Measuring the carbon footprint at Universidad de Navarra (Spain)

ICARB 2023

Cristina Muñoz Corsini,

Universidad de Navarra

Maria Eugenia Clouet,

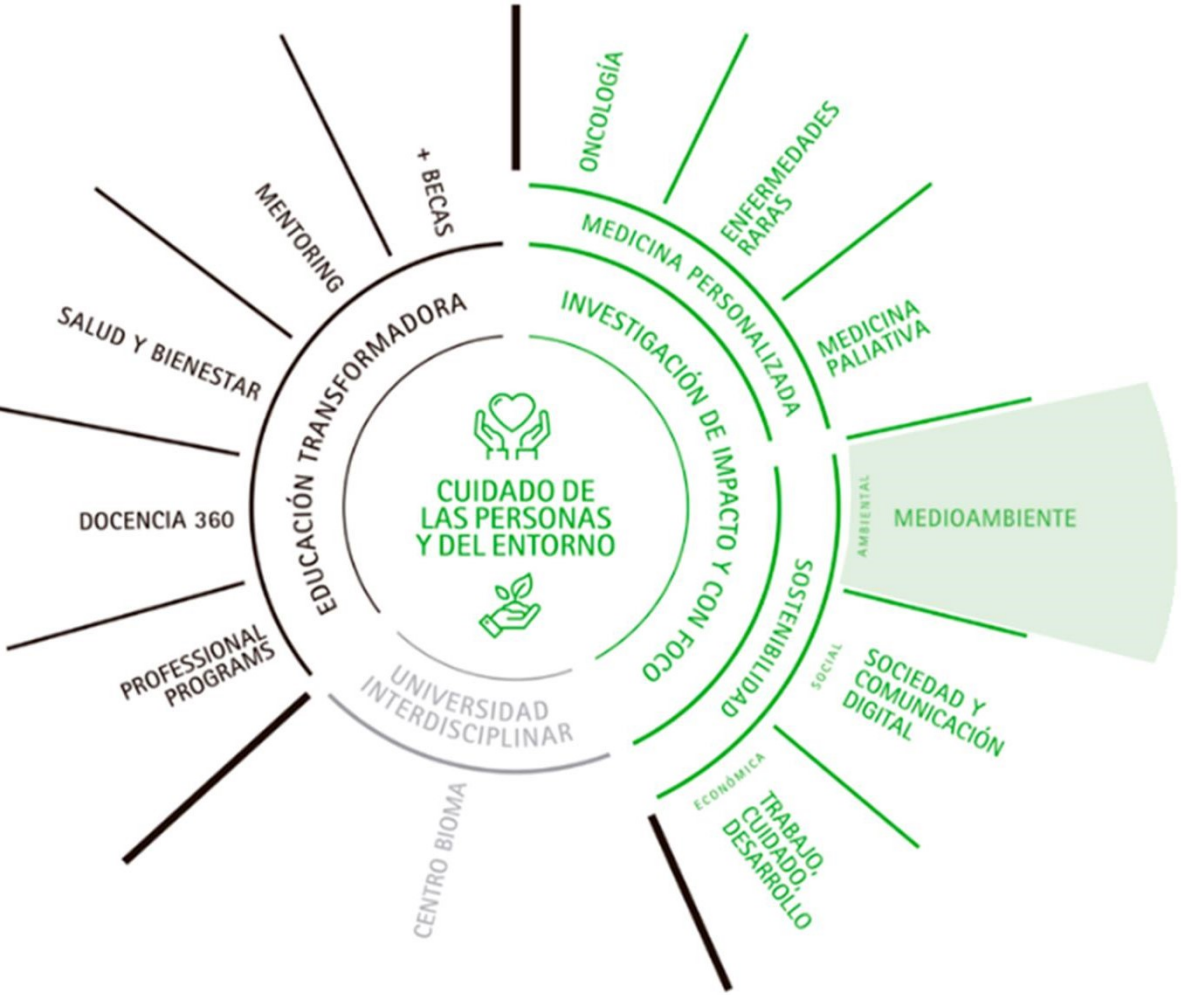
Universidad de Navarra

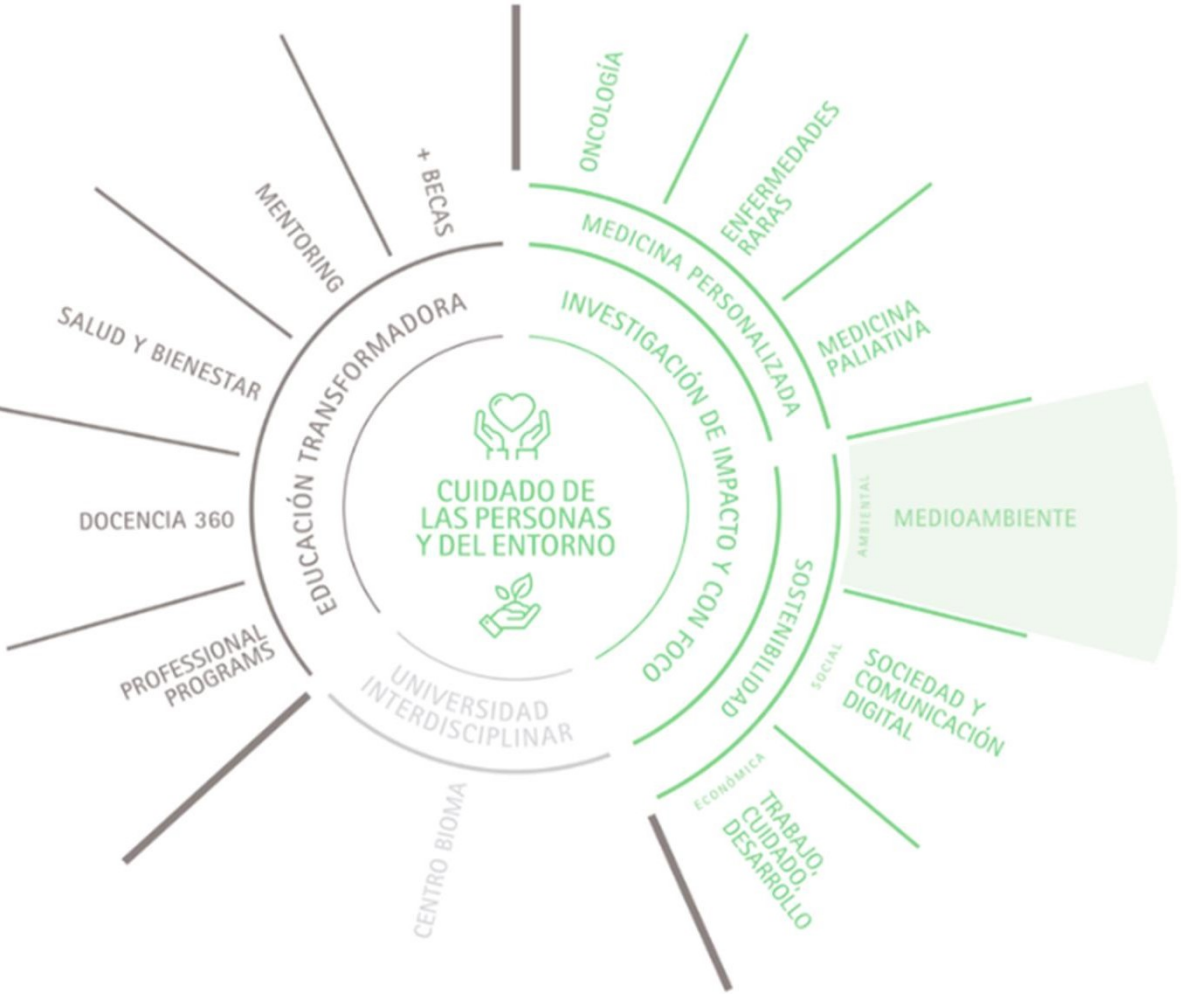
Sara Dorregaray-Oyaregui *

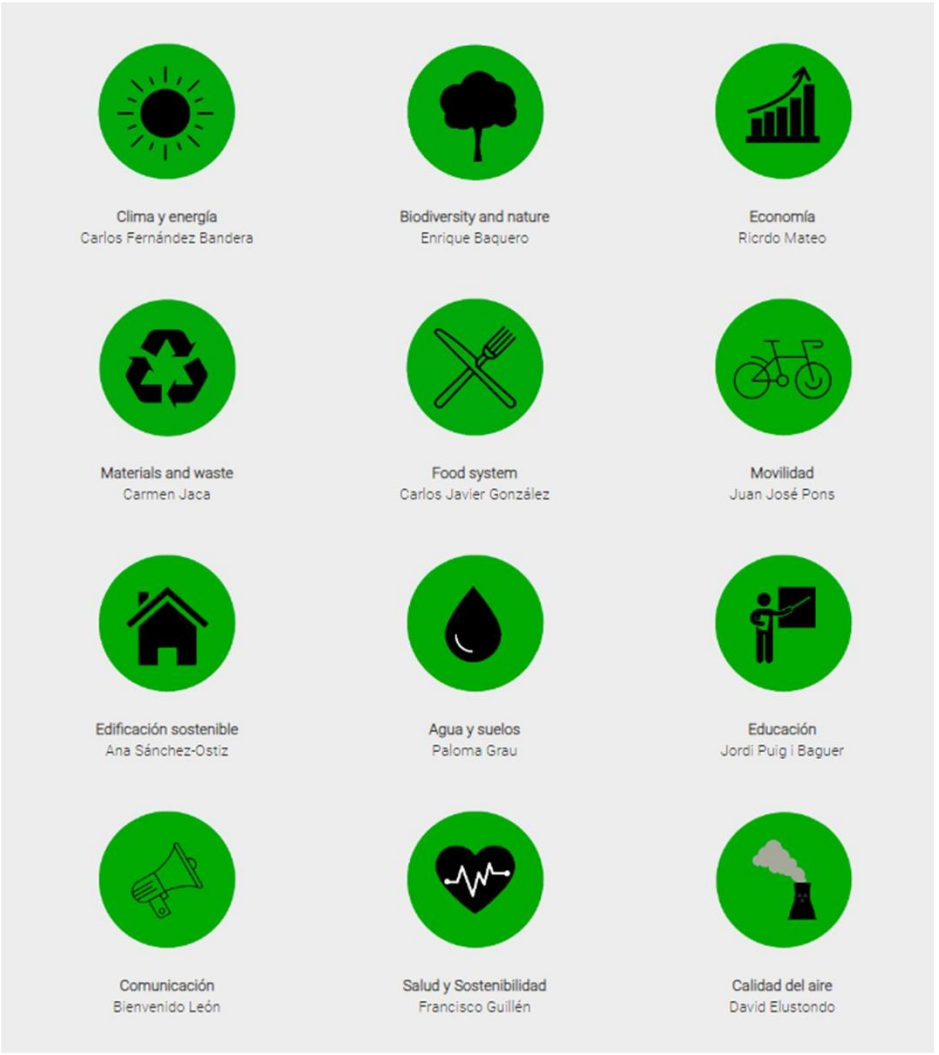
Universidad de Navarra | CÁTEDRA FUNDACIÓN SALTOKI


ICARB


Golfo de Vizcaya
Burdeos
Aviñón
Montpellier
Marsella
Toulouse
Carcasona
Bayona
Gijón
Santander
Bilbao
A Coruña
Oviedo
Santiago de Compostela
Lugo
Perpiñán
Andorra
Vitoria-Gasteiz
León
Burgos
Girona
Vigo
Zaragoza
Barcelona
Valladolid
Braga
Tarragona
Oporto
Salamanca
Aveiro
Madrid
Mar Balear
Palma
Coimbra
Toledo
Valencia
Portugal
España
Ibiza
Albacete
Denia
Lisboa
Alicante (Alacant)
Murcia
Córdoba
Argel
Sevilla
Granada
Albufeira
Almería
Faro
Málaga
Bouira
Cádiz
Marbella
Fuengirola
