RÉPUBLIQUE FRANÇAISE
Liberté Égalité Fraternité

DKarbonation

ADEME AGENCE DE LA TRANSITION ÉCOLOGIQUE

EXPERTISES

Regulatory note on the impact of the « Dunkirk heat highway » project with regard to the European Union emissions trading system

Oct. 2025

FRANCE 2030

Analysis of the qualitative effects of heat exchanges on installations' emission allowances.

General context

The Dunkirk Industrial and Port Zone (ZIP), a winner of the ZiBaC program, is conducting collective studies to achieve the decarbonization objectives of the European Green Deal. Accounting for 20% of France's industrial emissions, the territory aims to reach carbon neutrality by 2050 through strategies focused on energy efficiency, energy mix diversification, and CO_2 capture. The industrial heat network project is part of this dynamic by recovering waste heat from emitting industrial facilities to support the local ecological transition.

Within the framework of this project, EcosystemeD commissioned Citepa to carry out a regulatory analysis of the impacts of the "Heat Highway" project on emissions and on the allocation of free emission allowances for installations covered by the EU Emissions Trading System (EU ETS) and participating in the project. The objective of this analysis is to provide EcosystemeD with the necessary insights to take into account the effects of EU ETS regulation in the environmental and economic assessment of the projects proposed by candidates to the SEMOP call for tenders. The selected SEMOP entity would be responsible, under a concession contract, for the implementation of the DKarbonation – Heat Highway project, which involves the design, construction, and operation of a shared industrial heat network within the perimeter of the Dunkirk Urban Community (CUD). The launch of the call for tenders is scheduled for November 2025.

Objective of the study

This study aims to clarify the rules governing the calculation of free allocation of emission allowances under the fourth phase of the EU Emissions Trading System (EU ETS) (2021–2030), with a particular focus on the effects of heat exchanges (imports and/or exports) between industrial installations, whether or not they are covered by the EU ETS.

These rules are then applied through a technical configuration—which defines the position and role of each actor within the industrial value chain—in order to illustrate the qualitative impact of the project on emissions and on the free allocation of allowances for the installations involved.

Methodology

To carry out this study, Citepa relies on the European regulations relating to the EU ETS, the associated guidance documents, and its technical and regulatory expertise in greenhouse gas emissions from industrial installations.

The approach used in this study combines two components :

- **A regulatory component:** this section details the applicable rules and the parameters to be considered for estimating the free allocation of allowances for ETS installations, with particular emphasis on the rules for allocating allowances between installations when heat exchanges are involved. These elements are mainly based on Commission Delegated Regulation (EU) 2019/331 of 19 December 2018 (the "FAR Regulation"), Guidance Document No. 2 on the methodology for calculating free allocation of emission allowances, and Guidance Document No. 6 on heat exchanges between installations.
- **A technical component:** this section sets out the selected technical configuration, including the list of installations that would technically be connected to the heat highway, their roles, and their positions within the heat network (heat producer or consumer, industrial heat network operator, district heating network). This configuration is then schematically represented in order to clearly illustrate the heat flows involved and exchanged between the various actors described above. These elements are mainly based on information provided by EcosystemeD and on publicly available documentation concerning the industrial installations identified as project stakeholders (Géorisques, the EU ETS Union Registry, etc.).

Based on the flow diagram and the information available on the installations involved, the rules set out in the regulatory component are applied in order to identify, for each stakeholder, the qualitative impact of the project on their emissions and/or their free allocation of emission allowances, where the installation is covered by the EU ETS.

This qualitative impact is expressed as follows :

« Installation A, covered by the EU ETS, imports heat from the industrial heat network (Flow 1). This results in a reduction of its CO_2e emissions (compared with a scenario in which this heat is produced on site), and an increase in its free allocation of emission allowances. »

It should be noted that this qualitative impact assessment is carried out on the basis of the data available, in a context of uncertainty regarding the project's final technical configuration. Data gaps are identified in order to improve the reliability and accuracy of the results.

Results

The technical configuration retained following the data collection phase is as follows.

