

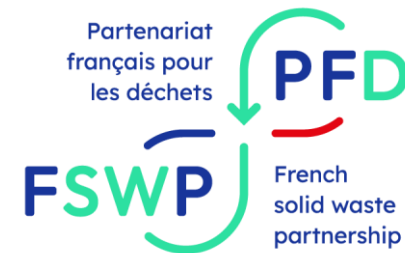
Nov 19

WEBINAR

14:00 – 15:30 (UTC+1)

Waste Management to Address the Climate Crisis

- A Circular and Mitigation Pathway





Agenda

- 1** Launch of the Publication
- 2** The waste management topic at COP – live from Baku
- 3** Mitigation pathways illustrated by case studies
- 4** International cooperation towards an ESM of waste

Housekeeping Rules



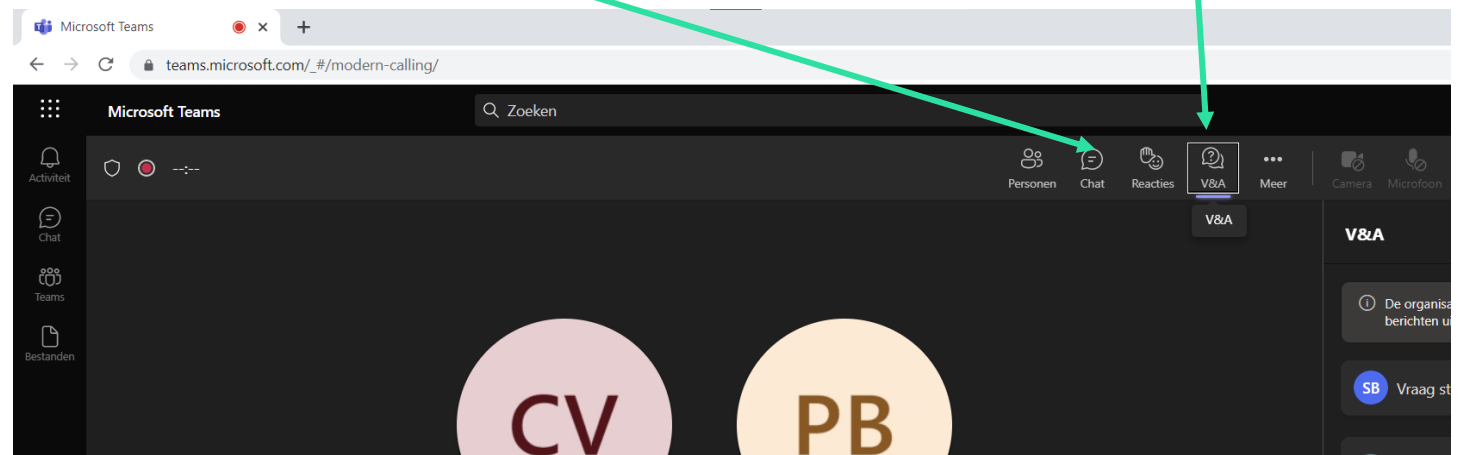
Webinar recorded
This webinar will be recorded and shared publicly

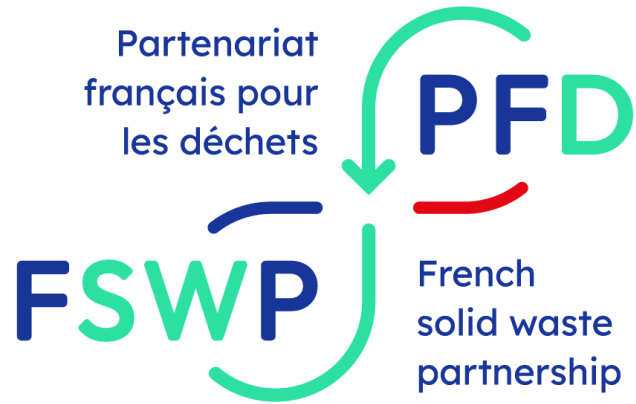


“Chat” section
Dedicated for comments only
NO QUESTIONS SHARE your name, organisation, country in the chat box

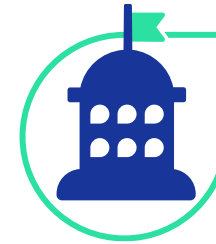


“Q&A” section
Ask your question in the Q&A box





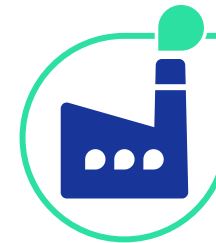
A multi-player platform



The State, state agencies, Members of Parliament



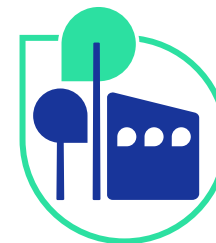
NGOs, Associations and Foundations



Companies



Scientific, technical, research and training organizations



Local authorities

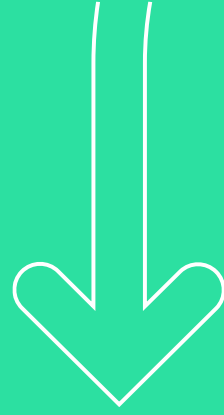


Individuals

Coordinating and amplifying the voice of French waste professionals

... to advocate in Europe and internationally for: the collection, treatment and recovery of the resources present in waste,

... promoting a sober and more circular economy to help achieve the 2030 Sustainable Development Goals.



Publication Launch

Waste Management to Address the Climate Crisis

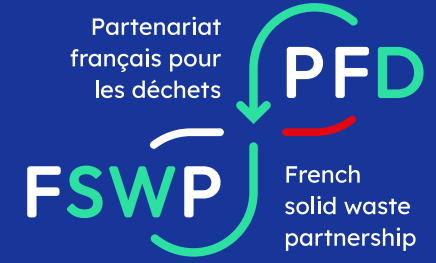
A Circular Economy and Mitigation Pathway