Gibraltar
Mar de Alborán
Bou Saâda
Provincia de Djelfa
Tetuán


CUIDADO DE LAS PERSONAS Y DEL ENTORNO
INVESTIGACIÓN DE IMPACTO Y CON FOCO
EDUCACIÓN TRANSFORMADORA
UNIVERSIDAD INTERDISCIPLINAR
MEDICINA PERSONALIZADA
SOSTENIBILIDAD
ONCOLOGÍA
ENFERMEDADES RARAS
MEDICINA PALIATIVA
AMBIENTAL
MEDIOAMBIENTE
SOCIAL
SOCIEDAD Y COMUNICACIÓN DIGITAL
ECONÓMICA
TRABAJO, CUIDADO, DESARROLLO
+ BECAS
MENTORING
SALUD Y BIENESTAR
DOCENCIA 360
PROFESSIONAL PROGRAMS
CENTRO BIOMA


CUIDADO DE LAS PERSONAS Y DEL ENTORNO
EDUCACIÓN TRANSFORMADORA
INVESTIGACIÓN DE IMPACTO Y CON FOCO
UNIVERSIDAD INTERDISCIPLINAR
+ BECAS
MENTORING
SALUD Y BIENESTAR
DOCENCIA 360
PROFESSIONAL PROGRAMS
CENTRO BIOMA
ONCOLOGÍA
ENFERMEDADES RARAS
MEDICINA PERSONALIZADA
MEDICINA PALIATIVA
AMBIENTAL
MEDIOAMBIENTE
SOSTENIBILIDAD
SOCIAL
SOCIEDAD Y COMUNICACIÓN DIGITAL
ECONÓMICA
TRABAJO, CUIDADO, DESARROLLO

