Municipal Solid Waste generated at UANL is collected and transported by authorized companies to the landfill of the Integral System for the Ecological Management and Processing of Waste (SIMEPRODE) in the municipality of Salinas Victoria, Nuevo Leon. This landfill is under the administration of the Government of the State of Nuevo Leon.

At this facility, collection trucks deposit the waste, which is then directed to a sorting plant responsible for separating recyclable materials such as cardboard, paper, aluminum, plastic, and steel. The remaining non-recyclable waste is transferred to landfill cells where it undergoes compaction to reduce its volume. Layers of clay and soil are applied to cover the waste.

Furthermore, there is infrastructure designed to capture methane (biogas) generated during the anaerobic decomposition of organic waste. Wells are strategically placed to monitor leachate. The collected biogas is transported through a specialized system to the bioenergy plant operated by the Sustainable Services of Nuevo Leon Association (Servicios Sustentables de Nuevo Leon S.A. de C.V.), which is connected to the landfill. At this plant, the biogas is converted into electricity, which serves as a power source for the public lighting systems in seven municipalities within the Monterrey metropolitan area. It also provides power to five state government agencies, Fundidora Park, and the Metrorrey Public Transportation System (urban electric train). This initiative contributes significantly to the country's efforts to mitigate greenhouse gas emissions.





## Waste Separation and Recycling Program (PROSER)

In February 2013, UANL initiated the Waste Separation and Recycling Program (PROSER). Currently, this program operates systematically in 65 institutions, comprising 42 academic schools and 23 central departments. The program's primary objective is to segregate recyclable materials (including cardboard, paper, aluminum, and PET) at the source of generation by providing dedicated containers for this purpose.

Once the recyclable waste is collected from UANL facilities by local companies, it is integrated as raw material into their own processes or those of third-party entities. This material is then utilized in the production of new products such as recycled cardboard, paper, aluminum cans, and PET bottles. It's important to note that this approach aligns with the principles of a circular economy, as established by the General Law of Circular Economy.



Annual generation of paper, cardboard, aluminum and PET



In 2022, the Waste Separation and Recycling Program (PROSER) operated in

**65** university facilities

### APOYA EN LA SEPARACIÓN DE LOS RESIDUOS

Únete y colabora con la separación de residuos en la UANL, depositando lo correspondiente en cada uno de los contenedores que se encuentran instalados en el Edificio y Anexo.

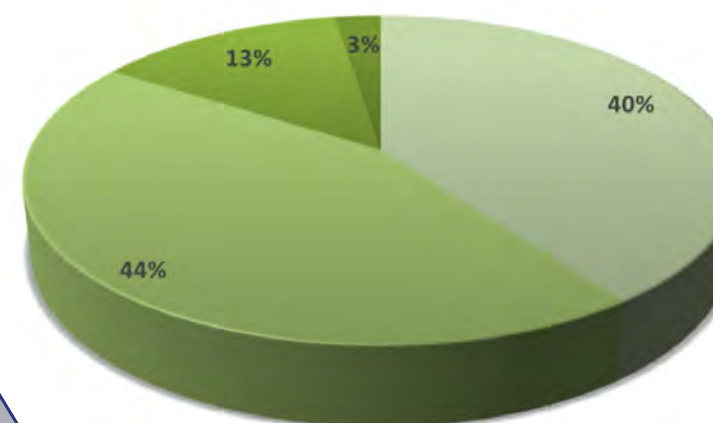
Puedes identificarlos por los colores de las tapas y sus etiquetas

- Papel**  
Papelera NO confidencial  
Perifoneo  
Revistas y libros  
Cartón  
Libretas sin resorte  
Sobres de papel
- Latas y PET**  
Latas de aluminio  
Botellas de refresco y agua (sin tapa y sin líquido)
- Basura General Orgánica**  
Restos de comida  
Recipientes de unicel  
Residuos sólidos de café  
Envases tetrapack  
Envolturas de alimentos (frituras/galletas)



Characterization of recyclable material 2013-2022

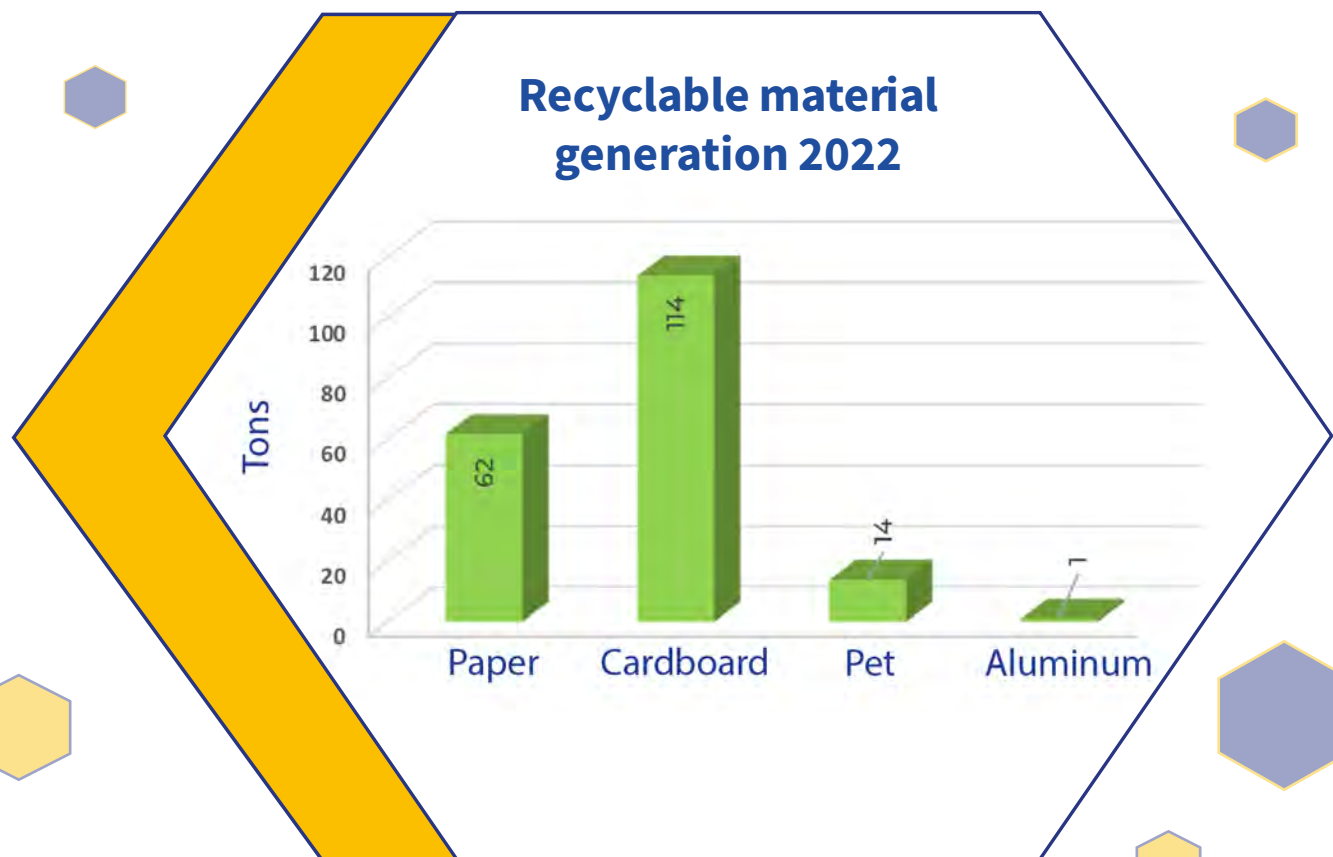
■ Paper ■ Cardboard ■ PET ■ Aluminum



From February 2013 to December 2022, a substantial total of 1,798.65 tons of recyclable material was successfully collected. This accomplishment yielded significant environmental benefits, such as conserving 8,070,690 kWh of energy, saving 54,559,654 liters of water from consumption, preserving 25,728 trees from being felled, preventing the emission of 6,127 tons of CO2, avoiding the utilization of 342,270 liters of oil, sparing 5,180 cubic meters of landfill space, and avoiding the need for 178 tons of bauxite.



In the year 2022 alone, a noteworthy amount of 190.14 tons of recyclable material was gathered, leading to considerable environmental advantages. These advantages include the conservation of 803,251 kWh of energy and the preservation of 5,378,326 liters of water, among other benefits, as depicted in the following figure:



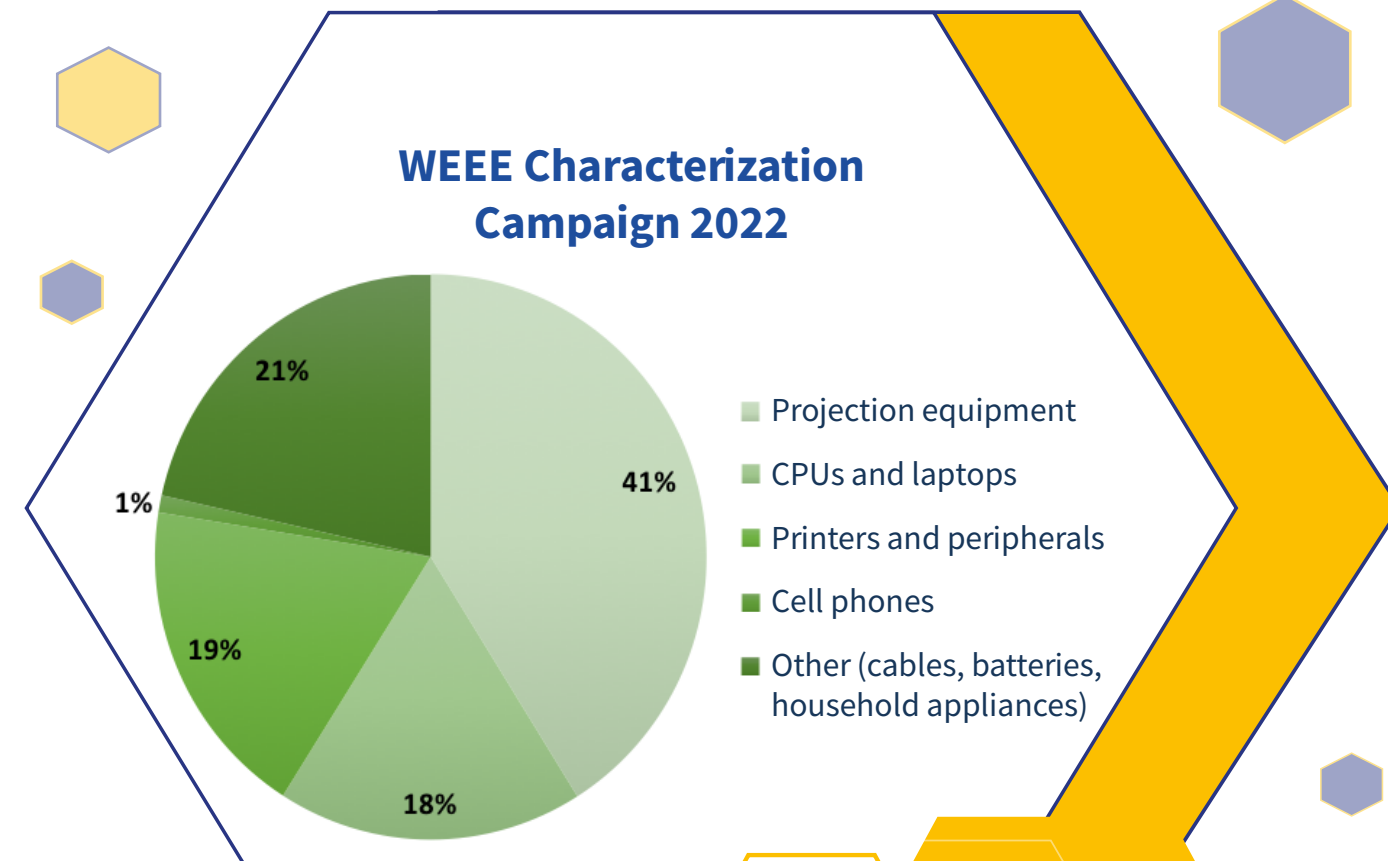
<b>2,981</b> Uncut trees	<b>5,278,326</b> Liters of water not consumed	<b>803,251</b> KWH unused electricity	<b>621</b> Tons of Co <sup>2</sup> not emitted
-----------------------------	--	--	---

<b>19,580</b> Liters of unused PET/Plastic oil	<b>501</b> Unused m <sup>3</sup> sanitary landfill	<b>4.09</b> Bauxite unused tons
---	---	------------------------------------

### Special Waste Management (SWM)

Given the current digital era, there has been an increase in the amount of waste electrical and electronic equipment generated, which can be harmful to the environment and human health if not disposed of properly.

In order to avoid this problem, the UANL through the SD conducted 2 electronic recycling campaigns in June and October 2022 in which 35.70 tons of Waste Electrical and Electronic Equipment (WEEE) were collected.



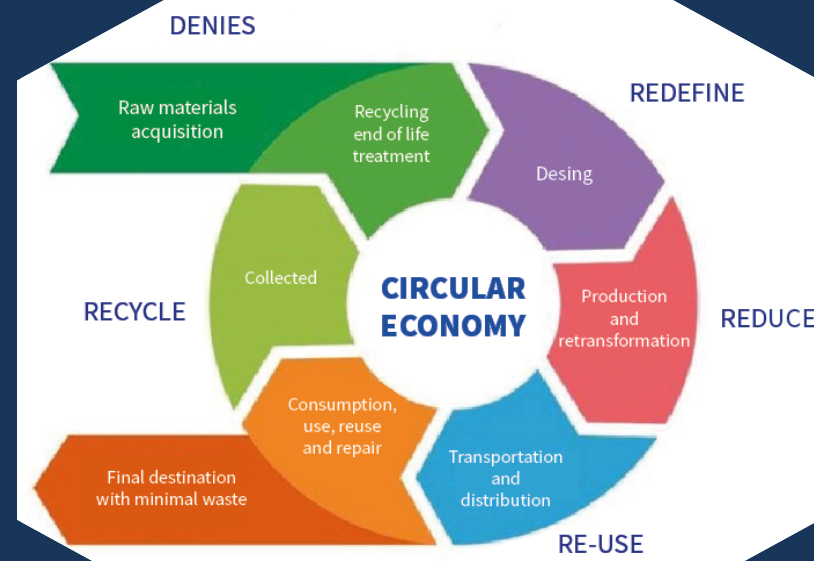
**131**  
tons of CO<sub>2</sub> not issued

**834,902**  
kWh electricity not used





Once collected by a service provider authorized by the state government, the waste is taken to collection centers where it is sorted into groups and separated into its different components. For example, plastic is taken to local recyclers to be incorporated as raw material for making new products such as toys and pallets; copper and aluminum are sent to a national foundry for making electrical cable, copper tubing, aluminum coils, etc.; and finally, electronic cards and power supplies are sent to foreign companies where precious metals and other materials are recovered and incorporated into other production cycles for making cell phones, car seats, fans, pens, etc. Therefore, the waste generated at UANL follows a circular economy model as shown in the following chart:



Source: Foundation Ellen McArthur





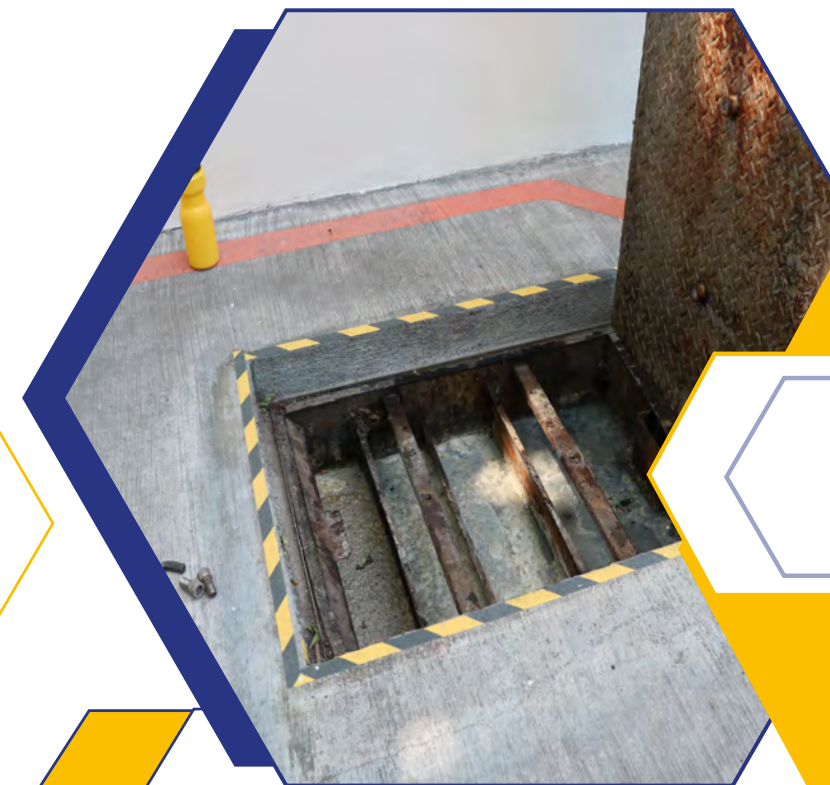
### Organic waste for educational purposes

The treatment of organic waste is becoming increasingly important given the dimension of the problem it represents, not only because of the increase in the volumes generated, but also because of the use of chemical fertilizers which, in addition to polluting the environment and having a higher cost, represent a health risk for the people who handle them and for the consumers of the products.

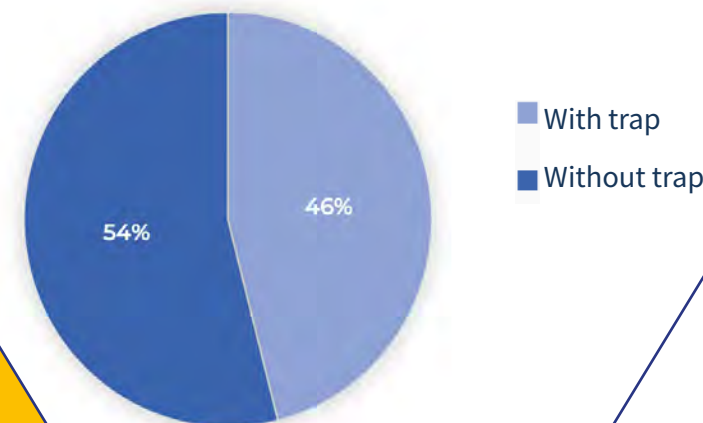
The School of Agronomy of the UANL is carrying out a project with didactic purposes for the use and utilization of livestock waste (manure) and pruning waste (garden waste) from the Marin campus, which consists of treating such waste using earthworms to obtain humus or compost (vermicompost) and a leachate rich in essential nutrients (fulvic acids) which are used to fertilize the nursery, experimental crops and gardens of the campus.



During the year 2022, approximately 0.75 tons of organic waste were treated, obtaining a total of 350 kg of humus or compost, as well as 500 liters (L) of leachate.



Grease traps in UANL cafeterias



27.20 tons of vegetable oil were collected to be recycled and subsequently used in the manufacture of environmentally friendly chemical products and biofuels.

Currently, there is a 46% progress in the installation of grease and oil traps in the UANL cafeterias to comply with Official Mexican Standards NOM-002-ECOL-1996 "Maximum permissible limits of contaminants in wastewater discharges to urban or municipal sewage systems" and NOM-251-SSA1-2009 "Hygiene practices for the processing of food, beverages or food supplements".

