

**National Technological University**  
**Paraná Regional School**  
**Civil Engineering Department**  
**Inglés II - 2023**

# **Low-Carbon 3D Printed Concrete: A General Review of the Technology and Method**

**Joaquin E. Soutus**

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# Introduction

Contextualization of

## THE PROBLEM

### The Construction Industry Issue

- CO2 emissions
- Pollution On-Site



# Introduction

## Global Framework of Reference



Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Make cities and human settlements inclusive, safe, resilient and sustainable



Ensure sustainable consumption and production patterns

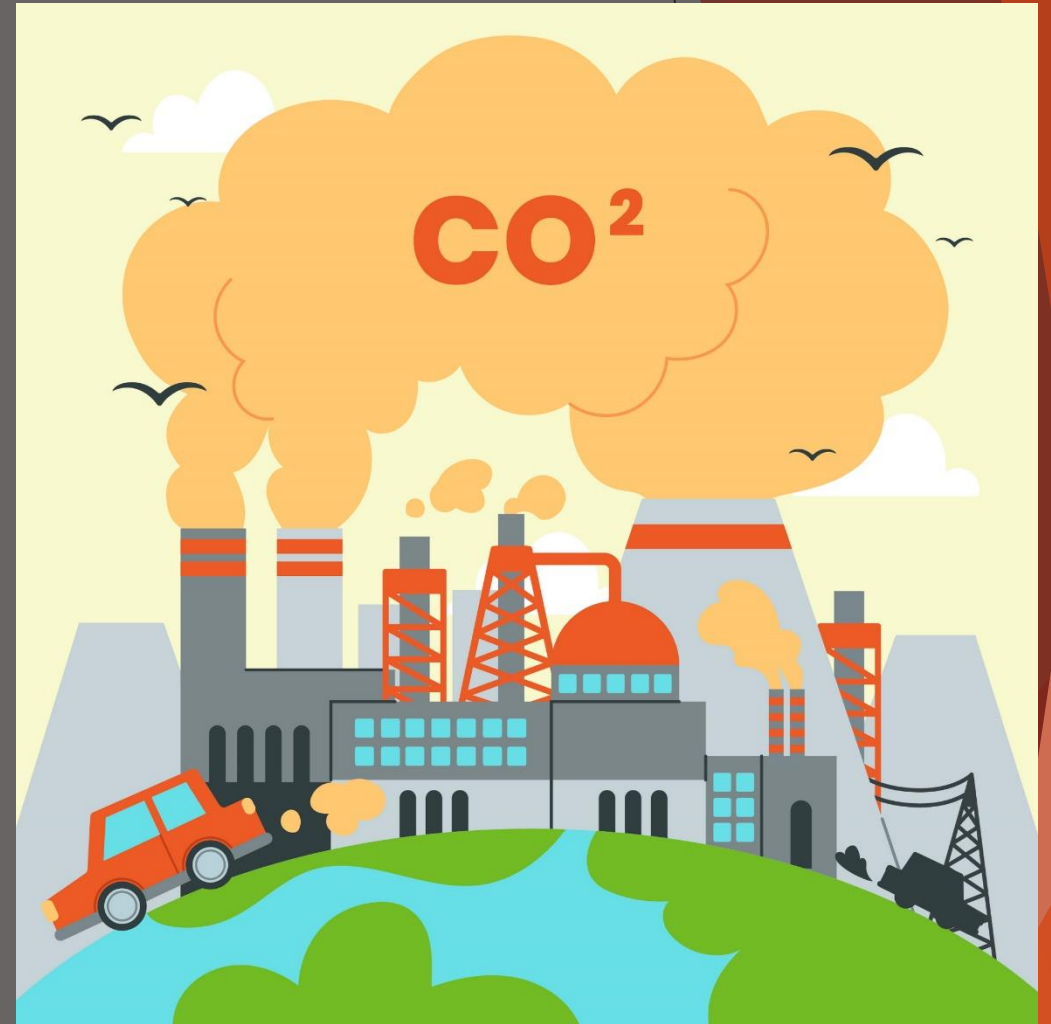
Take urgent action to combat climate change and its impacts