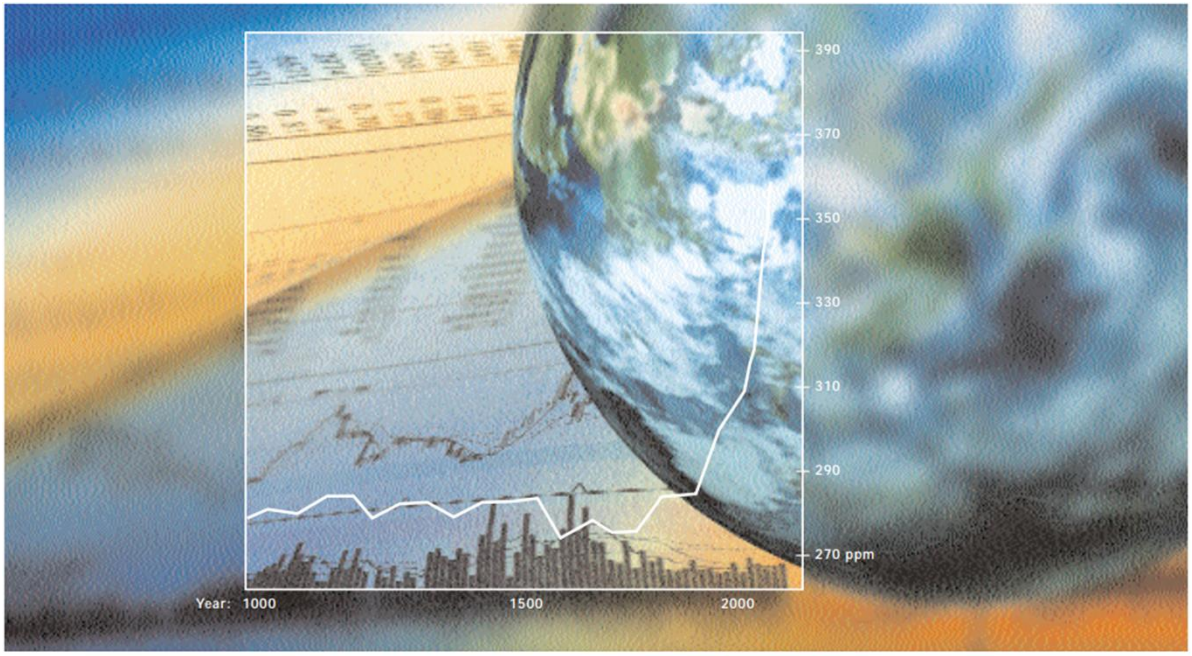

Clima y energía
Carlos Fernández Bandera
Biodiversity and nature
Enrique Baquero
Economía
Ricrdo Mateo
Materials and waste
Carmen Jaca
Food system
Carlos Javier González
Movilidad
Juan José Pons
Edificación sostenible
Ana Sánchez-Ostiz
Agua y suelos
Paloma Grau
Educación
Jordi Puig i Baguer
Comunicación
Bienvenido León
Salud y Sostenibilidad
Francisco Guillén
Calidad del aire
David Elustondo