In 2022,  
**27.20 tons**  
of vegetable oil  
was collected from  
cafeterias operating  
in different university  
facilities

### Waste fats and oils from cafeterias

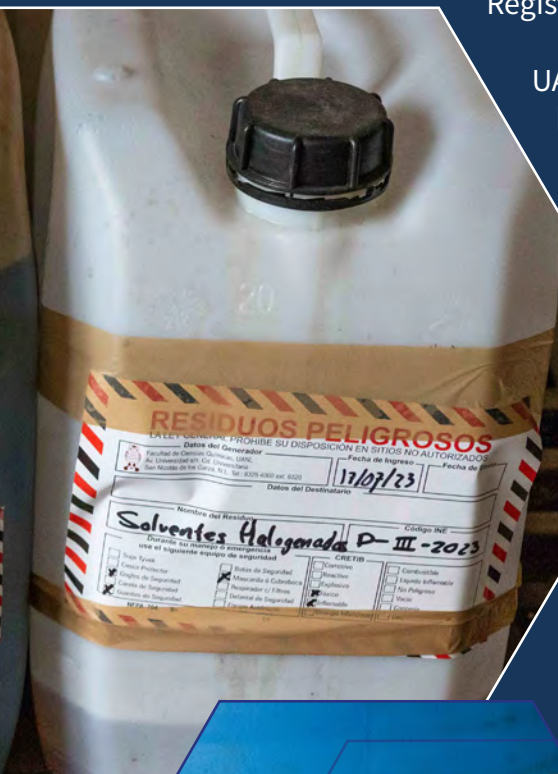
One of the main causes of contamination of surface and groundwater is the uncontrolled dumping of waste generated in the preparation of food, such as vegetable and/or animal oils and fats. UANL promotes a program for the collection and disposal of vegetable oil generated in the cafeterias that operate on campus with a specialized company that has the corresponding authorizations. In 2022,



## Hazardous Waste (HW)

In the management of HW it is important, first of all, to obtain registration as a generator before the Ministry of the Environment and Natural Resources (SEMARNAT), based on the average estimate generated in a year, locating the category in which they are (micro, small or large generator) in order to perform the management correctly. During the January-December 2022 period, 6 university departments completed the procedures before this federal agency and obtained their Environmental Registration Number (NRA) with the support and advice of the DGASO.

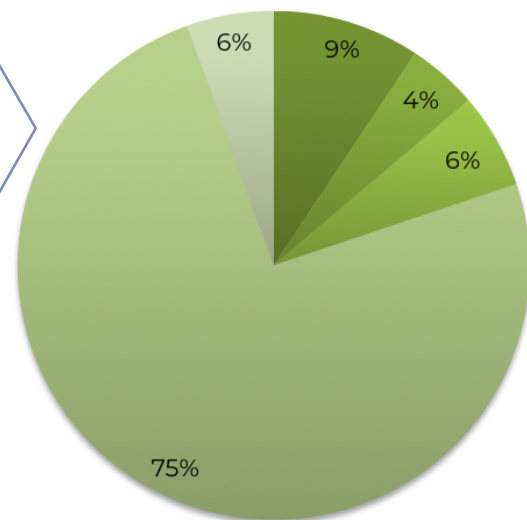
UANL has procedures to standardize the handling and disposal of hazardous waste in all of its facilities. During 2022, a total of 247.98 tons of hazardous waste was generated, of which 75% corresponds to Biological Infectious Hazardous Waste (BIHW) and the remaining 25% to chemical HW, which were managed in accordance with the current legal framework.



### Biological Infectious Hazardous Waste (BIHW)

These are those materials generated during health care services that contain biological-infectious agents according to the definition of NOM-087-SEMARNAT-SSA1-2002. During 2022, a total of 186.54 tons of this type of waste was generated. Seventy-five percent corresponded to non-anatomical waste and the remaining 25% to the other 4 types of BIHW as shown in the following chart:

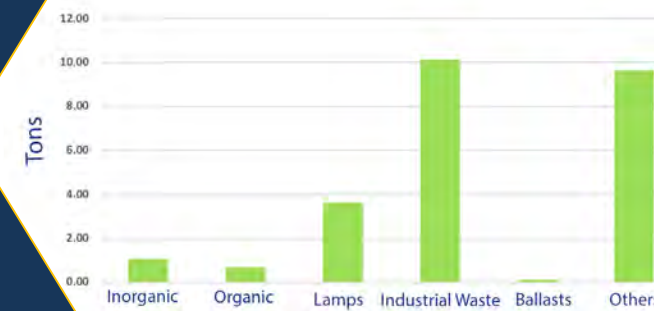
#### 2022 BIHW Characterization



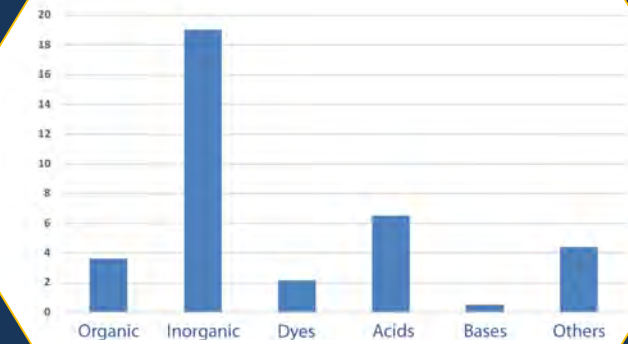
- Blood
- Pathological
- Sharp objects
- Cultures and strains of infectious agents
- Non-anatomical waste

During the same period, 61.44 tons of hazardous chemical waste were generated, of which 25.22 tons corresponded to solid waste and 36.22 tons to liquid waste.

#### 2022 Solid HW



#### 2022 Liquid HW



**100 %**  
of hazardous waste is managed in accordance with current legislation







**247.98 tons**

**Hazardous waste management and disposal**

**In 2022, 879.20 kg of expired medications was collected**

**61.44 tons of hazardous waste of chemical origin was generated, of which 25.22 tons corresponded to solid waste and 36.22 tons to liquid waste**



On the other hand, among the solid chemical origin hazardous waste are expired medicines. The UANL has 4 containers located in the University Pharmacy "Q.F.B. Emilia Vasquez Farias" of the School of Chemical Sciences, Technical Medical High School, UANL Medical Services and School of Nursing; the waste is deposited in these containers by the university community and the general public. During 2022, 879.20 kg of expired medicines were collected in the aforementioned collection centers.

Once collected by a company authorized by the corresponding authorities, HW is subject to treatment or confinement in accordance with current environmental regulations.

**Technical guidelines for waste handling and management**

The Sustainability Department of the UANL, through the Environmental Management and Operational Safety Department, formulated technical guidelines for:

- 🔹 Handling and management of urban solid waste with recyclable and special handling characteristics.
- 🔹 Handling and management of hazardous waste.

These contain information for university departments on the correct management of waste generated within the different university campuses. In addition to the sustainability guide for workshops and laboratories.





## RESPONSIBLE CONSUMPTION

The Universidad Autonoma de Nuevo Leon (UANL) promotes responsible consumption practices among members of the university community, which include reducing the use of single-use plastics, responsible waste management and the implementation of renewable energies, which also help reduce the institutional carbon footprint.

The reduction of the carbon footprint and the preservation of natural resources contribute directly to the fight against climate change and the protection of the environment.

Responsible consumption promotes civic awareness by encouraging students to consider the impact of their choices on society and the planet. This can inspire a generation of more engaged and ethical citizens. Additionally, responsible consumption practices mean significant economic savings for users by avoiding unnecessary spending and wasting fewer resources.

The program to replace the consumption of bottled beverages with drinking water available at the Ciudad Universitaria Campus, through 30 public drinking fountains supplied by two water purification plants, in 2022 recorded a consumption of 1,959,757 liters of water, which avoided the consumption of 3,919,757 bottles of 500 milliliters of bottled water in PET containers, which meant savings for users of about \$ 2 millions dollar per year.



*Economic benefits of the "Drinking water fountains" program*

Year	Number of liters of water consumed annually	No. of bottles (500 ml) not consumed annually	Annual savings for the users of the drinking fountains by not buying bottles (500 ml)
2019	2,469,293	1,215,110	\$ 2,047,706.00 (USD)*
2020	1,290,133	2,580,266	\$ 1,069,866.00 (USD)*
2021	607,555	4,938,586	\$ 503,826.00 (USD)*
2022	1,959,757	3,919,757	\$ 1,911,958.00 (USD)*

\*Considering the price of the 500 ml bottle at \$0.48 (USD)

From an environmental point of view, the drinking water program avoided the generation of 47 tons of PET, which in turn avoided the use of 255 m<sup>2</sup> of landfill space, among other environmental benefits mentioned below:

*Environmental benefits of the "Drinking water drinking fountains" program*

Year	Water consumed (L) in drinking fountains in CU	Equivalence in bottles (500 ml)	Ton PET not used	Energy not consumed (kWh)	Water not consumed (L) in the production of PET	CO <sub>2</sub> not emitted (ton)	Unused landfill (m <sup>2</sup> )	Oil saved (L)
2019	2,469,293	4,938,586	26	130,178	1,033,568	43.90	140	36,769
2020	1,290,133	2,580,266	31	155,993	1,238,528	52.60	168	44,061
2021	607,555	1,215,110	15	73,461	583,253	24.80	79	20,750
2022	1,959,757	3,919,514	47	236,958	1,881,367	80	255	66,930

In the year 2022, the consumption of almost **4 million** 500 ml bottles of water was avoided

saving users approximately **2 millions** US Dollars





# 7 AFFORDABLE AND CLEAN ENERGY



## EFFICIENT ENERGY USE

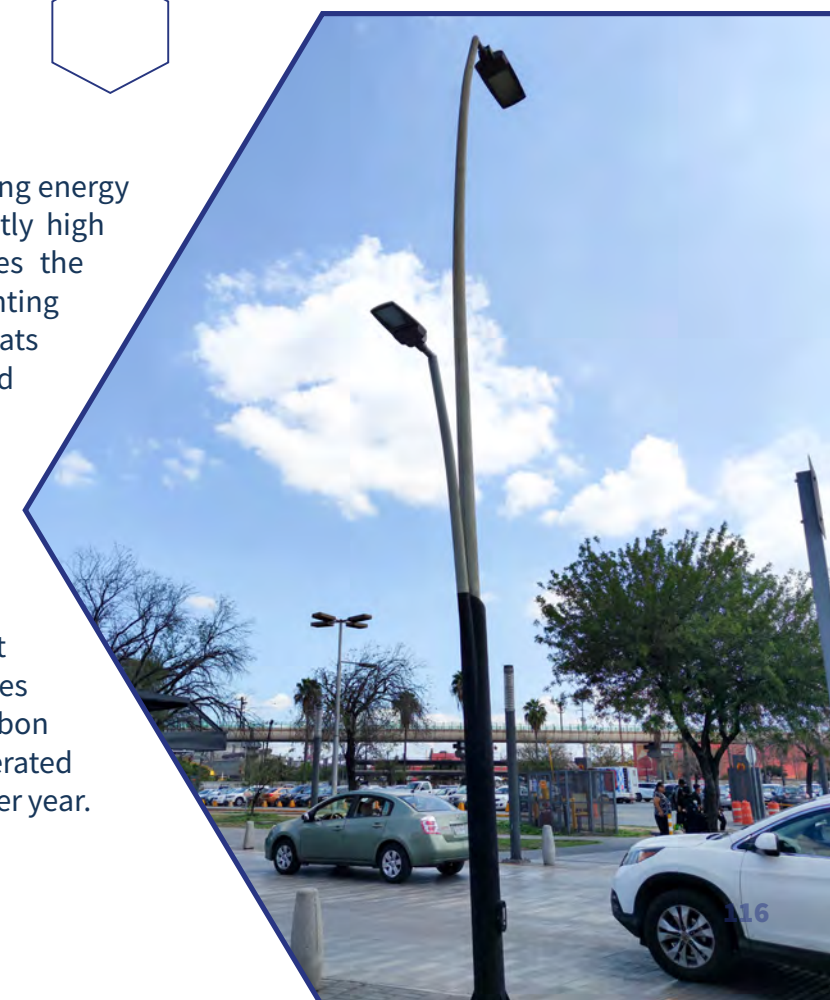


In 2022, the Universidad Autonoma de Nuevo Leon (UANL) recorded an annual energy consumption exceeding 90 million kWh, primarily allocated to meet the lighting and air conditioning demands of the approximately 230,000 individuals, including students, academics, and administrative staff, who study and work within its facilities.

**90,958,924 kWh**  
annual energy consumption in 2022

For over two decades, the UANL has been promoting energy efficiency on its campuses due to the consistently high annual energy consumption. This effort involves the implementation of technologies such as LED lighting systems, motion sensors, intelligent thermostats for precise and automated energy control, and the adoption of high-efficiency air conditioning systems in around 95% of university facilities.

Additionally, the UANL has made efforts to embrace renewable energy sources, including the installation of solar panels on roofs and wind generation systems. These measures not only decrease reliance on non-renewable sources but also significantly reduce the institution's carbon footprint. Currently, the UANL boasts a self-generated energy capacity of approximately 1,597,815 kWh per year.





The efficient use of energy in university environments plays a crucial role in the transition to sustainability. This practice not only contributes to reducing operating costs, but also promotes awareness of resource conservation and climate change mitigation among the student community and academic and administrative staff.

The emphasis on energy efficiency at UANL sets an example of responsible behavior for university community members. Therefore, educational efforts to highlight the significance of energy conservation can foster lasting environmental awareness and inspire future leaders to prioritize sustainability in their professions.



Energy consumption was

**399 kWh**  
per capita in 2022



Financially, reducing energy costs allows for reallocating resources to academic and infrastructure enhancements. Moreover, UANL, through its energy conservation efforts, contributes to electricity supply stability in the region and fosters energy resilience.



## TYPES OF ENERGY USED

According to a report provided by the supplier, of the total energy consumed in 2022, at least 35 % was generated using renewable sources.



**35 %**  
of self-generation of energy from renewable sources

## AUTOMATED ENERGY USE REGISTRATION SYSTEM

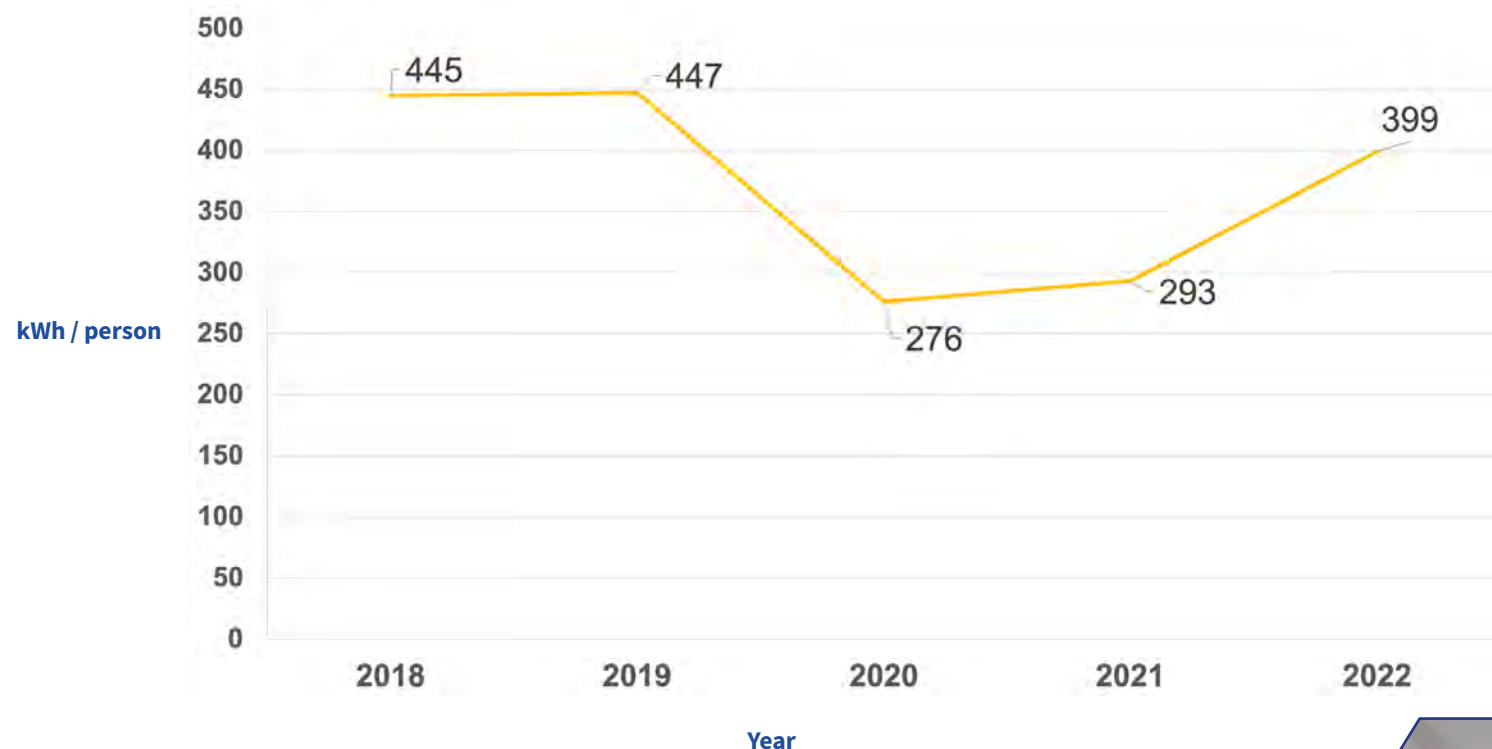
Since 2015, the UANL has implemented the Control Panel program, an automated system that records the energy consumption of university institutions throughout the year. This system is supported by 217 electric energy consumption meters and 48 gas meters, creating a database for real-time energy consumption analysis and sustainable energy management.

According to the annual report of the Control Panel for the year 2022, the total energy consumption of UANL was 90,958,924 kWh, which translated into a per capita consumption of 399 kWh.

