Who is the French Solid Waste Partnership?

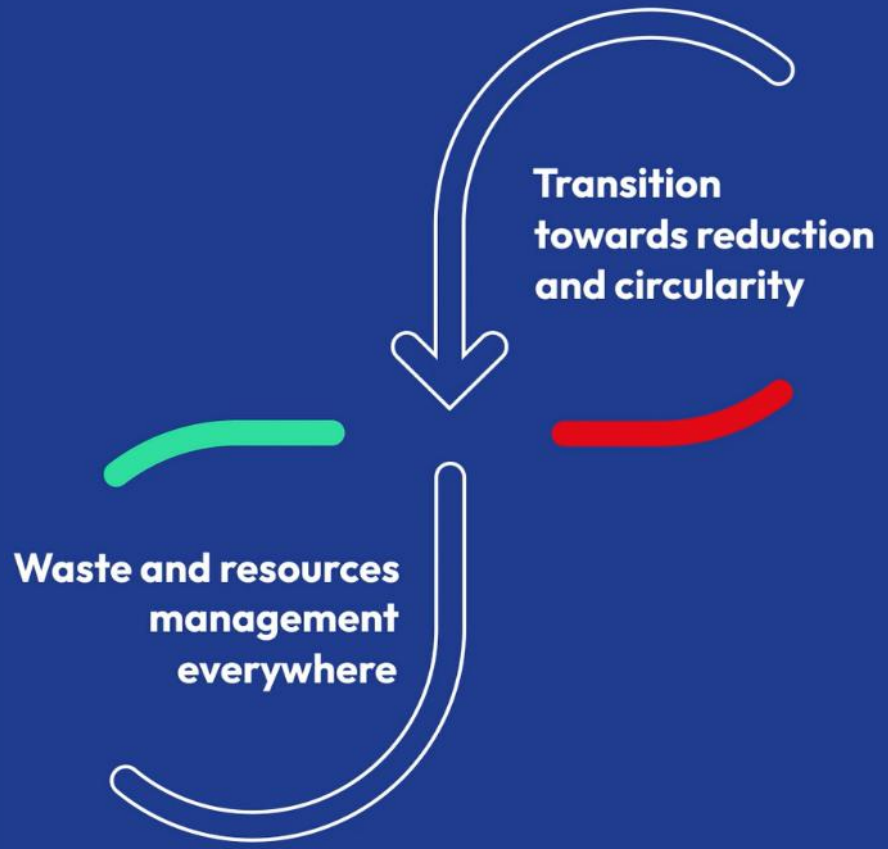
OUR MISSION



Coordinate and amplify

The voice of french waste stakeholders on the international stage

OUR VISION



MULTI-STAKEHOLDERS



The waste sector's climate impacts are under-estimated and under-exploited.

- **3 to 5% of total GHG** emissions come from the sector*
- A potential of **15 to 25% reduction** using a Lifecycle Approach*

* Lenkiewicz, L. et al. (2024). *Global Waste Management Outlook 2024: Beyond an age of waste. Turning rubbish into a resource*. UNEP and ISWA. Available at: doi.org/10.59117/20.500.11822/44939

The Business-as-Usual (BaU) scenario is unmanageable.

We need to act now!
Prioritising mitigation of methane from organic waste.

- **+50%** of waste volumes by 2050 (comp. to 2022)*
- **20%** of anthropogenic methane emissions come from the sector**

* Cook, E. et al. (2026). *What a Waste 3.0. Global Snapshot of Solid Waste Management towards Circularity until 2050*. World Bank Group. Available at: https://www.worldbank.org/en/publication/what-a-waste
** CCAC & UNEP (2021). *Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions.* United Nations Environment Programme, Nairobi. Available at: https://www.ccacoalition.org/sites/default/files/resources//2021_Global-Methane_Assessment_full_0.pdf.

METHANE MITIGATION – THE FASTEST LEVER

CH_4 is **~80 times more potent** than CO_2 over 20 years.
(27 times over 100y)

* Lenkiewicz, L. et al. (2024). Global Waste Management Outlook 2024: Beyond an age of waste. Turning rubbish into a resource. UNEP and ISWA. Available at: doi.org/10.59117/20.500.11822/44939

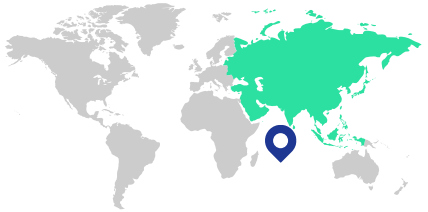
METHANE MITIGATION – THE FASTEST LEVER
4 priority actions

1. **Prevent Food Loss and Waste (FLW).**
2. Phase out open burning and uncontrolled landfills.
3. Capture methane from engineered landfills.
4. Build circular low-methane systems.

FLW accounts for **8 to 10% of global GHG** emissions.*

* Forbes, H. et al. (2024). Food Waste Index Report 2024: Think East Save. Tracking Progress to Halve Global Food Waste. UNEP. Available at: https://wedocs.unep.org/bitstreams/5c6e505d-e1d3-4731-b5b8-4ecb9693a056/download

CIRCULAR – Promoting Circular Food Systems



Sri Lanka, Colombo and Galle Distrits

A 16M€ program to reduce food and packaging waste

WASTE & CIRCULAR ECONOMY

REDUCTION OF SINGLE-USE PLASTICS

3M€ project by Expertise France:

- Raising awareness and changing behaviors across the single-use plastic value chain.
- Technical assistance to:
  - Sector businesses to transition towards circular models.
  - Financial institutions to understand and evaluate circular businesses.



EXPERTISE FRANCE
GROUPE AFD

BENEFIT

- More sustainable production, distribution and consumption of single-use plastics for food loss prevention.

CO-BENEFIT

- Build resilience to food crises and climate change.
- Reduce food loss and associated methane emissions.
- Improve livelihoods.

- https://www.expertisefrance.fr/en/projects/circular-project-sri-lanka

Partenariat français des déchets PFD
FSWP French solid waste partnership

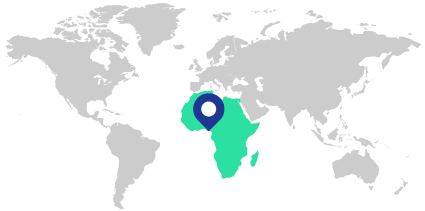
METHANE MITIGATION – THE FASTEST LEVER
4 priority actions

1. Prevent Food Loss and Waste (FLW).
2. **Phase out open burning and uncontrolled landfills.**
3. Capture methane from engineered landfills.
4. Build circular low-methane systems.

100 kg of food waste in an uncontrolled landfills emit **~190 kg CO_2e***

* Expert calculation by FSWP. Can be made available on request.

