

SUSTAINABLE DEVELOPMENT IN STERILIZATION DEPARTMENTS: A FIRST APPROACH



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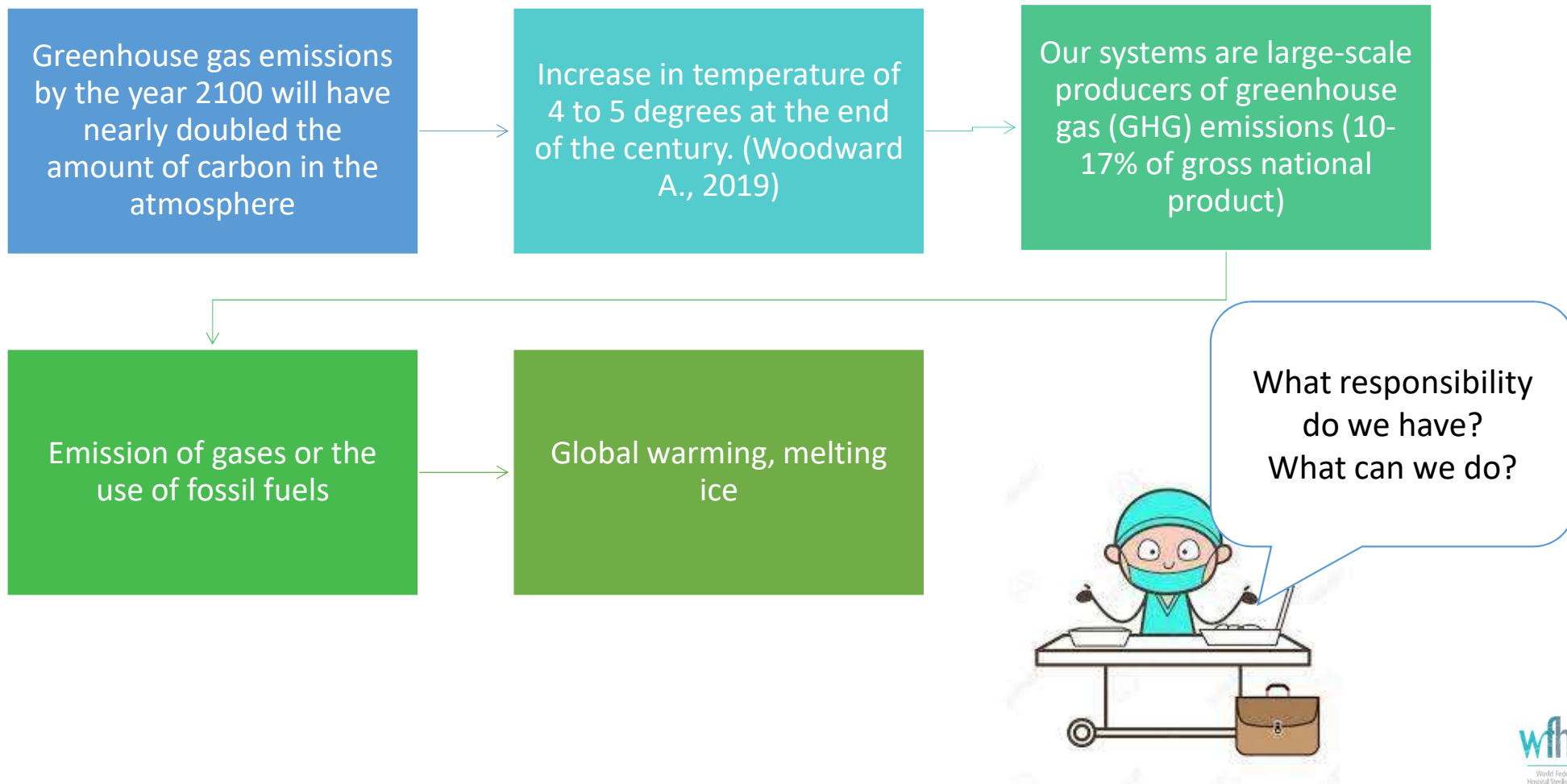
Filiation:

University Foundation of Health Sciences– FUCS

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Reflection



SUSTAINABLE DEVELOPMENT

Ability to meet current needs without compromising future capabilities

Balance between economic growth, care for the environment and social welfare

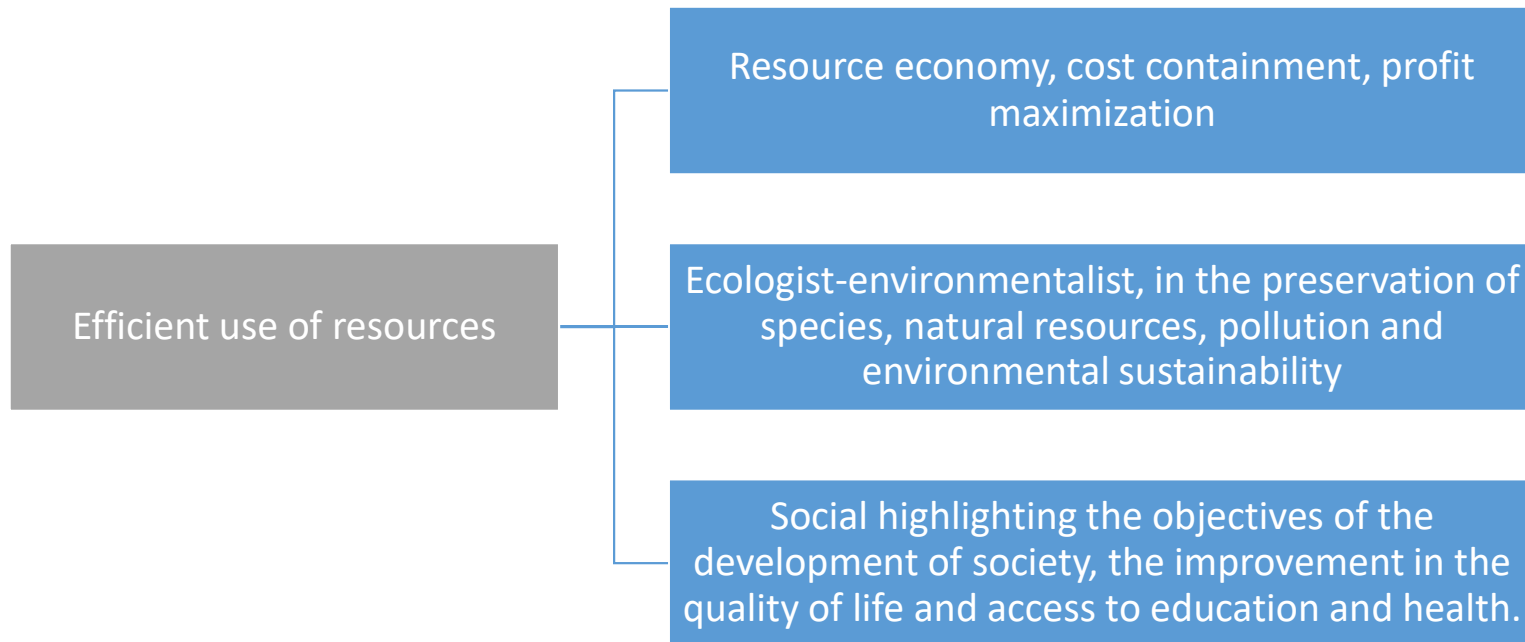
Use natural resources to be able to have good levels of consumption and have a balance of all resources

A sustainable activity uses renewable products to finance the start-up of a project

To ensure that a renewable production of a good will be carried out, which was given by the consumer, such as the absorption of waste generated without harm to ecosystems.