Partenariat
français pour
les déchets

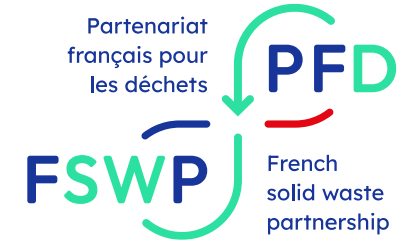
French
solid waste
partnership





**Waste sector = 5% of global emissions in 2016
(1.6 Billion Tons CO_{2eq}/year)**

**Business as Usual
= 2.6 Billion Tons CO_{2eq}/year by 2050**



Mismanaged organic waste emits 20% of global methane

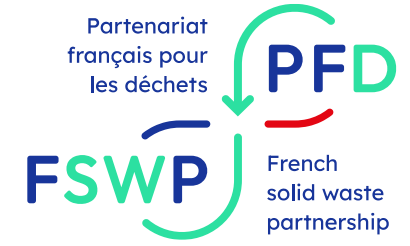
Source: Global Methane Hub

The French Solid Waste Partnership virtual presence at COP is supported by





COP29
Baku
Azerbaijan



Waste prevention and circularity has the potential to mitigate 20% of global GHG

Source: Global Methane Hub

The French Solid Waste Partnership virtual presence at COP is supported by





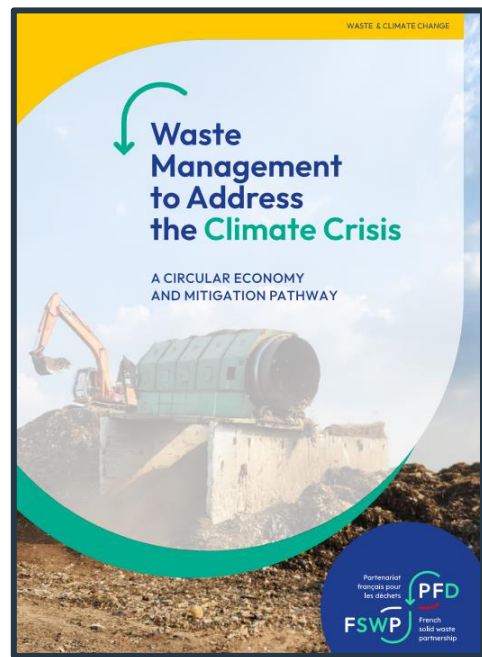
Waste Management to Address the Climate Crisis

A CIRCULAR ECONOMY AND MITIGATION PATHWAY



Contents

1. The Global Context
2. GHG Assessments for Solid Waste Management Activities
3. Technical Actions to Reduce GHG Emissions
4. The Policy and Regulatory Levers
5. International Financing

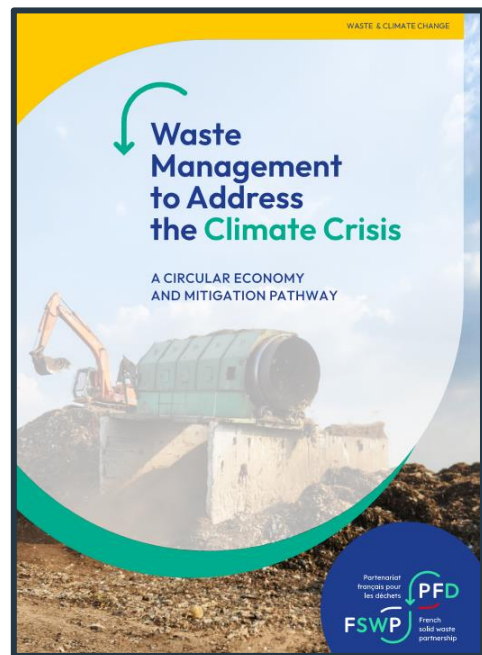


Chapter 1. Global Context

- Difference between the “Waste Sector” reporting and the organisational reporting.
- The definition of municipal solid waste and “Environmentally Sound Management” of Waste.
- GHG emissions result from fossil CO₂ emissions from incineration, from methane leakage, from black carbon.
- Climate COPs and international initiatives are increasingly raising waste management as a priority.

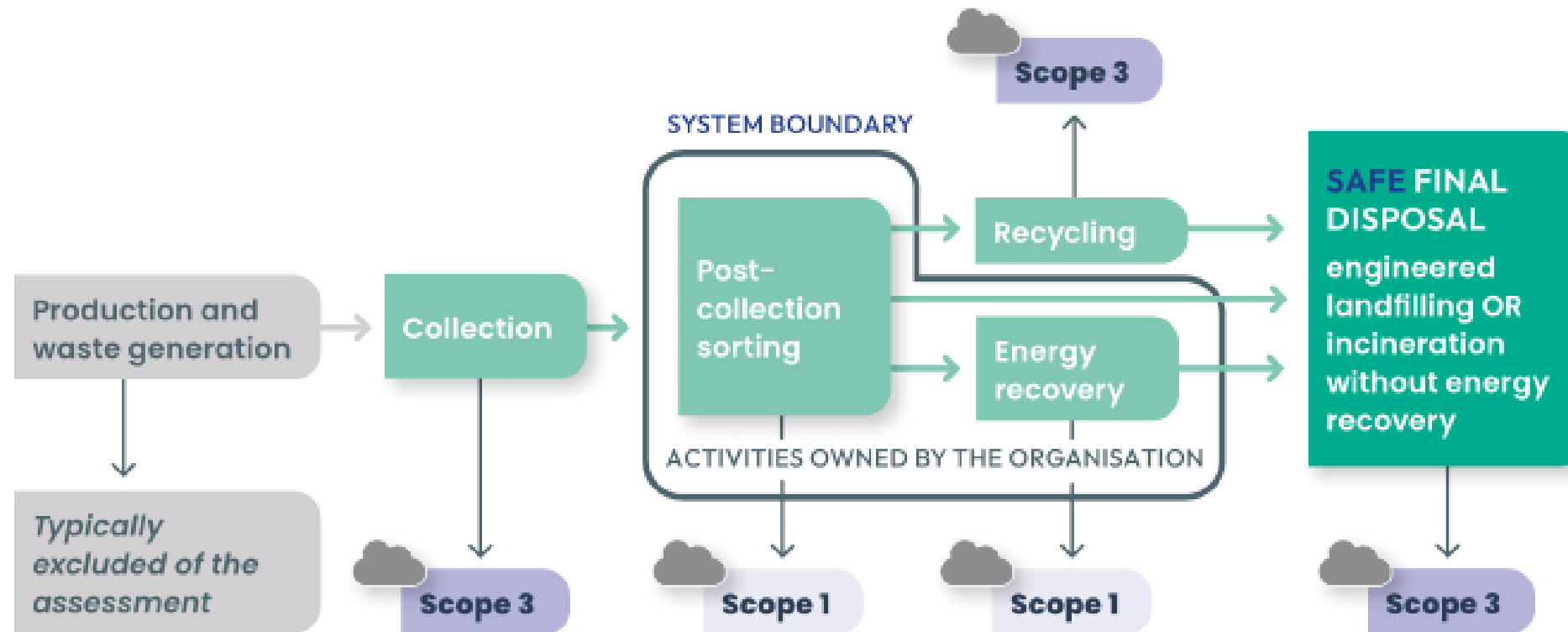
FIGURE 1 GHG emissions from the waste sector depending on the chosen system boundary³

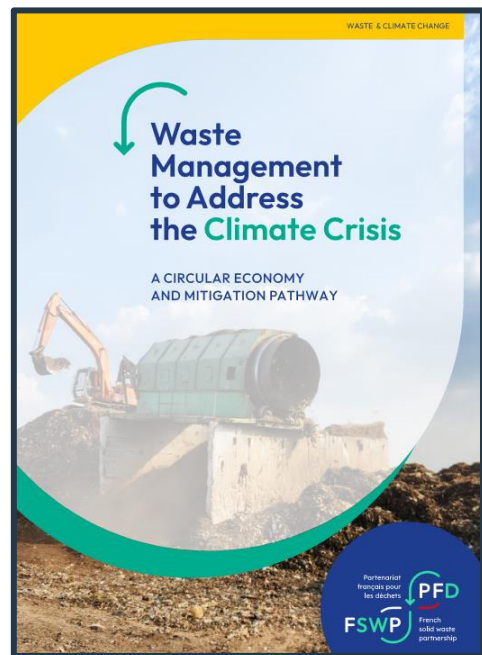




Chapter 2. GHG Assessments for Solid Waste

- GHG emissions assessments by organisations is the **basis of mitigation action**
- **System boundaries** : Difference between national and organisational reporting
- Organisational reporting: **Scopes 1, 2 and 3**, as well as **avoided emissions**