GEDEC Project in Togo



Local authorities' capacity for solid waste and sanitation management

TOGO

WASTE & SDGs

HOLISTIC WASTE MANAGEMENT

Solid waste management and fecal sludge management locally tailored systems in 5 municipalities:

- Co-defining each local strategy with the community.
- Data consolidation.
- Building local autonomy of municipal teams.
- Implementation, monitoring and evaluation.



GRET

IAWODO

EXPERTISE FRANCE
GROUPE AFD

ENTREPRENEURS du Monde

BENEFIT

- Improve drainage.
- Reduced pollution in the river.

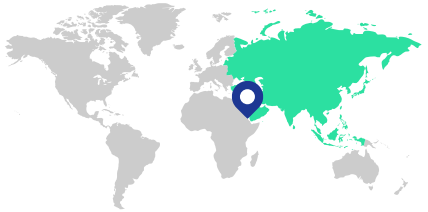
CO-BENEFIT

- 750,000 people with an improved quality of life.
- Improved hygiene.

- Gedec

Partenariat français des déchets PFD
FSWP French solid waste partnership

From Open Dump to Green Park



The Saida Landfill Rehabilitation

LEBANON – Saida

WASTE & SDGs

CLOSING DUMPSITE

A 3-hectare coastal dumpsite rehabilitated.





Waste was extracted and transferred to a secure, monitored landfill with a comprehensive waterproofing system, now transformed and reused as a public park.

- Wastes were studied & characterized.
- Leachates were collected, transferred and treated.
- Biogas was collected and treated.
- 700,000 tons of waste treated and secured.

BENEFIT

- Prevention of methane emissions.
- Treatment of 15,000 m³/y of leachate.
- Protecting health and the environment.

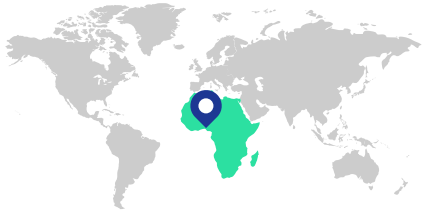
CO-BENEFIT

- Creation of a landscaped public park.
- Improved quality of life for 83,000 nearby residents and fishermen.
- No more toxic fumes or groundwater pollution.
- No more plastic or pollution into the sea.

- From Shame to Fame: Saida trash mountain to green park! - UNDP Lebanon, YouTube

Landfill Closure & Rehabilitation

Seizing the opportunity for decarbonation, depollution and regeneration



IVORY COAST – Akouedo



WASTE & POLLUTION

LANDFILL CLOSURE

90 hectares of landfill in Abidjan suburbs closed after 53 years of operation.

- Remodeling the landfill surface and slopes;
- Development of a watertight covering;
- Collection of water, leachate, and biogas;
- Treatment of leachate;
- Energy recovery from the biogas.

BENEFIT

- Air quality improvement.
- 6 hectares of green spaces with sport and education infrastructures.
- 80 000m3 of treated leachate/y
- 2 MWh produced energy (electrical and thermal)

CO-BENEFIT

- Avoided GHG emissions: 76 000 tons/y of CO2e.
- Soil, lagoon and biodiversity protection.
- Reduced odors nuisance and improved neighborhood's quality of life.
- Appropriation of the area around the site by the local population.
- Tourism development.

VEOLIA

PFO AFRICA

- Biogaz de décharge: quand la pollution devient solution

Partenariat français des déchets PFD FSWP French solid waste partnership

METHANE MITIGATION – THE FASTEST LEVER
4 priority actions

1. Prevent Food Loss and Waste (FLW).
2. Phase out open burning and uncontrolled landfills.
3. **Capture methane from engineered landfills.**
4. Build circular low-methane systems.

Managing **100 kg of food waste** in a state-of the art landfill versus uncontrolled, **reduces** GHG by **~150 kg CO_2e***

* Expert calculation by FSWP. Can be made available on request.

Upgrading uncontrolled landfills to State-of the art landfills reduces waste sector emissions.

190 / 86 / 43 $kgCO_2e$* reduced
in a landfill with
0% / 50% / 75% **gas capture**
(for 100 kg of food waste)

* Expert calculation by FSWP. Can be made available on request.

High-efficiency Landfill Gas Capture





FRANCE – Brittany

WASTE & CLIMATE CHANGE

LANDFILL GAS CAPTURE / MONITORING OF GHG EMISSIONS

Monitoring and optimised management of engineered landfills

Improved management leads to > 90 % capture efficiency thanks to monitoring of fugitive emissions: mapping higher emission potential areas, field measurements using flow chambers, and back-modelling of emissions.

- Eg. Engineered landfill in Brittany **Previous (2020)** / **New (2023)** monitoring:
  - Constant biogas production: 1.7 m^3 CH_4
  - CH_4 leaks: 230 t / 74 t
  - Capture rate: 83% / 94%



BENEFIT

- Maximises landfill gas capture to reduce fugitive methane emissions.
- Promotes best practices in site management.

CO-BENEFIT

- Increases the energy recovery from captured ladfill gas.
- Local renewable energy production as a substitute for fossil fuels.

Séché

Partenariat français des déchets PFD FSWP French solid waste partnership

- https://astee-tsm.fr/articles/tsm-4-3/

METHANE MITIGATION – THE FASTEST LEVER
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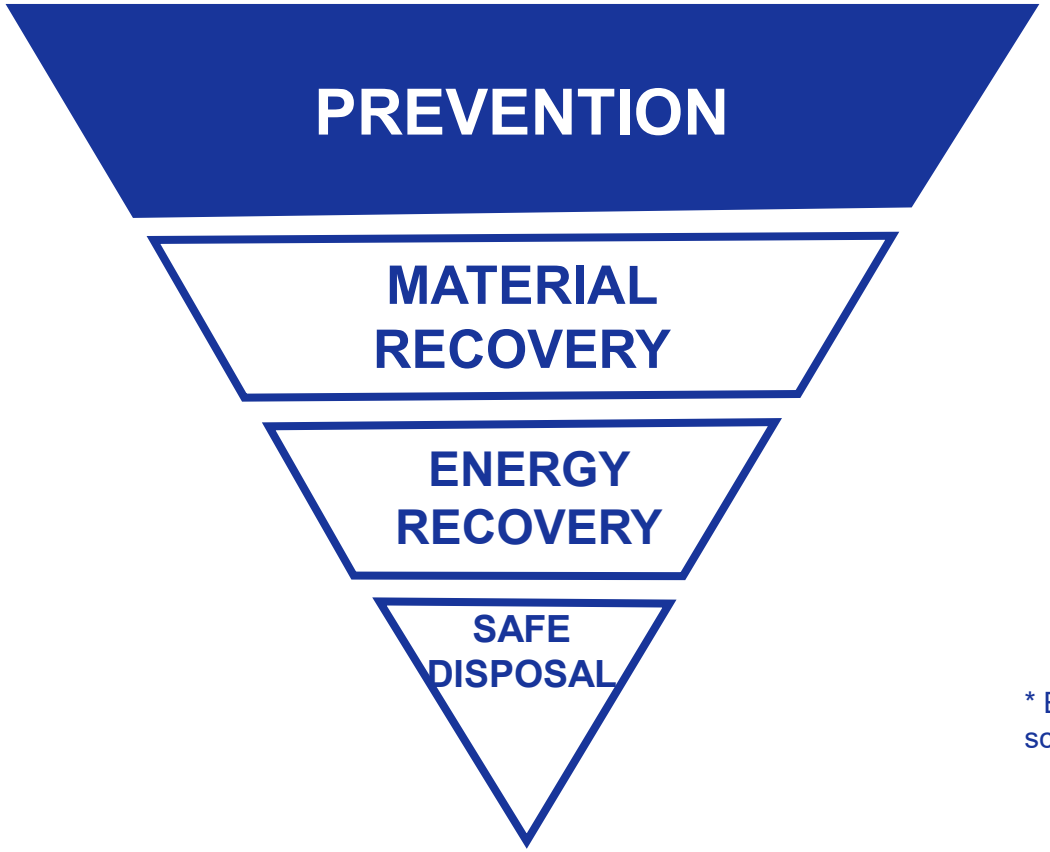
Recovered biomethane usage **avoids** **56 tCO2eq/TJ*** by replacing fossil energy