Brundtland Commission "Our Common Future" published in 1986

SUSTAINABLE DEVELOPMENT



Comprehensive perspective, sustainable development must be economically viable, socially equitable and environmentally sound

The 2030 Agenda for Sustainable Development



https://www.un.org/sustainabledevelopment/wp-content/uploads/2021/04/ODS_English.jpg

Sustainable development strategies in CE in Colombia

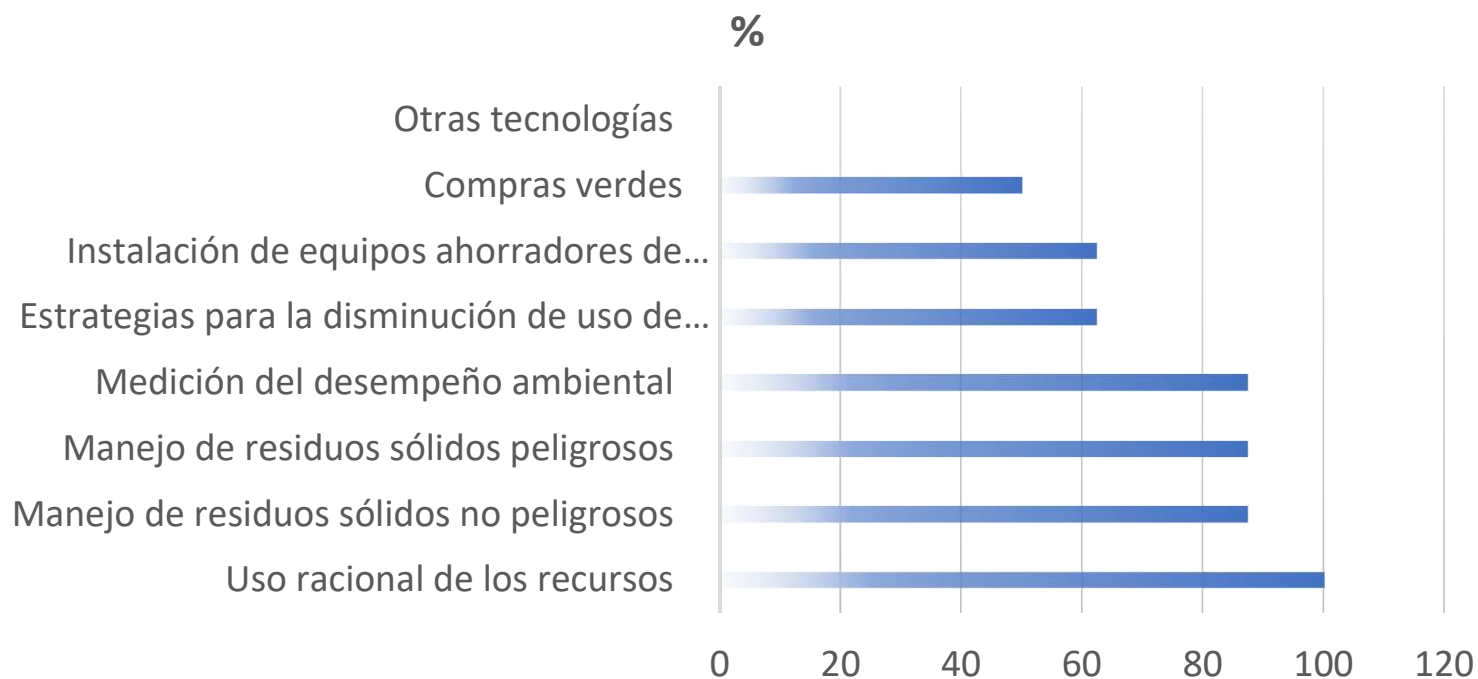
In 2018, a Benchmarking Study was carried out in 8 CEs in Colombia



Identify key factors of success and high quality sterilization centers in Colombia, based on a comparative study in the best positioned institutions in the country

Complexity level	4 (62.5%) 3 (37.5)
location zone	Urban (100%)
Certification level	Enabled (100%) Accredited (50%) ISO certified (25%) International certificate (25%)
Average beds	328.3
Average number of operating rooms	11.2
Average number of surgical procedures	17,827
Number of workers in the EC	between 5 and 15

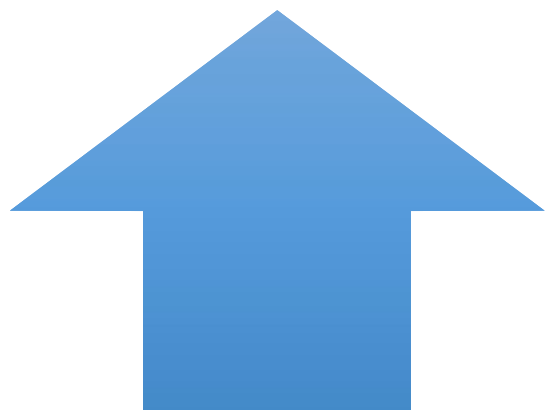
Sustainable development strategies in CE in Colombia