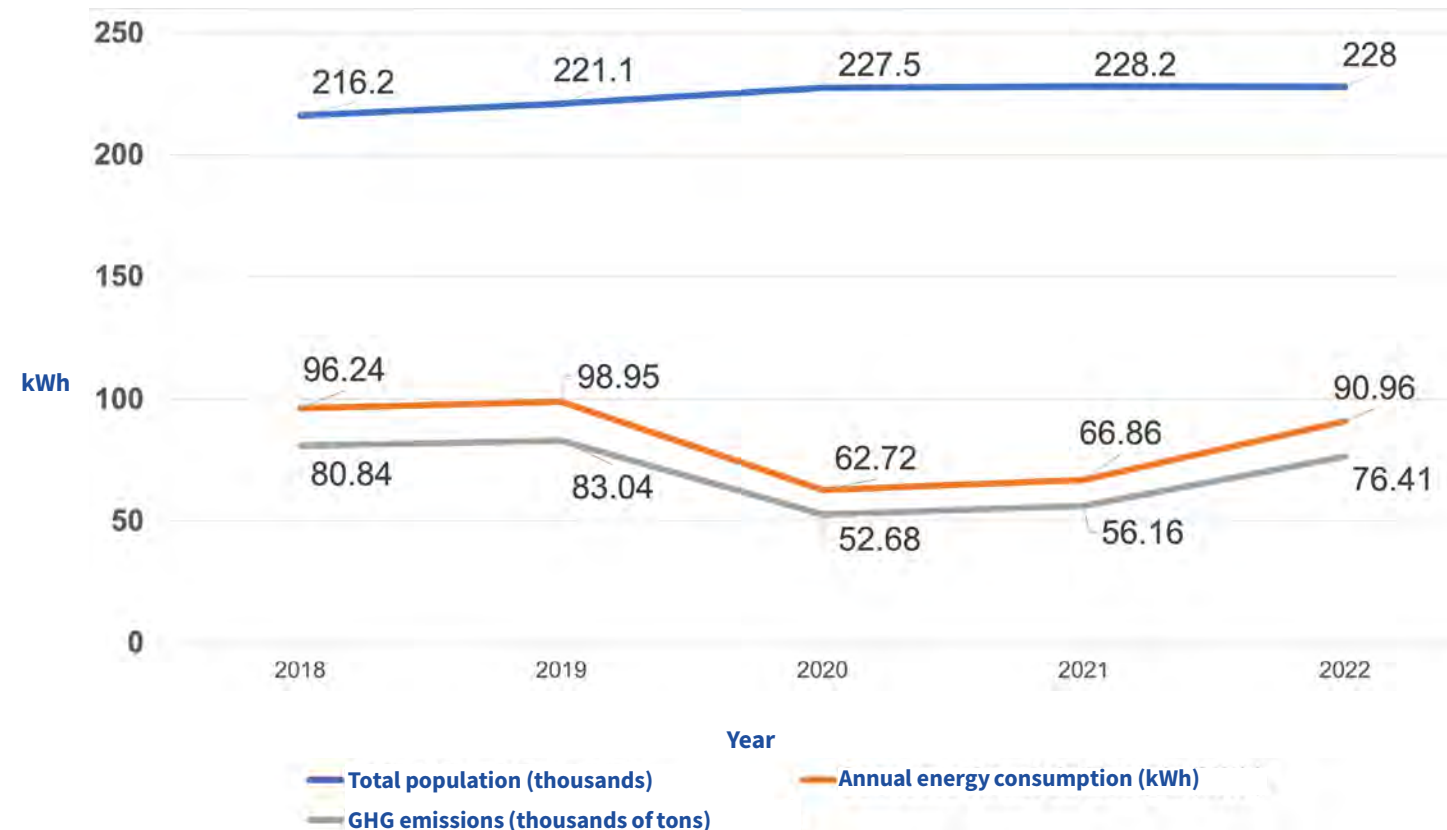




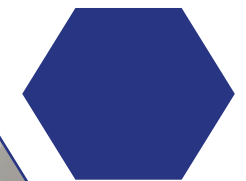
## ANNUAL PER CAPITA ELECTRICITY CONSUMPTION



## ELECTRICAL ENERGY CONSUMPTION 2018 - 2022



UANL has an estimated energy self-generation capacity of **1,597,815 kWh** per year