* 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2 (Energy), Chapter 1 (Introduction), Table 1.4 “Default CO_2 emission factors for combustion”. Page 1.24

METHANE MITIGATION – THE FASTEST LEVER

Build Circular Waste Management Systems

to replace mismanaged landfills



100 kg of food waste prevented

Emitted
0 $kgCO_2e$

Reduced Emissions*
~190 $kgCO_2e$

Avoided > 200 $kgCO_2e$, as FLW represents **8 to 10% of global GHG** emissions

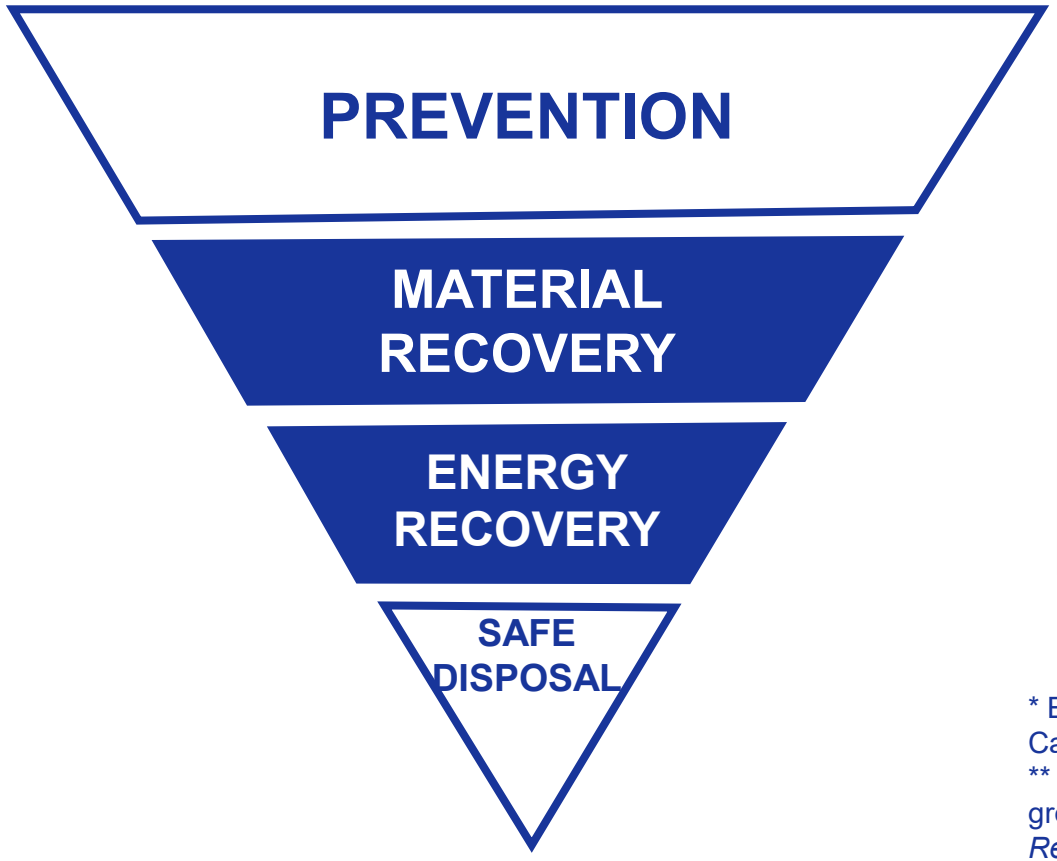
* Expert calculation by FSWP using uncontrolled landfills as the baseline scenario. Calculation can be made available on request.

Partenariat français des déchets PFD
FSWP French solid waste partnership

METHANE MITIGATION – THE FASTEST LEVER

Build Circular Waste Management Systems

to replace mismanaged landfills



100 kg of food waste **collected separately and…**

Composted	**Digested**
Emitted* : ~10 $kgCO_2e$	
Reduced* : ~180 $kgCO_2e$	
Avoided*	
Energy : 0 $kgCO_2e$	~17 $kgCO_2e$
Soil amendment**: 0.4 - 8 $kgCO_2e$	

