

# 12th INTERNATIONAL CONFERENCE ON LIFE CYCLE MANAGEMENT

## Anticipating Carbon Footprint Regulations for Aggregates: A New CO<sub>2</sub>-Calculator for Compliance and Strategic Insights

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### Introduction

#### Context and Challenges

- **Aggregates represent billions of tonnes consumed annually in construction.** Although they historically have a "low" carbon footprint (4–11 kg CO<sub>2</sub>eq/t), their huge consumption across the world leads to a significant impact.
- **With the new Construction Product Regulation (CPR) (January 2025), the Global Warming Potential (GWP) is now mandatory to declare for all construction products,** with a gradual implementation in time per product group.

#### Scientific Problem

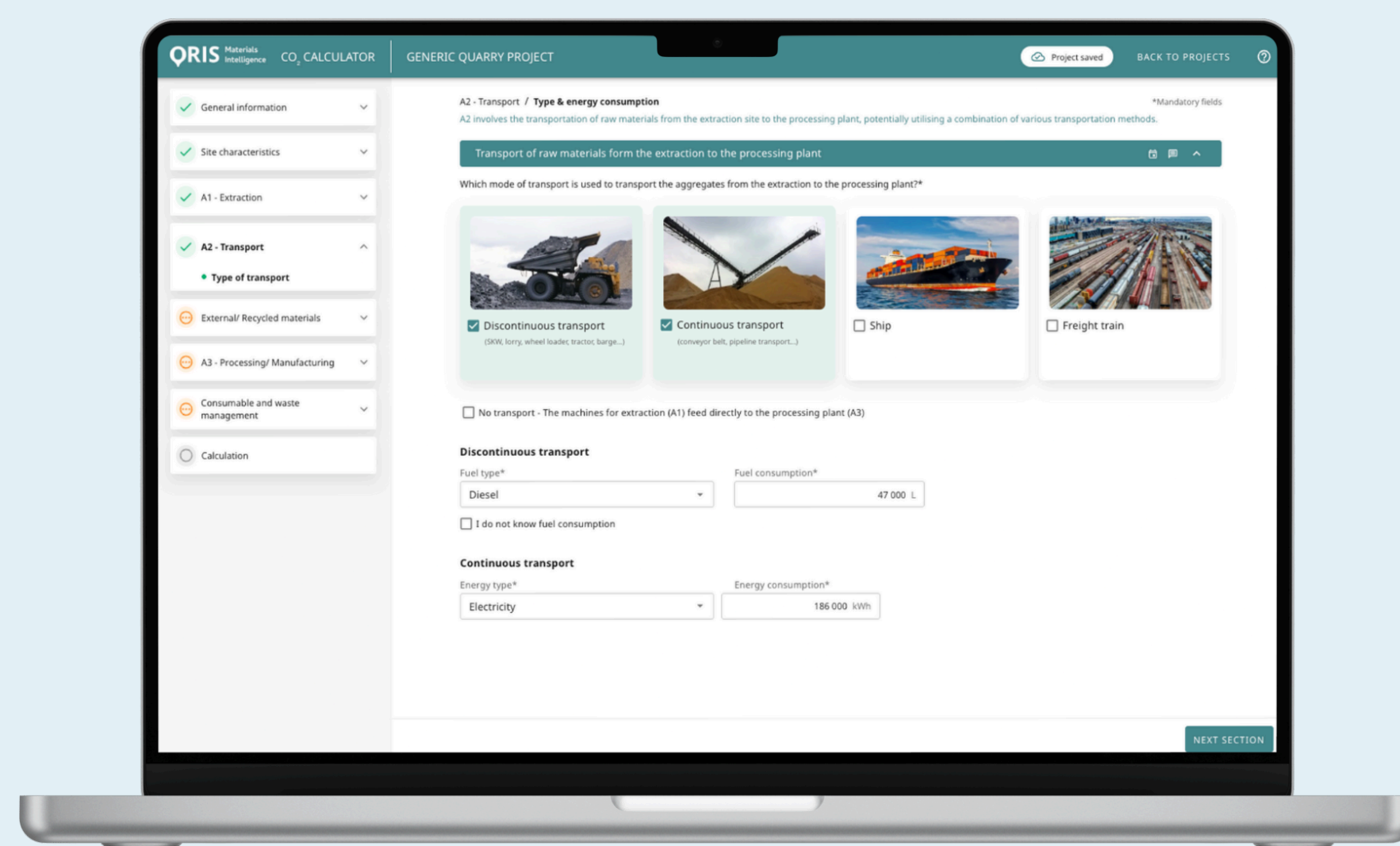
→ **Determining GWP at product-specific level is complex.** Current LCA methods are either time consuming and expensive, either not detailed enough or not industry-specific.