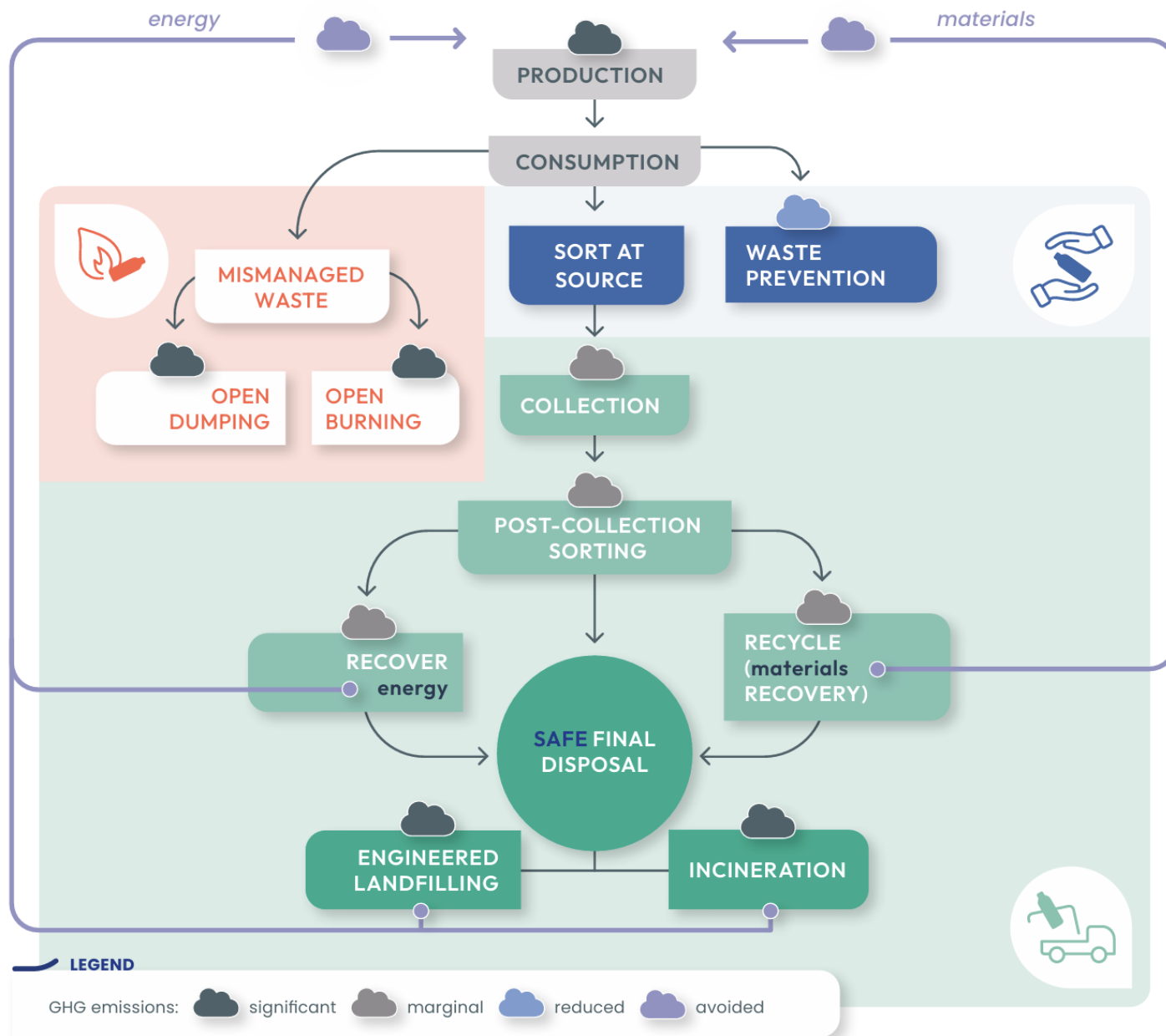




Chapter 3. GHG Reduction levers

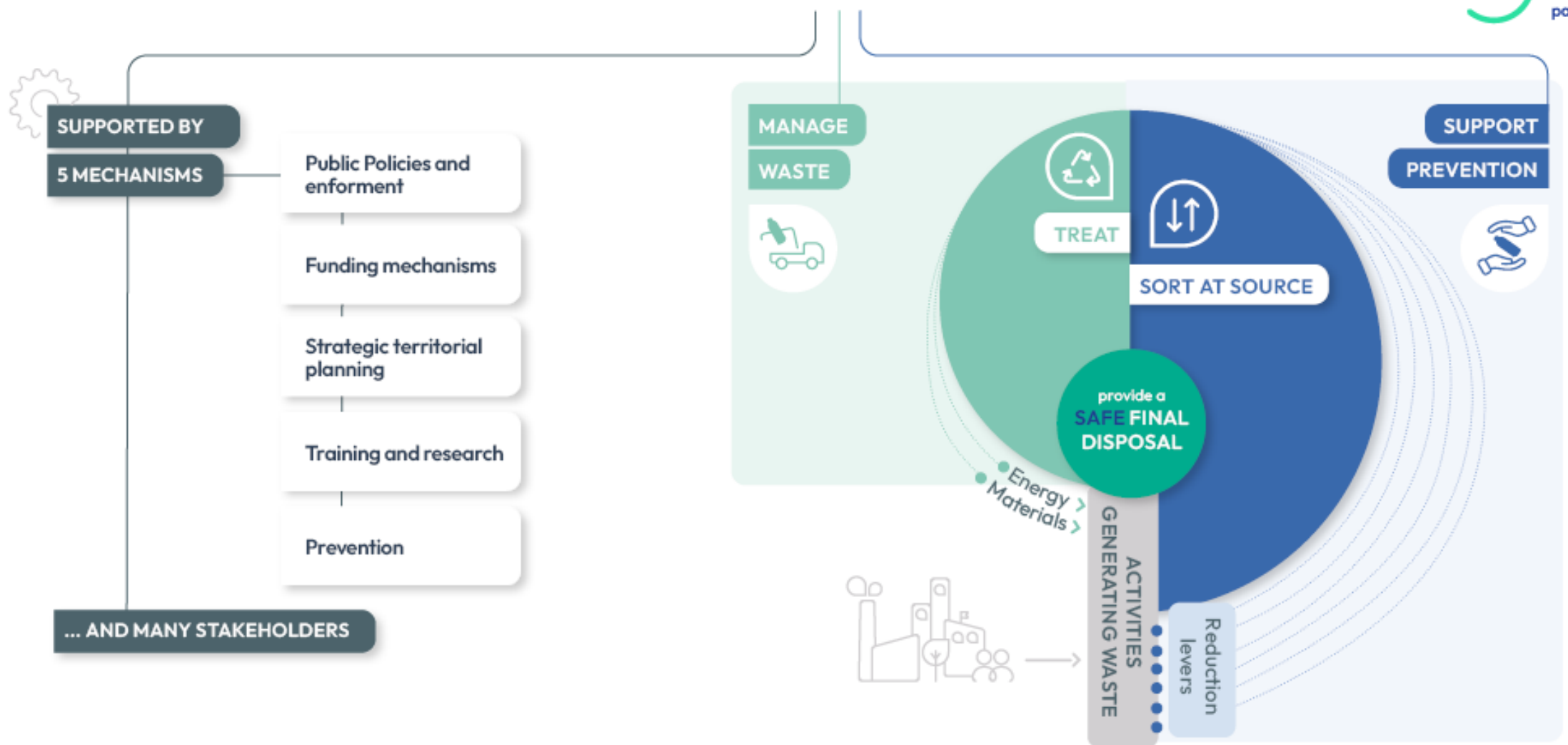
- Major **GHG emissions** result from mismanaged waste and safe final disposal
- Major **reduction opportunities** are in the prevention of waste generation, and the transition to 100% ESM of waste
- Major **avoided emissions** result of the recovery of materials and energy