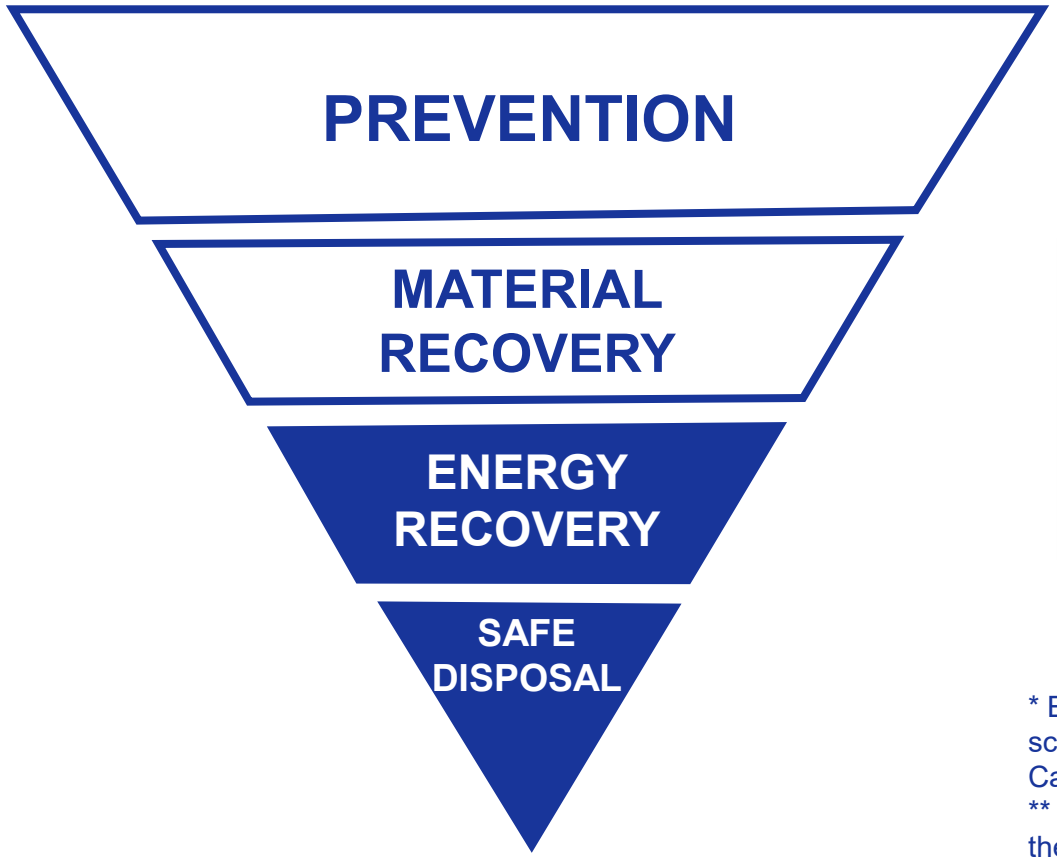
* Expert calculation by FSWP using uncontrolled landfills as the baseline scenario. Calculation can be made available on request.

** Boldrin, A. et al. (2009). Composting and compost utilization: accounting of greenhouse gases and global warming contributions. *Waste Management & Research.* Vol. 27(8). Available at: https://doi.org/10.1177/0734242X09345275

METHANE MITIGATION – THE FASTEST LEVER

Build Circular Waste Management Systems

to replace mismanaged landfills



100 kg **collected as mixed waste containing 27% of food waste and safely treated in a…**

Waste to Energy facility,	**State-of-the-art Engineered Landfill,**
Emitted* ~40 $kgCO_2e$	**Emitted*** ~35 $kgCO_2e$
Reduced* ~105 $kgCO_2e$	**Reduced*** ~110 $kgCO_2e$
Avoided** 28 /107 $kgCO_2e$	**Avoided*** 34 $kgCO_2e$

* Expert calculation by FSWP using uncontrolled landfills as the baseline scenario. 370kg of waste include 100kg of food waste (French average data). Calculation can be made available on request.

** Range assuming the French (white) or Turkish (yellow) electricity mix; and the IPCC2006 natural gas emission factor for the recovered biomethane.

Organic Waste Recovery

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



FRANCE – Greater Paris

WASTE & CLIMATE CHANGE

WASTE TO RESOURCES

Mandatory source separation of organic waste as of January 2024:

- Collection schemes : on-site composting, door-to-door collection, voluntary deposit.
- Targeting 100 kt/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.



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.

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

Food Waste Recovery Centers





FRANCE

WASTE &
CLIMATE CHANGE

FROM WASTE TO
RESOURCES

Deconditioning of organic waste before anaerobic digestion

Industrial sites for mass collection and deconditioning of food organic waste—i.e., separating organic matter from packaging:

- 80,000 tons/y received at Veolia's six industrial sites in France: organic waste from supermarkets, catering services, and households.
- Around 30 partnered anaerobic digestion plants recover the "soup" of food waste to produce green energy and digestate used to enrich agricultural land.



VEOLIA

BENEFIT

- Diverting organic waste away from landfilling.
- Production of green energy via organic digestion.
- Soil enrichment through the return of organic matter (digestate) to the soil.

CO-BENEFIT

- Reduction of GHG emissions.

- Example of the Bio-pôle in the Paris region

Partenariat français des déchets PFD
FSWP French solid waste partnership

WAGABOX®: Hybrid Biomethane Production

Combined recovery of biogas from an engineered landfill and an anaerobic digester



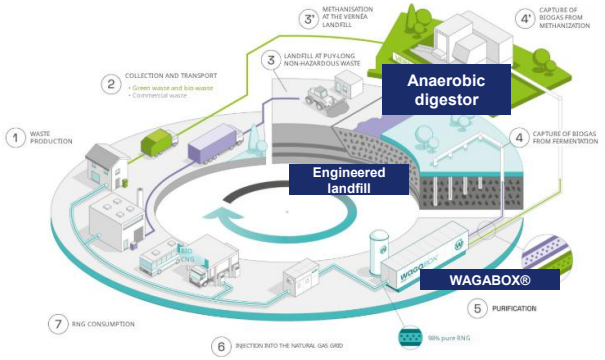
FRANCE – Clermont-Ferrand

WASTE & CLIMATE CHANGE

ENERGY RECOVERY / PPT

VALTOM and Waga Energy are jointly operating Europe's first hybrid WAGABOX® unit:

- On-site recovery of landfill gas and the Vernéa anaerobic digester.
- Biomethane production fed to the gas grid.
- A replicable model: 8 public-private partnerships in France, including the one with VALTOM.



BENEFIT

- Biomethane **100% renewable.**
- **15 GWh/year reinjected** (equivalent to the consumption of **~2,000 households).**
- **3,600 tCO_2e/year avoided** (replacing natural fossil gas).

