



Funded by
the European Union



REPUBLIC OF TÜRKİYE
MINISTRY OF ENVIRONMENT,
URBANIZATION AND CLIMATE CHANGE

Advancing ETS Readiness in Türkiye – Technical work on ETS benchmarks

This activity is part of the European Union Climate Dialogues Project (EUCDs)

Case study on fall-back approaches and biomass

Fabio Romani – Valentina Marini – Matias Franke

July 22nd 2026

This publication was funded by the European Union. Its contents are the sole responsibility of the author and do not necessarily reflect the views of the European Union



Case study — a kiln on mixed fuel

Installation	Plant making raw & laminated particleboard; single Annex I activity “Combustion of fuels”, 50 MW _m ; Category A, low-emitter (< 25,000 t fossil CO ₂ /yr)
Process	Drying unit (source S15) — process heat from mixed combustion feeding the panel line
Fuel mix	Natural gas + two waste wood-dust streams fired together: screening dust (F3) and sanding dust (F4)
Waste status	Both dust streams are classified as waste (Combustion: Waste, de-minimis), not virgin biomass — biomass share cannot be assumed
Question	Of the dryer’s CO ₂ , what share is biogenic (zero-rated) vs fossil, when gas and dust burn in one blended source?



Fig. 1: Woody materials

Quantifying the biomass share — EN ISO 21644

Standard	EN ISO 21644:2021 — biomass content of solid recovered fuels; lab test required per fuel batch
Selective dissolution	Acid/peroxide dissolves the biomass fraction, fossil fraction resists; quick, low-cost, less reliable on complex blends
¹⁴C method	Radiocarbon content marks biogenic carbon (modern ¹⁴ C) vs fossil carbon (none); more accurate, needs an accredited lab
Sampling	Both methods rely on representative sampling of the pulverino feedstock, batch by batch
Output	A % biomass figure (energy or mass basis) that splits kiln CO ₂ into biogenic and fossil
In this case	ISO 21644:2021 Annex B (selective dissolution), ISO/IEC 17025-accredited lab — result: 97.05% biomass on dry basis, 2.40% moisture (sanding dust, Silo 3)



Fig.2: Wood Dust



Relevance for the emissions balance

CER code Confirms *polverino* is a waste-derived fuel — waste origin doesn't block biomass accounting once analysed

Emission split	Only the lab-confirmed biomass % is treated as CO ₂ -neutral; the rest counts as fossil
-----------------------	--

Verification Lab results go into the monitoring plan and are checked by the verifier

Same logic	Mirrors the biomass fallback: zero-rating always needs documented proof
-------------------	---

In this case Only ~2.9% of each dust stream counts as fossil; the 97.05–97.15% biomass is zero-rated — 68,466 t CO₂ biogenic vs 4,216 t CO₂ fossil reported



Case study — the numbers (one reporting year)

Source stream	Type	Quantity	Biomass %	Fossil CO ₂ (t)	Biogenic CO ₂ (t) — zero-rated
F1 Natural gas	Fossil	1,000 [10 ³ Nm ³]	—	2,136.9	—
F2 Gas oil	Fossil	0.3 [t]	—	0.9	—
F3 Screening dust	Waste / biomass	35,000 [t]	97.15%	1,562.5	53,263.8
F4 Sanding dust	Waste / biomass	10,000 [t]	97.05%	462.1	15,202.6
F5 Office heating gas	Fossil	25 [10 ³ Nm ³]	—	53.4	—
TOTAL reported				4,216	68,466

Key parameters: wood dust NCV 15.242 GJ/t, EF 102.773 tCO₂/TJ; natural gas NCV 37.627 GJ/Nm³, EF 56.791 tCO₂/TJ. Biomass % by lab analysis (ISO 21644:2021). Fossil total is surrendered; biogenic total is a zero-rated memo item.