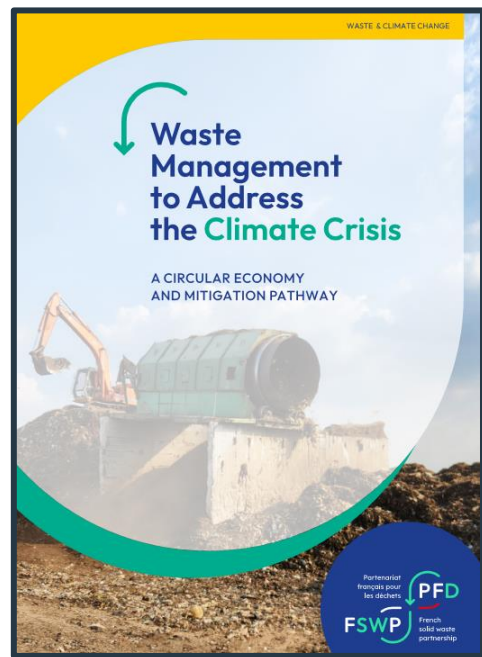
FIGURE 7 GHG emissions throughout the waste life cycle



Chapter 3. GHG Reduction levers

ENVIRONMENTALLY SOUND MANAGEMENT OF WASTE BY LOCAL AUTHORITIES





Chapter 4. The Policy and Regulatory Levers

Public policies have to

- Be ambitious, yet realistic, to drive incremental changes through incentives and requirements
- Establish the cost recovery mechanisms for operational costs
- Assign roles and responsibilities, and support cross-sectoral synergies

They are driven by international policies but can themselves drive international ambitions...

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A CIRCULAR ECONOMY AND MITIGATION PATHWAY



5. International Financing

- Financial mechanisms are a means to drive positive change
- They include: **carbon markets, green finance, grants and loans, and philanthropic funding**
- Zoom on carbon markets and their still limited potential

TABLE 4 Summary of carbon pricing instruments and their associated carbon markets

CARBON PRICING INSTRUMENTS	ETS AND CARBON TAX	CREDITING MECHANISMS	
		International Cooperation & Article 6(2) and 6(4) Market	Voluntary Carbon Market (international)
Type of market	Domestic Compliance Market	International Cooperation & Article 6(2) and 6(4) Market	Voluntary Carbon Market (international)
Purpose	Achieving NDCs domestically	Achieving NDCs cooperatively	Making additional contributions to mitigation action
Motivation	Compliance with regulations (ETS, carbon tax)	Increase NDC ambition and flexibility	Going beyond own emissions reductions targets
Buyers	Corporates/entities bound by regulation	Parties (countries)	Corporates/individuals
Units	Emission allowances and offset credits	Internationally Transferred Mitigation Outcomes (ITMOs)	Voluntary credits
Governance	National or sectoral regulations	International oversight and rules	Self-regulation with internationally recognised standards (e.g. IC-VCM, carbon standards)



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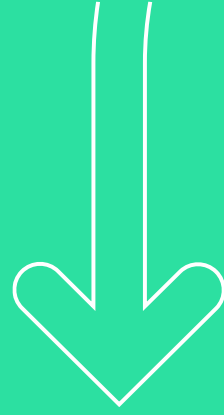


Scan this QR code to Download the publication



French Version to be released on 9 December 2024





**Live from the Waste & Resources
Pavilion in Baku**
Aditi Ramola, ISWA



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français pour
les déchets

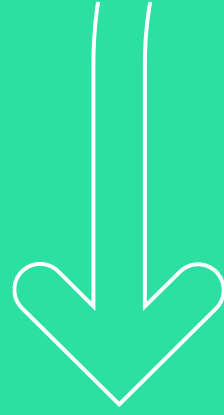
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solid waste
partnership





COP29
Baku
Azerbaijan





Policies and Regulations Driving Change

Paloma Gengoux, co-author of the publication



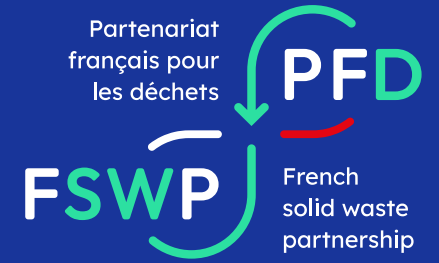
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Case of France