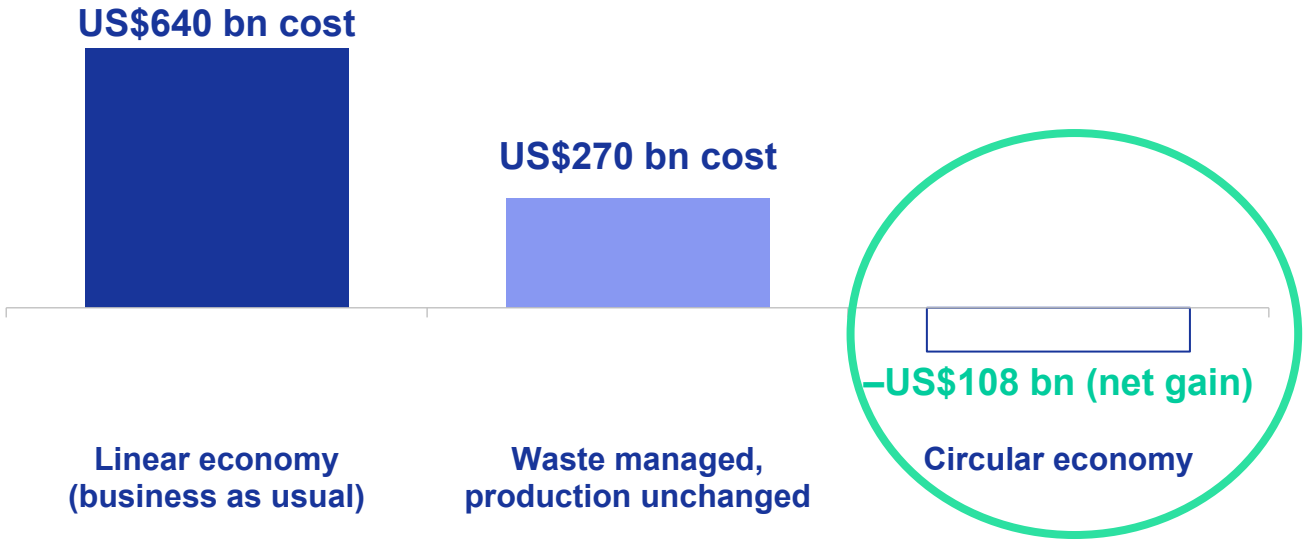
CO-BENEFIT

- Creation of **4 new jobs:**
  - A **public-private partnership model** that can be replicated, in which Waga Energy works with landfill sites operated by local authorities.
  - Scaling up: **8 public-private partnerships** in France to deliver a total production of **189 GWh/year and 43,000 tCO_2e/year avoided.**
  - Energy sovereignty.

- Unique WAGABOX installation inauguration - VALTOM, public authority in charge of waste treatment and valorisation in Puy-de-Dôme and Northern Haute-Loire

CIRCULAR ECONOMY – THE MOST EFFICIENT LEVER

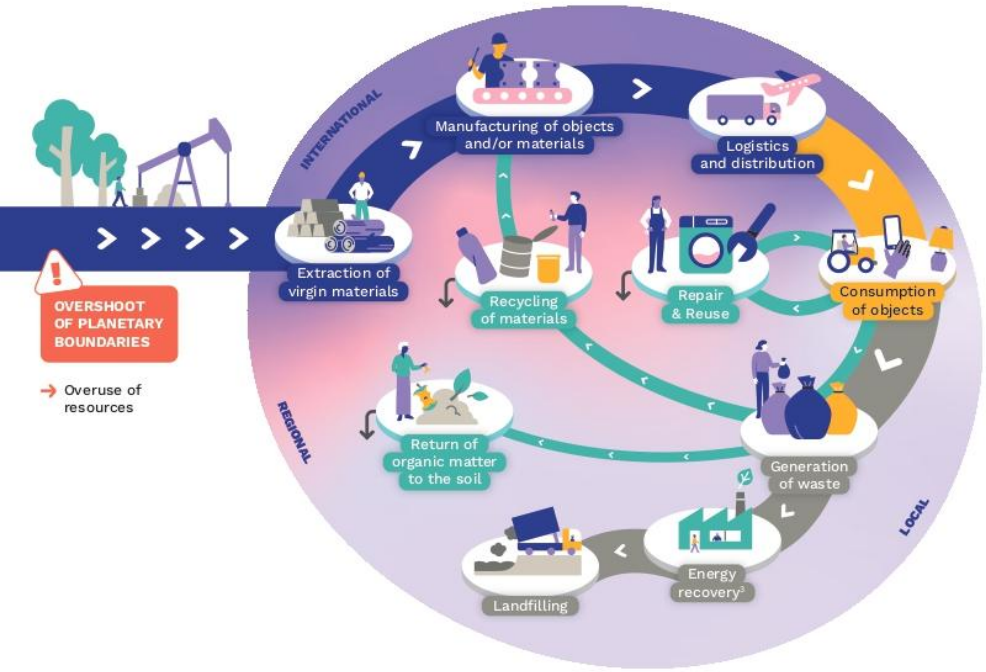
Tackles up to 20% of global emissions, and pays backs*



* Lenkiewicz, L. et al. (2024). *Global Waste Management Outlook 2024: Beyond an age of waste. Turning rubbish into a resource*. UNEP and ISWA. Available at: doi.org/10.59117/20.500.11822/44939
It requires changing our production, consumption and usage models.

EVOLUTION OF PRODUCTION, CONSUMPTION AND USAGE MODELS FOR A CIRCULAR ECONOMY

Schematic representation of the current situation

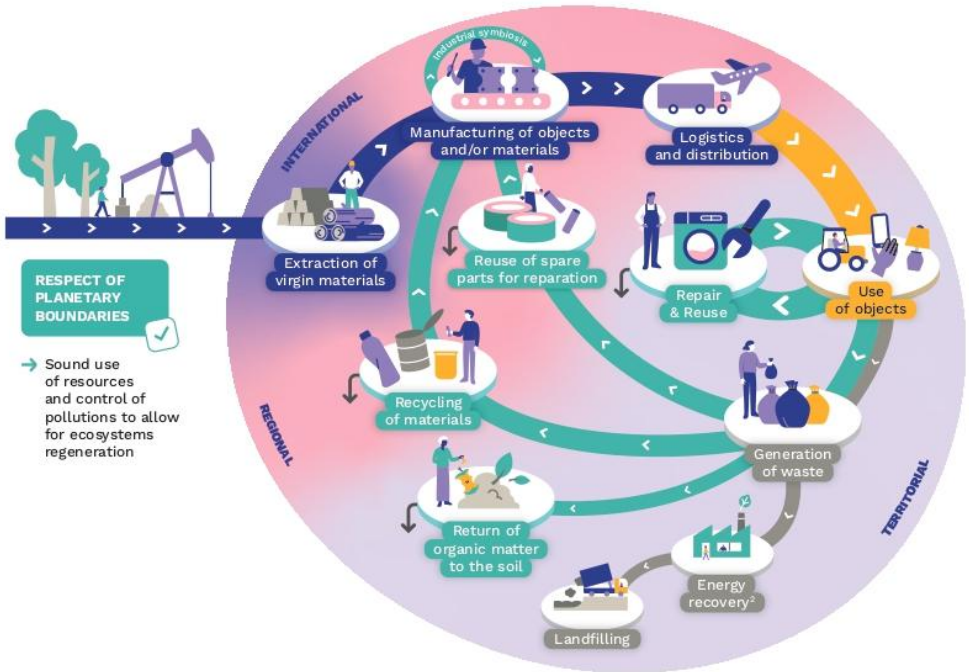


Production systems[1]: many products, not very durable or repairable, transported over long distances.

Consumption model[1]: the consumer purchases many goods and few services; the producer or seller does not retain ownership of the product.

Circular activities[1]: economy of reuse and repair, supported by the SSE[2] and mostly subsidised.

Schematic representation of the 2050 horizon



Modes of production[1]: fewer products, highly durable and repairable, better designed, transported less.

Consumption model[1]: functionality and sharing economy; the producer (or lessor) remains the owner of the product and/or responsible for its end of life.

Circular activities[1]: economic viability of reuse, repair, and other options.