Example: MP & AER



F4 Source Stream 4:

Source stream type:	Dust from sanding	De-minimis
Method applicable according to MRR:	Combustion: Waste	
Parameter to which uncertainty applies:	Standard method: Fuel, Article 24(1)	
	Amount of fuel [t]	

Art. 26(3) De-minimis source stream: Activity data and each calculation factor may be determined by using conservative estimations instead of using tiers, unless a defined tier is achievable without additional effort.

(c) Activity data tier level required: 1 Uncertainty shall not be more than ± 7,5%

(d) Activity data tier used: No tier #N/D

(e) Uncertainty achieved: Comment: de minimis estimate

Calculation factors:

(f) Applied tiers for calculation factors:

calculation factor	required tier	applied tier	full text for applied tier
i. Net calorific value (NCV)	2a/2b	2a	Type II default values
ii. Emission factor (preliminary)	2a/2b	2a	Type II default values
iii. Oxidation factor	1	2	Type II default values
iv. Conversion factor	n.a.		
v. Carbon content	n.a.		
vi. Biomass fraction (if applicable)	1	No tier	#N/D

(g) Details for calculation factors:

calculation factor	applied tier	default value	Unit	source ref	analysis ref	sampling ref	Analysis frequency
i. Net calorific value (NCV)	2a	Standard value	GJ/t	IS2: MP			
ii. Emission factor (preliminary)	2a	Standard value	tCO2/TJ	IS2: MP			
iii. Oxidation factor	2	Standard value	%	IS2: MP			
iv. Conversion factor							
v. Carbon content							
vi. Biomass fraction (if applicable)	No tier	laboratory analys	%	IS2: MP	L1: LAC s.r.l.	Piano di Cam	Annual

Comments and explanations:

(h) Comments and justification if required tiers are not applied:

The source stream is classified as non-hazardous special waste (EWC codes 03 01 05 and 10 01 19). As it is a de minimis source stream, the analyses to quantify the carbon content and the biomass fraction are carried out once a year on a mixed sample.

... B_Operator&Inst.ID C_InstallationDescription D_CalculationBasedApproaches E_SourceStreams F_Meas ... + :

4 F4. Solid - Other solid fuels; Grinding dust **Combustion** Emissions: **462,1** t CO2e

Combustion: Solid fuels zero-rated: 15,202,6 t CO2e

Detailed instructions for data entries in this tool can be found at the top of this sheet

i. AD: Is AD based on aggregation of metering of quantities (i.e. not on continuous metering)?

ii. AD: Open: Close: Import: Export:

Tier	tier description	Unit	Value	error
No tier		t	10,000.00	
2a	Type II default values	tCO2/TJ	102.77	
2a	Type II default values	GJ/t	15.24	
2	Type II default values		100.00%	
No tier			97.05%	
n.a.				
n.a.				
n.a.				
n.a.				

Tiers valid from: until: Waste catalogue number (if relevant): 03.01.05

ID that has been used in the monitoring plan for this source stream:

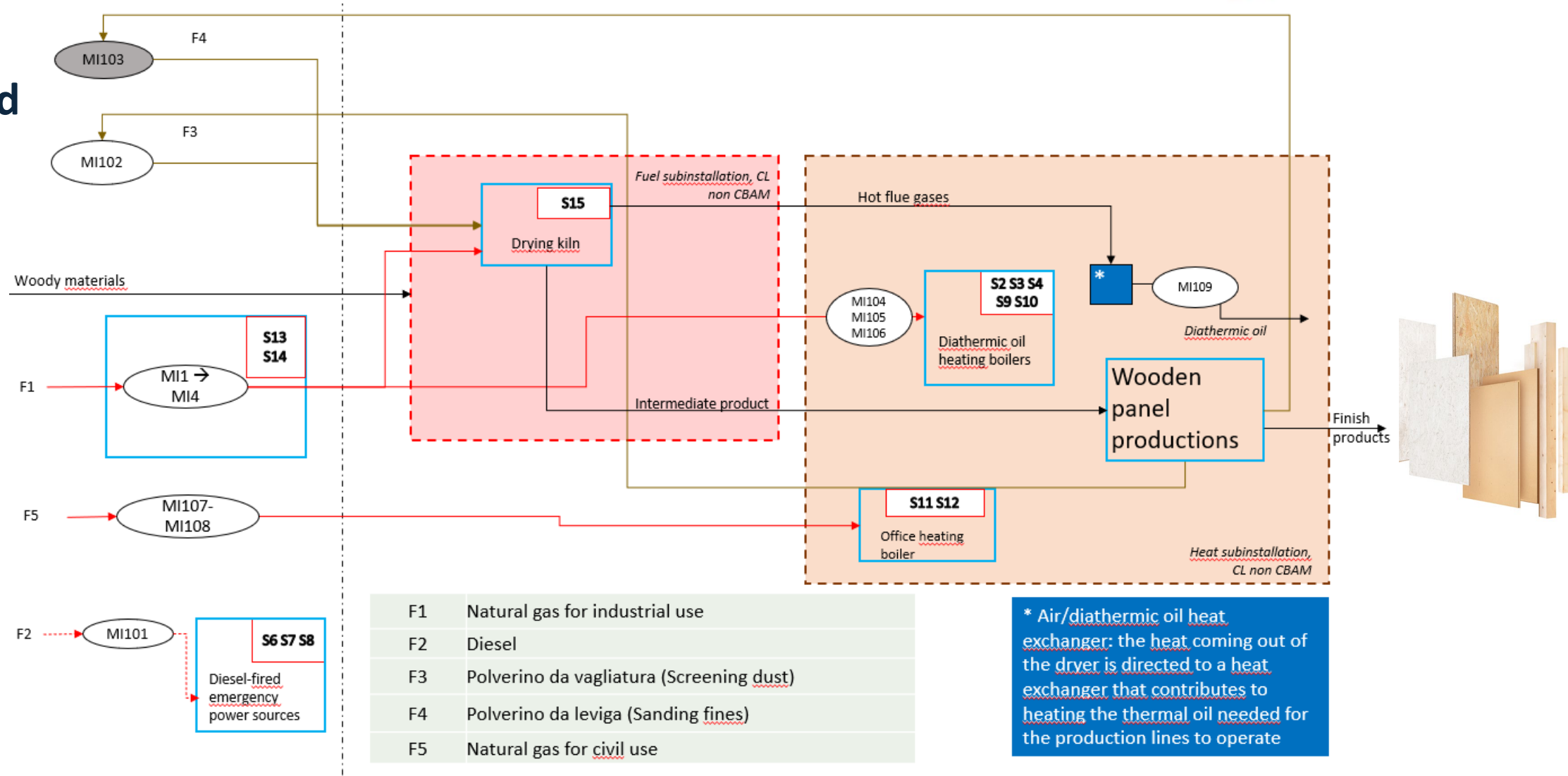
Comments:

RISULTATO DELL'ANALISI

Parametri richiesti	Unità di misura	Valori ottenuti	Metodo di prova
Residuo secco a 105 °C	%	97.60	ISO 21644:2021 Allegato B
Umidità a 105 °C	%	2.40	
Contenuto di Biomassa	% sul secco	97.05	
Contenuto di NON-Biomassa	% sul secco	2.95	



Heat and Fuel s.i.





MMP & ALC

Report template for allocation to new entrants, allocation level changes and cessations for Phase 4 of the EU ETS

Reporting year:

2026

CONTENTS

- GUIDELINES AND CONDITIONS
- A. Sheet "InstallationData" - GENERAL INFORMATION ON THIS REPORT
 - I [Reporting details](#)
 - II [Data from the NIMs baseline data report](#)
 - III [Identification of the Installation](#)
 - IV [Information on this activity level report](#)
 - V [List of technical connections](#)
- B+C. Sheet "Sub-installations" - IDENTIFICATION OF SUB-INSTALLATIONS AND INITIAL ALLOCATION
 - I [List of sub-installations](#)
 - II [Initial allocation](#)
- D. Sheet "Emissions" - ATTRIBUTION OF EMISSIONS
 - I [Total Direct Greenhouse Gas Emissions and Energy Input from Fuels](#)
 - II [Attribution of emissions to sub-installations](#)
 - III [Cogeneration tool](#)
 - IV [Waste gas tool](#)
- E. Sheet "EnergyFlows" - DATA ON ENERGY INPUT, MEASURABLE HEAT AND ELECTRICITY
 - I [Energy input from fuels](#)
 - II [Measurable heat](#)
 - III [Waste gas balance](#)
 - IV [Electricity](#)
- F. Sheet "ProductBM" - SUB-INSTALLATION DATA RELATING TO PRODUCT BENCHMARKS
 - I [Historic Activity levels and disaggregated production details](#)
- G. Sheet "Fall-back" - SUB-INSTALLATION DATA RELATING TO FALL-BACK SUB-INSTALLATIONS
 - I [Historic Activity levels and disaggregated production details](#)
- H. Sheet "SpecialBM" - SPECIAL DATA FOR SOME PRODUCT BENCHMARKS
 - I [CWT \(Refinery products\)](#)
 - II [Lime](#)
 - III [Dolime](#)
 - IV [Steam cracking](#)
 - V [CWT \(Aromatics\)](#)



MONITORING METHODOLOGY PLAN for Phase 4 of the EU ETS

CONTENTS

- GUIDELINES AND CONDITIONS
- A. Monitoring Methodology Plan versions
 - I [List of monitoring methodology plan versions](#)
- B. INSTALLATION DATA
 - I [Identification of the Installation](#)
- C. INSTALLATION DESCRIPTION
 - I [List of sub-installations](#)
 - II [Description of the installation](#)
 - III [Connections to other EU ETS installations or non-ETS entities](#)
- D. Methods and procedures at installation level
 - I [Methods at installation level](#)
 - II [Procedures](#)
- E. Energy Flows
 - I [Energy input](#)
 - II [Measurable heat at installation level](#)
 - III [Waste gas balance at installation level](#)
 - IV [Electricity at installation level](#)
- F. Sheet "ProductBM" - SUB-INSTALLATION DATA RELATING TO PRODUCT BENCHMARKS
 - I [Product BM sub-installations](#)
- G. Sheet "Fall-back" - SUB-INSTALLATION DATA RELATING TO FALL-BACK SUB-INSTALLATIONS
 - I [Fall-back sub-installations](#)
- H. Sheet "SpecialBM" - SPECIAL DATA FOR SOME PRODUCT BENCHMARKS
 - I [CWT \(Refinery products\)](#)
 - II [Lime](#)
 - III [Dolime](#)
 - IV [Steam cracking](#)
 - V [CWT \(Aromatics\)](#)
 - VI [Hydrogen](#)
 - VII [Synthesis gas](#)
 - VIII [Ethylene oxide / glycols](#)
 - IX [Vinyl chloride monomer \(VCM\)](#)
- I. Sheet "MSspecific" - ADDITIONAL DATA REQUIREMENTS BY THE MEMBER STATE
 - I [To be defined by the Member State](#)
- J. Sheet "Comments" - COMMENTS AND FURTHER INFORMATION





Funded by
the European Union



REPUBLIC OF TÜRKİYE
MINISTRY OF ENVIRONMENT,
URBANIZATION AND CLIMATE CHANGE

Interactive Q&A



➔ <https://partici.fi/23503622>



Funded by
the European Union



REPUBLIC OF TÜRKİYE
MINISTRY OF ENVIRONMENT,
URBANIZATION AND CLIMATE CHANGE



REPUBLIC OF TÜRKİYE
MINISTRY OF ENVIRONMENT,
URBANIZATION AND CLIMATE CHANGE

Thanks for your Attention!



Next: Day 2 — Iron & Steel