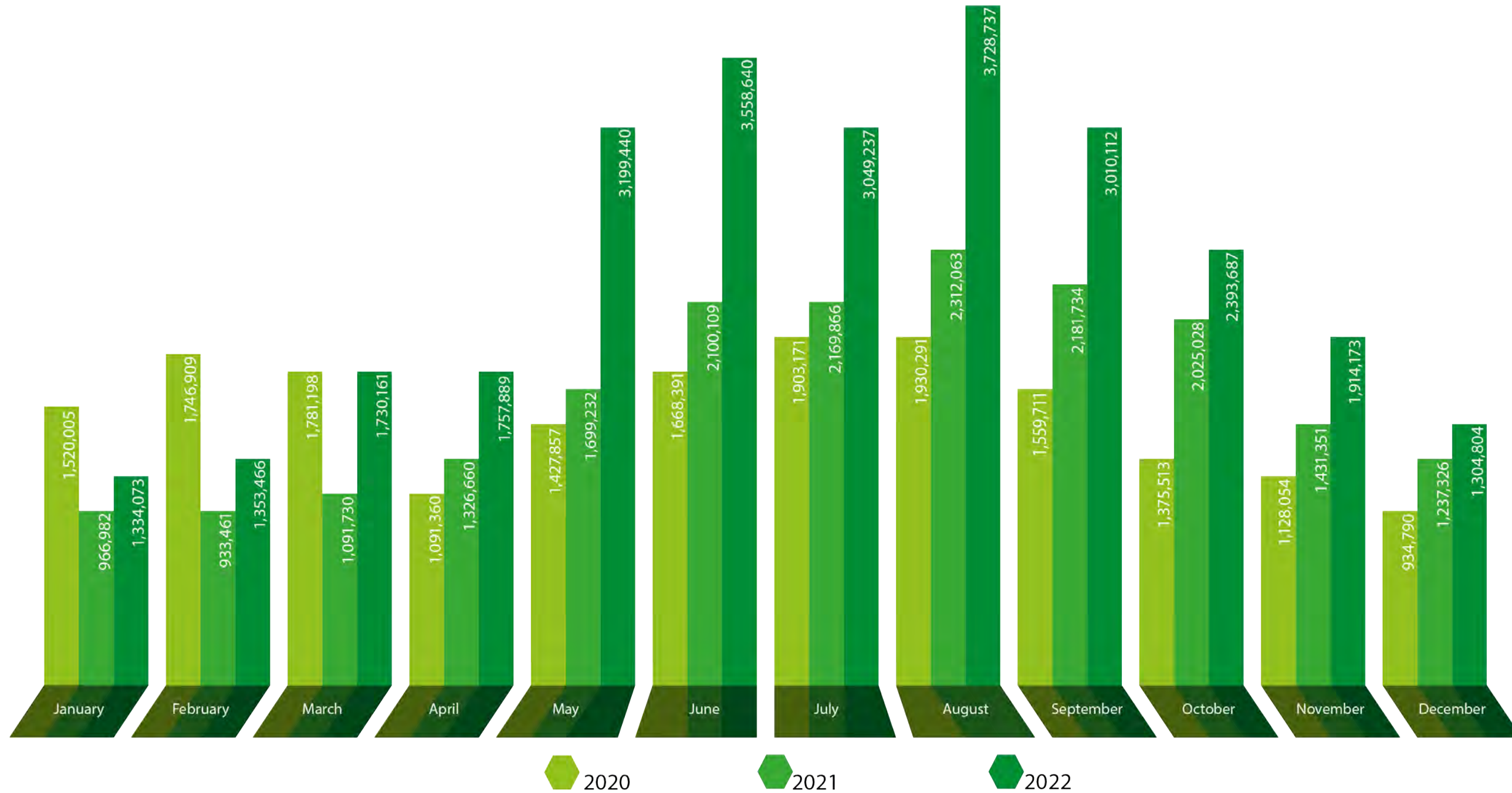




# MONTHLY ENERGY CONSUMPTION kWh

## Ciudad Universitaria Campus

kWh



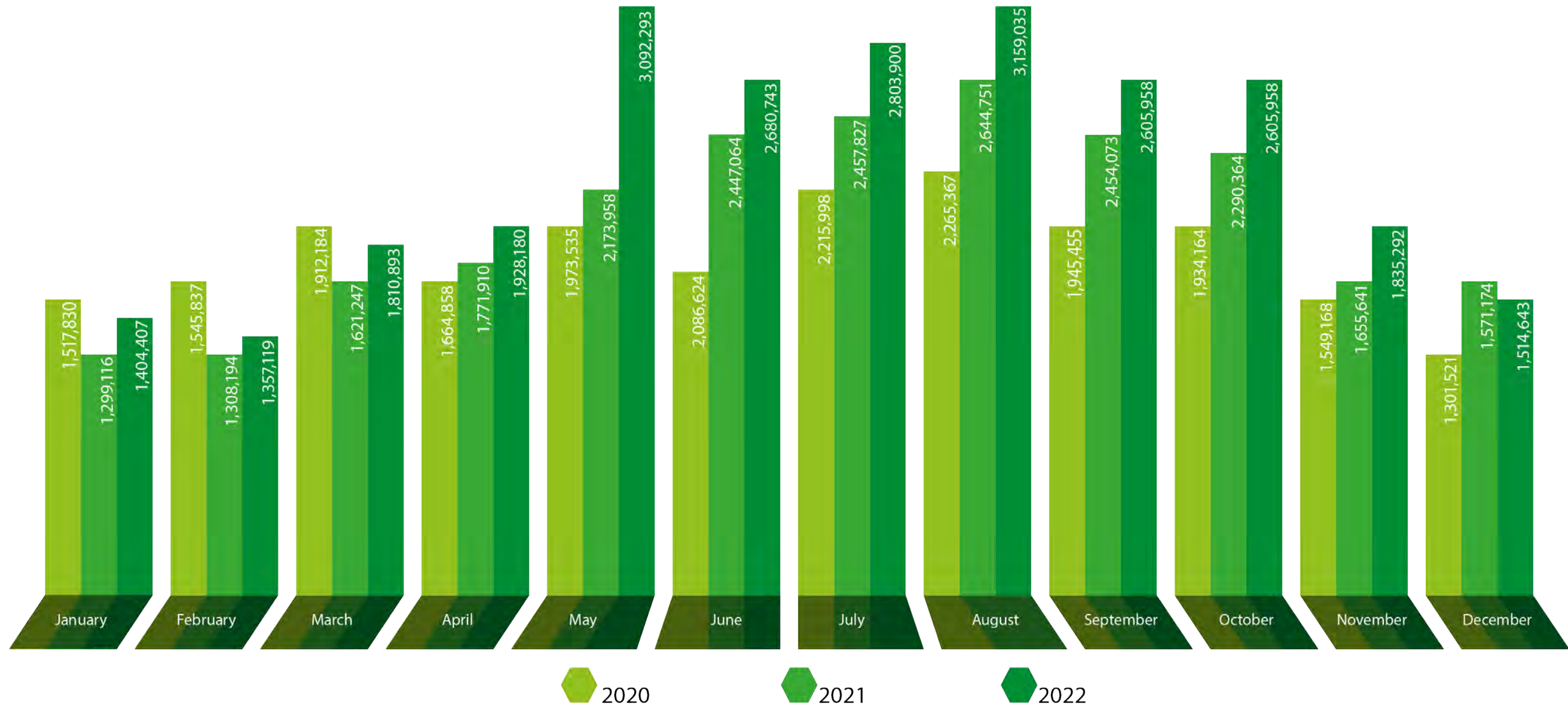


# MONTHLY ENERGY CONSUMPTION kWh

## Health Sciences Campus



kWh

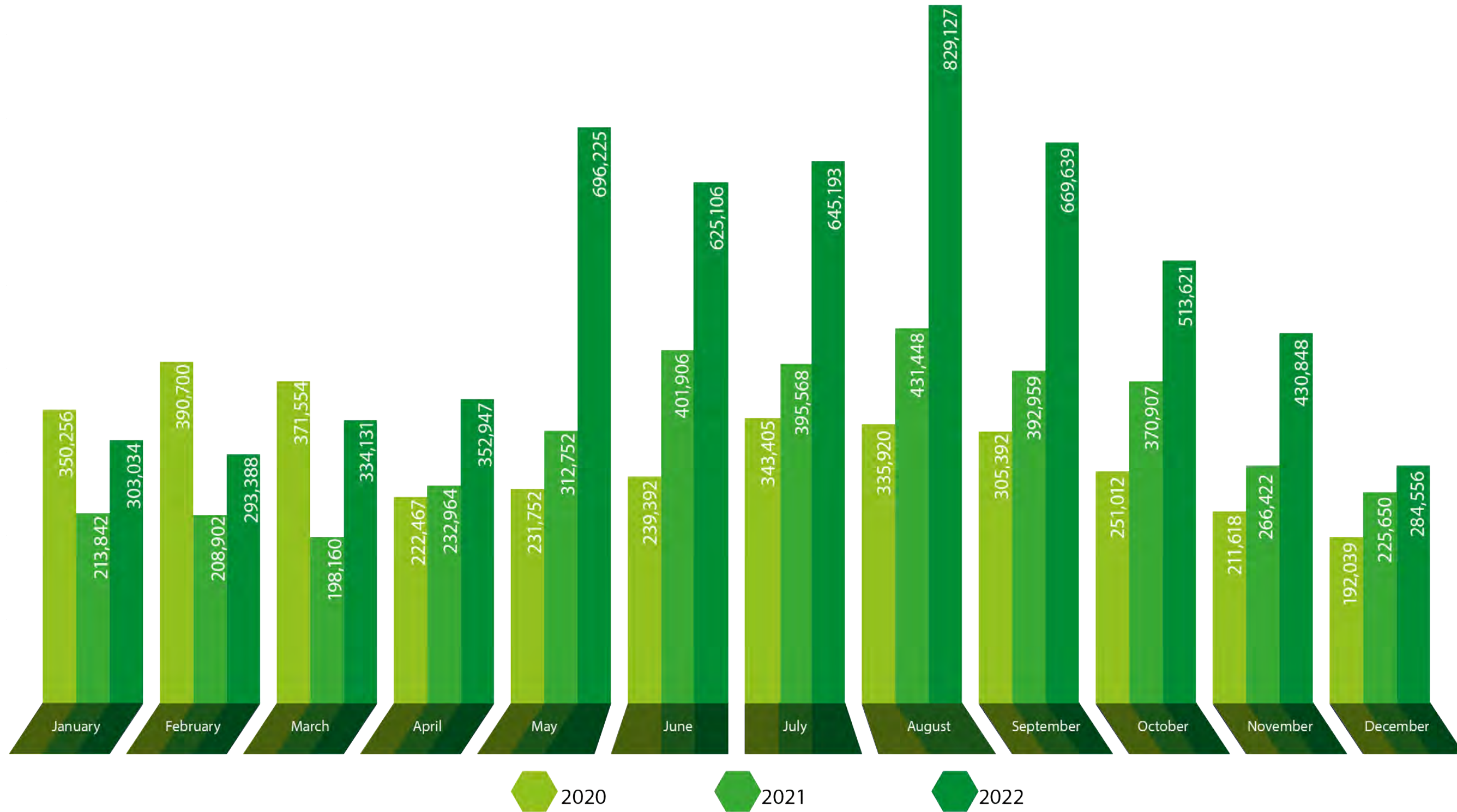




# MONTHLY ENERGY CONSUMPTION kWh

## Mederos Campus

kWh



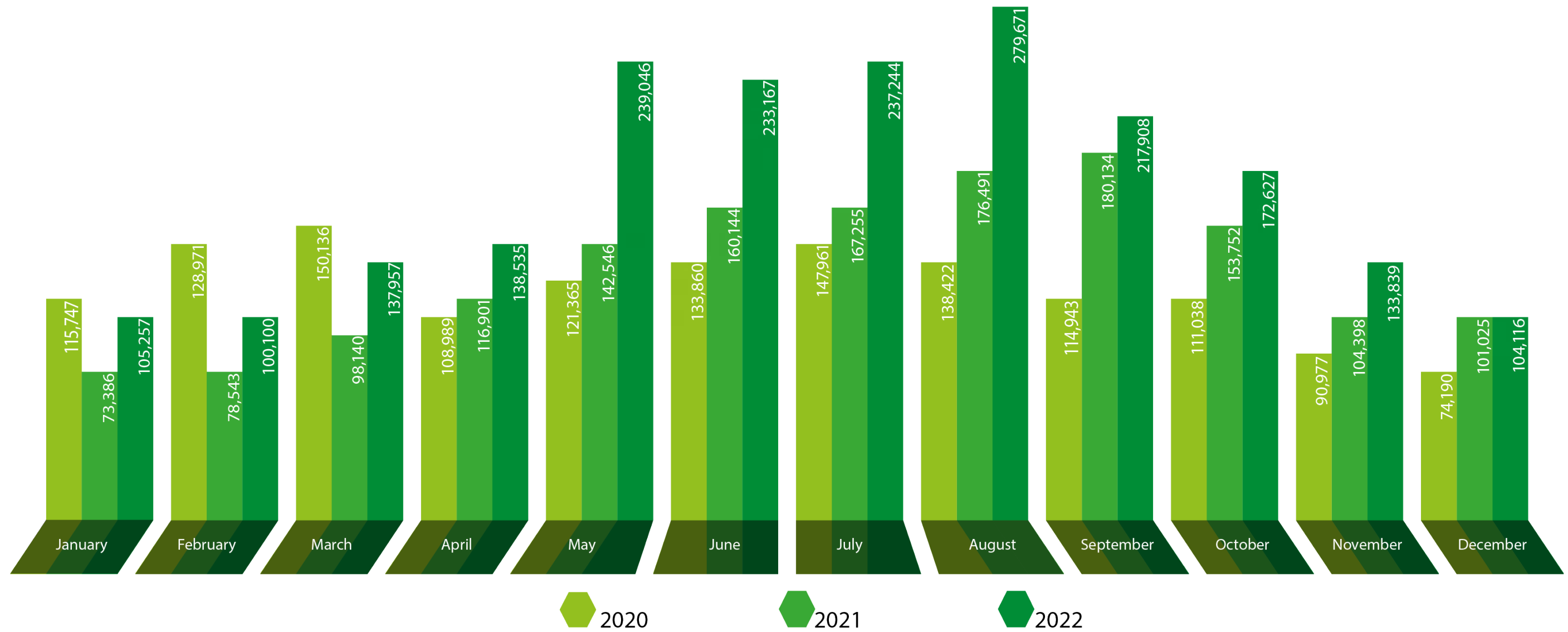


# MONTHLY ENERGY CONSUMPTION kWh

## Agricultural Sciences Campus



kWh

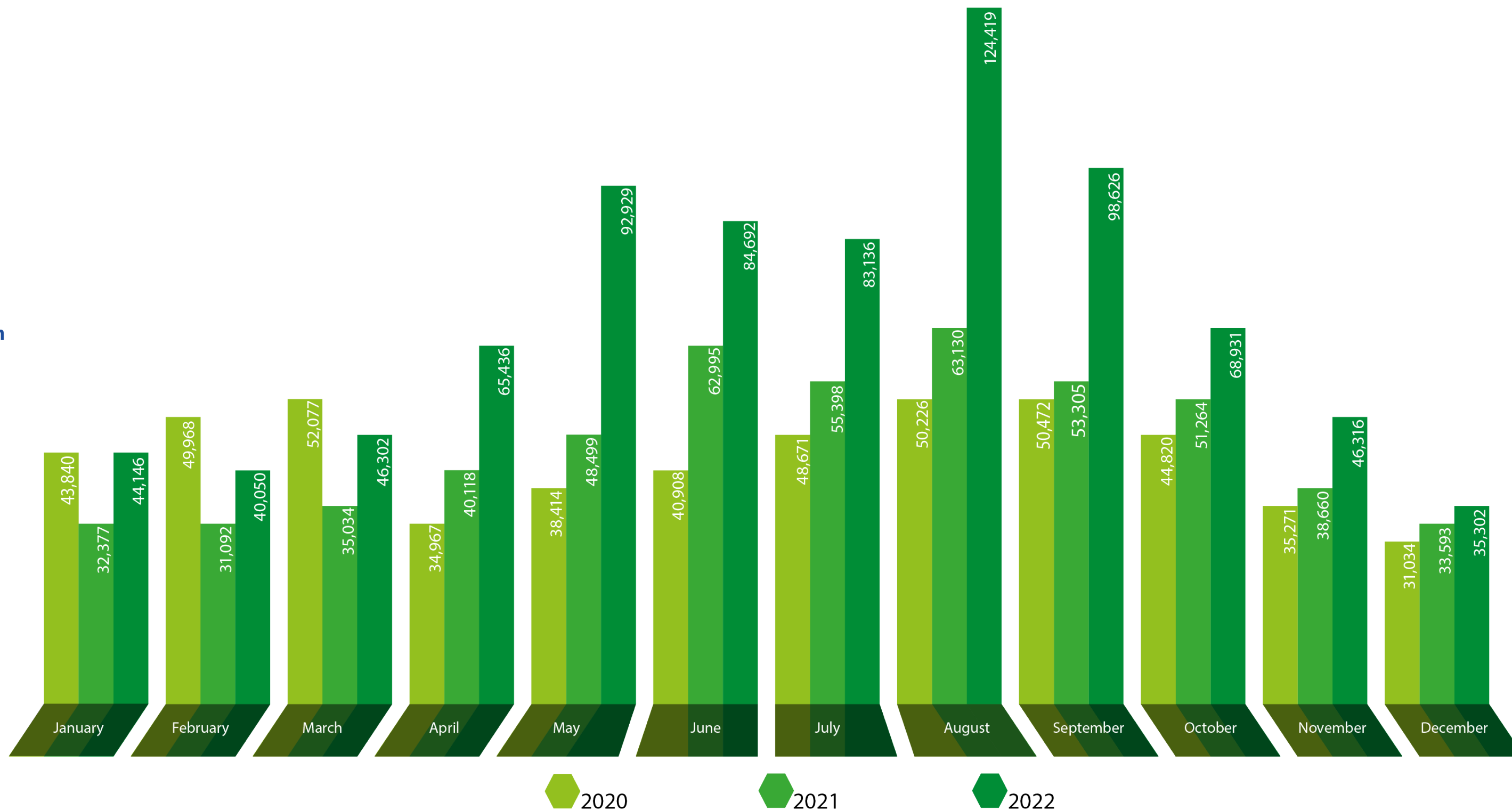




# MONTHLY ENERGY CONSUMPTION kWh

## Linares Campus

kWh

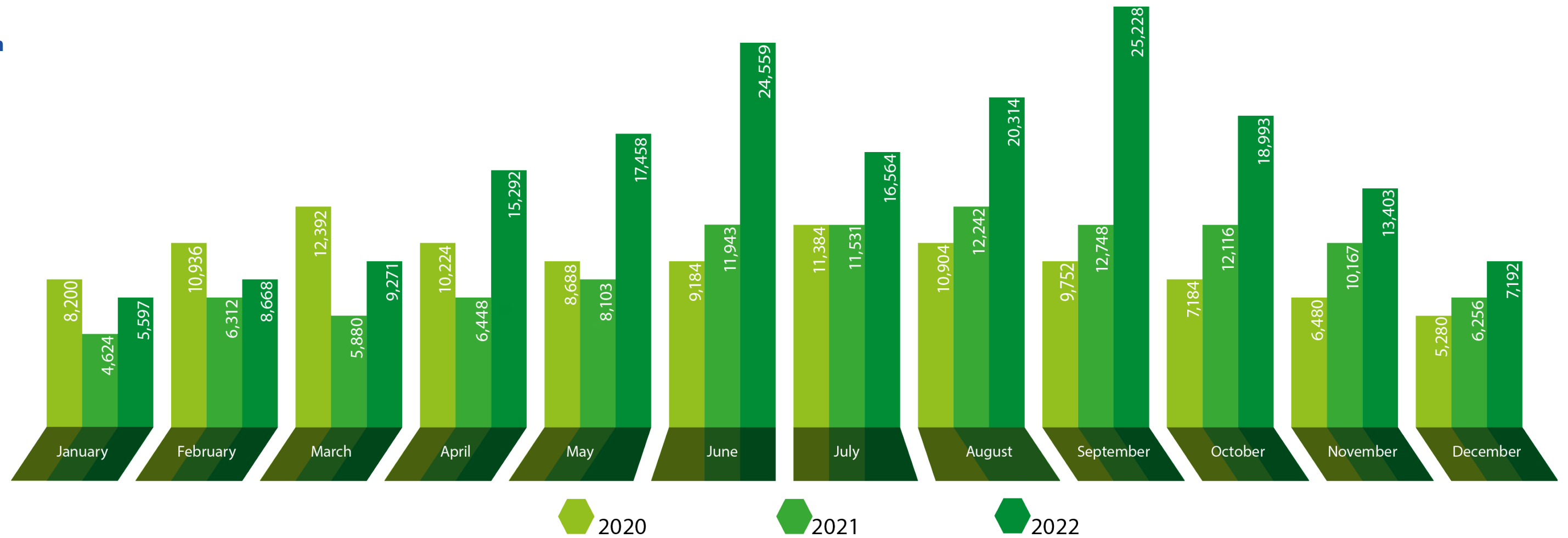




# MONTHLY ENERGY CONSUMPTION kWh

## Sabinas Hidalgo Campus

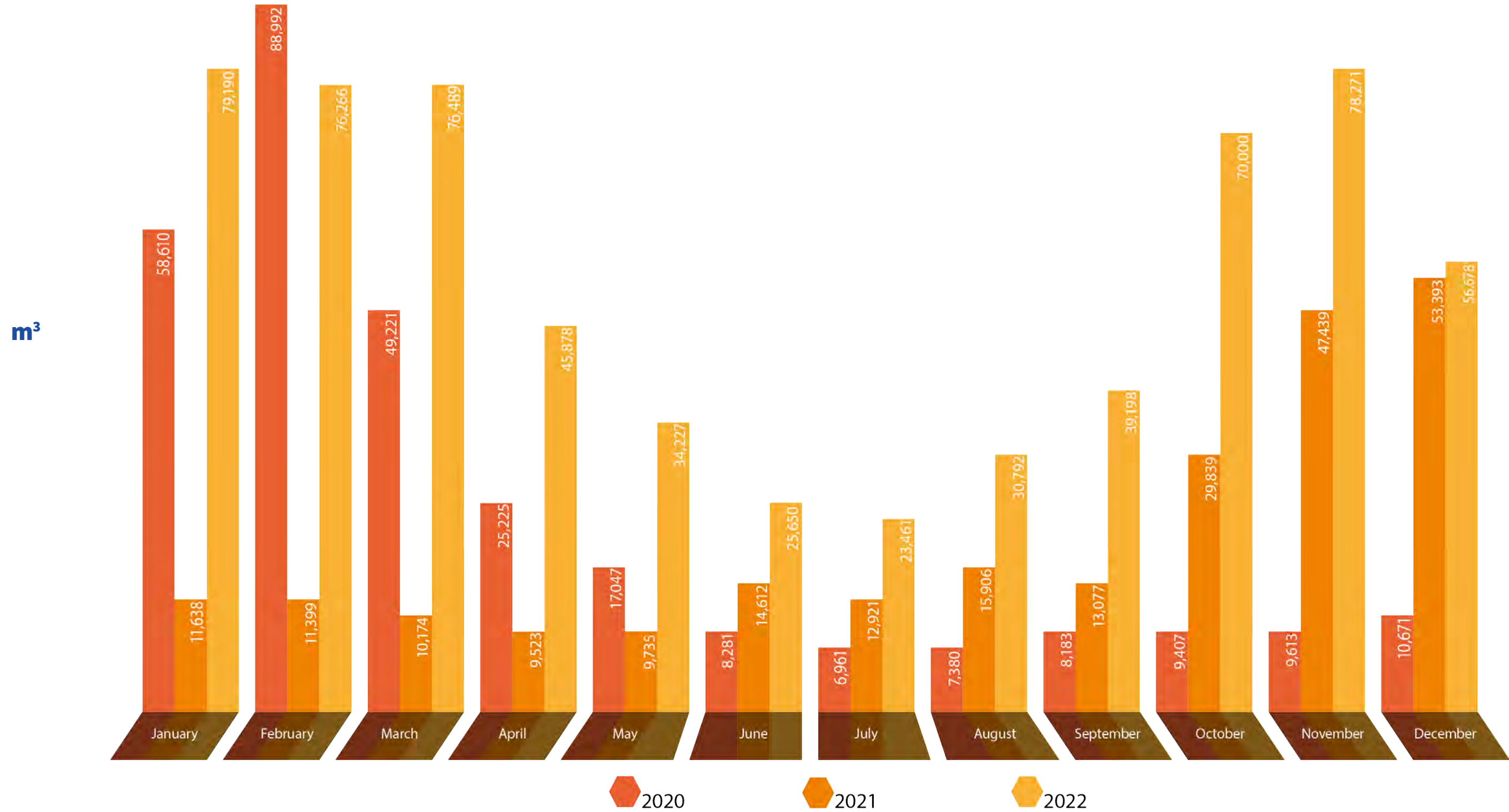
kWh





# MONTHLY GAS CONSUMPTION m<sup>3</sup>

## Ciudad Universitaria Campus

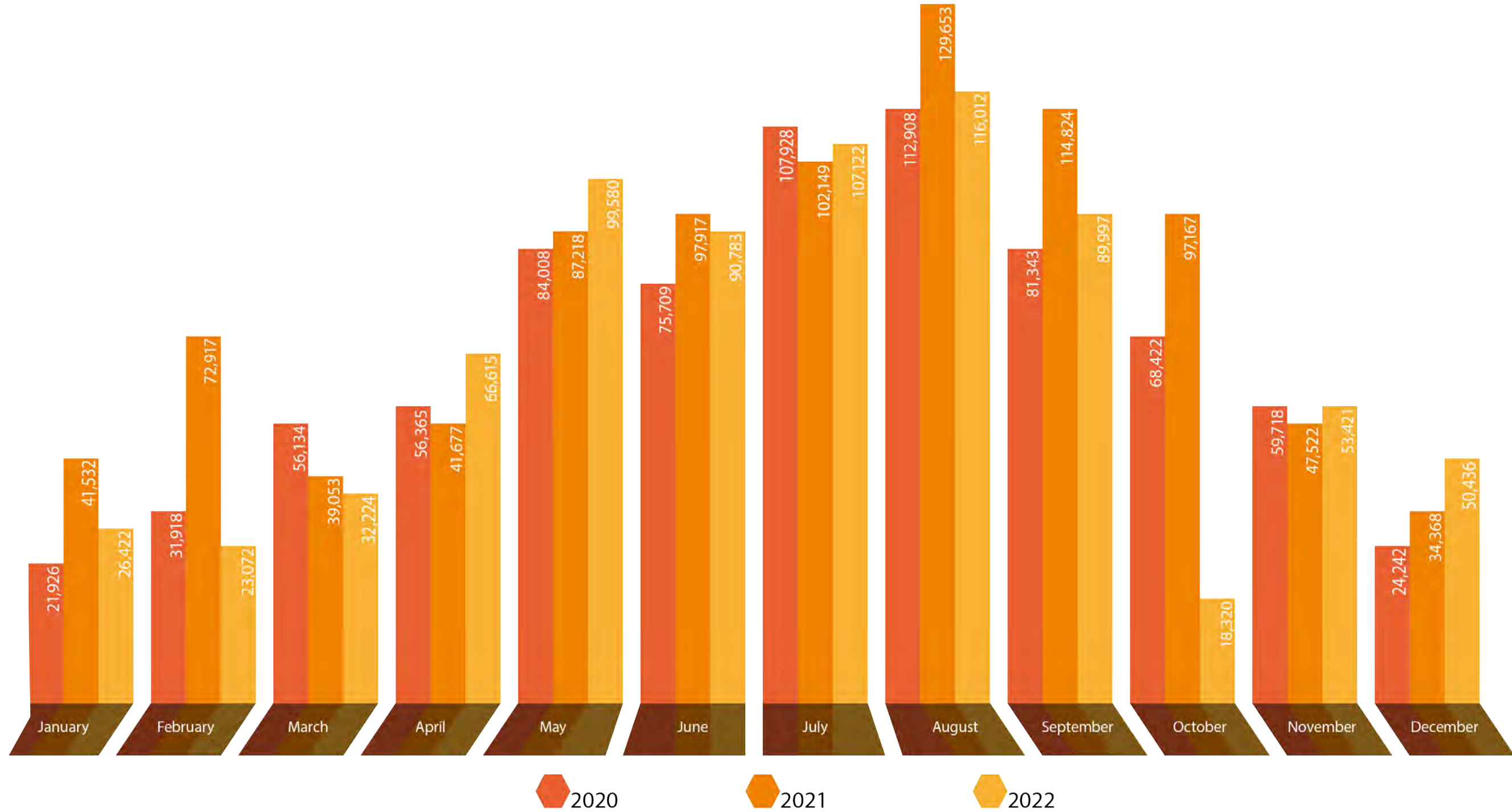




# MONTHLY GAS CONSUMPTION m<sup>3</sup>

## Health Sciences Campus

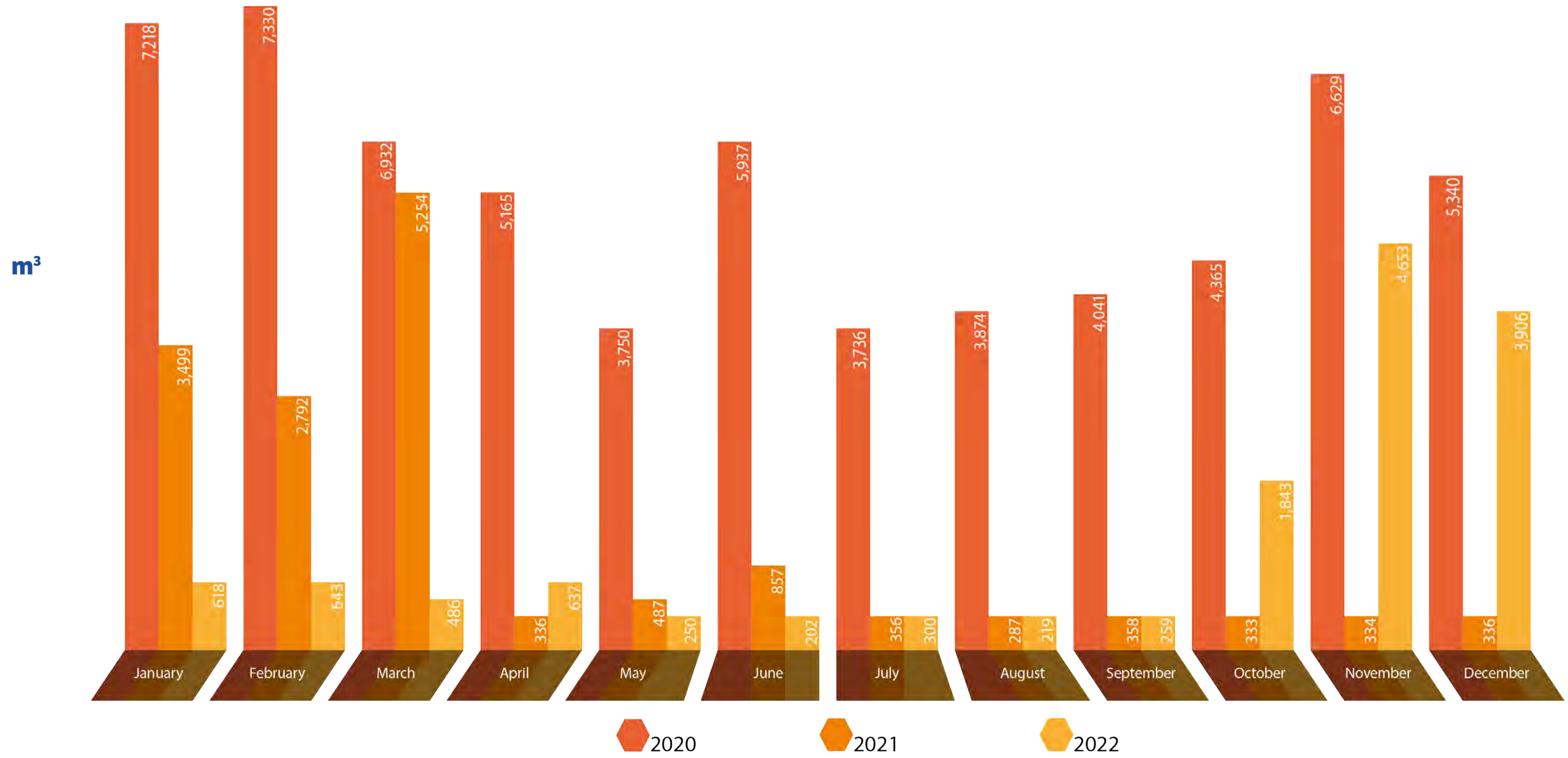
m<sup>3</sup>





# MONTHLY GAS CONSUMPTION m<sup>3</sup>

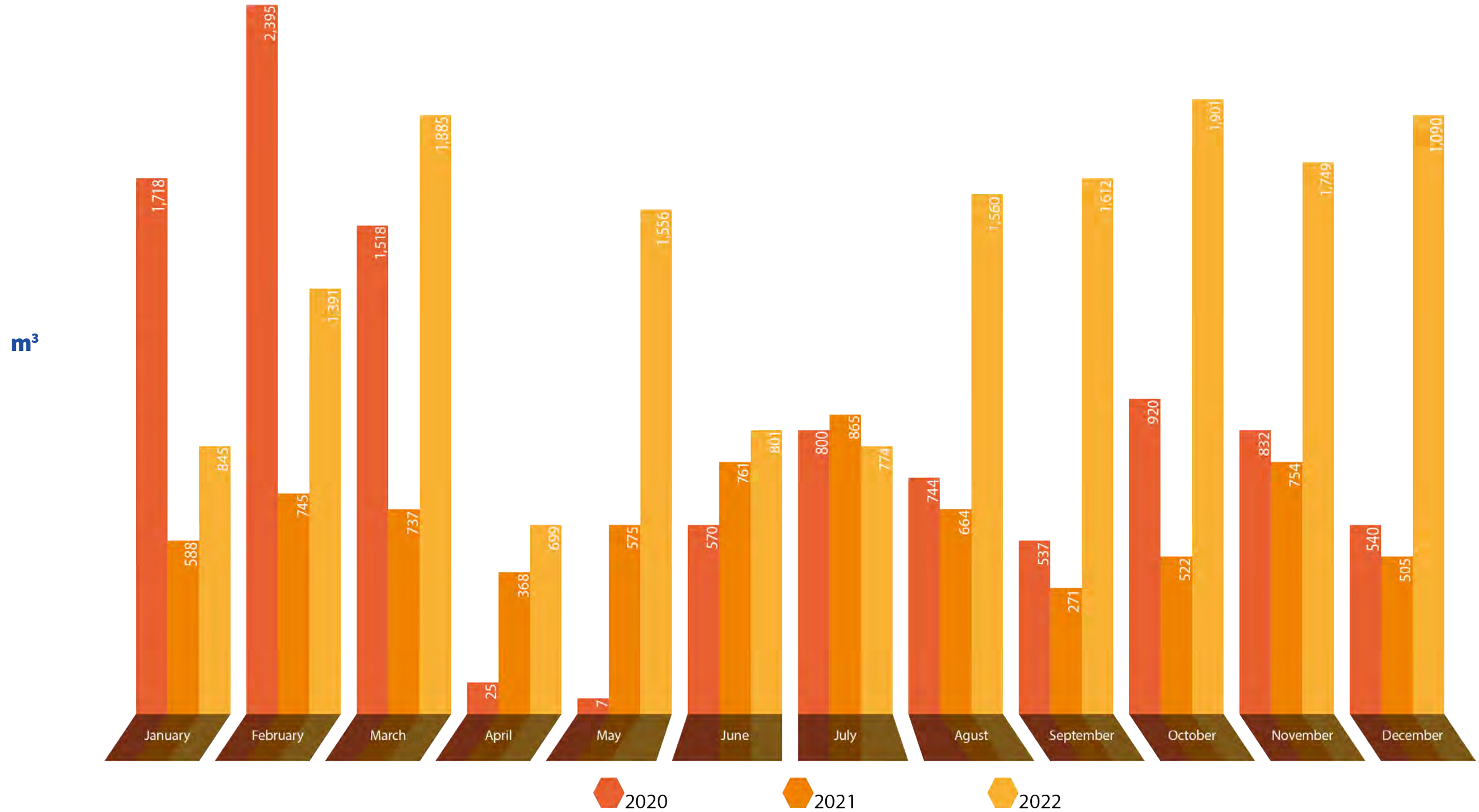
## Mederos Campus





# MONTHLY GAS CONSUMPTION m<sup>3</sup>

## Agricultural Sciences Campus







# 11 SUSTAINABLE CITIES AND COMMUNITIES



## SUSTAINABLE MOBILITY

Sustainable mobility in university environments contributes not only to environmental conservation but also enhances the quality of life for both the student community and staff. It promotes physical activity and wellness, optimizes space utilization, and bolsters the institution's image. This investment paves the way for a more sustainable future, benefiting individuals and the community as a whole.

First, sustainable mobility reduces greenhouse gas emissions and air pollution, thereby enhancing the environmental quality and the well-being of both students and university staff. By decreasing reliance on motorized vehicles, it also lowers noise levels, fostering a quieter and more enjoyable environment for both learning and social interactions.



Furthermore, this mode of mobility fosters an active and healthy lifestyle within the university community. Walking and cycling not only serve as eco-friendly alternatives but also promote daily physical activity, mitigating sedentary behaviors and enhancing individual well-being.

Sustainable mobility also exerts a positive influence on urban infrastructure by alleviating vehicular congestion and liberating parking spaces. This, in turn, allows for the repurposing of these areas into green spaces, recreational zones, or potential expansions of academic facilities.





More than  
**65%**  
 of the university  
 population

travels by public  
 transportation  
 and non-motorized  
 means

From an economic perspective, students can realize substantial cost savings by opting for more economical transportation modes such as public transit or bicycles instead of expensive private vehicles. Additionally, universities can build a reputation for their dedication to sustainability and social responsibility by actively encouraging sustainable mobility among their constituents.