#### Research Objective

→ **Develop an advanced CO<sub>2</sub>-calculator for aggregate producers, enabling product-specific carbon footprint in a quick, reliable and affordable way.**

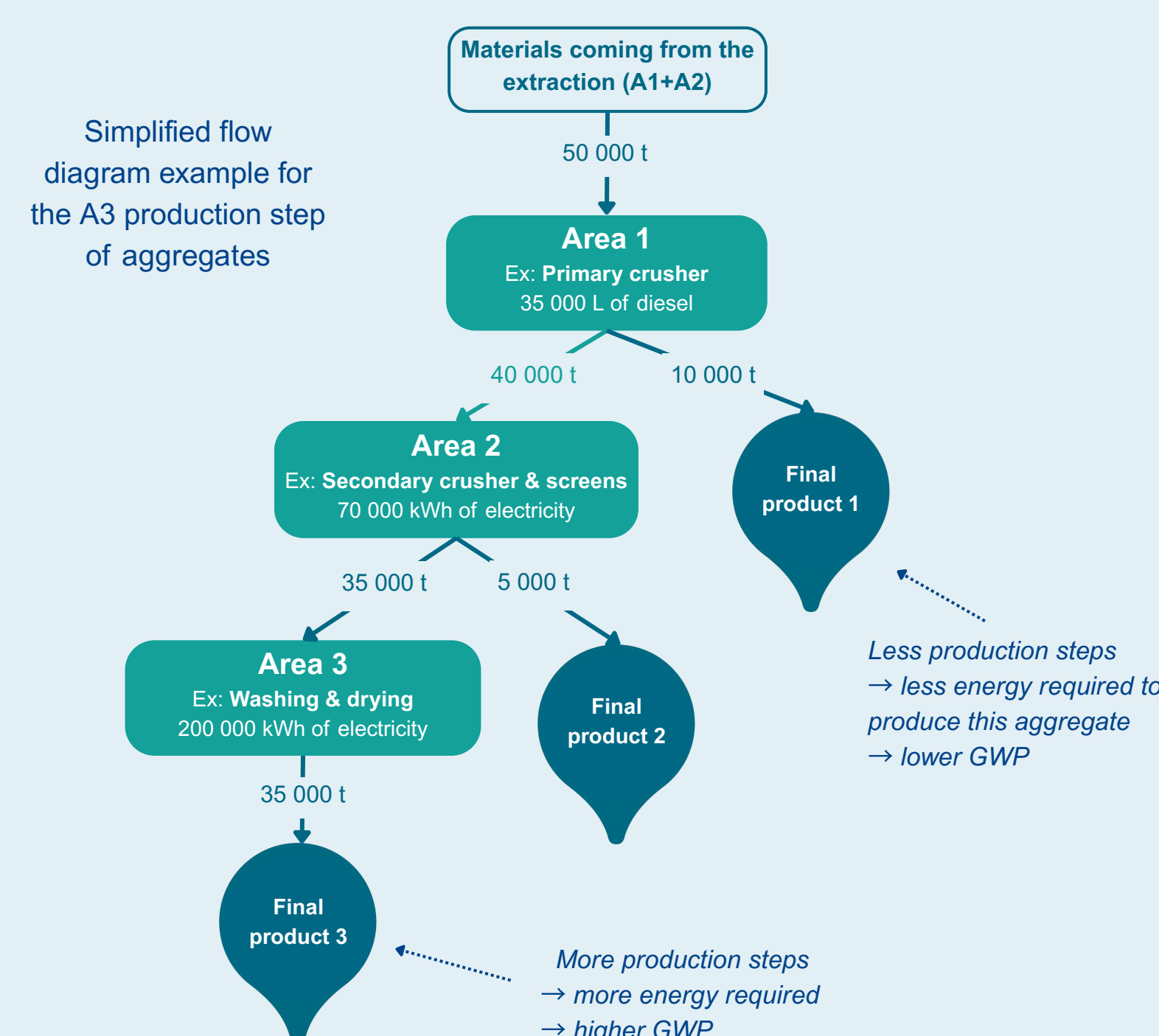
### Methodology

→ **Data is collected on the ORIS platform**



Data collection on the ORIS CO<sub>2</sub>-calculator for the transport in A2

→ **Users define their own simplified flow diagram for the A3 production step**



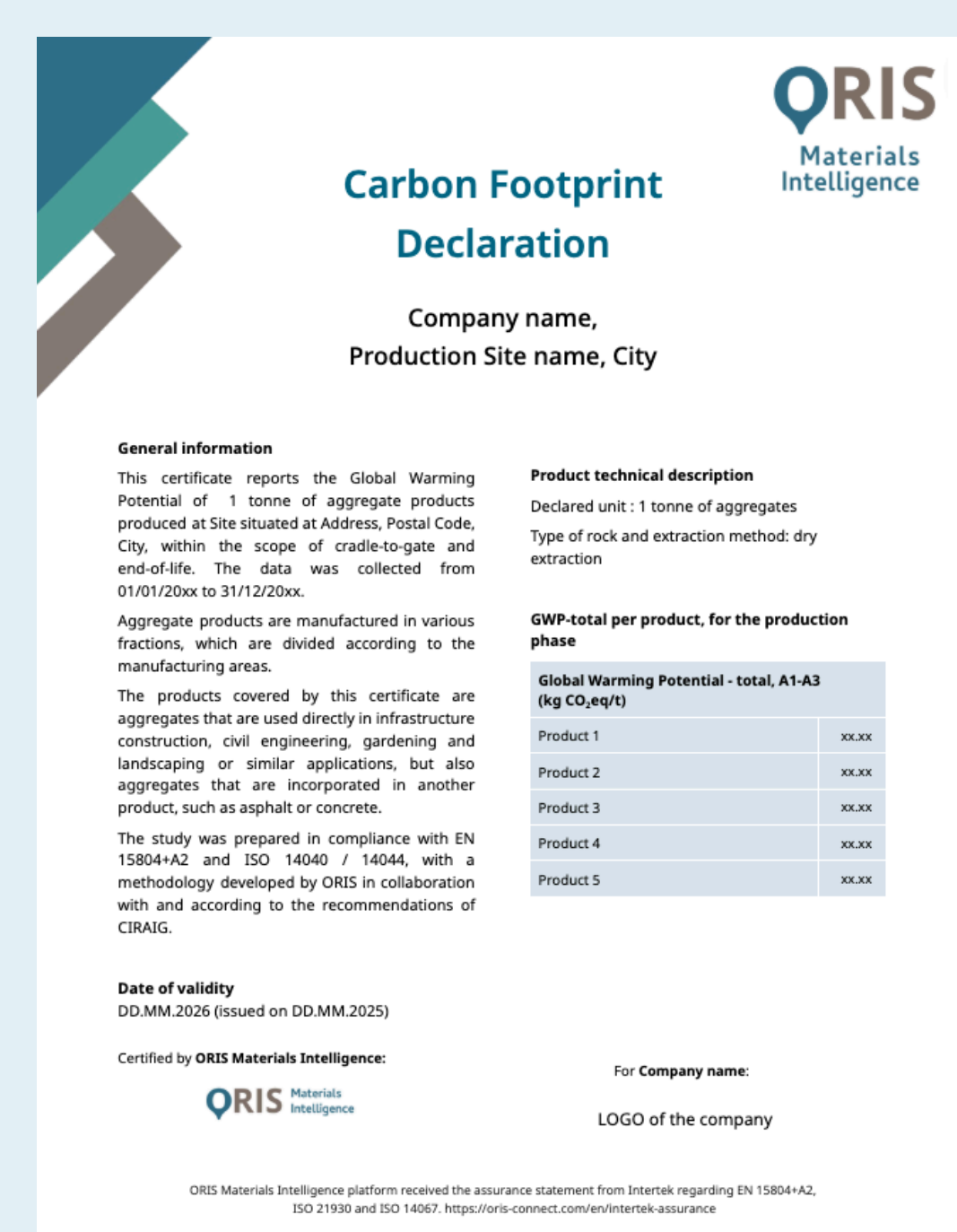
The calculation follows EN 15804+A2, and uses datasets fromecoinvent v3.10, system model EN 15804 and EF v3.0 for LCIA.

For each area, the user gives its incoming & outgoing flows, and its energy consumption. Energy is allocated in proportion to **mass flows**, giving a GWP for each area output.

→ **Calculation of product-specific GWP**

Users **define their commercial products** by indicating their production areas of origin. The tool then calculates a **specific footprint for each commercial product** using a mass pro rata.