Remarkable attribute in the quality of the CE

- Concern about the environmental impact generated
- Development of strategies to improve the disposal of waste, the waste of products necessary for the operation, and the management of green purchases

Approach of the Problem



We are left with the seed of interest to delve into this topic that is current and pertinent to the historical moment of society.

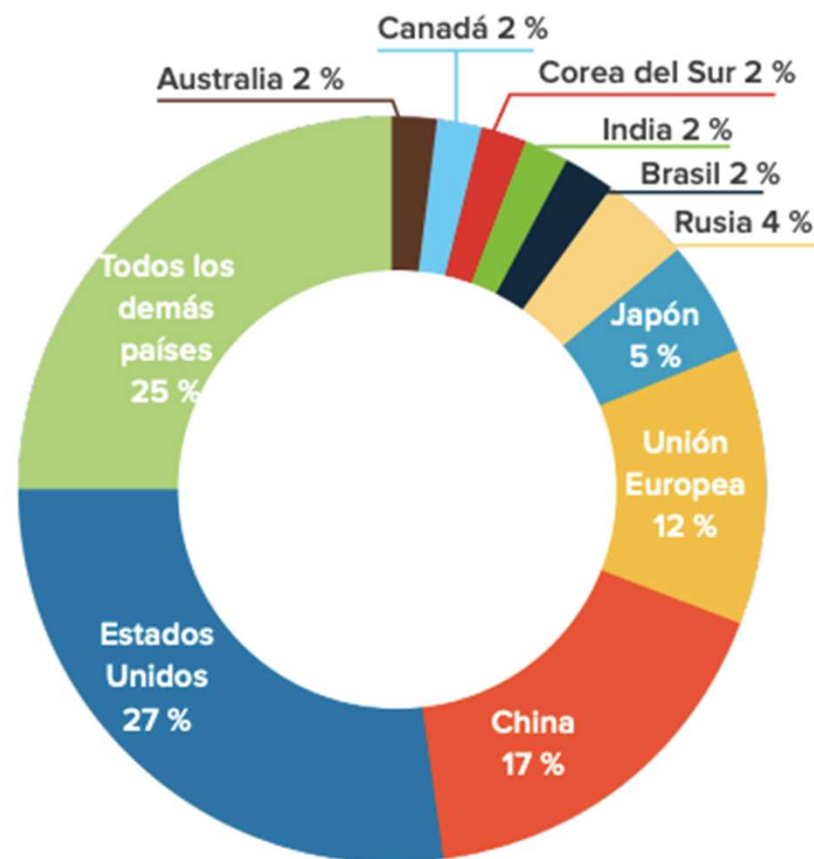


From this seed arises the Statement of the problem....

Sustainable development in Health

Health sector is responsible for a significant percentage of the Carbon Footprint HC

- United States, where emissions reach between 8 and 10% of total GHG production
- United Kingdom where it generates 25% of the HC of the public sector (MacNeill et al 2017)
- In Colombia, by 2017 there were 96 hospitals attached to the global network of green hospitals, which corresponded to 3.84% of the 2,500 IPS in Colombia (Ardila, 2019).



Taken from: Salud sin Daño, Climate footprint of the health sector

Sustainable development in Health

North American hospitals have the highest daily waste generation (7-10 kg of daily waste per hospital bed)

Western Europe (3-6 kg of waste daily per hospital bed)

Latin America (approximately 3 kg of waste daily per hospital bed)

East Asia with highest income (2.5-4 kg of daily waste per hospital bed per day)

Developing countries struggle with the large volume of waste disposal and storage

Sanitary and safe disposal of waste.

Cannot afford basic waste management technologies (clean and environmentally safe incinerators)

They also do not have a clear plan for storing waste, which can lead to even greater environmental and social hazards.