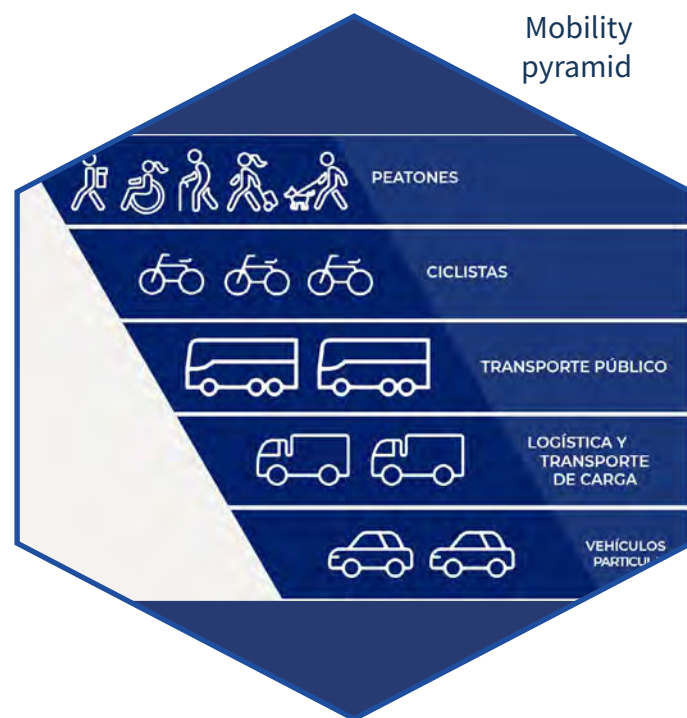
Therefore, sustainable mobility within university environments transcends mere transportation adjustments. It entails fostering a cultural shift toward more conscientious and responsible practices that yield positive effects on the environment, the physical and mental well-being of individuals, and the local economy. Embracing this approach enables educational institutions not only to set benchmarks for environmental stewardship but also to equip their community members with the essential tools to act as catalysts for constructing a more sustainable future.





## HUMAN SCALE MOBILITY PROGRAM (UNIVERSITY CITY)

To understand the objectives of mobility with human scale, it is necessary to visualize it from two key concepts: urban connectivity and accessibility. Urban connectivity is essential for functional mobility among the university community. According to the principles of the Institute for Transportation and Development Policy (ITDP), there is a descriptive instrument called Inverted Mobility Pyramid, which prioritizes the distribution of road space, in order to create norms and regulations that support it. This model prioritizes pedestrians, leaving mobility in private vehicles in the least relevant place. The right to free transit, especially for pedestrians, should be universal, so it is necessary to give priority in the access and road system for their movement.



Source: Head Office of Planning and Management of University Spaces and Buildings

In terms of accessibility, the operation of urban and landscape spaces must be determined. According to the UN-HABITAT 2016 Agenda, as well as federal, state, and metropolitan authorities, and finally the Institutional Development Plan 2019-2030 of UANL, cities should create the necessary conditions for their communities to benefit from new forms of social inclusion. This includes promoting greater equality, access to services, opportunities, participation, and mobilization that reflect the diversity of cities, countries, and the world itself.

At Ciudad Universitaria, a high percentage of the population commutes to and from the campus. Therefore, it is of utmost importance to prioritize non-motorized mobility within this campus. This mobility model offers multiple benefits, both for the environment and for users, as it strengthens the social fabric and contributes to the development of public space infrastructure. Through urban design, it promotes the creation of more inclusive and sustainable cities.

Source: Head Office of Planning and Management of University Spaces and Buildings

### Specific objectives

- Connect the interior of the campus with the immediate context of Ciudad Universitaria, prioritizing safe pedestrian mobility.
- Encourage the use of non-motorized transportation on campus to improve mobility.
- Discourage the use of automobiles by reorganizing parking spaces.
- Generate collaboration agreements to efficiently link with key stakeholders, among them: Municipalities and State Agencies.

### Policies

- Priority will be given to programs and projects that favor the use of non-motorized means of mobility and the safety and integrity of pedestrians.
- Non-motorized mobility within Ciudad Universitaria will be encouraged.
- Connections between agencies will be implemented, as well as alternatives to promote the use and movement of non-motorized mobility.
- The efficiency and safety of internal public transportation systems will be promoted.
- Projects for the reorganization and improvement of vehicular traffic routes will be promoted.
- Accessibility between campus spaces and buildings, as well as with the immediate external context, will be promoted.





### Ordering

- 🔧 Planning and implementation of a support system for non-motorized mobility around the campus.
- 🔧 Coordinate actions between departments and schools related to the planning, elimination and improvement of physical barriers that impede free movement between spaces and buildings.
- 🔧 Coordinate with external urban transportation for the planning, scheduling and safety of their routes that run through Ciudad Universitaria.
- 🔧 Develop urban improvement actions at Ciudad Universitaria campus accesses to regulate the entry and exit of motorized means of mobility.



### Planning

- 🔧 Promote the improvement of roads, walkways and crosswalks to facilitate non-motorized travel in CU.
- 🔧 Promote non-motorized and zero-carbon mobility.
- 🔧 Promote the reorganization of spaces destined to service motorized vehicles.
- 🔧 Manage the removal of obstacles, elements and/or barriers that jeopardize non-motorized mobility in a safe manner, as well as universal accessibility.

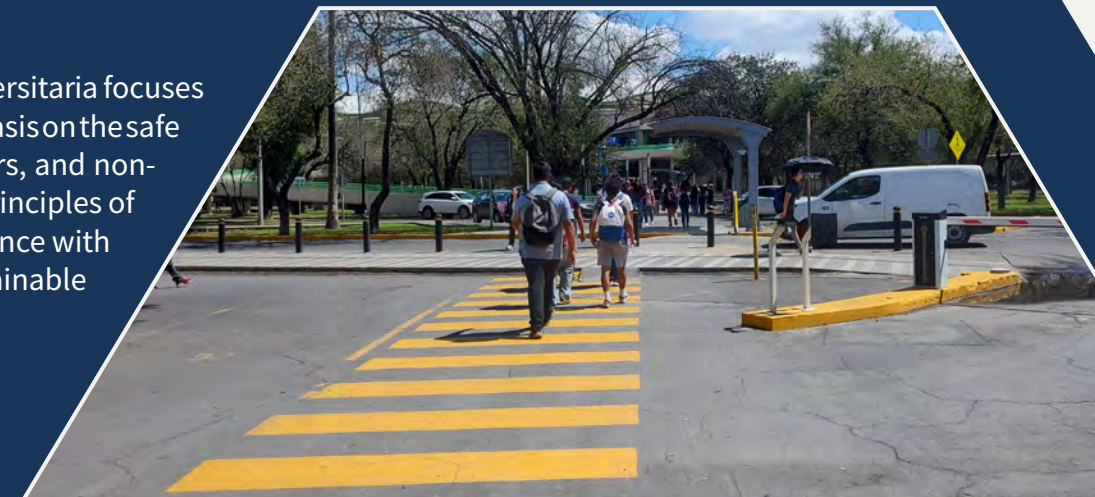


### Goals

- 🔧 Connect 70% of the areas inside the campus through walkways and crosswalks during the period 2021 - 2024.
- 🔧 Incentivize 50% of private car users to use non-motorized means of transport during the period 2021- 2024.
- 🔧 Reorganize 40% of parking lots during the period 2021 - 2024.
- 🔧 Generate an updated collaboration agreement with the municipality of San Nicolas de los Garza for the period 2021 - 2024.

### Projects

The Human Scale Mobility Program for Ciudad Universitaria focuses on the development of projects with a primary emphasis on the safe transit of pedestrians and users of bicycles, scooters, and non-motorized vehicles. These projects align with the principles of the inverted pyramid of mobility and are in accordance with global, national, state, and local guidelines for sustainable mobility:



Source: Head Office of Planning and Management of University Spaces and Buildings



**SIMBOLOGÍA**

	LÍMITE CAMPUS
	ÁREA PERMEABLE
	ÁREA NO PERMEABLE
	ÁREA EDIFICADA



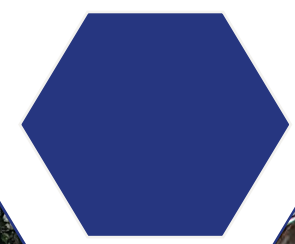
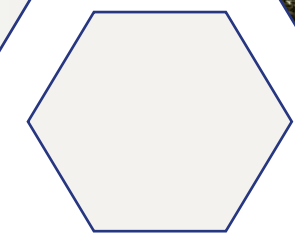
## Pedestrian walkways

These spaces are designated for the unrestricted movement of pedestrians, connecting various points such as buildings, public areas, subway stations, bus stops, bicycle and scooter racks, and other forms of transportation.

Therefore, it is crucial that they adhere to design guidelines set forth by national and international organizations promoting sustainable mobility. Furthermore, these pathways should be designed to promote inclusivity by avoiding changes in elevation and incorporating both horizontal and vertical signage to facilitate effective utilization by users. They should meet comfort requirements, including providing shade, ensuring safety, enhancing connectivity, and accommodating varying volumes of pedestrian traffic. Walkways are categorized into main and secondary based on user flow, incident rates, and length.

## Safe Crosswalks

Safe crosswalks encompass at-grade crossings featuring pavement markings that clearly define pedestrian priority zones. Additionally, these crossings incorporate bollards positioned along the sides of the streets to safeguard the well-being of users and to establish connections with adjacent pedestrian traffic areas. To meet safety standards, these crossings must adhere to the Nuevo Leon State Technical Standard for Sidewalks established by SEDUVI24, as well as guidelines outlined in the Global Street Design Guide - NACTO25, among other relevant criteria.





### Accessibility and Inclusion in Pedestrian Spaces

Currently, guidelines exist for the appropriate geometric design of pedestrian, bicycle, vehicular, and shared spaces within Ciudad Universitaria (CU). These guidelines are aligned with universal accessibility standards as recommended by official agencies such as SEDATU, SEDUVI, ITDP, NACTO, and others. To ensure compliance with these standards, they should be rigorously implemented in the creation and design of new spaces as well as in the enhancement of existing ones, following the subsequent set of guidelines:



### Non-motorized means of transportation

Non-motorized means of transportation are those means of mobility that do not need an engine or fuel, but work through human impulse. They are usually bicycles and skates.

### Unibici

This program offers free access to both mechanical and electric bicycles within Ciudad Universitaria. It operates through strategically placed virtual stations where users can conveniently pick up and return bicycles. To participate, users must use bicycles equipped with GPS and automated locks. This program is intended for UANL students, faculty, and administrative staff, and it's completely free of charge.



### Electric motorized means

Electric motorized vehicles encompass all those whose movement depends on electricity. Typically, these include electric bicycles, scooters, and segways, among other options.

### Tiger Scooters

This network comprises strategically placed electric scooters across the campus. These scooters are powered by electricity from charging stations and are accessible to the entire university community.







**40**  
public transportation routes feed the area around Ciudad Universitaria.



### Public Transportation

These are the modes of collective, mass, or rental transportation. They typically encompass the mass public transportation system, such as the subway, radial, peripheral, and local bus routes, as well as urban and long-distance buses. Additionally, public transportation for hire includes taxis and vehicles from digital platforms like Uber, DiDi, Cabify, Beat, and others.

Travel to and from Ciudad Universitaria is mostly by motorized means of mobility. In the specific case of public transportation, there are 40 routes that feed the surroundings of Ciudad Universitaria. The urban bus routes that currently pass through Avenidas Pedro de Alba, Universidad, Nogalar - Fidel Velazquez, Manuel L. Barragan and Av. Guerrero 10 are the following:

1. R-Álamo Santiago - Directo UANL
2. R-Auto Transportes Azules y Amarillos General Terán - Monterrey - UANL
3. R-Interenlace Directo Cadereyta - UANL
4. R-1 Sector 1 San Nicolás - Tecnológico - Central - Las Puentes
5. R-1 Sector 1 San Nicolás - Tecnológico - Directo - Pabellón
6. R-1 Sector 4 Pilares - Central de Autobuses
7. R-16/316 La Unidad - UANL
8. R-17 Auditorio San Pedro - UANL
9. R-17 Pio X - UANL
10. R-17 Santuario - UANL
11. R-88 Cosmópolis - Jardines
12. R-88 Cosmópolis - Moisés Sáenz
13. R-101 Ébanos
14. R-101 Manantial

15. R-134 Fresnos - Puentes - 15 de Mayo
16. R-134 Telmex - Metroplex - 15 de Mayo
17. R-207 Penitenciaria
18. R-209 Escobedo - Punta de Loma - Bosques
19. R-209 Escobedo - Punta de Loma - Renacimiento - Olivos
20. R-209 Exprés Escobedo - Hidalgo
21. R-213 Cosmópolis - UANL
22. R-213 Directa - UANL
23. R-213 Quintas - UANL
24. R-219 Sector 1 Tréboles - UANL - B. Reyes
25. R-220 Pedregal
26. R-220 Provileon
27. R-226 Sector 1 - Buena Vista - Balcones - Alameda
28. R-226 Sector 3 - Buena Vista - Joyas - Alameda
29. R-227 Clouthier - 16 de Septiembre
30. R-227 Clouthier - Constitución
31. R-227 Emiliano - 16 de Septiembre
32. R-227 Emiliano - Constitución
33. R-229 Ébanos - Metroplex - Mercado. Juárez
34. R-229 Robles - Metroplex - Mercado Juárez
35. R-232 La Unidad
36. R-232 La Unidad - San Marcos
37. R-316 Libramiento - Paraje San José
38. R-320 Fresnos - Puentes - Colón
39. R-685 Sector 1 Salinas Directo
40. R-685 Sector 2 Bosques de los Nogales

## MOTORIZED MOBILITY



Mobility by motorized means in Ciudad Universitaria

Mobility by motorized means in Ciudad Universitaria	%
Motorized mobility	%
City bus lines	45.00 %
Private car	26.00 %
Metrorrey Mass Transport System	17.00 %
Rental cars (cabs, uber, didi, cabify, beat, etc.)	3.40 %
Hitchhiking or ride-along	2.10 %
Ecovia	1.30 %
Motorcycle	0.50 %
<b>Total</b>	<b>95.30 %</b>

Source: Planning and Management of University Spaces and Buildings Head Office

In 2022, the university population primarily relied on two main modes of public transportation: urban bus lines, which accounted for 45%, and the Metrorrey System, which accounted for 17%. A smaller portion of the population opted for rental cars, such as taxis and ride-sharing platforms like Uber, DiDi, Cabify, Beat, etc., making up 3.4%. Additionally, there was a percentage of individuals who utilized ride-sharing or hitchhiking (2.1%). A minor portion, 1.3%, used Ecovia, and 0.5% chose motorcycles as their mode of transportation.

Projects applicable to motorized means:

- Design and construction of vehicular access gauze on Av. Universidad (FACPyA).
- Design and construction of vehicular access gauze on Av. Universidad (Provost's Tower).
- Design and construction of vehicular access gauze on Av. Fidel Velazquez (General Services).

Vehicle fleet breakdown

Type of vehicle	Central unit	Schools	Total units
Automobile	78	87	165
Van	119	257	376
Cargo truck	0	32	32
Bus	38	98	136
Motorcycle	9	5	14
Electric	4	1	5
<b>Total</b>			<b>728</b>



### Ascent and descent bus stops

These are designated areas located alongside vehicular roads intended for the safe boarding and disembarking of passengers from public and private transportation vehicles. These spaces should be equipped with features that ensure the safety and convenience of their users. These features may include bollards, changes in pavement texture, spacious sidewalks, clear signage, appropriate widths based on the type of arriving vehicles, comfortable and secure seating, among other amenities.

Source: Head Office of Planning and Management of University Spaces and Buildings



### Public Transportation Monitoring System

A monitoring software should be developed to track and locate the public transportation units that operate in Ciudad Universitaria, implemented in conjunction with the AET (or equivalent), EISA system and SEDESU Nuevo Leon, through which it will be possible to know the arrival time of the units that will be projected on digital screens in the bus stops of ascent and descent inside and outside the campus. An application that is compatible with smart phones or the technology currently in use must also be implemented.

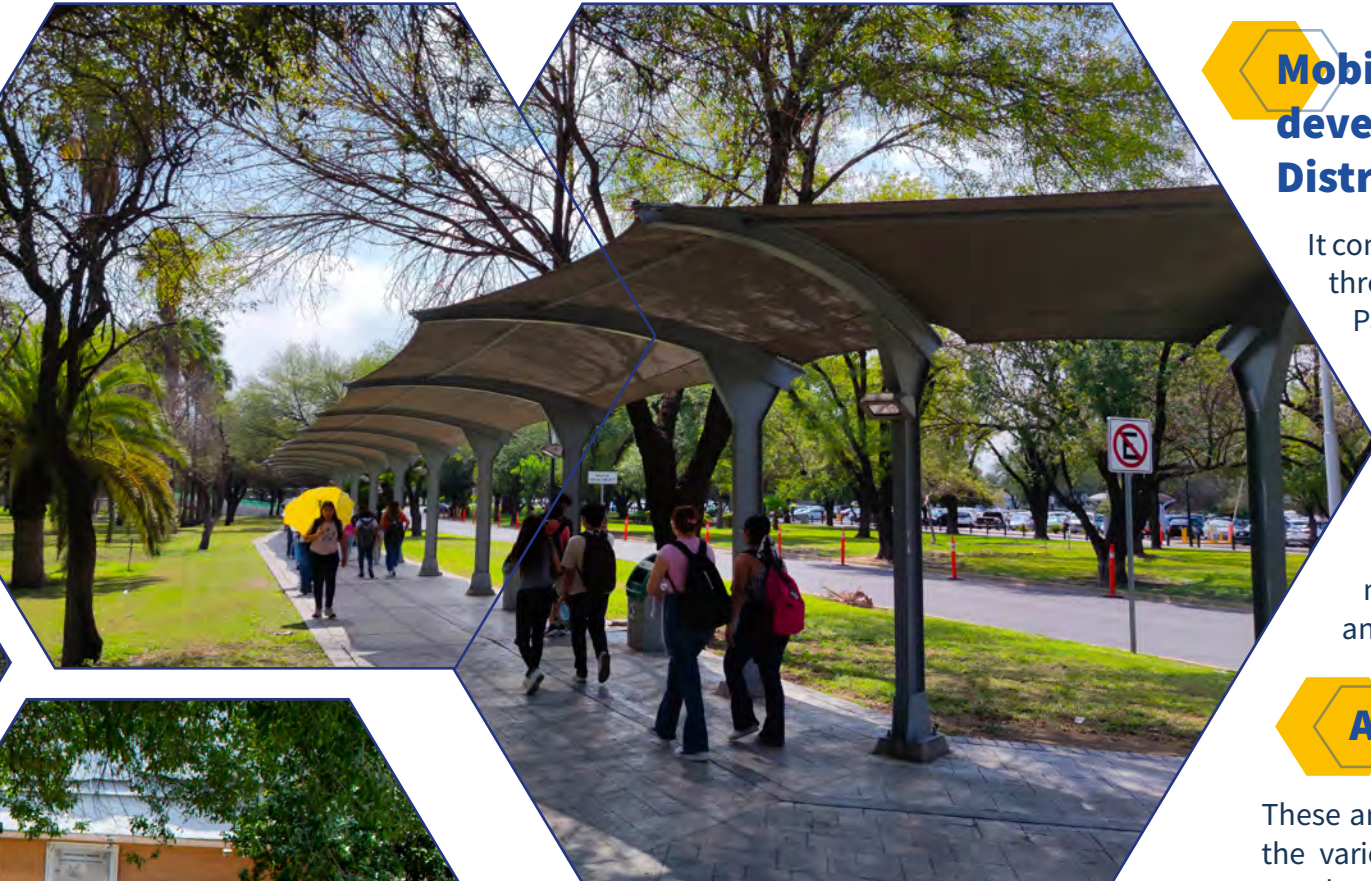
### Reorganization of parking spaces

The attributes with which the reorganization of the 54 parking lots identified at CU must comply in order to replicate best practices worldwide are as follows:

- ⬢ Permeable pavement systems that allow the absorption of rainwater into the subsoil.
- ⬢ Automated access control systems.
- ⬢ To have absorption areas, equipped with regional tree species and creeping plants.
- ⬢ Parking spaces for disabled persons, motorcycles, electric vehicles, compact vehicles, large vehicles, and for loading and unloading (where applicable).
- ⬢ Adequate horizontal and vertical signage, based on applicable regulations.
- ⬢ Defined interior walkways that guarantee pedestrian safety.