LEGEND

FLOWS
- Linear supply chain
- Consumption
- Circular economy
- Waste, end-of-life
- Rejects

SCALES
- International
- Regional
- Local

[1] ISO 59004 presents and orders circular economy actions according to the life cycle (https://pfd-fswp.fr/presentation-de-l-economie-circulaire-par-iso-anglais), especially in the diagram on page 4 of the PDF 'EN Presentation'.
[2] Social and Solidarity Economy.
[3] Energy recovery when the context allows and if there is a market for the energy produced.

[1] ISO 59004 presents and orders circular economy actions according to the life cycle (https://pfd-fswp.fr/presentation-de-l-economie-circulaire-par-iso-anglais), especially in the diagram on page 4 of the PDF 'EN Presentation'.
[2] Energy recovery when the context allows and if there is a market for the energy produced.

Watch the 2-min movie

PREVENTION – THE FIRST LEVER

Starts with product design and usage:

refuse, rethink, reduce, reuse, repair

avoids emissions at every stage.

Over **55% of global GHG** emissions come **from the extraction and processing** of materials, fuels and food.*

* Bruyninckx, H. et al. (2024). *Global Resources Outlook 2024: Bend the trend. Pathways to a liveable planet as resource use spikes*. UNEP and IRP. Available at: https://wedocs.unep.org/bitstreams/d196c011-a90e-4fe3-b249-e3204a2ded4a/download

Preventing plastic pollution through education

“Plastics, Let’s Act!”: a MOOC from information to action



FRANCE - Paris

WASTE & POLLUTION

PREVENTION OF PLASTICS AWARENESS RAISING

Decoding the systemic plastics crisis to act more effectively:

- Science-based overview of the stakes (health, ecosystems, society).
- 4 hours to get an overview of the plastics’ crisis, state of scientific knowledge, key concepts, and practical steps to act and fund projects.
- Key target audience: decision-makers, IFIs and development banks.



BENEFIT

- Multilingual access to information and education.
- Improved understanding of the stakes of plastics reduction for informed decision-making.

CO-BENEFIT

- Free access to information.
- Improved production, consumption and management of plastics.

- Accueil | Les Moocs du Campus AFD

The reuse of shared packaging in shops

Turning packaging into reusable resources for a circular economy

WASTE & CIRCULAR ECONOMY

REUSE

Since 2025, the French Producer Responsibilty Organisation (PRO) Citeo has been trialling the introduction of reusable, shared packaging on shop shelves:

- **362** participating **shops** across **4 pilot regions.**
- **16 million consumers** involved.
- **Shared pool of standardised packaging.**
- **Shared and interoperable logistics loop** : collection → consolidation → washing → return to manufacturers.

FRANCE - NORTH-WEST REGION



BENEFIT

- Reduction in packaging waste.
- Reducing CO_2 emissions.
- Reducing material consumption.

CO-BENEFIT

- Testing viable circular economic models (deposit schemes, logistics, washing).
- Engaging stakeholders: retailers, manufacturers, consumers.
- Establishing a national re-use sector.

- Reuse: Four French regions launch the ReUse scheme

Pole R, a Local Circular Economy



France – Grenoble

A 16 000 m² site dedicated to reuse, repair, and waste reduction

8,000 m² managed as a Hub for Circularity, with shared spaces, equipment, human resources, and material resources.

WASTE & CIRCULAR ECONOMY

FROM WASTE TO RESOURCES

Three buildings:

- Anti-waste zone dedicated to food deposits.
- *Fabricanova* : a cooperative hosting platforms for sorting, reuse, repair, and upcycling.
- An incubator for new circular economy activities (textiles, sports and leisure items, wood).



BENEFIT

- Target of a 20% annual reduction in the volume of waste produced in the region.
- 20% reuse and repair rate (7,500 tons).
- 40 000 packaging items avoided.

CO-BENEFIT

- Territorial cooperation between local authorities, the social and solidarity economy, industry, research, environmental associations, etc.
- A thriving local economy.
- Accessibility for residents: drop-offs and purchases of reclaimed materials.

- https://www.grenoblealpesmetropole.fr/327-le-soutien-a-l-economie-circulaire.htm

BeMed+

For a Mediterannean Sea without plastics!



Mediterranean Countries

WASTE & POLLUTION

PLASTICS

Structure a network of players, build their capacities and test replicable projects.

- Strengthen financial and technical capabilities.
- Share micro-solutions at the basin scale.
- Develop integrated, multi-actor projects to combat plastic pollution in Albania and Tunisia.
- Guarantee the transferability of results by setting up global, regional and local governance.



BENEFIT

- Tackling the 229 000 tonnes/y of plastic waste entering the Mediterannean.
- Integrated approach on life cycle, pollution and waste management.

CO-BENEFIT

- Capacity development.
- Impulsing new projects through regional emulation.

FONDS FRANÇAIS POUR L'ENVIRONNEMENT MONDIAL

PRINCE ALBERT II OF MONACO FOUNDATION

Fondation Didier et Martine Primat

Aether Fund of the Foundation for Future Generations

Fondation Audemars-Watkins

France-IUCN Partnership Nature & Development

IUCN

République Française

AFD Agence Française de Développement

BEYOND PLASTIC MED

Partenariat français des déchets PFD

FSWP French solid waste partnership

- https://www.ffem.fr/fr/projets/mer-mediterranee-sans-plastique-bemed

RECYCLING – TURNING WASTE INTO A RESOURCE

Turning waste into secondary raw materials
Avoiding extraction and processing emissions

1 ton of recycled steel avoids 0,9 ton of raw material extraction**

Using recycled steel **reduces** emissions by **~75%*.**

* Broadhent, C. (2016). Steel's recyclability: demonstrating the benefits of recycling steel to achieve a circular economy. *The International Journal of Lifecycle Assessement.* Vol. 21, pp. 1658-1665. Available at: https://link.springer.com/article/10.1007/s11367-016-1081-1

** Lenkiewicz, L. et al. (2024). *Global Waste Management Outlook 2024: Beyond an age of waste. Turning rubbish into a resource*. UNEP and ISWA. Available at: doi.org/10.59117/20.500.11822/44939

Recycled PET Production

France Plastiques Recyclage



FRANCE - Limay

WASTE &
CLIMATE CHANGE

WASTE TO
RESOURCES

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.



PAPREC

BENEFIT

- rPET produced generates 70% les CO_2 tan primary PET.
- 50kTon CO_2 eq avoided by 2022 by using rPET in place of primary PET.

CO-BENEFIT

- Increases the sustainability of the bottled water industry.