Author Depositphotos


ICARB

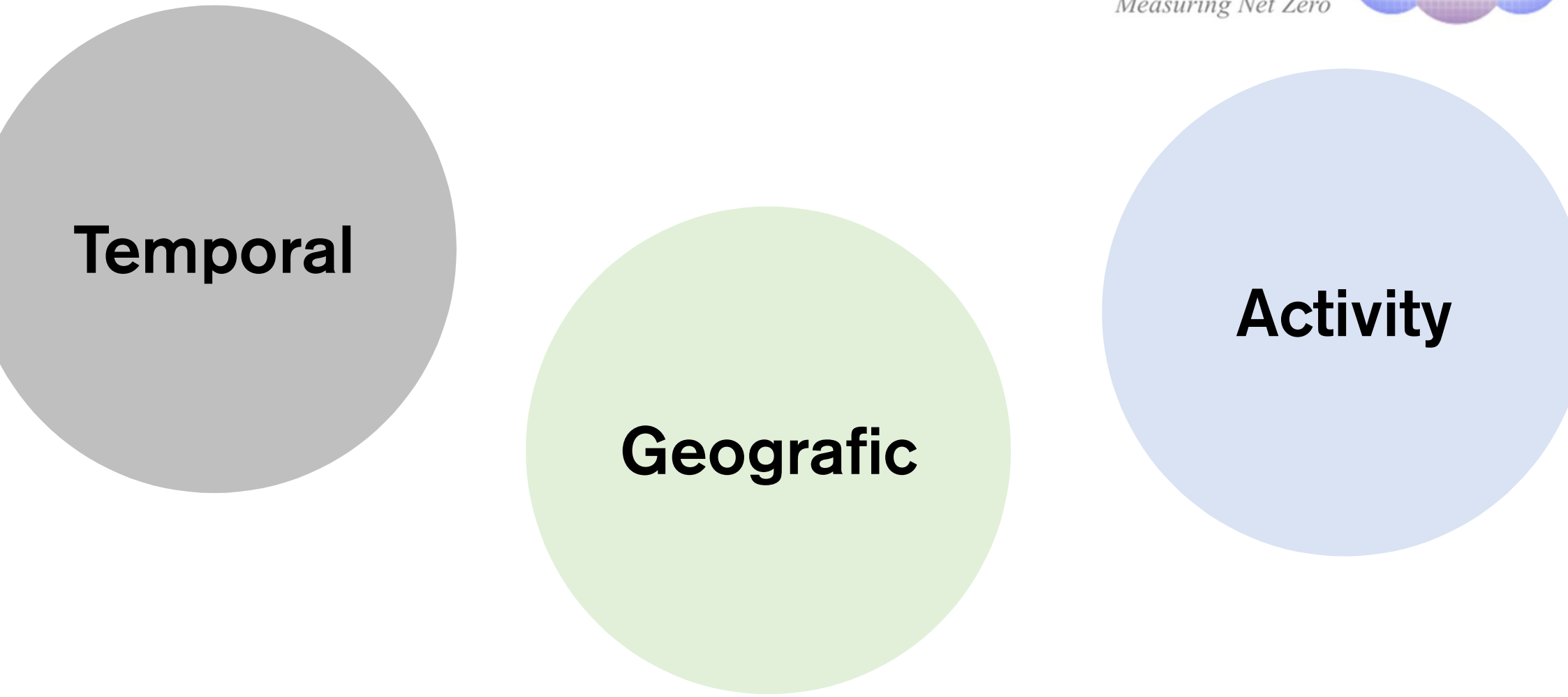
GREENHOUSE GAS PROTOCOL

Operational control criteria with GHG



A Corporate Accounting and Reporting Standard


ICARB


Temporal
Geografic
Activity

Temporal
2021-2022

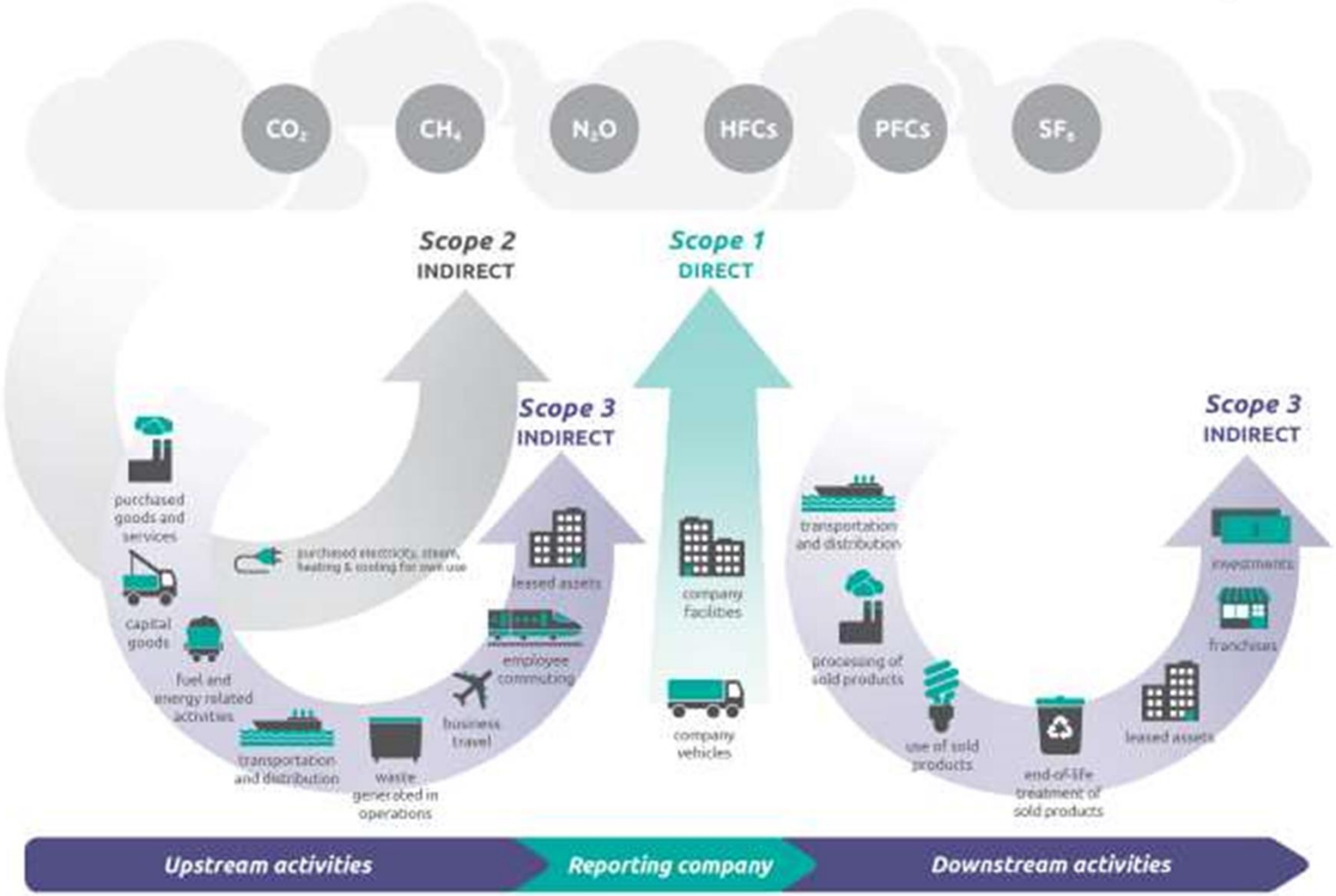
Geografic

Activity
University life

mplona

San Sebastián

Madrid



Author GHG Protocol

Scope 1

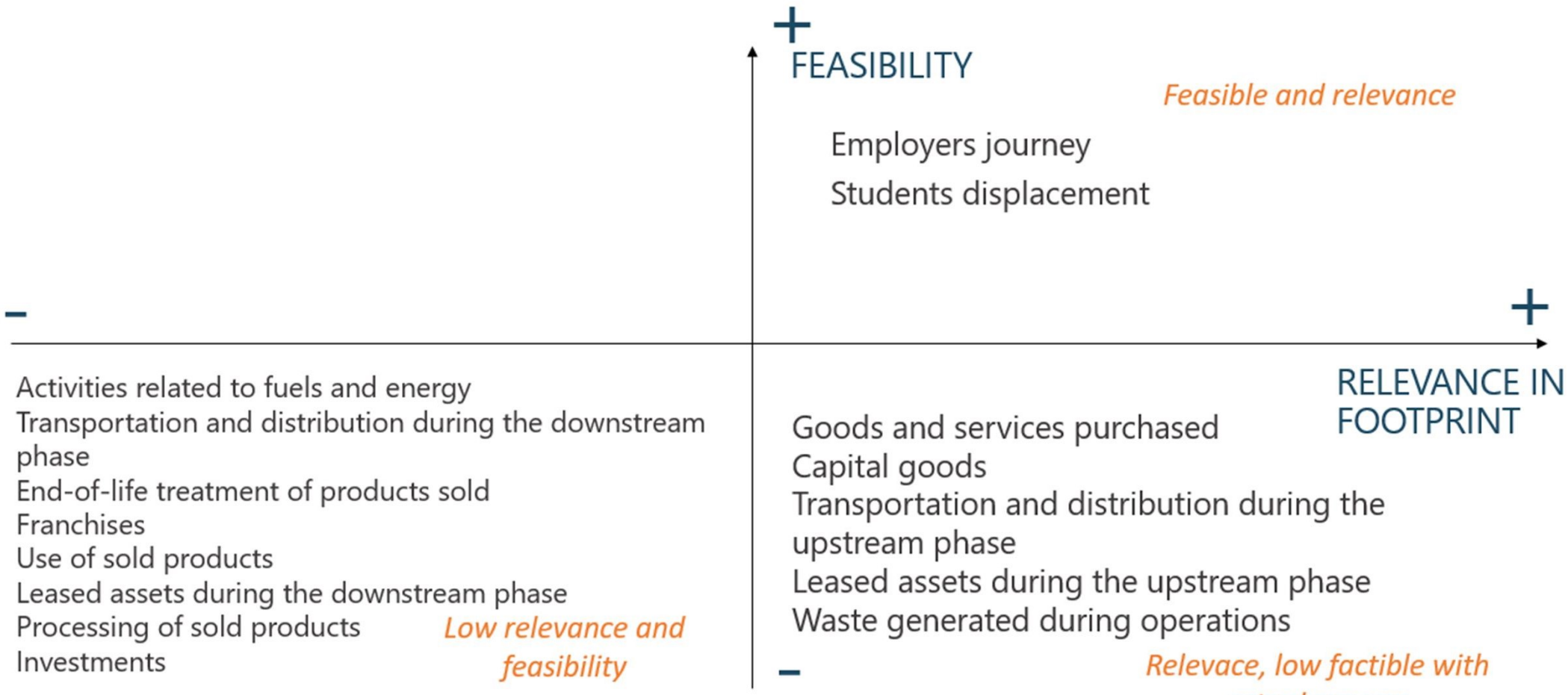
boilers
Vehicles
Air conditioning

Scope 2

Electric consumption

Scope 3

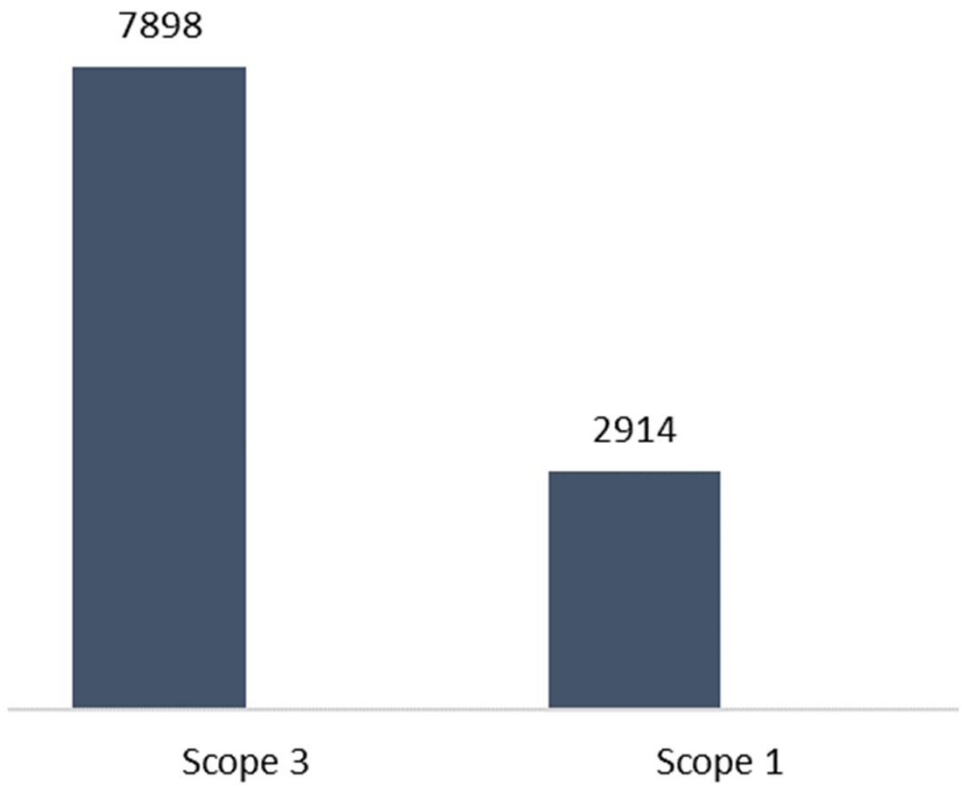
15 emission sources


+
FEASIBILITY
Feasible and relevance
Employers journey
Students displacement
-
+
RELEVANCE IN FOOTPRINT
Activities related to fuels and energy
Transportation and distribution during the downstream phase