Use of Resources in Central Sterilization

Washing and drying

Water

Detergents

Compressed air

Disposable towels

Energy
(Thermoisinfector ,
automatic washing
machines)

Inspection and packing

Energy

Lubricants

Packaging (Cotton,
polypropylene,
medical grade)

External indicators

Integrators.

Sterilization

Water

Hydrogen peroxide

Ethylene oxide

Energy

Storage and administrative area

Energy

Methodology

Objective: Identify the strategies that are carried out to carry out processes that promote sustainable development from sterilization centers worldwide through a review of the literature.

Literature review

Article

Search and Snowball Equations

Databases and meta search engines

BVS

Pubmed

ClinicalKey

Google
Scholar

Keywords (Mesh-Decs)

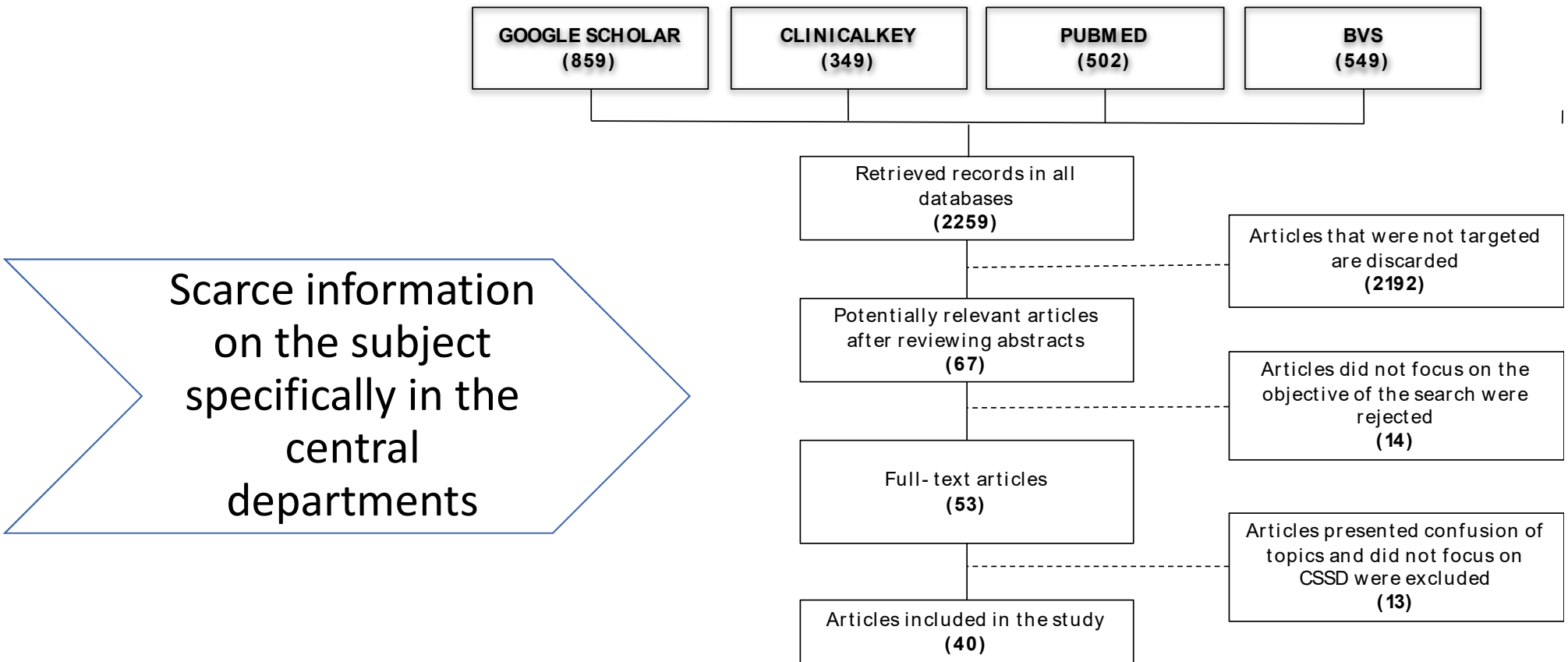
- Sterilization
- Sustainable development
- Sustainability
- Carbon footprint