- France Plastiques Recyclage : dernière ligne droite pour les travaux d'extrusion - Paprec

Partenariat français des déchets PFD
FSWP French solid waste partnership

Closing the loop of lead battery recycling

WASTE & CIRCULAR ECONOMY

RECYCLING CO_2 EMISSIONS REDUCTION

How to improve lead battery recycling while relocating industry in France



France – Caen

Vertical integration of the lead battery recycling in implementing innovative treatment process, foundry and refinery steps

- Inclusion of an innovative desulfurization stage to reduce the amount of residual waste, improve material recovery and reduce the quantity of energy required
- Simplified logistics thanks to complete onsite processing and production of valuable metals



Choose France™
Édition France
17.11.2025, Paris

DERICHEBOURG
environnement

BENEFIT

- **75 kt/year** of lead batteries recycled
- **40 kt/year** of lead metals produced
- Improved material recovery :
  - **+400 t/year of Lead**
  - **280 t/year of Antimony** (classified as CRM)

CO-BENEFIT

- **80 new jobs**
- Halved waste generation during the smelting stage : **- 7600 t/year**
- Reduced GHG emissions across the lead value chain: **- 15 kteqCO2/year**
- Reduced transports
- French reindustrialisation

- Derichebourg Environnement : collecte et recyclage des déchets

Partenariat français des déchets
PFD
FSWP
French solid waste partnership

A Waste to Resources Industrial System



France – Tarn

A systemic approach to reduce landfilling, recycle materials, and produce energy

WASTE & CLIMATE CHANGE

WASTE TO RESOURCES

A municipal solid waste plant to valorize 80% of waste into new raw materials, solid fuels and biomethane:

Materials Balance : for 100,000 t/y of waste.

- Biomethane = 62 GWh/y.
- New raw materials = 6,000 t/y.
- Fertilising products = 12,000 t/y.
- Refuse Derived Fuel (RDF) = 150 GWh/y.



urbaser

Tarn TRIFYL

BENEFIT

- 23% reduction of CO2eq emissions compared to baseline.

CO-BENEFIT

- Increased income allows to stabilise waste treatmeant cost.
- Landfill diversion.
- Scalable and adaptable to various waste streams & energy needs.

- Vers un nouveau mode de gestion des déchets | Trifyl

Partenariat français des déchets PFD FSWP French solid waste partnership

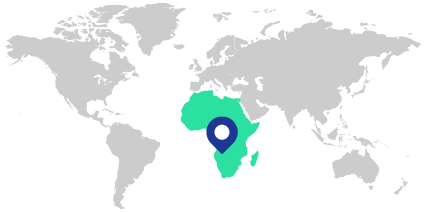
SAFE DISPOSAL of mixed waste: A KEY SAFEGUARD

Protects health and the environment from the waste that could not be prevented, reused or recycled.

- About **40%** of the world's waste is **mismanaged**.*
- **2,7 billion people lack access to waste collection**.*

* Lenkiewicz, L. et al. (2024). *Global Waste Management Outlook 2024: Beyond an age of waste. Turning rubbish into a resource*. UNEP and ISWA. Available at: doi.org/10.59117/20.500.11822/44939

Integrated Solid Waste Management (SWM)



ANGOLA - Luanda

WASTE & TERRITORIAL GOVERNANCE

SOLID WASTE MANAGEMENT / INSTITUTIONAL STRANGTHENING / PRIVATE SECTOR ENGAGEMENT

25M€ EU project to strengthen SWM in Luanda, Angola

4 main areas of action to strengthen SWM and enable circular economy:

- Stronger political, and regulatory role of the National Waste Agency.
- More efficient waste collection (with FIAP).
- Private investment and infrastructure development (with the IFC).
- Informal waste workers' integration, formalization and protection (with Camões).



EXPERTISE FRANCE
GROUPE AFD

BENEFIT

- Improved waste management, including better collection.
- Enhanced local and national capacities.
- Coordination between national/local and public/private stakeholders.

CO-BENEFIT

- Private investment in infrastructure.
- New recycling and resource recovery value chains.
- Creation of decent and green jobs, with focus on women and youth.
- Improved public awareness and multi-stakeholder dialogue.

- https://www.expertisefrance.fr/fr/projets/ameliorer-gestion-dechets-solides-luanda

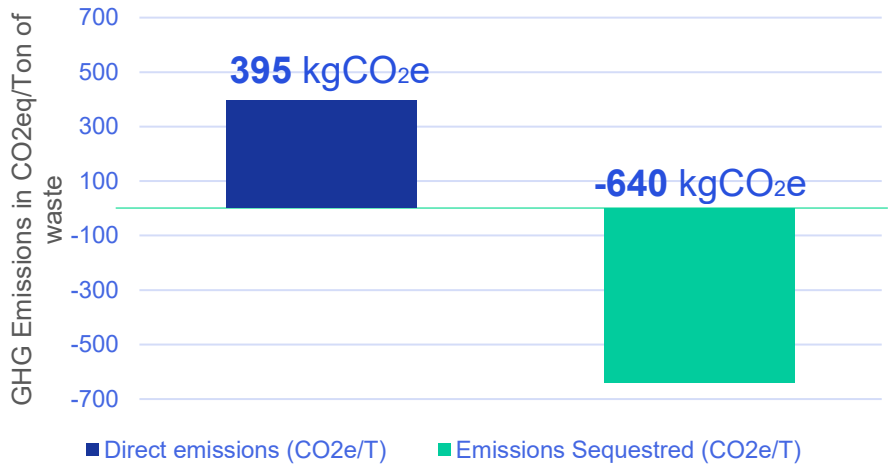
Partenariat français des déchets PFD
FSWP French solid waste partnership

ENERGY RECOVERY from mixed waste,
WHEN PRECONDITIONS ARE MET

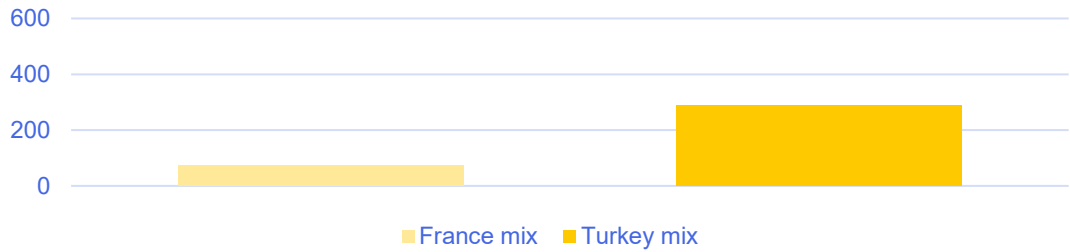
State of the art Waste to Energy with CCUS**

1 ton of mixed waste in ESM compliant WTE

GHG Emissions*



Avoided Emissions*

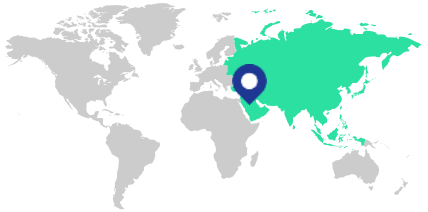


* Expert calculation by FSWP, assuming 42% of CO2 emitted is fossil (French average data). Avoided emissions calculated in reference to the French and Turkish electricity mix. Calculation can be made available on request.