End-of-life treatment of products sold
Franchises
Use of sold products
Leased assets during the downstream phase
Processing of sold products
Investments
Low relevance and feasibility
Goods and services purchased
Capital goods
Transportation and distribution during the upstream phase
Leased assets during the upstream phase
Waste generated during operations
-
Relevace, low factible with actual process


ICARB

Data  **Tons of CO_2**

Gross emissions **10,812 Tons of CO_2**



	Scope 1+2	Scope 3	Total
Emissions Ton CO_2 eq	2.914	7.898	10.81212
Intensity: Ton emissions CO2 eq. Per student	0,25	0,67	0,91

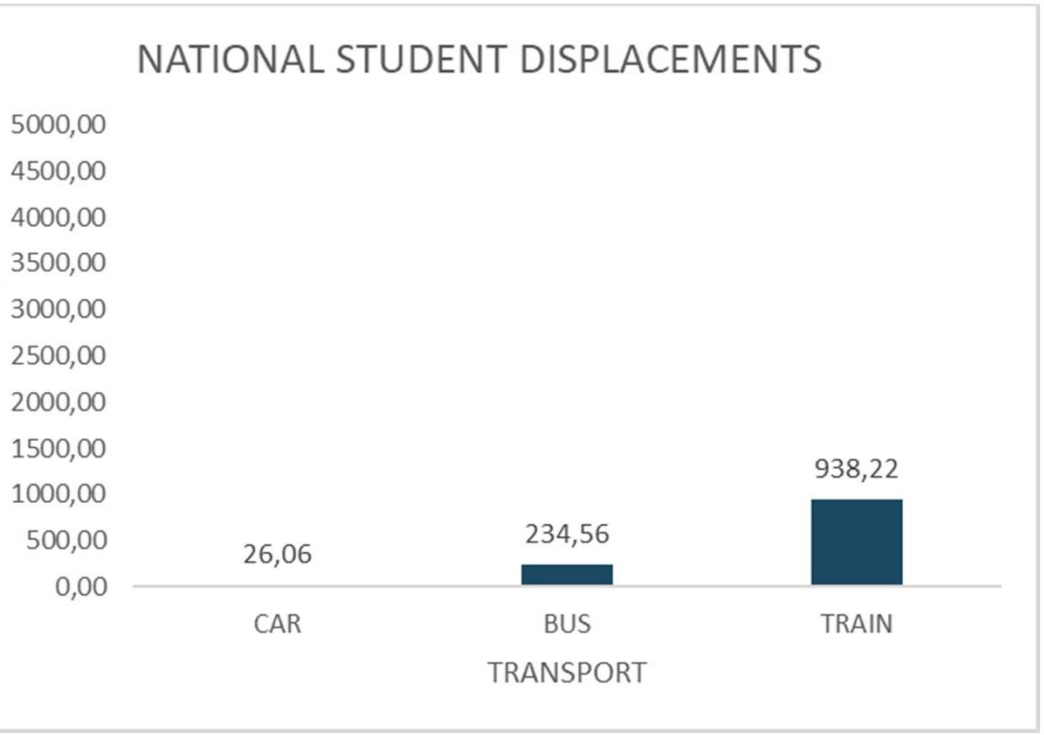
	Scope 1+2	Scope 3	Total
Emissions Ton CO_2 eq	2.914	7.898	10.81212
Intensity: Ton emissions CO2 eq. Per student	0,25	0,67	0,91