Inclusion
criteria

English and
Spanish

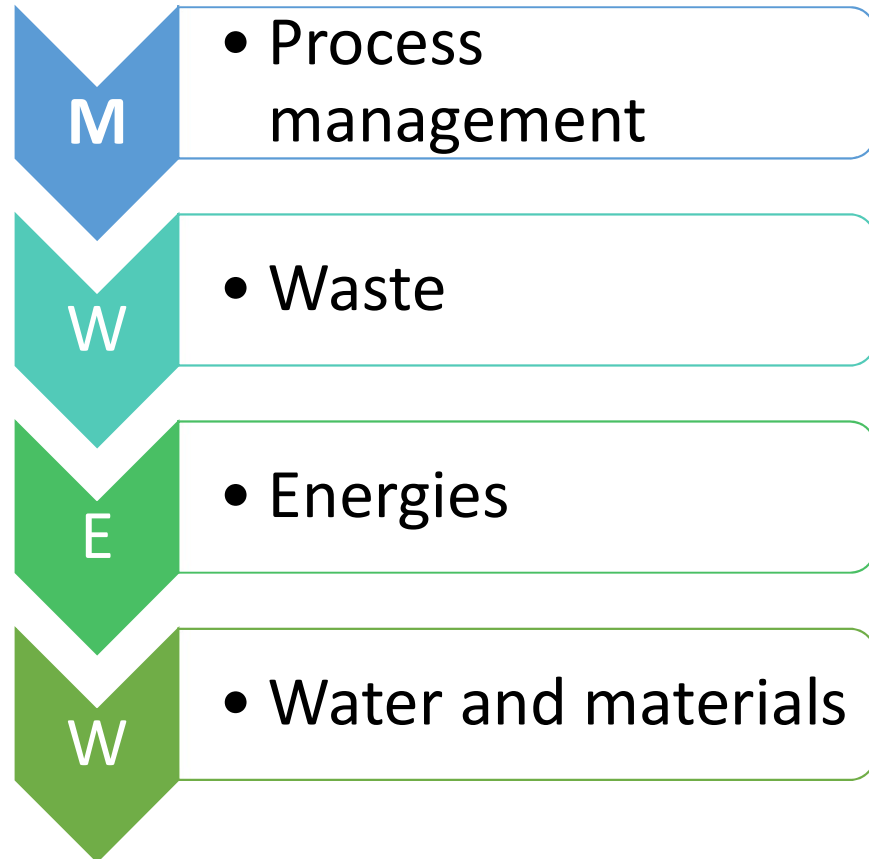
Without
time limit

Results



Results

The information found was organized into 4 groups



Process Management



Medical devices are removed from their packaging but no is used “overage”



The proportion of instruments actually used during a typical surgical intervention ranges from 13 to 22% (Mhlaba et al, 2015)



Analyze the life cycles of medical equipment, the environmental impact of new technologies and the development of “green” environments and devices (M. Selvy et al, 2020)



Lack of interest, training and leadership in the area leaders.

Process Management



Instruments Management

- Use of instruments



Equipment life cycle analysis



Green Shopping – Environmentally Preferred Shopping



Program design (recycling, reuse, exploitation)



Use of the 5 Rs



Process Management

REDUCE

- (A) Proper waste segregation
- (B) Reusable sharps container
- (C) Fluid waste management
- (D) Energy expenditure
- (E) LED surgical lamps
- (F) Greener equipment packaging
- (G) Reusable hard case
- (H) Just-in-time model to reduce overage

REUSE

- (I) Reprocessing of single-use devices
- (J) Reusable surgical linens

RECYCLE

- (K) Recycle clean plastic and paper

RETHINK

- (L) Anesthetic gas reclamation

RESEARCH

- • • • Life cycle analyses of materials, cost comparison of technologies and development of "green" devices

Taken from: Yoan Kagoma MD, Nathan Stall , Edward Rubinstein and Douglas Naudie

Waste

Overwrapping in plastic and paper (Sterile Barrier) approximately 19% of the waste (from the surgical patient)

Disposal of red bag waste costs 10 times more than regular garbage.