French Policies and Regulations

Driving change towards low carbon waste management

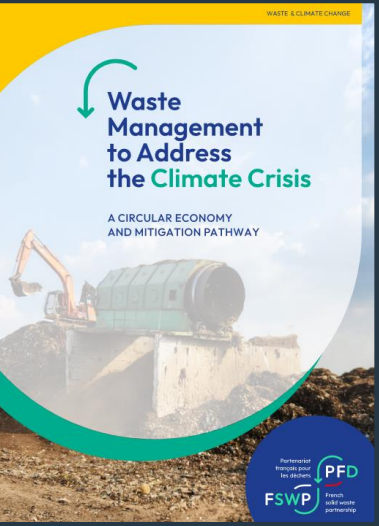
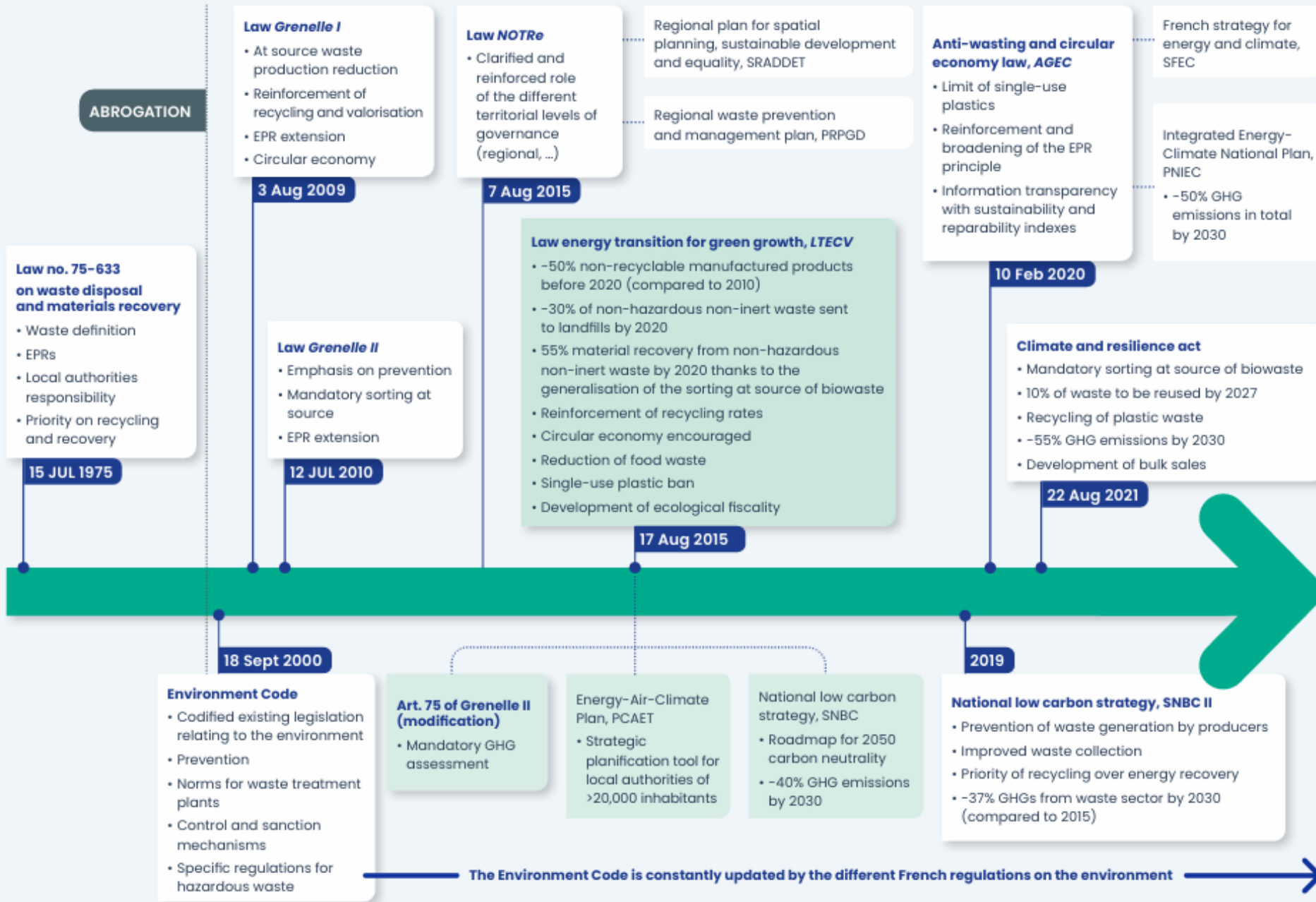
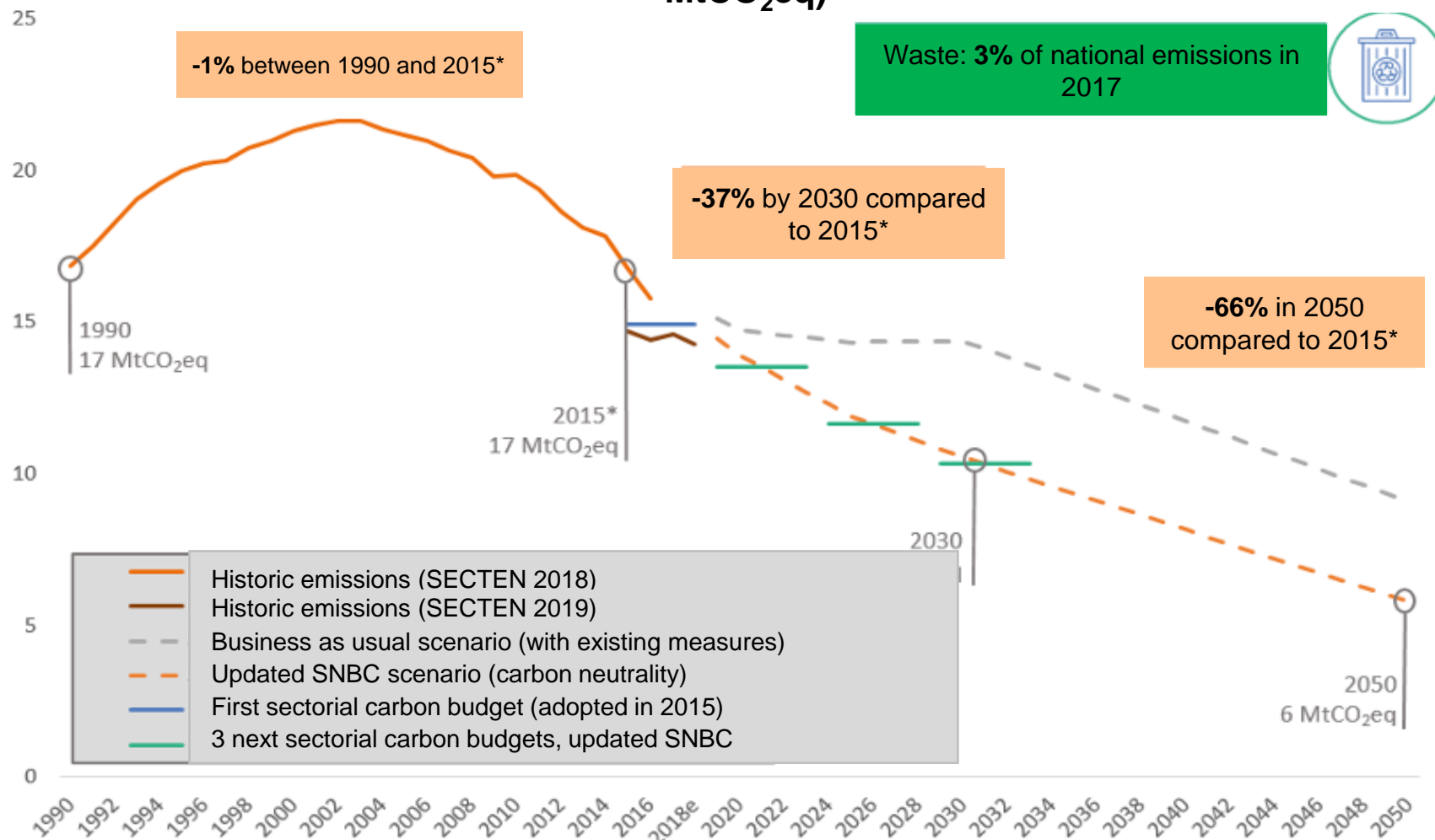


FIGURE 8 The French regulatory framework driving the transformation of waste management to prevention and resource recovery



The trajectory of the French National Low Carbon Strategy (SNBC)

Historic and estimation of waste sector emissions from 1990 to 2050 (in MtCO₂eq)



*Les émissions utilisées pour l'année 2015 sont celles de l'inventaire CITEPA SECTEN 2018

e : estimation. Sources : inventaire CITEPA d'avril 2018 au format SECTEN et au périmètre Plan Climat Kyoto ; Scénarios AME et AMS 2018

https://www.ecologie.gouv.fr/sites/default/files/documents/2020-03-25_MTES_SNBC2.pdf



Conclusion

To what extent are public policies (which are influenced by evolving social concerns) key in driving waste management mitigation measures?