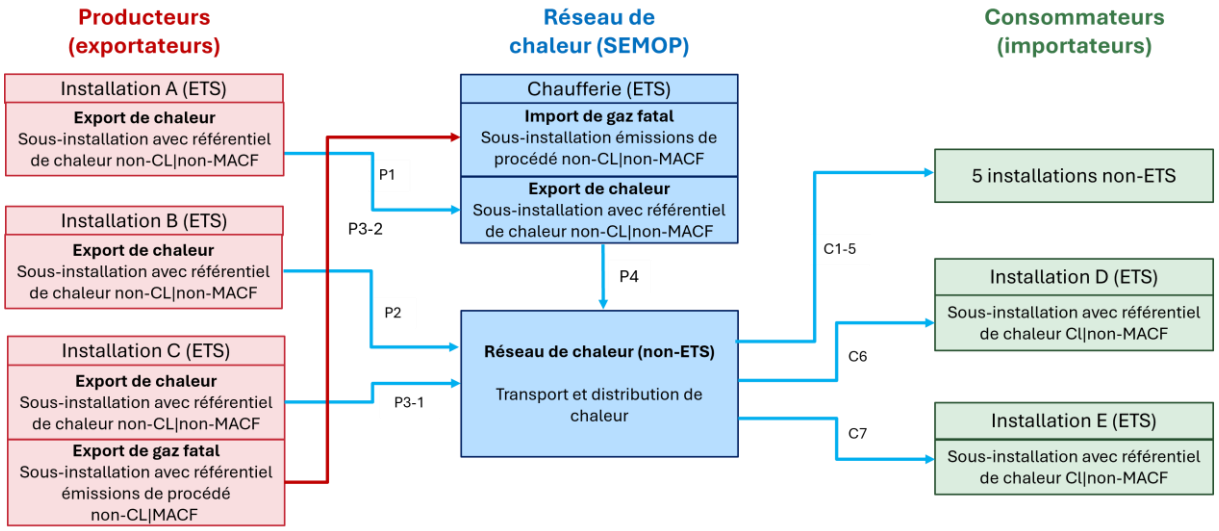

Figure 1. Selected technical configuration. *In red: waste heat producers; in blue: boiler plant operated by the SEMOP (ETS) and the industrial heat network (considered non-ETS for the transport of heat between installations); in green: heat consumers. Blue flows correspond to steam, and the red flow to waste gas.atal.*

For the producers, three types of flows are distinguished:

- **Flows P2, P3-1 and P4** correspond to the direct export of waste heat to the heat network.
- **Flow P1** corresponds to the export of waste heat (steam) to the network via a boiler plant, with the purpose of increasing the temperature and pressure of the steam flow. **Flow P4** therefore corresponds to the sum of the steam produced in the boiler plant and the reheated P1 steam.
- **Flow P3-2** corresponds to the export of waste gas (gaseous effluents containing carbon monoxide) to the boiler plant. This gas is added to the boiler plant's fuels and is recovered in the form of heat.

For the consumers, two types of flows are distinguished:

- **Flows C1–5** correspond to the import of heat from the network by industrial installations not subject to the EU ETS.
- **Flows C6 and C7** correspond to the import of heat from the network by industrial installations subject to the EU ETS.

The application of the rules governing the free allocation of emission allowances relating to exchanges of heat and waste gas between installations makes it possible to determine the holder of the allowances and the allocation arrangements.