# Introduction

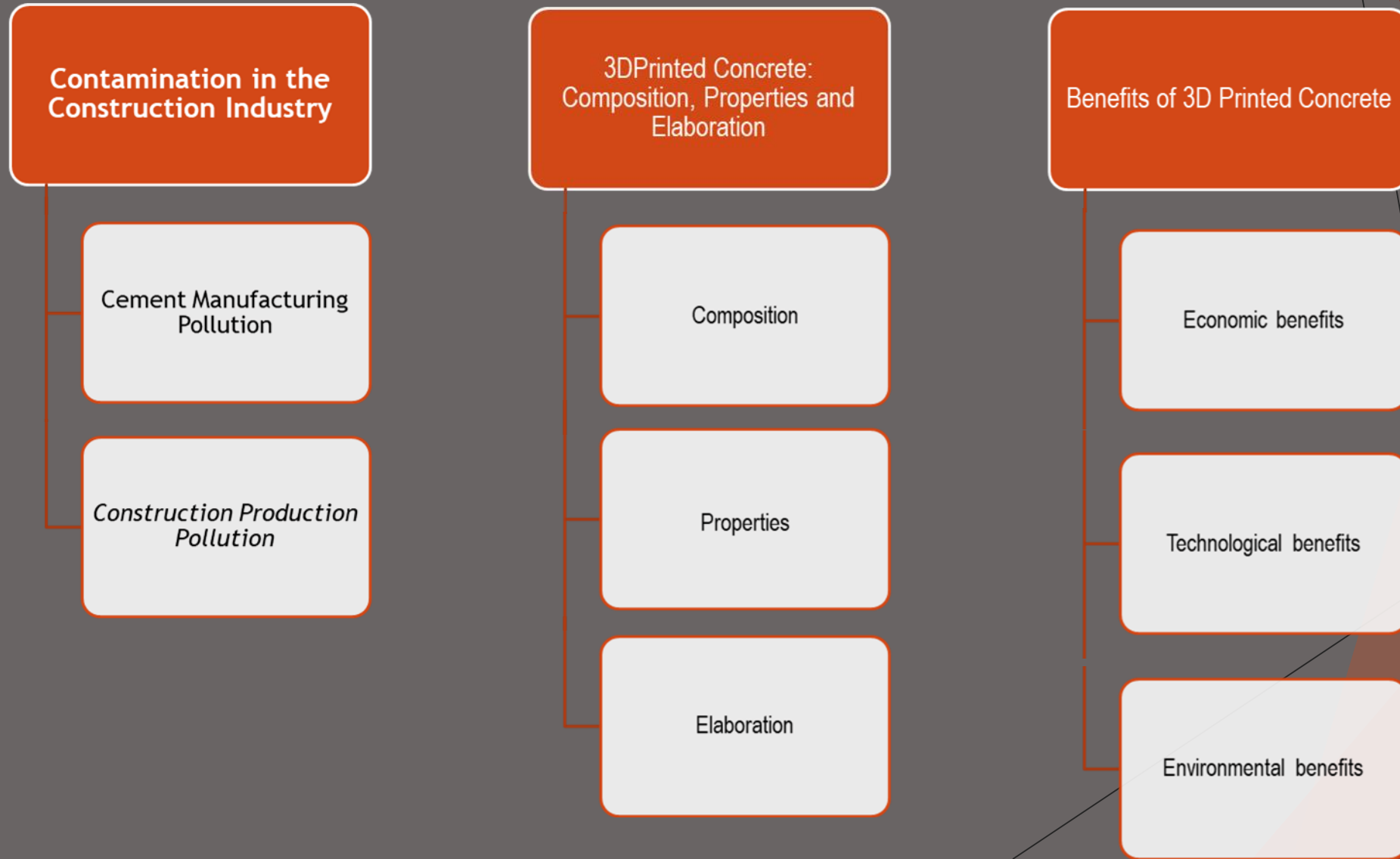
## PURPOSE of the project:

Address to solve the pollution problems in the construction industry in general and concrete industry in particular and its possible solution with 3DPC technology.