## Mobility projects linked to the development of the UNI District Partial Plan

It consists of projects that complement each other through the development of the UNI District Partial Plan, with the purpose of improving the campus and its surroundings. These will provide the connectivity required to achieve especially the continuity of non-motorized mobility to and from the surrounding neighborhoods. They are classified as follows: motorized means, sustainable mobility corridors, accesses and vehicular overpasses.



### Acces

These are those spaces whose functions are the entry and exit of users through the various means of mobility. These must be designed in accordance with the characteristics of legibility, accessibility, safety and identity, for the improvement of CU as well as the immediate urban environment.

Accesses in need of intervention:

- Redesign and update of the access to the Campus through Av. Universidad and Av. Pedro de Alba.
- Design and construction of signage at the access to the Campus through Manuel L. Barragan Avenue and Pedro de Alba Avenue.
- Redesign and update of the access to the campus through Manuel L. Barragan Avenue (Ing. Raymundo "Chico" Rivera Stadium).
- Redesign and update of the access to the Campus through Manuel L. Barragan Avenue (FCQ Gymnasium).
- Redesign and update of the access to the Campus through Fidel Velazquez Ave. and Calle
- Redesign and update of the access to the Campus through Fidel Velazquez Avenue and Gustavo A. Becquer Street (Northeast).
- Redesign and update of the access to the Campus through Fidel Velazquez Avenue and Gustavo A. Becquer Street (tunnel).
- Redesign and update of the pedestrian access to the Campus along Fidel Velazquez Avenue (Hundido Baseball Park); includes an information station for the visually and hearing impaired.
- Redesign and update of the accesses to the parking lot of the East Universitario Stadium (Gates 1, 2 and 3), through University Avenue.
- Redesign and update of the accesses to the parking lot of West Universitario Stadium (Gates 8, 9 and 10), along Manuel L. Barragan Avenue.
- Redesign and update of the access to the Campus from Av. Universidad to the IIC parking lot (vehicular).
- Redesign and update of the access to the campus from University Avenue to the IIC parking lot (pedestrian).

## Poket parks

Tienen como propósito ofrecer un punto de encuentro, articular los espacios y mejorar la conectividad dentro del campus; estos, deberán contar con elementos de mobiliario urbano, tales como bancas, apoyos isquiáticos, conectores eléctricos para dispositivos móviles, cubiertas que generen sombra y protección de lluvia, mismos que pueden ser naturales o artificiales, tótems de información y ubicación. Así mismo su diseño debe garantizar la inclusión y la accesibilidad universal.

### Location of pocket park projects





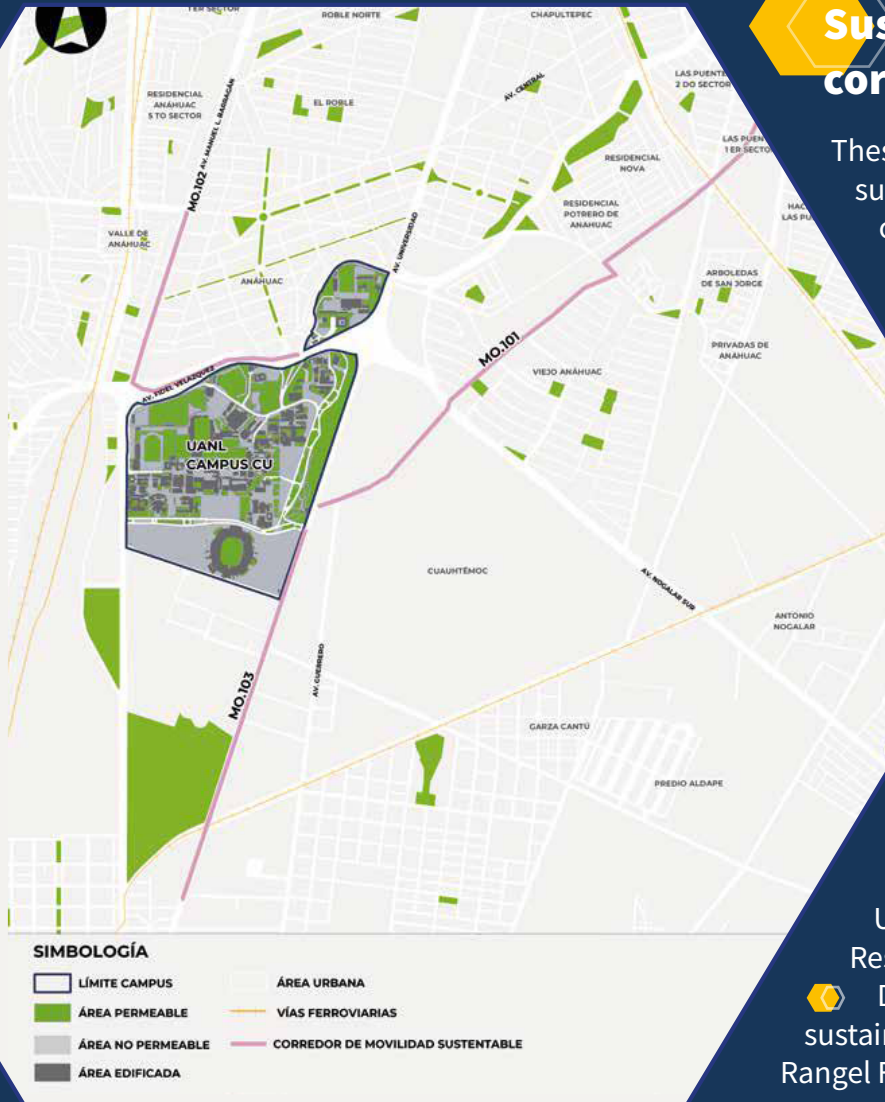
## Sustainable urban mobility corridors

These are the connections with the immediate surroundings of the campus that should offer optimal conditions for pedestrian and non-motorized circulation: they consist of the development and design of a comprehensive urban proposal, which includes, among other things: widening of pedestrian walkways, installation of street furniture, elimination of barriers and changes in level, safe crossings, reforestation, public lighting systems, horizontal and vertical signage.

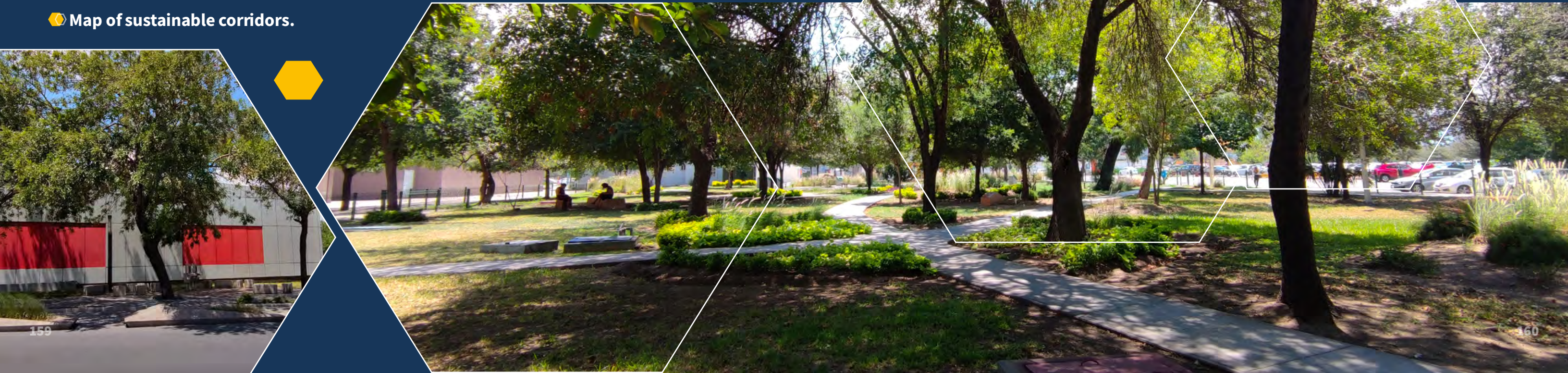
- Design, management and construction of a sustainable urban mobility corridor UANL - Av. Munich - Colonia Nova - Las Arboledas Park.

- Design, management and construction of the sustainable urban mobility corridor UANL - Colonia Anahuac - Av. Almazan - Colonia Residencial Anahuac.

- Design, management and construction of the sustainable urban mobility corridor UANL - Raul Rangel Frias Library - Regina Subway Station.



Map of sustainable corridors.





## TigreBus



The TigreBus of the Universidad Autonoma de Nuevo Leon (UANL) is an innovative initiative that has revolutionized public transportation due to its contribution in reducing traffic and vehicular congestion in a city in constant growth such as Monterrey. It offers a comfortable and reliable alternative for UANL students, which helps to alleviate traffic pressure in the city and reduce air pollution.

The transportation services provided by the UANL TigreBus are free of charge, which means significant economic savings for users, in addition to promoting sustainable mobility and inclusion.

Tigrebus operates in the university campuses of the Monterrey metropolitan area with the purpose of facilitating fast and safe access to schools.

### TigreBus Route in CU



**5,353,600**  
free services provided to students by 2022

Environmental and economic benefits derived from the operation of university public transportation.

### TigreBus

Year	Number of daily trips	Total services per year	Free services provided	Savings to users through the program
2021	14	3,878	155,120	\$55,919.00 (USD)
2022	478	107,072	5,353,600	\$ 1,929,908.00 (USD)

\* Considering a rate of \$0.36 (USD) that applies to students.

Source: Sustainability Secretariat Project Development Head Office, September 2023.

**478**  
daily trips



In 2022, savings approximately **2 million dollars** to users





Inter-campus interconnection service

Departure Campus	Arrival Campus	Days of service	Hours of operation	Total daily services
Ciudad Universitaria (CU)	Mederos	Monday to Friday	06:15, 11:00 y 16:00 hours	11
Ciudad Universitaria (CU)	Health Sciences	Monday to Friday	06:15 hours	1
Ciudad Universitaria (CU)	Agricultural Sciences	Monday to Friday	06:15 hours	1
Ciudad Universitaria (CU)	Center for Research and Innovation in Aeronautical Engineering (CIIIA)	Monday to Friday	08:30, 13:40 y 16:00 hours	3
Mederos	Ciudad Universitaria (CU)	Monday to Friday	13:00, 18:00, 21:15 hours	9
Health Sciences	Ciudad Universitaria (CU)	Monday to Friday	14:00 y 21:15 hours	3
Agricultural Sciences	Ciudad Universitaria (CU)	Monday to Friday	20:30 hours	2
Center for Research and Innovation in Aeronautical Engineering (CIIIA)	Ciudad Universitaria (CU)	Monday to Friday	12:00, 19:20 y 21:30 hours	3

TigreBus

Departure Campus	Hours of operation	Number of units	Number of trips per unit	Total daily trips
Mederos	6:15 hours 21:15 hours	5	5	220
Health Sciences	6:15 hours 21:15 hours	2	2	144
Agricultural Sciences	6:15 hours 20:30 hours	2	2	64
Ciudad Universitaria (CU)	6:45 hours 21:15 hours	1	1	44
Centro de Investigación e Innovación en Ingeniería Aeronáutica (CIIIA), Salinas Victoria	8:30 hours 21:30 hours	1	1	6
<b>Total</b>				<b>478</b>

RUTA DEL TIGREBUS  
Campus Ciencias Agropecuarias



RUTA DEL TIGREVAN  
Campus Ciencias de la Salud



RUTA DEL TIGREBUS  
Campus Unidad Mederos UANL



RUTA DEL TIGREVAN  
CAMPUS CIUDAD UNIVERSITARIA







# EDUCATION AND RESEARCH FOR SUSTAINABILITY



Education and research in sustainability play a fundamental role in the formation of future generations and in the search for solutions to the environmental challenges facing our planet. These two pillars complement and nurture each other, contributing to the development of a more conscious and responsible society.

The importance of sustainability education lies in the need to create environmental and citizenship awareness in students from an early age. Universities are ideal places to promote this awareness, as they provide a space for critical reflection and interdisciplinary learning. Through academic programs that include subjects related to sustainability, students can acquire knowledge about global environmental issues, sustainable practices, as well as social and economic issues linked to sustainable development.

On the other hand, sustainability research plays an essential role in the generation of knowledge and the search for innovative solutions. University researchers can address key issues such as climate change, natural resource management, renewable energy and biodiversity conservation. Their research contributes to the advancement of science and the development of more sustainable technologies that can have a positive impact on society.

The essential characteristics of sustainability education and research include interdisciplinarity, collaboration between academic institutions and the community, practical application of acquired knowledge, and commitment to social and environmental responsibility. In addition, it is vital to encourage student participation in projects and activities related to sustainability, which gives them the opportunity to apply what they have learned in real environments.





## UNIVERSITY ACADEMY FOR SUSTAINABLE DEVELOPMENT (UASD)

The Academy for Sustainable Development of the Universidad Autonoma de Nuevo Leon (UANL) is a leading institution in the promotion of sustainability in Mexico. Founded with the vision of promoting equitable and responsible development, the academy has become a reference in the region and nationally in the promotion of sustainable practices in various fields.

UASD currently brings together more than 130 specialists from various fields, such as environmental sciences, economics, sociology and engineering, among others, to address the challenges of sustainability from multiple perspectives. This allows the generation of comprehensive solutions adapted to the complexity of current environmental and social problems.

One of the most outstanding characteristics of the UANL Academy for Sustainable Development is its interdisciplinary approach.

The academy has obtained significant results in research and promotion of sustainable practices in the region. Through research projects and the dissemination of best practices, it has contributed to the development of strategies for the conservation of natural resources, the reduction of the carbon footprint and the improvement of the quality of life of local communities.

The Academy for Sustainable Development is a reference in the promotion of sustainability in Mexico, standing out for its interdisciplinary approach and the concrete results obtained in research and the promotion of sustainable practices, in addition to supporting different academic activities such as courses, conferences and workshops for members of the university community and society.



**35**

academic events  
broadcasts through  
various digital  
platforms and  
on-site

Over

**2,000**

participants

Participation of

**58**

national and  
international  
experts



## EDUCATIONAL OFFERINGS RELATED TO SUSTAINABILITY ISSUES

In 2022, the UANL offered 26 undergraduate and 101 graduate degrees related to sustainability issues:

### Undergraduate

1. Energy and Sustainable Development Management
2. Biology
3. Genomic Biotechnology
4. Food Science
5. Political Science and Government
6. Economy
7. Social Responsibility Management
8. Veterinary Medicine and Zootechnics
9. Nutrition
10. Bacteriological and Parasitological Chemist
11. Pharmaceutical Chemist Biologist
12. Social Work and Human Development
13. Agribusiness
14. Agronomy
15. Environmental
16. Biomedical
17. Biotechnology
18. Civil
19. Forestry
20. Geophysics
21. Geology
22. Geologist Mineralogy
23. Food Industries
24. Natural Resource Management
25. Petroleum
26. Chemical Engineering

### Masters degree

1. Master's Degree in Gender in Public Policy
2. Master's Degree in Physical Activity and Sports specialty in Health Promotion
3. Master's Degree in Building Project Management

4. Master's Degree in International Management specialty in Sustainable Business
5. Master's Degree in Animal Science

#### Master of Science with orientation in:

6. Food
7. Urban Affairs
8. Molecular Biology and Genetic Engineering
9. Architectural Design and Management
10. Medical Entomology
11. Food Industries
12. Environmental Engineering
13. Biosystems Engineering
14. Immunobiology
15. Wildlife Management and Sustainable Development

In 2022, the UANL offered

**26**  
undergraduate

and

**101**  
graduate degrees  
related to  
sustainability  
issues

16. Plant Resource Management and Administration
17. Microbiology
18. Applied Microbiology
19. Medical Microbiology
20. Nutrition and Food Technology for Aquatic Organisms
21. Sustainable Processes
22. Biomedical Chemistry
23. Chemistry of Natural Products
24. Environmental Chemistry and Technology
25. Social Work

#### Master's Degree in Engineering Sciences specialty in:

26. Thermal and Renewable Energies
27. Nanotechnology
28. Energy Technology

#### Master of Science in:

29. Nutrition
30. Agricultural Production
31. Public Health
32. Forestry
33. Geological
34. Policy and Governance

35. Master's Degree in Social Sciences specialty in Sustainable Development
36. Master's Degree in Conservation, Wildlife and Sustainability

37. Master's Degree in Criminology specialty in Security and Prevention

#### Master's Degree in Law specialty in:

38. Constitutional Law and Governance
39. Electoral Law and Systems





- 40. Master's Degree in Constitutional Law specialty in Human Rights
- 41. Master's Degree in Energy Law and Sustainability
- 42. Master's Degree in Human Development
- 43. Master's Degree in Medical and Veterinary Entomology
- 44. Master's Degree in Government and Public Administration
- 45. Master in Hydrogeology
- Master's Degree in Engineering specialty in:*
- 46. Environmental Engineering
- 47. Traffic and Roadway Engineering
- 48. Master's Degree in Sustainable Mobility Engineering
- 49. Master's Degree in Environmental Engineering and Management
- 50. Master's Degree in Management and Integral Use of Biotic Resources
- 51. Master's Degree in Alternative Dispute Resolution Mechanisms
- 52. Master's Degree in Psychology specialty in Gender Violence

*Master's Degree in Regulation specialty in:*

- 53. Energy
- 54. Regulatory Improvement
- 55. Regulated Sectors
- 56. Master's Degree in International Relations
- 57. Master's Degree in Ecological Restoration
- 58. Master's Degree in Social Work specialty in Social Projects
- 59. Master's Degree in Valuation

**Doctor's Degree**

- 60. Doctor's Degree in Animal Science
- 61. Doctor's Degree in Agricultural Sciences

*Doctor's Degree in Sciences specialty in:*

- 62. Food

- 63. Molecular Biology and Genetic Engineering
- 64. Biotechnology
- 65. Medical Entomology
- 66. Pharmacology and Toxicology
- 67. Immunobiology
- 68. Natural Resource Management
- 69. Wildlife Management and Sustainable Development
- 70. Plant Resource Management and Administration
- 71. Microbiology
- 72. Applied Microbiology
- 73. Nutrition and Food Technology for Aquatic Organisms
- 74. Sustainable Processes
- 75. Biomedical Chemistry
- 76. Materials Chemistry
- 77. Chemistry of Natural Products

- 78. Environmental Chemistry and Technology
- 79. Doctor's Degree in Earth Sciences
- 80. Doctor's Degree in Economic Sciences
- 81. Doctor's Degree in Social Sciences specialty in Sustainable Development
- 82. Doctor's Degree in Conservation, Wildlife and Sustainability
- 83. Doctor's Degree in Law specialty in Constitutional Law and Governance
- 84. Doctor's Degree in Medical and Veterinary Entomology

*Doctor's Degree in Philosophy specialty in:*

- 85. Architecture and Urban Affairs
- 86. Political Science
- 87. Doctor's Degree in Engineering specialty in Environmental Engineering
- 88. Doctor's Degree in Materials Engineering
- 89. Doctor's Degree in Management and Integral Use of Biotic Resources
- 90. Doctor's Degree in Medicine
- 91. Doctor's Degree in Alternative Dispute Resolution Methods

*Doctor's Degree in International Business specialty in:*

- 92. Agribusiness
- 93. Biotechnology
- 94. Business in Healthcare
- 95. Doctor's Degree in Social Work and Social Policy

**Specialties**

- 96. Specialty in Conservation, Wildlife and Sustainability
- 97. Specialty in Community and Family Health Nursing
- 98. Specialty in Medical and Veterinary Entomology
- 99. Specialty in Epidemiology
- 100. Specialty in Management and Integral Use of Biotic Resources
- 101. Specialty in Sustainability in Petroleum Processes





## DIAGNOSIS ON THE INCORPORATION OF SUSTAINABILITY IN THE UANL UNIVERSITY CURRICULUM

In 2022, the 26 schools that are part of the Universidad Autonoma de Nuevo Leon offered an educational offer composed of 85 bachelor's degrees in which 7,686 Learning Units (LU) were taught.