### Results

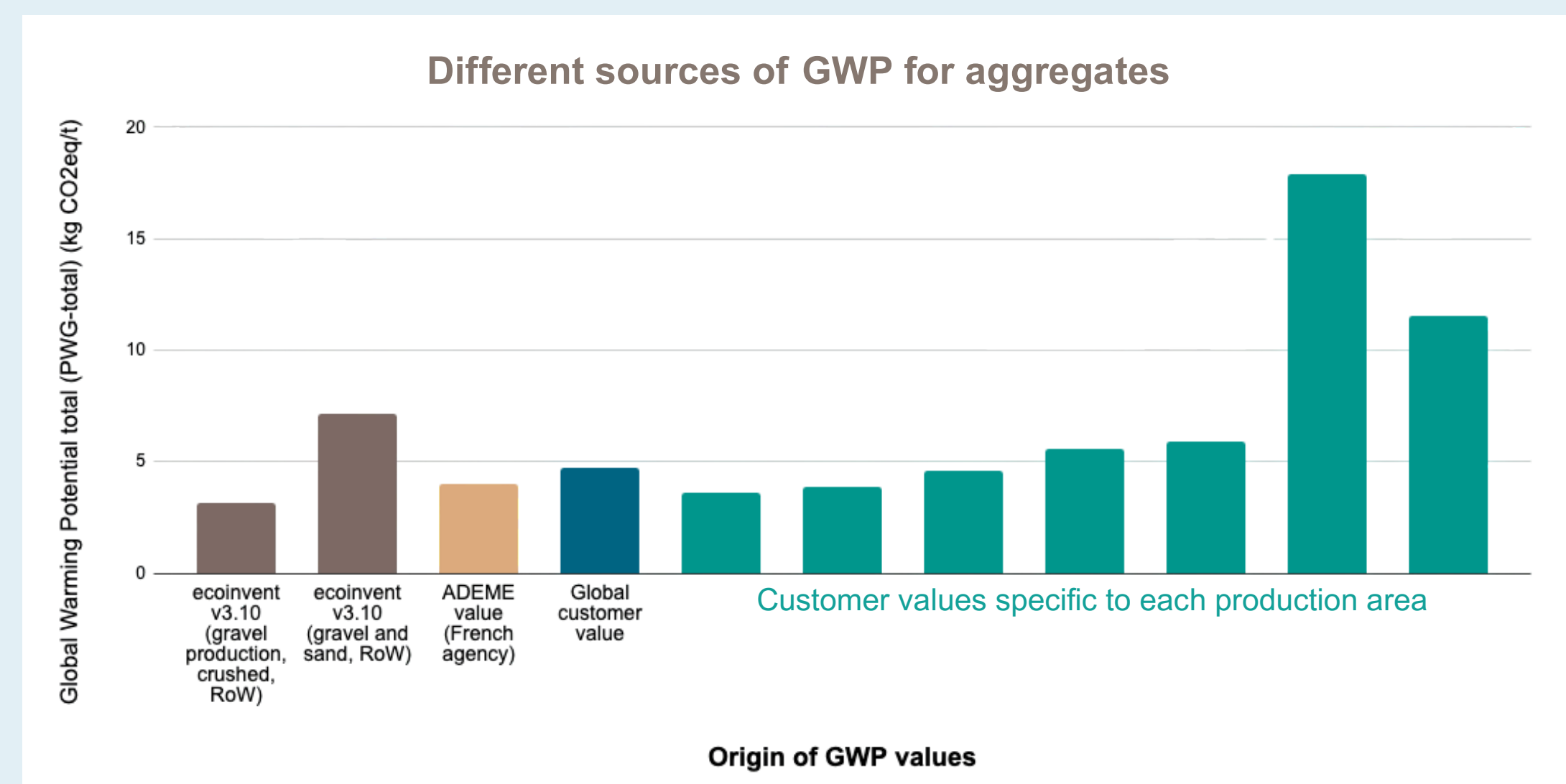


A certificate with the Global Warming Potential of each aggregate product and a background report is delivered for each calculation.

**1. There are surprising variabilities across plants: from 0.3 to 48.9 kg CO<sub>2</sub>eq/t**

**2. There are surprising variabilities for a same plant: from 3.6 to 21.4 kg CO<sub>2</sub>eq/t** whereas the conventional way of calculation for the same plant gives 4.7 kg CO<sub>2</sub>eq/t

The main factors are the **drying of aggregates** (without or with natural gas), a **variable electricity mix**, and **cogeneration** (combined heat and power plant).



**What is the impact on an asphalt formula?**

Using an aggregate with 7.0 kg CO<sub>2</sub>eq/t instead of 4.0 kg CO<sub>2</sub>eq/t increases the GWP of a regular asphalt of more than 5%.

→ **This variability fully justifies a specific approach to aggregates.**

### Conclusion

**In conclusion, our tool meets three challenges:**

**1 Regulatory compliance with the Construction Product Regulation (CPR)**

**2 Identify strategic optimisation levers for aggregate producers**

**3 Regulatory obligation becomes an opportunity for innovation**  
A scientific contribution with a methodology transposable to other materials.