# Introduction

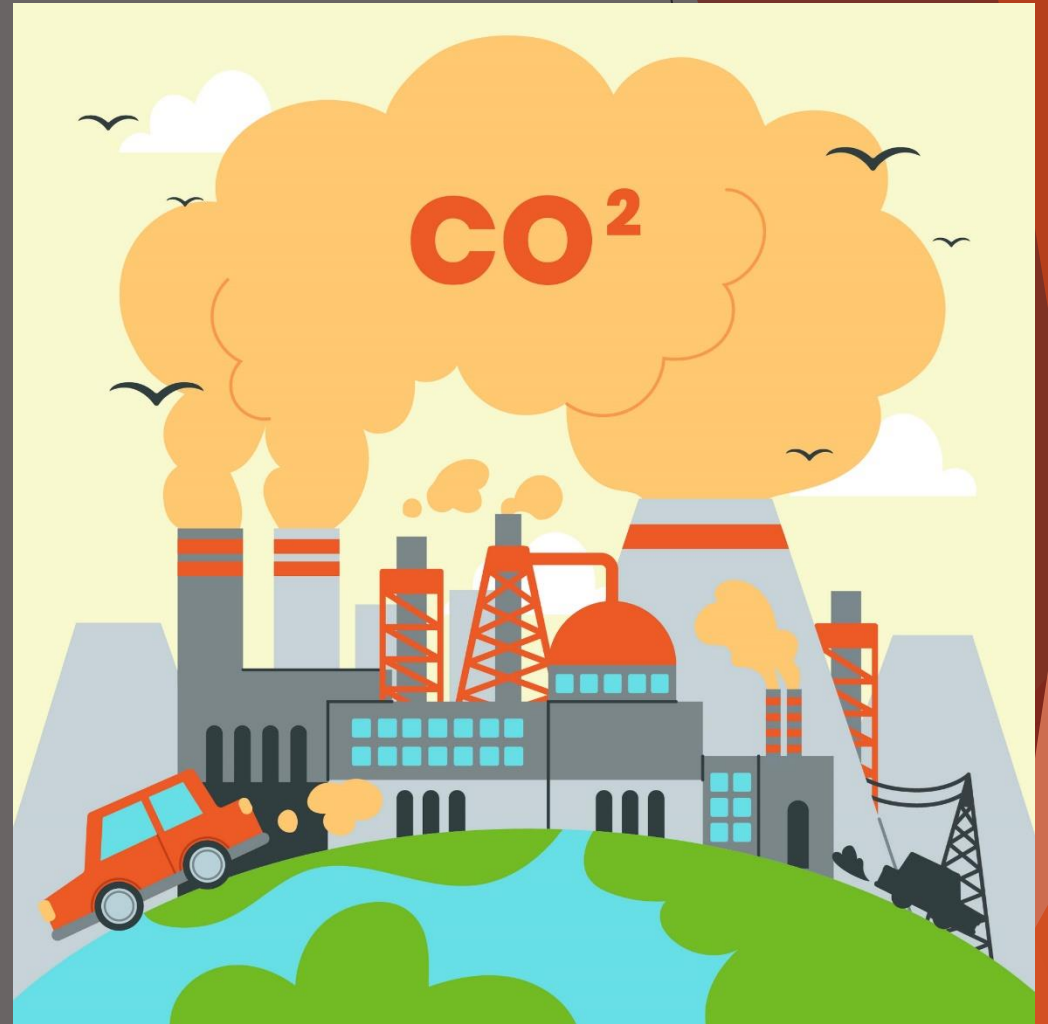
## Map of the Presentation



# Introduction

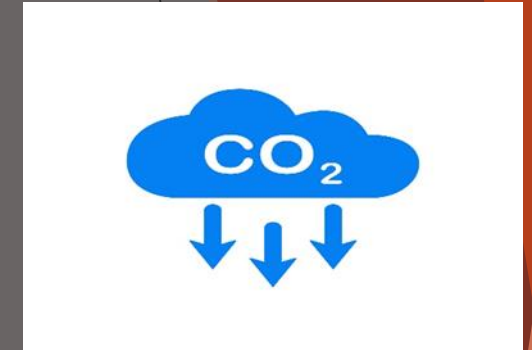
## IMPACT of the project:

this method can eliminate waste and pollution caused to the environment by the stages of the building process, 3DPC technology becomes a more than acceptable option to replace old concrete technologies.



## Cement Pollution

- CO<sub>2</sub> emissions by cement manufacture



## Construction Pollution

- Pollution On-site



# 3D Printed Concrete

## Composition

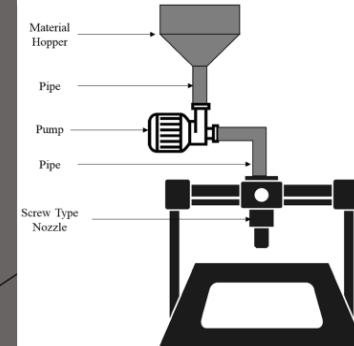
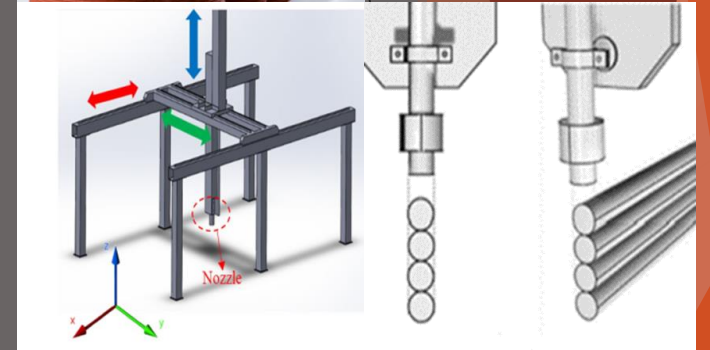
- SCMs replaced by OCP

## Properties

- *Flowability*
- *Extrudability*
- *Buildability*
- *Open time*
- *Rheometry Evolution*

## Elaboration

- Preparation of materials
- Printing process





# Benefits:

## Economic

- does away with formwork
- demands less construction time, material and labor.



## Technological

- creates complex geometry
- integrates automated services
- develops efficient structures



## Environmental

- does away with OPC and chemicals
- can eliminate waste and pollution



# Conclusion

The method only uses concrete where it is needed, thus eliminating much of the contamination generated by the construction industry.



# References

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**thank you!!**

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