Of which 3,607 are related to sustainability issues:

1,677 social

1,349 environmental

3,607 learning units

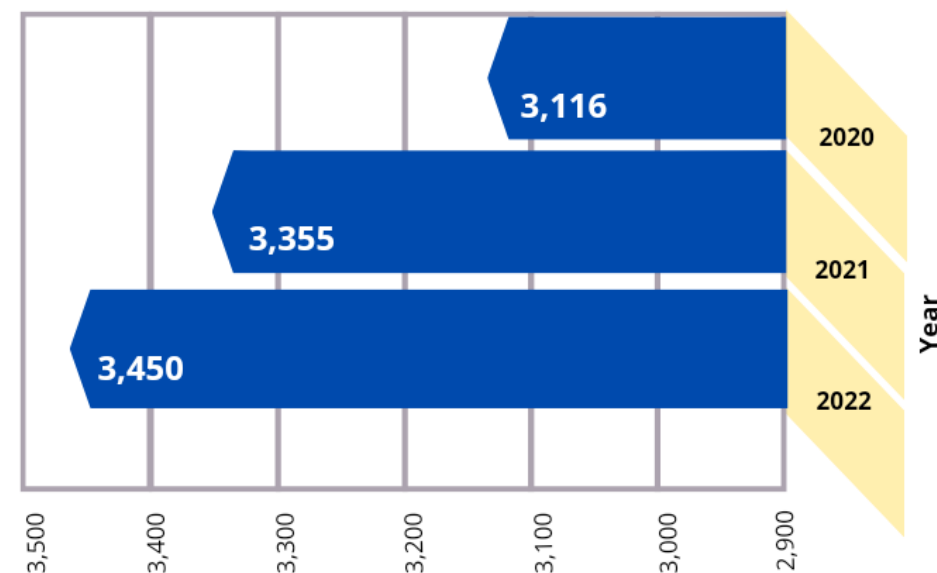
581 economic



More than **46%** of the learning units are related to sustainability issues

## Research and scientific dissemination in sustainability

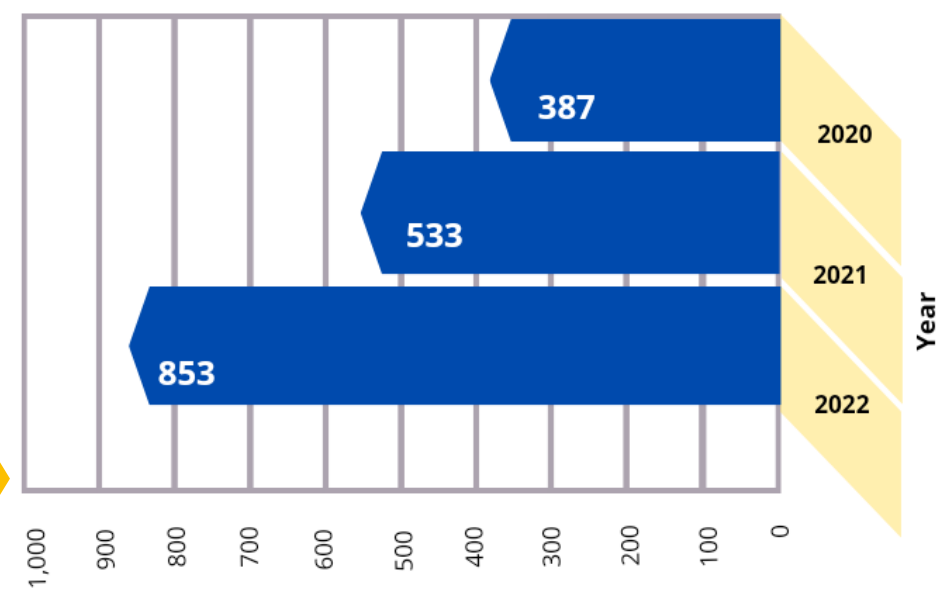
Dissemination academic publications related to sustainability



Dissemination academic publications

Source: Project Development Department, UANL.

## Academic and outreach events related to sustainability



Total academic and dissemination events

Source: Project Development Department, UANL.



## RECOGNITION OF THE ACADEMIC STAFF

6,894

professors at UANL

1,429

professors with desirable profile of the Program for the Professional Development of Teachers (PRODEP)

1,116

professors in the National System of Researchers (NSR)



## DIGITAL EDUCATION PROGRAM (PED)

The digital education program at the Universidad Autonoma de Nuevo Leon (UANL) represents a vanguard in educational transformation. With a focus on technological innovation, UANL has implemented a wide range of digital resources to enrich the learning experience of its students. This includes online learning platforms, interactive virtual classes, and access to world-renowned digital libraries. In addition, the university strives to promote digital inclusion and equitable access to education by providing online training opportunities to remote communities. UANL's digital education program embodies the vision of quality education accessible to all.

UANL's online learning platform allows students to access study materials, participate in interactive virtual classes, and take assessments in a convenient manner. This not only facilitates continuous learning, but also fosters collaboration and communication between students and professors, regardless of their geographic location.

In 2022, the UANL provided educational services through the PED to 17,138 students, thus avoiding the emission of 6,834,112 kg of CO<sub>2</sub> equivalent, due to the fact that fuel expenses were avoided in the transportation of students to the university campuses, in addition to avoiding the consumption of energy and water that would have been generated by these same academic activities, but in face-to-face mode.

Source: Head Office of Digital Education

In 2022 the UANL through the Digital Education Program provided services to

**17,138** students



## EDUCATIONAL PLATFORMS USED AT UANL



### VIRTUANL

Online learning system that allows students to choose between different modalities during their university career, combining in the same semester face-to-face, blended or online learning units, according to their needs and preferences.

### CÓDICE

Electronic catalog of libraries integrated by 68 dependencies of the UANL.



### TERRITORIUM

It is a collaborative platform for education, designed by educators and developers that allows students to progress in various skills, it can be considered a private social network for learning, for its ease of use.

### MOODLE

It is a platform that allows the creation and management of online learning and teaching spaces adapted to the needs of teachers, students and administrators.



### NEXUS

Institutional virtual platform that facilitates collaboration between students and teachers in the teaching and learning process in face-to-face, distance and blended modalities.

**157,126 students served**

### SIASE

It supports and optimizes the administration processes of the departments in the educational institutions such as Academic Department, Human Resources, Finance, among others; to obtain information in a timely and reliable way for decision making.





# INNOVATION AND ENTREPRENEURSHIP PROGRAM RELATED



The Tiger Tank innovation program at the Universidad Autonoma de Nuevo Leon (UANL) is an exciting initiative that encourages creativity and entrepreneurship among its students. Inspired by the famous television series "Shark Tank," this event brings together brilliant minds from the university community who compete to present their innovative ideas to a panel of expert judges. Tiger Tank fosters a culture of innovation, giving participants the opportunity to receive valuable feedback and resources to take their projects to the next level. It also promotes collaboration and entrepreneurship, contributing to the economic and social growth of the region.

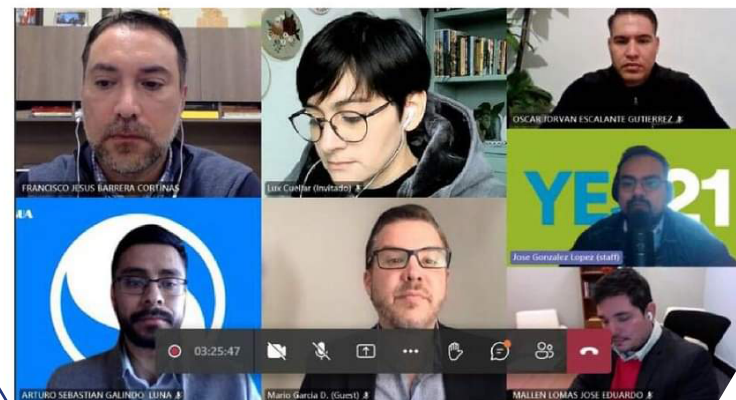
## Tiger Tank 2022

**Project: PLACE AND PEACE MÉXICO**  
**Unit: School of Civil Engineering-Communication Sciences**

Problem/solution: The project links all those foreigners who wish to change their residence to live their retirement in Mexico, solving problems of health, housing, security, food and entertainment. This helps both local people, who have the possibility of increasing their market internationally and promotes the growth of the place selected as suitable for foreign retirement. It promotes a relaxed and carefree life to live either for terms of three to six months or years.



### SOLAGUA



**Project: SOLAGUA**

**Unit: School of Civil Engineering**

Problem/solution: The design and construction of a semi-pilot scale photocatalytic reactor with compound parabolic collectors (CPC) to complement the physicochemical and biological processes of a treatment plant, achieving the degradation of emerging pollutants that cannot be eliminated by conventional processes.

**Project: EVA PERIODS**

**Unit: School of Physical and Mathematical Sciences**

Problem/solution: products such as the eva menstrual cup and eva menstrual panty liners, which with their 1-to-1 impact model, will revolutionize the way of menstruating by helping. In addition to the first reusable tampon applicator, reducing the environmental impact of this project.

**Project: AGACEL**

**Department: School of Mechanical and Electrical Engineering**

Problem/solution: through advanced processes and nanotechnology, we convert barley spent grain (BSG) into various food supplements. Our process reduces the drying time of brewer's spent grain (only 4 hours), obtaining special flour with all the elements separately such as starch-fiber-protein, maltose and husk.

The CREALTII program of the Universidad Autonoma de Nuevo Leon (UANL) is an innovative initiative that promotes research, creativity and technology transfer in the university community. Through CREALTII, collaboration between professors, students and companies is fostered, allowing the development of multidisciplinary projects that address contemporary challenges.



## EVA PERIODS





This program promotes the training of highly qualified professionals and contributes to scientific and technological progress in Mexico. CREALTII offers resources, training and technical support, facilitating the creation of effective solutions to complex problems. The UANL thus demonstrates its commitment to academic excellence and the generation of knowledge that benefits society.

## CREALTII 2022

### Project: Printek

**Unit: School of Civil Engineering.**

Description: one technology that can be implemented in construction using portland cement-based mixtures is 3D printing, with a series of potential advantages such as: reduction of raw material consumption, less waste of materials during construction, reduced production times and constant efficiency, as well as less labor demand, which make it not only viable but also sustainable.

### Project: Social Liaison Center

**Unit: School of Social Work and Human Development**

Description: Formalization of the Liaison Unit of the School of Social Work and Human Development, Generation of Research, Programs and Projects that promote social welfare. Project directed to Public and Private Institutions.

### Project: Lovali

**Unit: School of Public Accounting and Administration.**

Description: generate a program that provides the necessary skills and tools so that people living in marginal sectors can become self-employed by offering their services and products manufactured by themselves. The above, through a liaison with the private sector and with government support.

### Project: Community Center for Social Innovation

**Unit: School of Social Work and Human Development.**

Description: The objective of the center is to strategically and jointly manage social processes and the management of resources for community advocacy, through the collective participation of the network of allies.





# STUDENT PARTICIPATION



Student participation in the programs that the Universidad Autonoma de Nuevo Leon (UANL) carries out to build a more sustainable future empowers young people to become agents of change.

The participation of students in projects related to waste reduction, efficient use of renewable energy and water, conservation of natural environments, among others, not only allows them to acquire practical knowledge, but also to develop leadership, problem-solving and teamwork skills. These acquired competencies are not only valuable in the academic environment, but are also transferable to professional practice and daily life.



## Activities to promote sustainability with student participation

Activity	Date	Student participation
Conference "Urban Agriculture"	February 3, 2022	752
Conference "Importance of the study of aerobiology in the Metropolitan Area of Monterrey"	February 24, 2022	587
Conference "Pollinators of Nuevo León"	March 3, 2022	514
Student participation dynamics "How do you reduce your carbon footprint?"	February 3 to 14, 2022	11
Campaign of recovery of natural environments in "la silla" river.	March 14, 2022	250
Dynamics of student participation "Water care"	March 22 to 31, 2022	26
Training course for leaders promoting sustainability (session 1)	March 23, 2022	1,200
Diagnosis of the current status and proposal for sustainable management of the forest capital of the Faculty of Economics	March 23 to April 1, 2022	15
Training course for leaders promoting sustainability (session 2)	March 30, 2022	983
Conference "The role of bacteriophages as agents of change"	March 31, 2022	555
Training course for leaders promoting sustainability (Session 3)	April 6, 2022	959
Conference "Impact of air pollution on health"	April 7, 2022	529
Training course for leaders promoting sustainability (session 4)	April 27, 2022	672
Conference "Interdisciplinarity in the development of future sustainable technologies"	May 2, 2022	792
Training course for leaders promoting sustainability (session 5)	May 4, 2022	465
Training course for leaders promoting sustainability (session 6)	May 11, 2022	913
Diagnosis of the current state and proposal for sustainable management of the forest capital of the Faculty of Visual Arts	May 11 to 27, 2022	15
Dynamics of student participation "Care of urban natural spaces"	May 4 to 18, 2022	12



Activities to promote sustainability with student participation

Activity	Date	Student participation
Conference "Composting and gardening at home, learning from practice"	May 12, 2022	769
Conference "Migration and climate change"	May 26, 2022	558
Conference "Let's talk about fast fashion and second-hand shopping"	June 6, 2022	381
Conference "Entrepreneurship to care for the environment"	June 9, 2022	448
Campaign of recovery of natural environments in "la huasteca" ecological park	June 10, 2022	250
Diagnosis of the current state and proposal for sustainable management of forest capital of the Research Center for Sustainable Development of the UANL	July 4 to 21, 2022	4
Dynamics of student participation "Fauna Observers"	August 17 to 30, 2022	50
Diagnosis of the current state and proposal for sustainable management of the forest capital of the Faculty of Communication Sciences	August 17 to October 20, 2022	40
Conference "The current tasks of critical ecopedagogy within the framework of the earth charter"	August 25, 2022	756
Campaign for the propagation of native and/or endangered plants	August 26, 2022	250
Conference "Sustainable lives"	September 1, 2022	599
Training course for leaders promoting sustainability (session 1)	September 21, 2022	295
Training course for leaders promoting sustainability (session 2)	September 28, 2022	243
Campaign of recovery of natural environments in "la silla" river	September 29, 2022	250
Conference "Promoting of environmental care through the Social Responsibility model"	September 29, 2022	740
Training course for leaders promoting sustainability (session 3)	October 5, 2022	688
Conference "Great stories of small species"	October 6, 2022	753

Activities to promote sustainability with student participation

Activity	Date	Student participation
Dynamics of student participation "Literature for sustainability"	October 6 to 18, 2022	17
Training course for leaders promoting sustainability (session 4)	October 12, 2022	575
Training course for leaders promoting sustainability (session 5)	October 19, 2022	619
Training course for leaders promoting sustainability (session 6)	October 26, 2022	493
Conference "Animal Welfare"	October 27, 2022	387
Conference "We are AWWA"	November 3, 2022	465
Dynamics of student participation "native flora of N.L. in university campuses"	November 2 to 20, 2022	22
Conference "Methodology for the identification of natural capital in the Faculty of Philosophy and Letters of the UANL"	November 24, 2022	430
<b>Total</b>		<b>19,332</b>





There are 133 student organizations registered at UANL that work with issues related to the three aspects of sustainable development: social, economic and environmental, of which 56 correspond to independent organizations, 35 to university federations and 42 to student societies representative of each School, both university federations and student societies maintain an organizational scheme headed by a president, and a secretary general, supported by groups of young leaders, who support the realization of projects inscribed in an annual work program, putting them into practice, with the purpose of benefiting the university community and its social environment.



**133**  
student associations  
linked to  
sustainability  
issues







In 2022,  
**73** activities  
were carried out to  
promote sustainability  
with student  
participation

More than  
**27,000**  
participantes  
en actividades para  
promover la  
sustentabilidad



Through promotional campaigns, educational events and service projects, students can inform their peers about sustainable practices and their implications for the planet and future generations. This collective awareness can have a multiplier effect as students share what they have learned with their friends, families and communities, thus extending the impact beyond the boundaries of college campuses.

Student participation also contributes to innovation in sustainable solutions, as young people often approach challenges from fresh and creative perspectives, which can lead to the generation of innovative ideas and approaches to address environmental, social and economic problems.

Students not only acquire academic learning on university campuses, but also become responsible citizens. Their participation in sustainability programs promotes the adoption of sustainable habits in daily life.

As students become leaders and advocates for sustainability, they contribute significantly to addressing global challenges and forging a path toward a more equitable world in harmony with nature, becoming role models in their social circles.







# 17 ALIANZAS PARA LOGRAR LOS OBJETIVOS

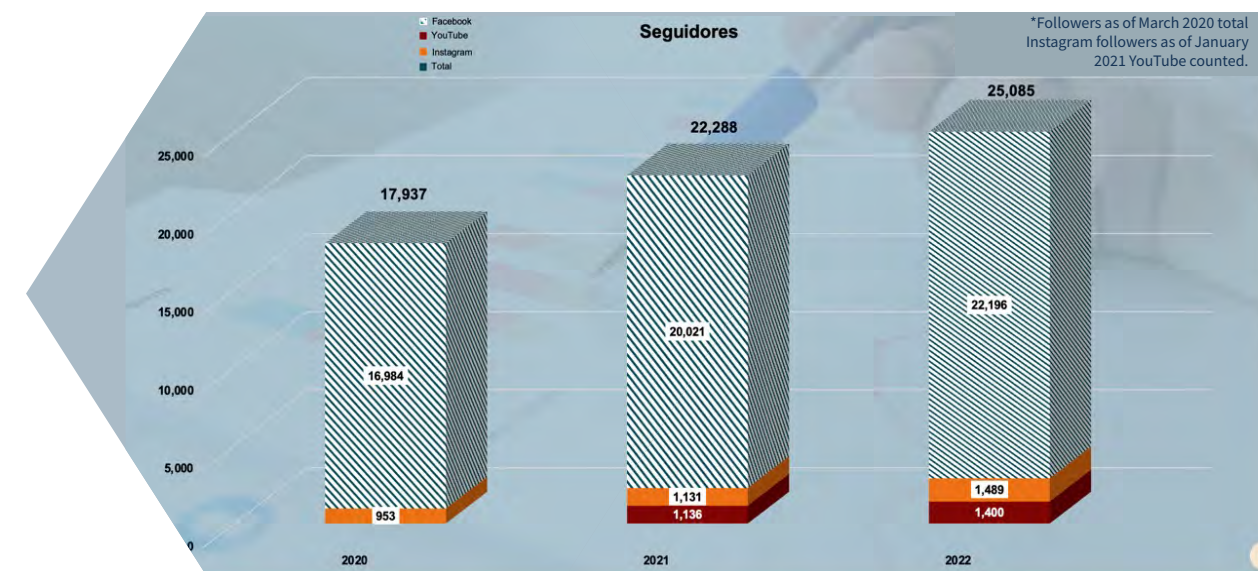


## SUSTAINABILITY COMMUNICATION AND DISSEMINATION PROGRAM

The Universidad Autónoma de Nuevo Leon (UANL) promotes activities that increase the awareness and participation of the student community in sustainability issues, both on and off campus. In this context, the Project Development Department (PDD) of the Sustainability Department (SD) of the UANL, created the Sustainable UANL Communication and Dissemination Program, with the objective of motivating students, as well as academic and administrative staff to become agents of change towards sustainability.

The Program uses ICTs (Information and Communication Technologies) as mechanisms of change, in such a way that social networks, such as Facebook, Instagram and YouTube, are used to motivate the social agents that observe them to adopt, within their lifestyle, the principles, values and tasks of sustainability.