1. Public policies reflect social representations and the current state-of-mind regarding waste

- 1975 law, defining what waste management means in itself
- 2000 Environment Code, recognizing waste's links with environmental questions
- 2015 law on energy transition for green growth, waste's potential in climate crisis mitigation

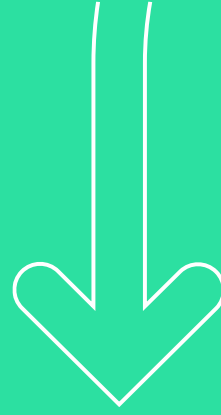
2. Public policies to make change happen: the example of the French national low-carbon strategy (SNBC)

- A roadmap for carbon neutrality by 2050
- Policies to motivate change – going beyond the business-as-usual scenario
- Policies trigger change – the necessary involvement of all stakeholders



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partnership



Case studies on mitigation pathways





Our speakers



Nicolas Almodovar
**International project
manager, Merlin Group**



Sophie Sicard
**Deputy Director of
Sustainable Development
and Corporate Affairs,
Paprec**



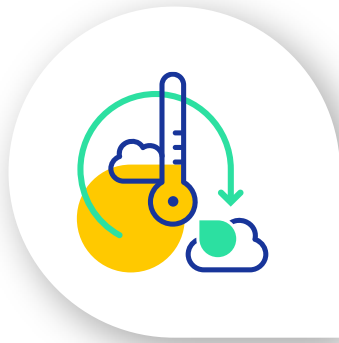
Malik Kerkar
**Carbon Project Director,
Suez**



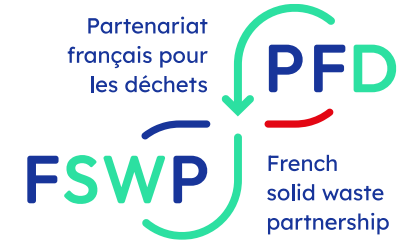
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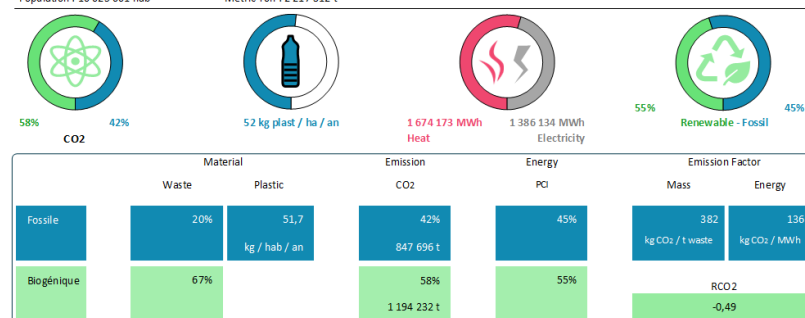
MASSBIO₂ the CO₂ Dashboard



Assessing biogenic and fossil carbon fractions in incineration flue gas, waste and energy.



From flue gas to waste composition... by measuring the origin of CO₂ (¹⁴C analysis)
An algorithm assesses biogenic and fossil CO₂, the waste composition, and the renewable energy fraction.



CLIMATE BENEFIT:

> Measure CO₂ emissions to understand waste composition and identify levers driving mitigation actions.

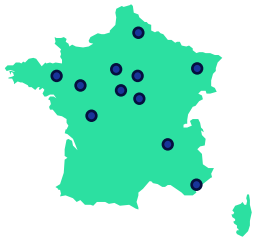
CO-BENEFIT:

> Citizens and decision-makers awareness to reduce waste production

> Metrics on waste composition to drive action

WASTE & CLIMATE CHANGE

WASTE TO ENERGY



FRANCE - 11 locations

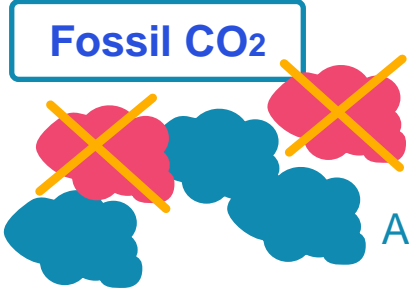


➔ [Nos innovations -R&D | Groupe Merlin \(cabinet-merlin.fr\)](https://cabinet-merlin.fr)

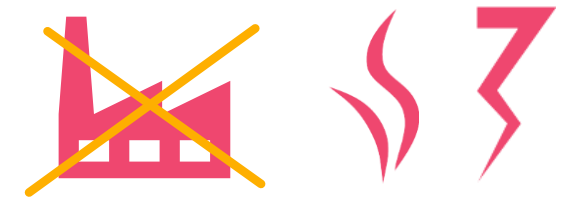




Long cycle ~ 100 000 000 years

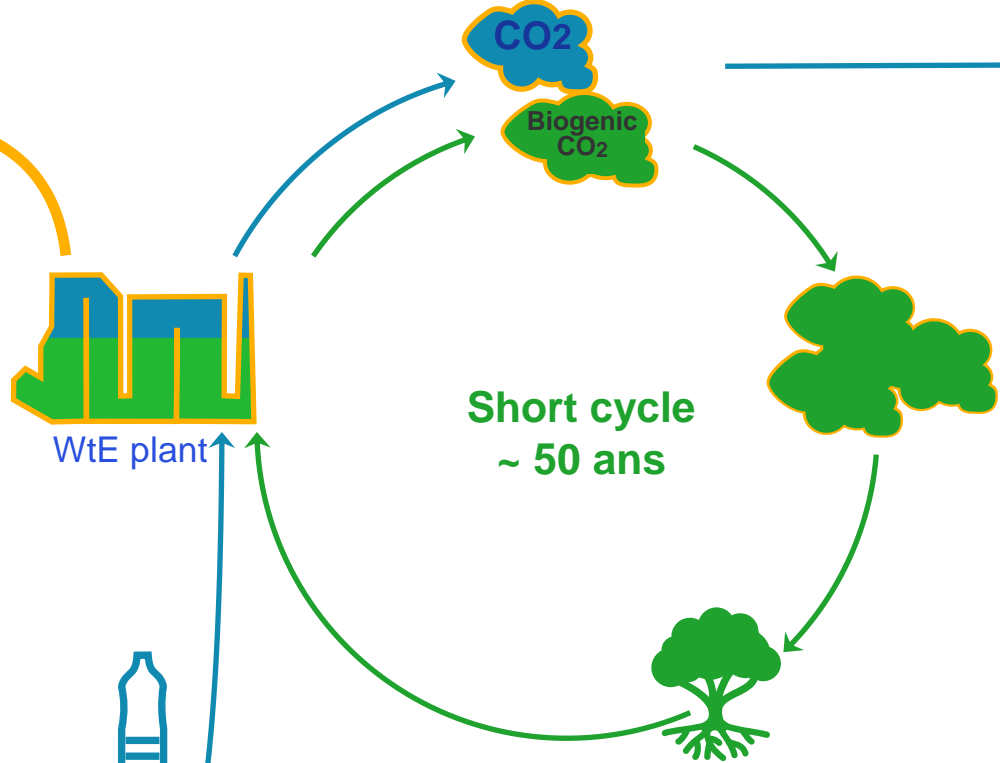


Accumulation of fossil CO₂
Greenhouse effect



Fossil CO₂ avoided
(compared to other energy mix)