American hospital can recover up to 4000 kilos of blue containers used for sterilization purposes.

Efficient and adequate waste management



Sterilize biohazardous waste in autoclave and then dispose of in normal trash.



Classification and recycling of waste to selective classification of waste and recycling of recoverable waste

Waste

The blue wrapper is sold to recyclers where the material is pelletized and made into plastic products.

During the 39 days of the pilot, 1,247 pounds of blue wrap was collected (32 pounds collected daily).

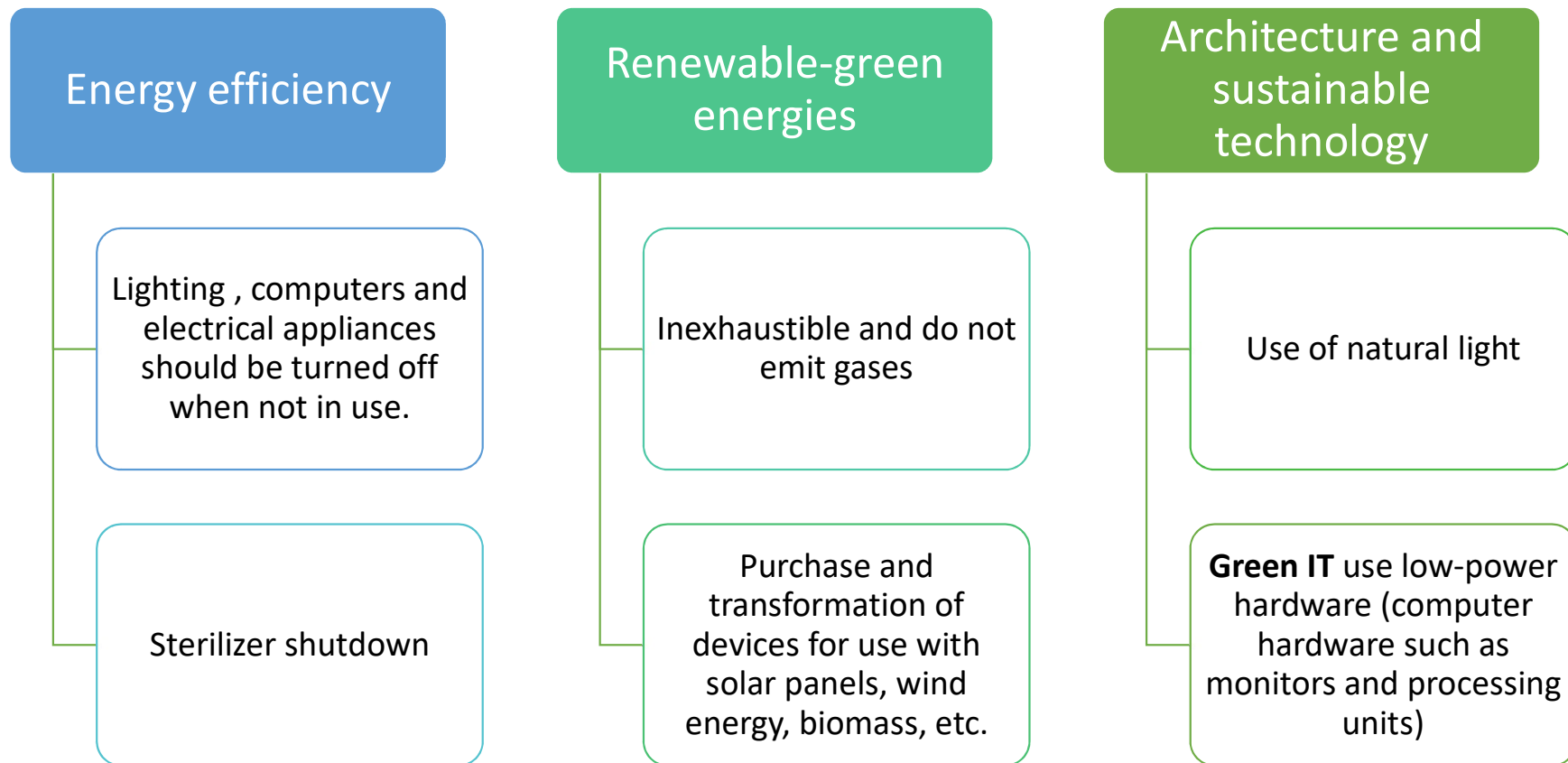
The revenue received from the blue casing packaged was 8 cents per pound.