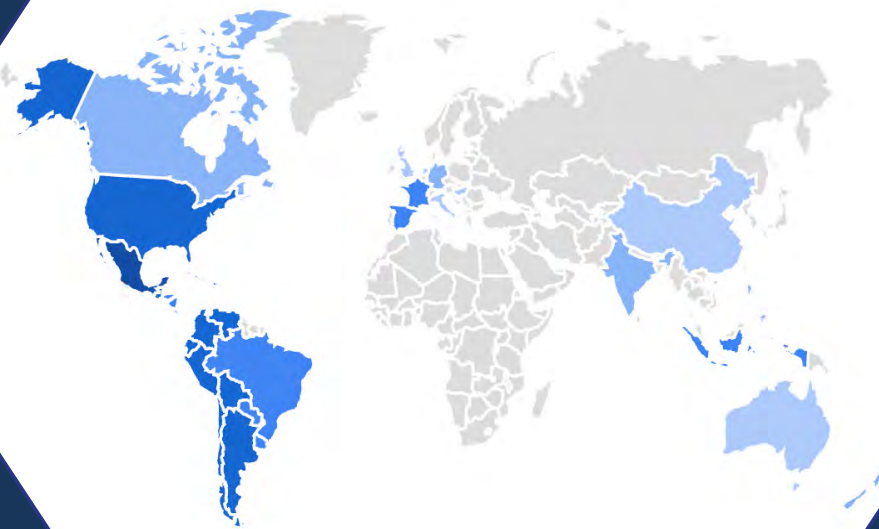
Through daily publications, 365 days a year, on research results, best practices, tips and news, among other aspects, related to sustainable development, they allow members of the university community and society to be part of the social segment that supports the construction of sustainable societies.



UANLSustentable's social media followers during 2022



During the year 2022, more than 1,360,000 people around the world were reached through the publications made in the social networks and the web page managed by the DDP-SS-UANL, which demonstrates the great interest that an increasing segment of society has in issues related to sustainability.



In 2022, more than 2,500 publications were disseminated through Facebook and Instagram UANLSustentable reaching more than 720,000 people living in México, Estados Unidos, Colombia, Chile, Perú, Argentina, Canadá, Spain, Germany, Bolivia and Ecuador.

Through the YouTube channel in 2022 more than 200 videos were produced and published, 41 of which corresponded to conferences that were transmitted online and 52 to weekly educational sessions carried out in virtual mode and in the case of the Sustainability website (sds.uanl.mx) registered a traffic of more than 640 thousand visits from people living in 163 countries.

**¿Sabías que los árboles nativos tienen mayor resistencia a temperaturas extremas y plagas, su mantenimiento es de bajo costo y además filtran mayor cantidad de partículas contaminantes?**

**¿Qué árboles sembrar en el área metropolitana de Monterrey?**

- Huizache
- Encino
- Anacahuíta
- Magnolía
- Ébano
- Mezquite
- Palo Blanco
- Crespón
- Duraznillo
- Sicomora

**BIBLIOTECA PARA LA SUSTENTABILIDAD**

PLAN SUBREGIONAL DE **TURISMO SUSTENTABLE**

TURISMO DE MONTAÑA

El Plan Subregional de Turismo Sustentable en Áreas Naturales Protegidas: Turismo de Montaña en el Eje Neovolcánico es un instrumento que tiene el objetivo de fortalecer las acciones de conservación a través de procesos de coordinación y colaboración con actores clave para el manejo y ordenamiento de la actividad turística, que permitan la generación de impactos positivos y el desarrollo sustentable local.

**OBSERVADORES DE FAUNA SILVESTRE EN LA UANL**

VIGENCIA DE LA CONVOCATORIA DEL 17 AL 31 DE AGOSTO DE 2022

**Huizache** (*Vachellia farnesiana*)

Tiene una importante capacidad de adaptación en distintos territorios de climas desértico o semidesértico.

ORGULLO DE NUEVO LEÓN

Es un árbol cubierto de espinas agudas, cilíndricas y blanquecinas. Presenta un tronco corto y delgado, bien definido. Flores en glomérulos de color amarillo que producen una sustancia aromática muy agradable, llamada aceite de acacia o de cassia.

FRUTO ES UNA LEGUMBRE MORENO ROJIZA, Y LAS SEMILLAS DEN PERMANECER EN EL SUELO EN ESTADO DE LATENCIA VARIOS AÑOS, DANDO ASI ORIGEN A NUEVAS PLANTAS.

**"LA NATURALEZA NO ES UN LUGAR PARA VISITAR. ES EL HOGAR"**

-Gary Sherman Snyder

**CARTELERA DE LA SUSTENTABILIDAD**

**La educación ambiental en la defensa del territorio y la justicia ambiental**

Miércoles 26 de enero 10:00 horas (CDMX)

LIVE SEMARNATMX, SEMARNAT TV y UPN.MX

UPNAjusco

**CONOCIENDO LA IMPORTANCIA DE LOS MURCIÉLAGOS**

M.C. AQUETZALLI NAYELLI RIVERA VILLANUEVA

FACULTAD DE CIENCIAS BIOLÓGICAS, UANL

JUEVES 9 DE JUNIO DE 2022

HORARIO: 13 HORAS

VÍA: MICROSOFT TEAMS

**17 DE JUNIO**

DÍA MUNDIAL DE LUCHA CONTRA LA DESERTIFICACIÓN Y LA SEQUÍA, "SUPERANDO JUNTOS LAS SEQUÍAS"

Monitor de Sequía de México

**SEMINARIO PERMANENTE ACADEMIA UNIVERSITARIA PARA EL DESARROLLO SUSTENTABLE**

25 DE AGOSTO DE 2022

4:00 PM

UBICACIÓN: UANL Sustentable



## SUSTAINABLE WORLD



The educational television program Mundo Sustentable, was created in 2015 with the main objective of disseminating the actions carried out by members of the university community and society in favor of sustainability.

During 2022, 20 programs were produced and broadcasted through the open television signal of Channel 53, with the participation of 20 distinguished specialists in the three axes of sustainability: environmental, social and economic.



## CULTURAL EXPRESSIONS LINKED TO THE PROMOTION OF SUSTAINABILITY

The Universidad Autonoma de Nuevo Leon has promoted sustainable development not only through an adequate environmental management, but also by means of artistic expression activities, which were able to sensitize the members of the university community about the importance of caring for the planet for the welfare of present and future generations.

In 2015, the Project Development Department of the Sustainability Department of the UANL created the photography contest "In the Sight of Sustainability", which in the year 2022 held its eighth edition with the theme "Actions for the care of wa-ter" in which more than 400 students from 12 university departments participated.

The winning entries in the photography contests were used to create the photography exhibit "En la Mira de la Sustentabilidad" which in 2022 consisted of 63 works and was exhibited in 3 university facilities before more than 1,350 spectators.









# ACKNOWLEDGMENTS



...na de Desarrollo  
del Estado de Nuevo León  
otorga el presente

**Reconocimiento a:**

*Dra. Liliana Ramírez-Freire*

Por sus acciones a favor del medio ambiente en la categoría "Biodiversidad"

...retaría  
...rrollo

Ing. Manuel Villalón  
Secretaría de...



**CIEES**

Los Comités Interinstitucionales para la Evaluación de la Educación Superior, A.C. otorgan el presente

**RECONOCIMIENTO**

por haber obtenido el Nivel 1

al programa educativo

...enciatura en Multimedia y Animación Digital

...te en la Facultad de Ciencias Físicas y Matemáticas  
Universidad Autónoma de Nuevo León



Clúster Energético de Nuevo León  
Premio Nacional de Innovación Energética

El Clúster Energético de Nuevo León Otorga el presente

**Reconocimiento**

a

*Jorge Alberto Briones Carrillo*

Por obtener el Segundo Lugar en la Categoría de Eficiencia Energética para el Hogar

Con el Proyecto "Sistema de enfriamiento/calefacción de aire por medio de energía geotérmica para casa habitación"

ING. CÉSAR GARDUÑA CÁDENA  
PRESIDENTE

DR. AMARDO VILLARREAL GONZÁLEZ  
DIRECTOR GENERAL



**GOBIERNO DE MONTERREY**

**EL GOBIERNO MUNICIPAL DE LA CIUDAD DE MONTERREY**

OTORGA EL PRESENTE

**RECONOCIMIENTO**

a la

**Academia Universitaria para el Desarrollo Sustentable de la Universidad Autónoma de Nuevo León**

Por su destacada trayectoria y logros que representan un modelo a seguir, siendo merecedora de la **Medalla al Mérito Ecológico, edición 2019.**

Alejo Echeverría de la Cerza Santos  
PRESIDENTE MUNICIPAL

Monterrey, Nuevo León, 6 de Octubre de 2019

**CERTIFICATE OF REGISTERED ORGANIZATION**

Normalización y Certificación NYCE, S.C., accredited certification body with registration number 02/09 by the Entidad Mexicana de Acreditación (EMA) certifies that the Service Management System of:

**UNIVERSIDAD AUTÓNOMA DE NUEVO LEÓN**

Complies with the requirements of the standard ISO/IEC 20000-1:2011 Information Technology - Service management - Part 1: Service Management System Requirements.

For the following scope:  
The Department of Information Technology, which is located in Ciudad Universitaria, after obtaining approval with a Technical Email, integrated library management, Finance, user services, Administration and Training, Support Services and Health, Social Organization Systems Management Systems and the development of all other IT services related to the University Administration, including the development of the University Technology Tools in the following areas of interest.

Validity: 3 years  
Certified since: May 05, 2014  
Issue date: May 22, 2017  
Expiry date: May 21, 2020

**NYCE**  
NORMA ISO/IEC 20000-1:2011  
CERTIFICADO

**ema**  
ENTIDAD MEXICANA DE ACREDITACIÓN

CERTIFICATE: SGT-016



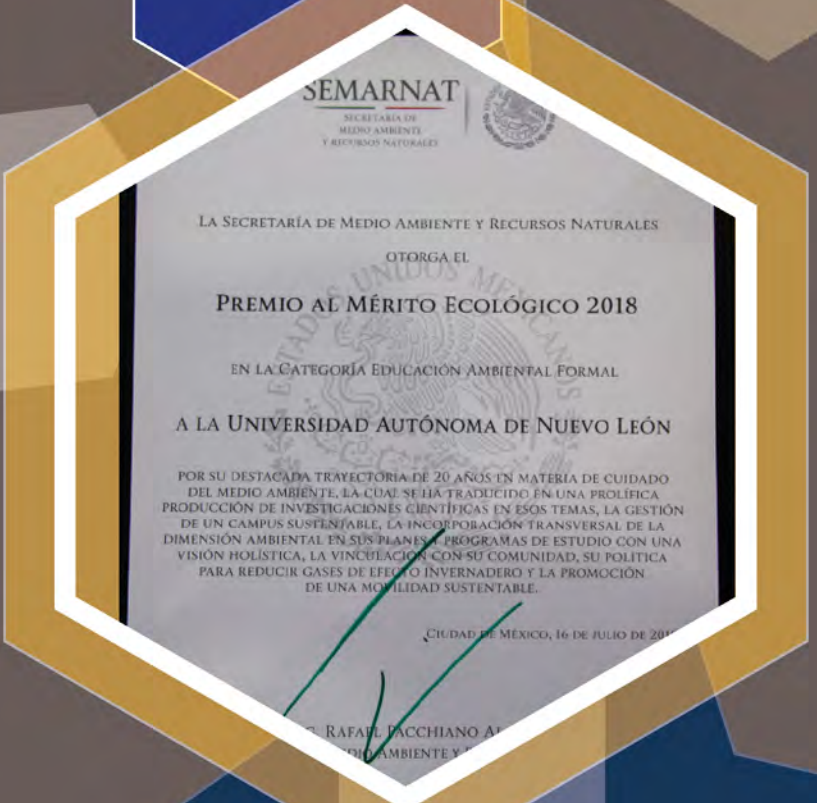
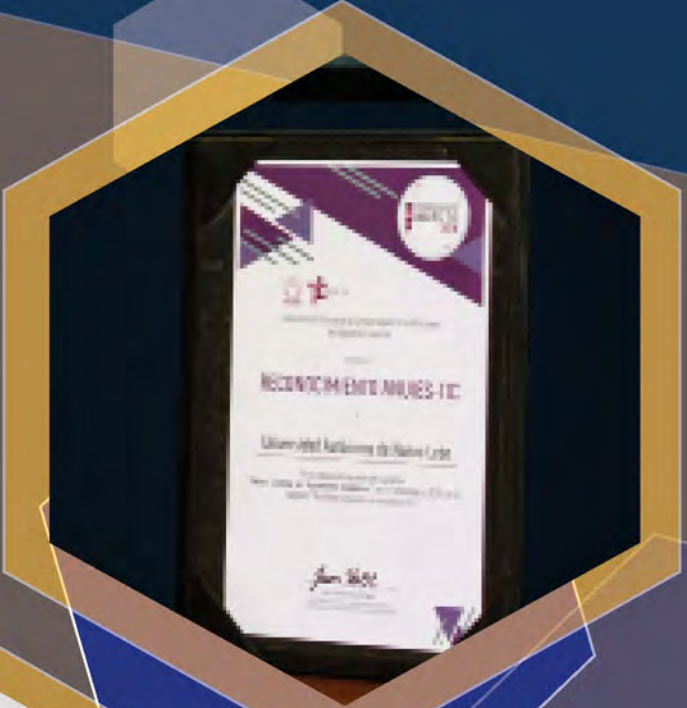


# ACKNOWLEDGMENTS





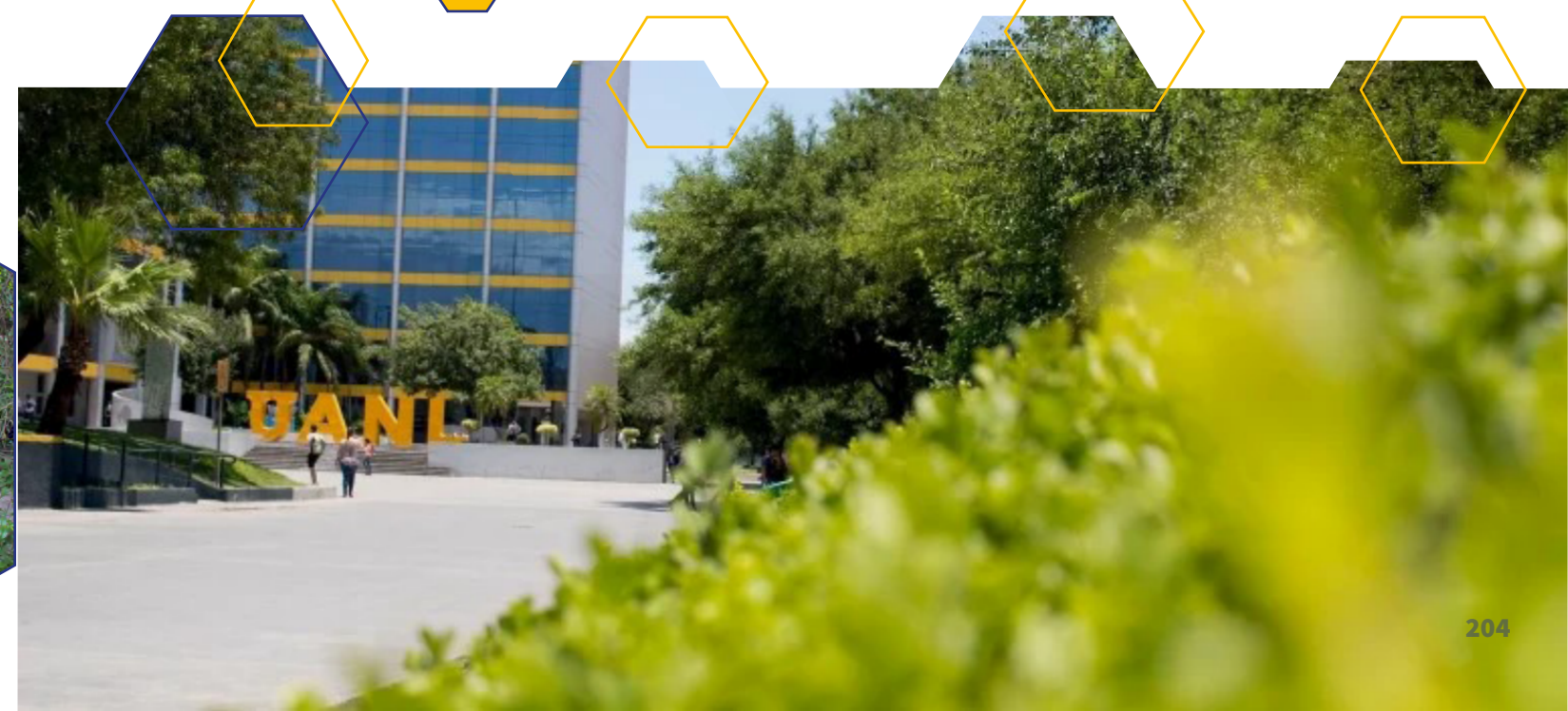
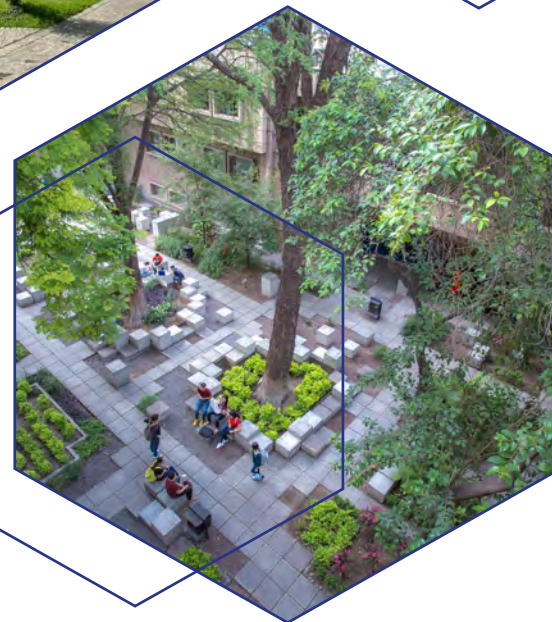
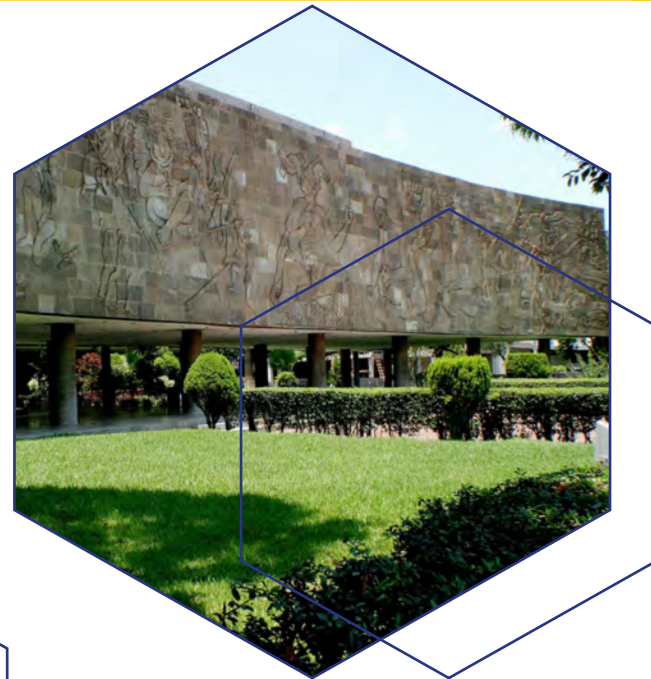
# ACKNOWLEDGMENTS





### PHOTO CREDITS

- UANL Photographic Archive
- Paola Denisse Menchaca Candanoza
- Jesús Gerardo Martínez Mora
- Edali Paola Arriaga Martínez
- André Salvador Genis Pérez





# *We are the most sustainable university of Mexico\**

*\*According to World university ranking UI GreenMetric 2022*