Energy produced



Short cycle
~ 50 ans

WtE plant





Case of France



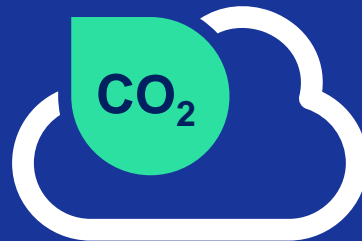
Waste to energy (incineration)

~380 kg CO_{2eq}/t of waste
(from fossil-based products)

+

~550 kg CO_{2biogenic}/t of waste
(from organic content)

42%



58%



Case of **France**



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PFD

FSWP

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partnership

Waste to energy (incineration)

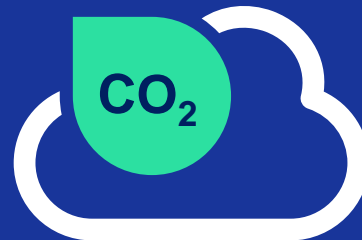
~ **0.3 MWh/ ton of waste**
(Heat and Electricity)

Quantity of energy produced.



~ **140 kg fossil CO_{2eq} /MWh***
Emitted

* Scope 1 & 2 emissions only



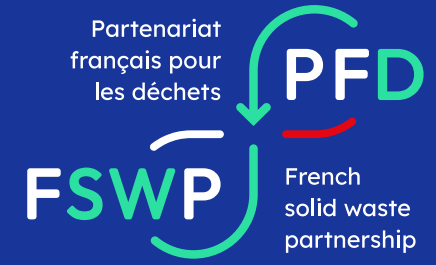
~ **180 kg fossil CO_{2eq} / MWh****
Avoided

** Compared to
French energy mix





Case of France

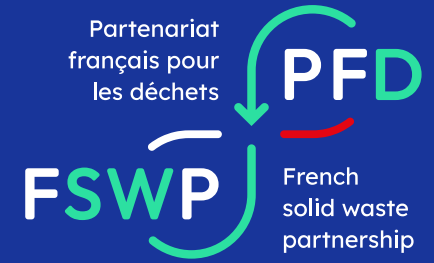


The national strategy aims to increase sorting at source of

- **Biowaste**
- **Recyclable plastics & cardboards**



Case of France



Biowaste methanization

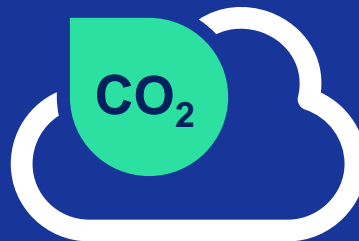
~ 1.1 MWh PCS
biomethane / T biowaste

~ 45 kg $\text{CO}_{2\text{eq}}$ /MWh*
Emitted

~ 240 kg $\text{CO}_{2\text{eq}}$ /MWh
** **Avoided**

*Scope 1 & 2 of the energy
production process only.

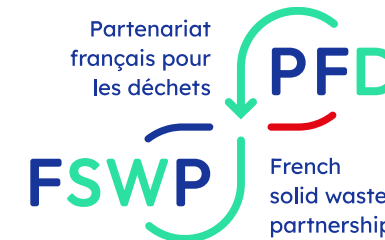
** Compared to the use of the
French mix of natural gas





Organic waste recovery

Supporting local authorities to sort, collect and treat domestic food waste



WASTE & CLIMATE CHANGE

WASTE TO RESOURCES



FRANCE – Greater Paris



Mandatory source separation of organic waste as of January 2024:

- Collection schemes : on-site composting, door to door collection, voluntary deposit
- Targeting 50 kTon/year of biowaste collected in the service area
- Construction of a methanizer on the river port of Gennevilliers by 2026 to produce biomethane and organic fertilizers

➔ [Plan Biodéchets : améliorer le tri et la valorisation des déchets alimentaires - Syctom \(syctom-paris.fr\)](#)

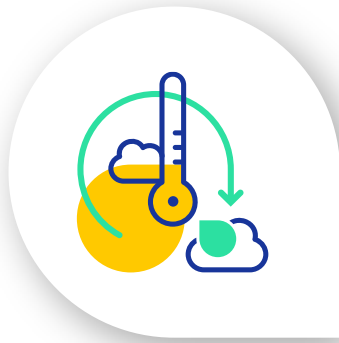
CLIMATE BENEFIT:

- > Biogas production
- > Organic fertilizer use, to avoid GHG emissions from chemical fertilizer production

CO-BENEFIT:

- > Citizens' awareness on reducing food waste and recovering the value of waste





WASTE & CLIMATE
CHANGE

WASTE TO
RESOURCES



FRANCE - Limay

Recycled PET production

France Plastique Recyclage

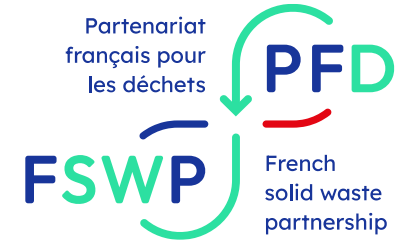


Production of recycled plastic (rPET) as a substitute for primary PET

- 45,000 t/year of PET bottles from selective collection processed
- 41,000 t/year rPET produced

→ [France Plastiques Recyclage : dernière ligne droite pour les travaux d'extrusion - Paprec](#)

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les déchets



CLIMATE BENEFIT:

- > rPET generates 70% less CO₂ than primary PET
- > 50 kTon CO₂eq avoided per year by using rPET in place of primary PET

CO-BENEFIT:

- > Increases the sustainability of the bottled water industry.





Biogas Recovery from Engineered Landfills

Operational
practices:

Good

Bad

**CO_{2eq} emitted /t waste
over the lifespan of the waste**

~ 300 kg CO_{2eq}/t *

> 900 kg CO_{2eq}/t *

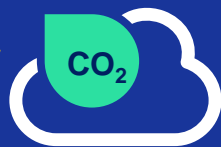
**Biomethane /t waste
over the lifespan of the waste**

~ 0.78 MWh/t*

~ 0.42 MWh/t*

**By 2025 in France,
landfill biomethane will**

**contribute
6 TWh
of renewable
natural gas**



* based on the French landfilled waste mix, accounting for organic fraction reduction trends as per EU Directive



Case of 

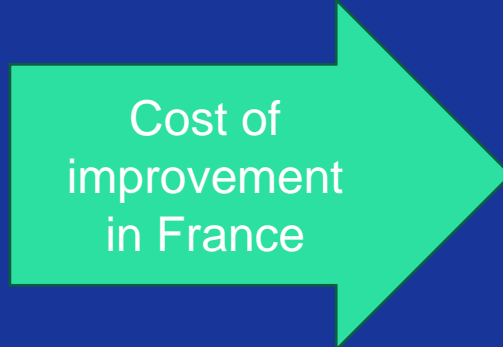
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Biogas recovery from Engineered Landfills