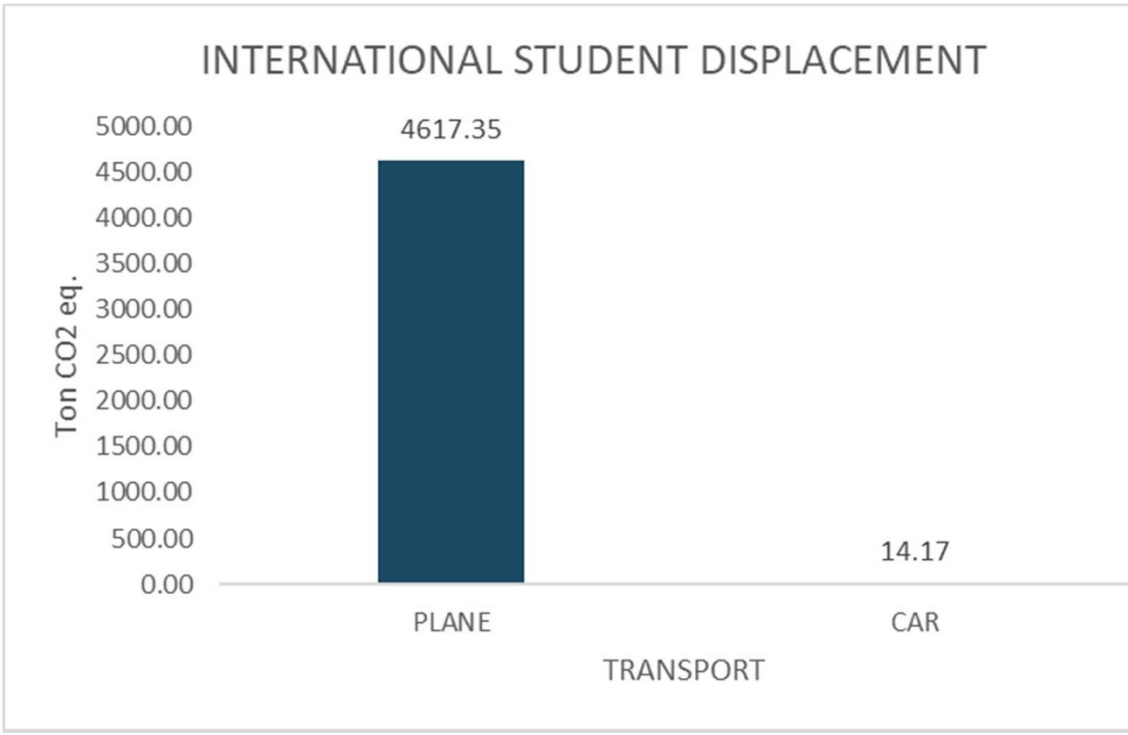
	Pamplona	San Sebastian	Madrid
Intensity: scope 1+2: Ton emissions CO_2 eq. Per student	0,27	0,10	0,20

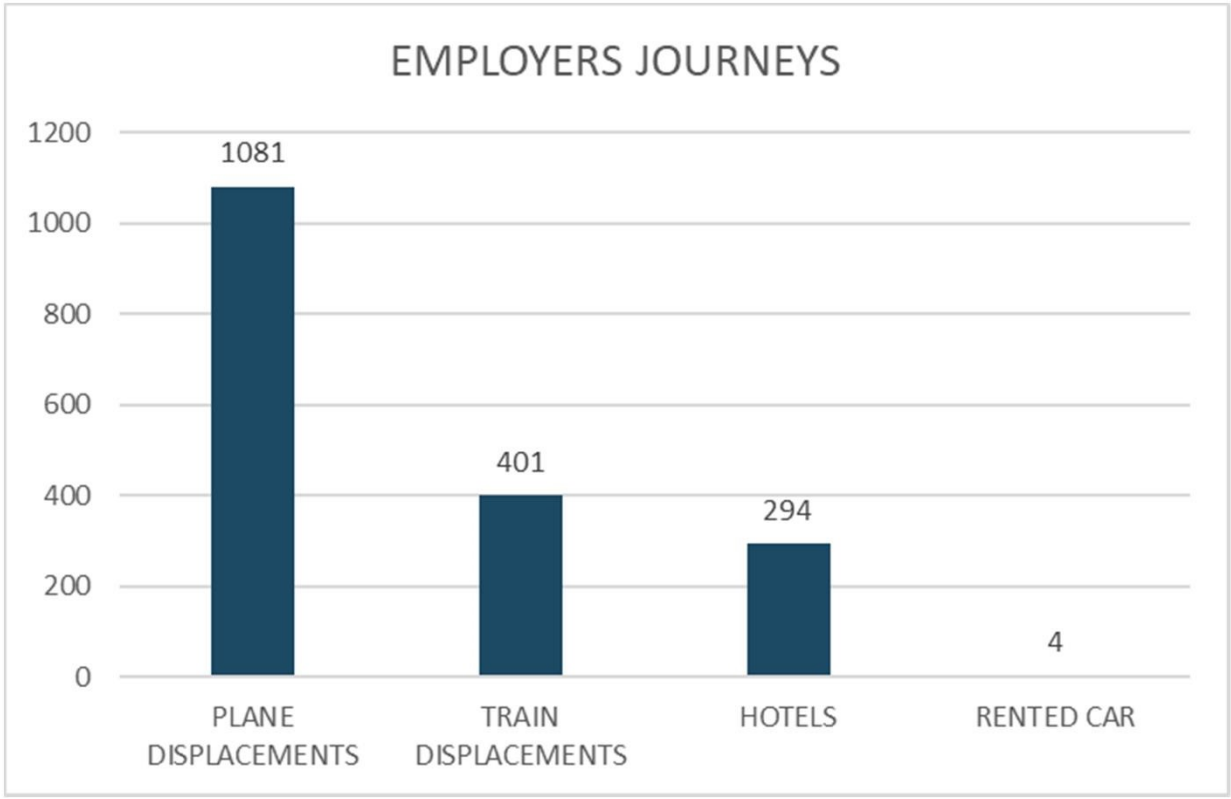
	Concept	Amount	Unit	Ton. emissions CO_2 eq.
1	Private vehicles	787517,00	Km/year	217
2	Boiler	16823,00	Mw/h/year	2681
3	Air conditioning	10,50	Kg recharges/year	16