Installation	Allowance allocation	Change in CO_2 emissions[1]
Installation A	No free allowances allocated (flow exported to an EU ETS installation; allowances are allocated to the consumer).	The export of heat to the boiler does not change the EU ETS emissions of Installation A.
Installation B	Free allowances allocated for flow P2.	The export of heat to the boiler does not change the EU ETS emissions of Installation B.
Installation C	Free allowances allocated for flow P3-1.	The export of heat to the boiler does not change the EU ETS emissions of Installation C.
	The export of waste gas (flow P3-2) leads to a reduction in the allocation related to the installation's process emissions.	The export of waste gas leads to a reduction in the installation's emissions. These emissions are attributed to the consumer (SEMOP).
SEMOP (Boiler house)	Free allowances allocated for heat flows P4 and for flow P3-2 (production & consumption of waste gas).	The valorization of heat from flows P4 and P3-2 avoids fuel consumption and therefore leads to a reduction in emissions. However, all carbon contained in the waste gases (P3-2) is considered to be emitted by the SEMOP boiler.
Installation D	Not eligible for free allowances (flow imported from a non-EU ETS entity).	The import of heat avoids on-site fuel use and results in lower emissions.
Installation E	Not eligible for free allowances (flow imported from a non-EU ETS installation).	Heat import avoids on-site fuel consumption and leads to a reduction in emissions.
Installations no-ETS	N/A	The import of heat avoids on-site fuel consumption and results in a reduction of emissions.

Note : 1) Emissions reported under the EU ETS, compared to a scenario without the industrial heat network project.

Conclusions

This study is a qualitative analysis of the impact of the Heat Highway project on EU ETS (EU Emissions Trading System) allowance allocations and emissions. It highlights the dependence of financial allocations (allowances) and environmental outcomes (emissions) on the technical configuration chosen for the project. At the time this study was carried out, this configuration remains subject to change, requiring certain assumptions for some parameters. Nevertheless, the technical report clarifies the rules for allowance allocation, enabling conclusions to be adjusted if the technical configuration is modified.

From a practical perspective, this regulatory analysis allows us to conclude that the Heat Highway project results in:

1. An overall increase in allowance allocations compared to a situation where waste heat is not valorized.
2. A potential redistribution of free allowances among actors, relative to the current configuration in which actors are "isolated."
3. A reduction in CO_2 emissions for the end-users of steam, compared to a scenario where these consumers would need to produce this heat on-site using fuels.

The perspectives for the continuation of this work are as follows:

- Consolidate the reliability of these conclusions by more precisely accounting for ETS parameters that influence free allowance allocations (sub-installations producing and/or consuming heat, their status regarding carbon leakage risk, and the Carbon Border Adjustment Mechanism), based on updated information about the technical configuration compared to the data available during the study period.
- For each actor and/or each waste gas or heat flow, quantify the impact in terms of allowances and CO_2 emissions, based on real data provided by the operators of the installations concerned.

RÉSUMÉ

This study is a regulatory analysis of the impact of the "Dkarbonation – Dunkirk Heat Highway" project on CO_2 emissions and the free allocation of allowances for installations subject to the European Union Emissions Trading System (EU ETS). It was conducted during the summer of 2025.

The report first clarifies the rules for allocating free allowances, particularly in the case of heat exchanges between installations, whether or not they are covered by the EU ETS. Based on a potential technical configuration (involving the actors concerned, their EU ETS status, and their roles as heat producers or consumers, etc.), the study applies these allocation rules (defined by Regulation (EU) 2019/331 and further specified in accompanying guidance documents) to this configuration. This approach allows the qualitative assessment of the impact of various heat or waste gas exchanges between installations on the free allocation of allowances to EU ETS-covered installations, as well as on the CO_2 emissions of the different installations.

The regulatory analysis shows that valorizing waste heat and waste gases is beneficial in terms of overall free allowance allocations and the reduction of CO_2 emissions reported under the EU ETS, particularly for steam consumers. However, the free allocation of allowances for installations connected to the industrial heat network could be redistributed between heat producers and consumers compared to a configuration without technical connection between installations. This reconfiguration of allocations must be carefully understood and analyzed to grasp the financial and commercial implications for the different stakeholders in the project.

Ce document est diffusé par l'ADEME

ADEME
20, avenue du Grésillé
BP 90 406 | 49004 Angers Cedex 01

CITATION DE CE RAPPORT

Maxime CELESTE, Yasmine HATIM (2025). *Regulatory Note on the Impact of the "Dunkirk Heat Highway" Project on the European Union Emissions Trading System (EU ETS)*. 44 pages.