It would produce \$5,000 in annual revenue and \$174,240 in avoided costs.

It not only reduces the environmental footprint, but also helps generate income

(Maya et al, 2019)

Use of energies



Use of energies



A strategy to turn off idle sterilizers would reduce electricity use by 66 MWh and water use by 1,004 kl per year, saving 26% in electricity use and 13% in water use, resulting in savings financing of AUD\$13,867 and a reduction of 79 tons of CO2 emissions per year.



An alternative strategy of turning off one sterilizer from 10:00 am and a second from midnight would have saved 30 MWh and 456 kl of water



(McGain F et al, 2017)

Water and Materials

Water

Reuse of autoclave
water

Recirculation of
water in sterilizers

Efficient use of
water



Materials

Biodegradable
enzymatic
detergents

Lack of impact study
and sustainability
strategies

About our experience

Reuse of polypropylene packaging for medical-surgical devices.

Take advantage of its good condition and clean

Excellent waterproofing and resistance characteristics

Disposable sheets for stretchers in surgery rooms and outpatients for patient transfer



Ecological bags to deposit their belongings for companions and patients who go to surgery



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About our experience

1. Recolección de insumos



2. Traslado a la lavandería



3. Selección y corte



4. Confección



5. Diseño de manijas



6. Finalización



Process for
creating
ecological
cloth bags
and
stretchers

Impact

Reduction in garbage collection, in about 200 to 300 kilos per month and that will have the sanitary landfill as final disposal

Costs with the decrease in the purchase of disposable sheets for stretchers and the purchase of ecological bags for patients.

Positive impact on the culture of recycling

Empowerment of this process in health professionals

About our experience

Ecologic bag



Ecological sheet



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Conclusions

Sterilization department management must be transparent and innovative in creating sustainability policies, recognizing not only the responsibility to protect the environment, but also the immense cost savings inherent in a more environmentally friendly medical practice

A sustainable sterilization department, in terms of sustainable development and its social, environmental and economic dimensions, is one that carries out its processes and activities for the care of people's health in such a way that it is economically viable, sensitive to social needs of the community to which it belongs and respectful of the environment.

The leaders of the sterilization centers must manage the efficient use of natural, energy and material resources with the least environmental impact and implement measures and actions that limit their own carbon footprint. This management has an impact on cost savings, improves the image and reputation of your hospital and can generate income (recycling).

There is still a need to analyze in depth the issue of the impact and management of detergents and chemicals used in the sterilization center, it must be an interdisciplinary work.

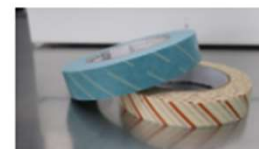
Collaborative academic network in
FUCS sterilization center

RACCE

Joint strategy in order to strengthen the
growth of the knowledge of the sterilization
center and carry out joint research and
connections in Latin America and the world.



Red académica colaborativa en central de esterilización FUCS



RACCE. Red académica en central de esterilización FUCS, es una estrategia conjunta para el desarrollo constante del ámbito de la central de esterilización, enfocada desde el saber académico y conceptual que agrupa actores multidisciplinares para desarrollarse y conectarse con diversos puntos del saber en esterilización.

RACCE. Red académica en central de esterilización FUCS

Misión

Establecer una comunidad en central de esterilización, que permita el crecimiento continuo, constante e interdisciplinario sobre los saberes de la central de esterilización.



Visión

Para el año 2023 consolidar una red académica en centrales de esterilización que permita ofrecer capacitación, investigación conjunta y conexión latinoamericana para el fortalecimiento de la central de esterilización.

Access link:

[https://sites.google.com/fucsalud.edu.co/clubname/qui%](https://sites.google.com/fucsalud.edu.co/clubname/qui%25)

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