Table 4: Emissions Scope 3

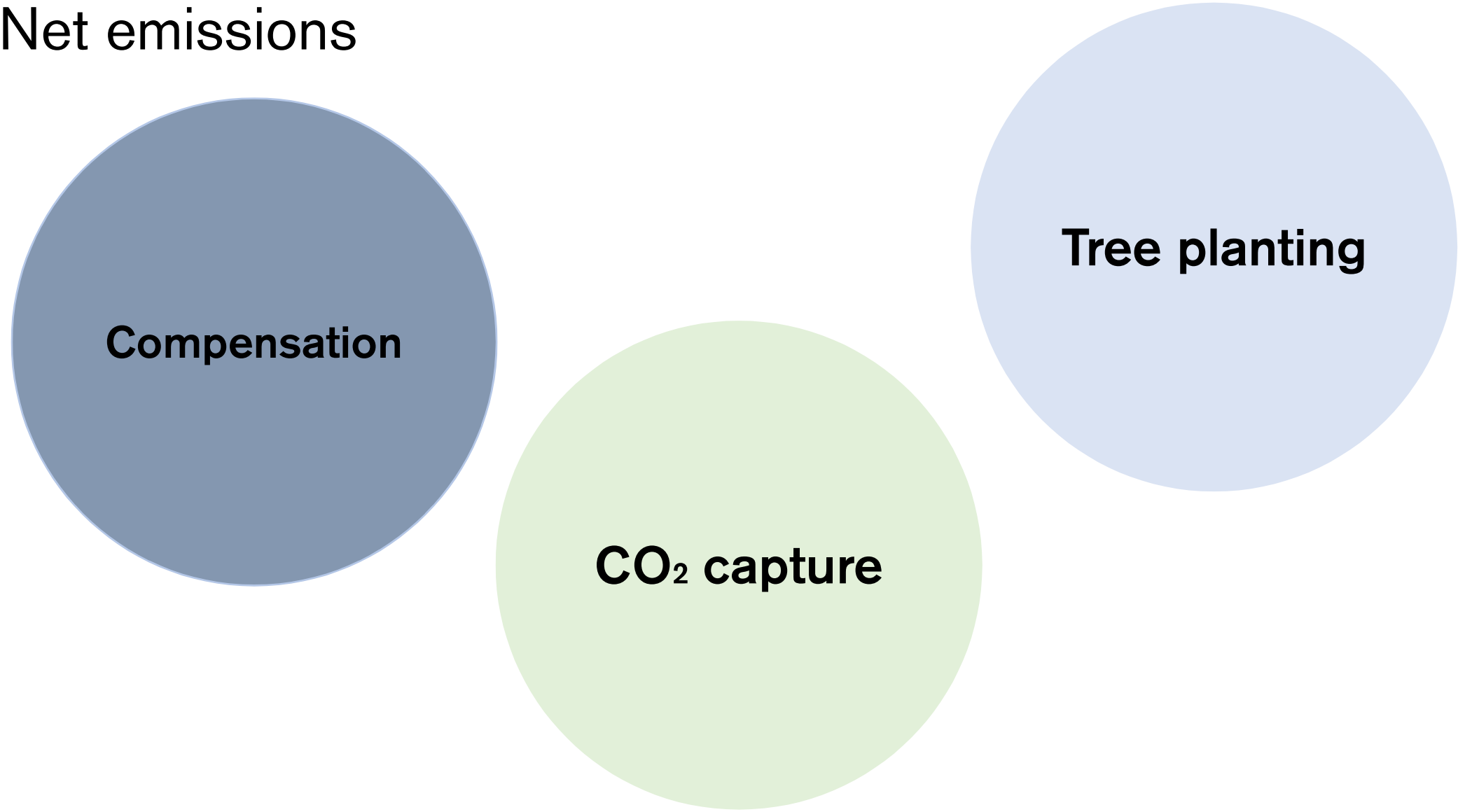
Concept	Amount	Unit	Total Ton CO_2 eq.
Student displacement			
Students from outside of Navarra	61065353	Km	5830
Voluntary exchange	3363268	Km	290
Total	59890878	Km	6120
Employers journeys (PDI + PAS)			
Displacement to the cities	17415969,82	Km	1.485
Stays carried out	6958,00	Overnight stays	294
Total	17422927,82	Km	1.779


NATIONAL STUDENT DISPLACEMENTS
5000,00
4500,00
4000,00
3500,00
3000,00
2500,00
2000,00
1500,00
1000,00
500,00
0,00
26,06
234,56
938,22
CAR
BUS
TRAIN
TRANSPORT

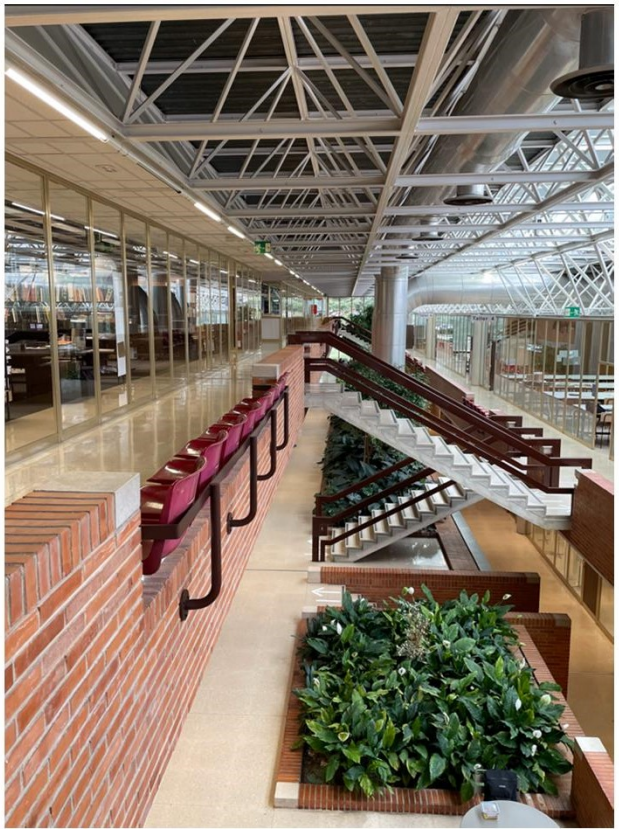

INTERNATIONAL STUDENT DISPLACEMENT
Ton CO2 eq.
5000.00
4500.00
4000.00
3500.00
3000.00
2500.00
2000.00
1500.00
1000.00
500.00
0.00
4617.35
14.17
PLANE
CAR
TRANSPORT