Engineered landfill with
Poor Practices

> 900 kg CO_{2eq}/t of waste*
(over the lifespan of the waste)



Cost of
improvement
in France

~ 2 to 4 €/t of waste

Engineered landfill with
Good Practices

~ 300 kg CO_{2eq}/t of waste*
(over the lifespan of the waste)

* based on the French landfilled waste mix, accounting for organic fraction reduction trends as per EU Directive

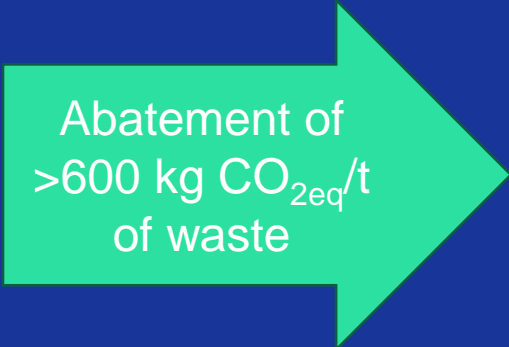


Biogas recovery from Engineered Landfills

Poor Practices

- No capture during operation
- Delay in implementing the capture system post operation
 - Semi-permeable cover
 - No bioreactor
- Poor monitoring & maintenance
 - Flaring all the biogas
 - Leakages*

*non-optimized treatment of residual CH₄
& non-preservation of cover integrity



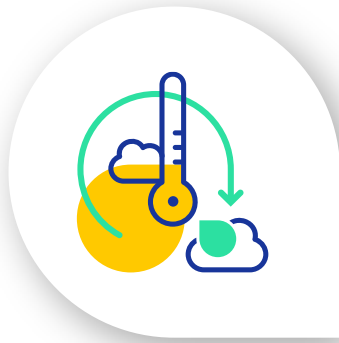
Abatement of
>600 kg CO_{2eq}/t
of waste



Good Practices

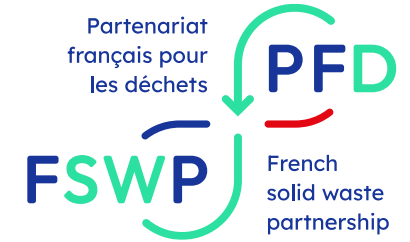
- Capture during operation*
 - *temporary cover
 - Impermeable cover
- Bioreactor with >60% waste kept humid
- Frequent monitoring & maintenance
 - Energy valorisation of biogas
 - Minimized leakages*

*optimized treatment of residual CH₄
& preservation of cover integrity



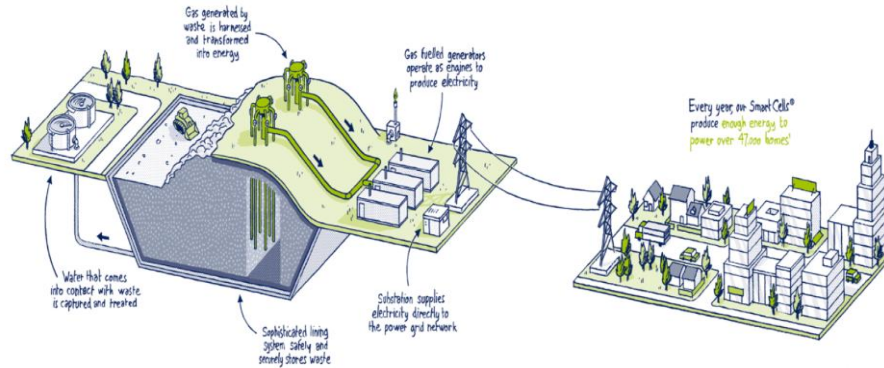
Green landfill to energy

Integrated infrastructure to replace dumpsites



WASTE & CLIMATE CHANGE

WASTE TO ENERGY/
METHANE REDUCTION



An innovative financing model for waste treatment in developing economies

- Produce biomethane, produce electricity
- Improve waste management from open dumpsites to environmentally controlled landfills
- The case of Meknes, Morocco:
 - 200 kTon/ y of waste safely managed
 - 70% reduction in emissions by 2033
 - 5,500 MWh/y production capacity

➔ [A waste recovery centre in Meknes combines the fight against global warming with social innovation - SUEZ Group](#)

CLIMATE BENEFIT:

- > Methane capture
- > Production of renewable energy

CO-BENEFIT:

- > Land value enhancement
- > Reduced pollution through leachate treatment
- > Improved energy autonomy





Q & A Session



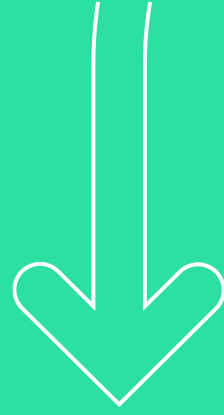
Mitigation Pathways



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International Cooperation towards an Environmentally Sound Management (ESM) of Waste

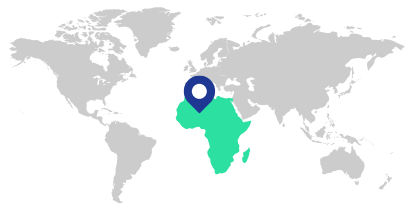
Alexandra Monteiro, AFD





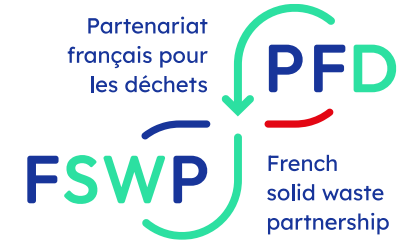
WASTE FOR ALL
SDG

HOLISTIC WASTE
MANAGEMENT



Improving household waste management

Towards a sustainable urban transition in Lomé



Holistic domestic waste management system in the Grand Lomé: 1.8M people, 300 kTon/y of solid waste.

An ongoing multi-tranch project since 2006:



- Improvement of the holistic solid waste management system and capacity building support
- Implementation of engineered landfills with long term biogas and leachate management
- Strengthening recovery & recycling initiatives,
- Improvement of the sector financial resources
- Gradual increase of performance requirements

CLIMATE BENEFIT:

- > Reduced GHG emissions through improved collection and landfill operation conditions

CO-BENEFIT:

- > Improved hygiene
- > Reduced pollution and drainage blockages causing chronic flooding
- > Capacity building

TOGO - Lomé



➔ [FOCUS | La gestion des déchets solides | AFD - Agence Française de Développement](#)



Call to action:

**Include waste management in the
Nationally Determined Contributions
by next year**



Q & A Session

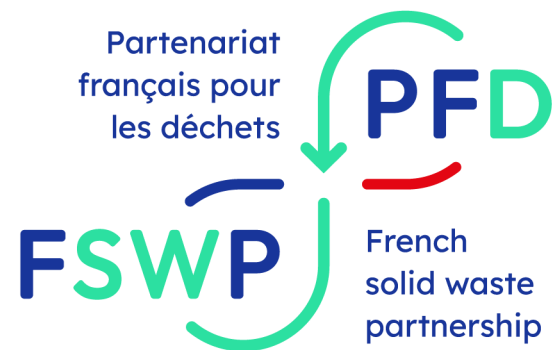


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