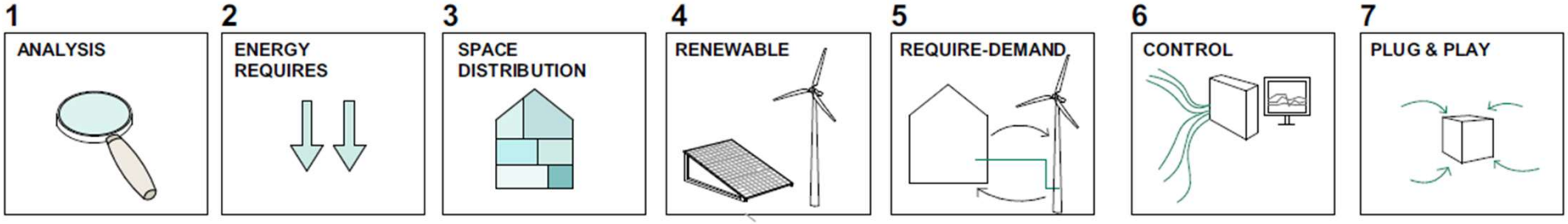

EMPLOYERS JOURNEYS
1200
1000
800
600
400
200
0
1081
401
294
4
PLANE DISPLACEMENTS
TRAIN DISPLACEMENTS
HOTELS
RENTED CAR

Net emissions

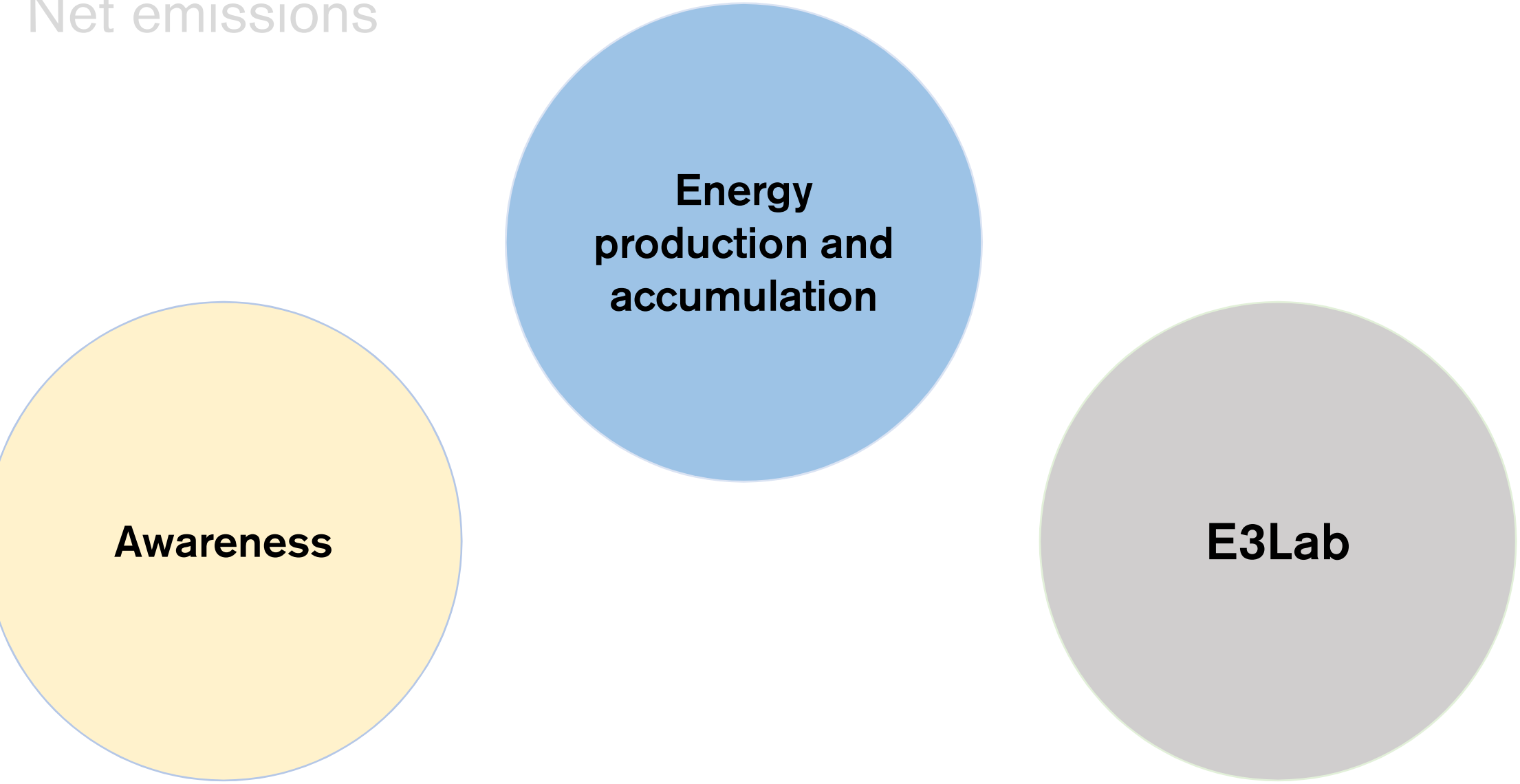



Cátedra Fundación
Saltoki




1
ANALYSIS
2
ENERGY REQUIRES
3
SPACE DISTRIBUTION
4
RENEWABLE
5
REQUIRE-DEMAND
6
CONTROL
7
PLUG & PLAY

Net emissions



Scope 1
Reduce gas boilers emissions

Scope 2
Local production

Scope 3
Air travel

Laboratories

Vehicles destined for gardening work

Data capture

International benchmarking

Dayly displacement of student and employees

Waste

- Veicles: $\sum Ton\ COe = \frac{\text{amount of Km with car (Km)x Emission factor (KgCO2e)}}{1000}$
- Boiler: $\sum Ton\ COeq = \frac{\text{Total consumption (mmBTU)x emission factor (Kg}\frac{\text{CO2e}}{\text{mmBTU}}\text{)}}{1000}$
- Refrigerant:
  $ATU\ emissions - chiller\ (Ton\ CO2\ eq.) = \frac{\text{Kg chiller recharge charg x PCG}}{1000}$
- Mobility: $\sum Ton\ COeq = \frac{\text{Amount of Km (Km) x Emission factor (KgCO2e)}}{1000}$


ICARB

10,812 tons CO2 due to

-Boilers

-Air travel

FOR THE FUTURE

- To decrease carbon emissions and enhance the measuring procedure.
- More compensations for tree areas trhough payments.
- Evaluate displacement alternatives, car sharing, etc
- Data integration for decision making

THANK YOU

MUCHAS GRACIAS

ESKERRIK ASKO

MERCI BEAUCOUP

GRAZIE MILLE

Universidad de Navarra

Universidad de Navarra | CÁTEDRA FUNDACIÓN SALTOKI

sdorregaray@unav.es
Sara Dorregaray-Oyaregui