** Carbon Capture, Utilization and Storage

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Istanbul Waste-to-Energy Plant



TÜRKIYE- Istanbul

Istanbul Metropolitan Municipality - İSTAÇ A.Ş

WASTE & CLIMATE CHANGE

WASTE TO ENERGY

Treatment capacity of 1.1 M/t waste per year:

- Europe's largest waste to energy facility.
- Electricity production by an 85 MW turbine = meets the needs of 1.4 million inhabitants.
- Objective of carbon neutrality by 2053.



BENEFIT

- 1,4 $MtCO_2eq/y$ of caron emissions are reduced (through reduced landfilling and transportation).
- Green electricity production.

CO-BENEFIT

- Improve the environment for inhabitants.
- Improved energy autonomy.

- Décarbonation: Veolia devient l'opérateur du 1er site de production d'énergies à partir de déchets de Turquie

Energy Recovery at Toulouse



FRANCE – Toulouse

Integrated planning across waste, energy and water sectors

WASTE & TERRITORIAL GOVERNANCE

WASTE TO ENERGY

Tomato production for a competitive price thanks to an innovative concept:

- Econotre, operated by SUEZ, uses the heat released by incineration of the waste to produce electricity.
- Low-termperature energy is also recovered to supply heat to greenhouses.
- The necessary proximity was made possible through integrated land planning.



BENEFIT

- Alternative for cooling are explored to address climate change.

CO-BENEFIT

- 2,200 tons of oil equivalent saved.
- 6,000 tons of CO_2 avoided/y.
- Food production.

- Econotre | Ecopôle de traitement et de valorisation des déchets | Bessières

Ecocombust II

Black pellets from wood waste as a substitute for coal



FRANCE – Cordemais

WASTE &
CLIMAYE CHANGE

WASTE TO
ENERGY

Wood waste conversion into black pellets to fuel the Cordemais coal-fired power plant:

- Transformation of wood waste by steam cracking to produce 160,000 t of black pellets/year as an alternative fuel to coal.
- The plant uses 250,000 t/year of B-wood and 40,000 t/year of Solid Recovered Fuels.



BENEFIT

- 6millions tons of CO2eq avoided over 20 years compared to fossil fuel.
- Fossil fuel substitution by renewable energy.

CO-BENEFIT

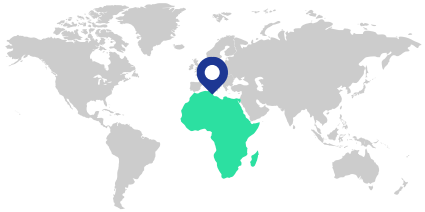
- Energy autonomy.
- Existing coal-fired power plant infrastructured can be leveraged to produce green energy.

PAPREC

Partenariat français des déchets PFD
FSWP French solid waste partnership

Plast'ile

Innovative technical solution for plastic waste on an island



TUNISIA- Kerkennah Archipelago

Waste collection and management

WASTE & POLLUTION

PLASTICS

- State-of-the art collection operation.
- Waste management plans adapted to each geographic contexts.
- **Converting plastics that are too contaminated for recycling, into fuel** (by pyrolysis) for use by the fishermen.
- Set up of an Island Committee for governance.



BENEFIT

- Tackling the 600 tons/y of waste thrown in the sea.
- Local governance of waste management.

CO-BENEFIT

- Curbing plastics consumption.
- Sustainable fishing.
- Strengthened capacities.

FONDS FRANÇAIS POUR L'ENVIRONNEMENT MONDIAL

SMILO SUSTAINABLE ISLANDS

Municipalité Kerkennah

Conservatoire du littoral

earth wake

Partenariat français des déchets PFD FSWP French solid waste partnership

- Innovating for the sustainable management of plastic waste on the Kerkennah Islands in Tunisia | FFEM - Fonds Français pour l'Environnement Mondial

Recovering CO_2 through oxycombustion - CCU



FRANCE

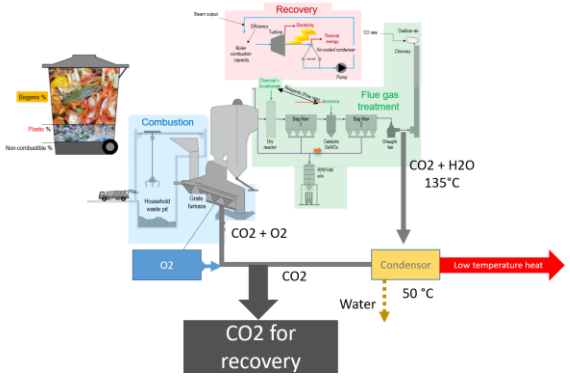
A promising technology for CO_2 from the combustion of household waste, biomass and sewage sludge

WASTE & CLIMATE CHANGE

ENERGY RECOVERY / R&D PROGRAMME

Combustion using O_2 in place of air.

- Combustion using O_2 mixed with recycled flue gas (after condensation) reduces the costs of purifying CO_2 for recovery (no nitrogen).
- Innovative retrofit to oxycombustion without shutting down the existing plant.
- Innovative TERRAO turbulent condenser for continuous recovery of CO_2.



BENEFIT

- Amine-free CCUS process.
- Favourable energy balance (despite the use of pure O_2).

CO-BENEFIT

- Recovery of low-temperature heat from the condenser in district heating networks (via heat pumps).
- Retrofittable on existing boilers: waste, biomass and sludge incinerators.

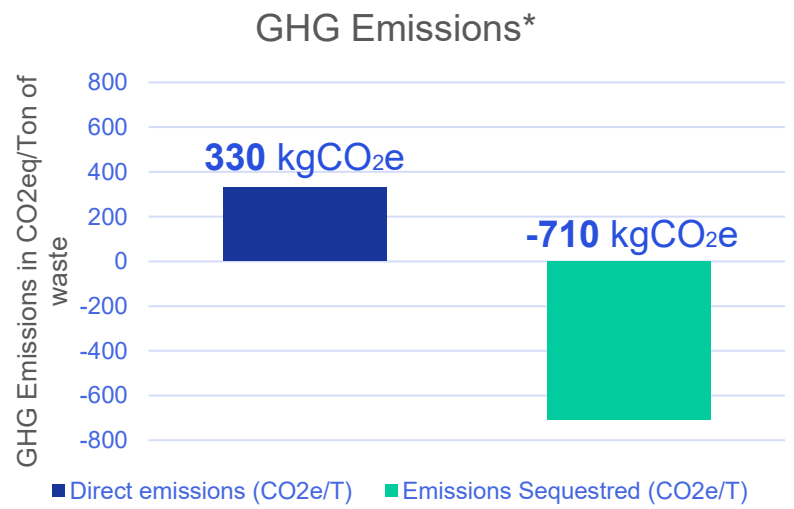
- www.cabinet-merlin.fr

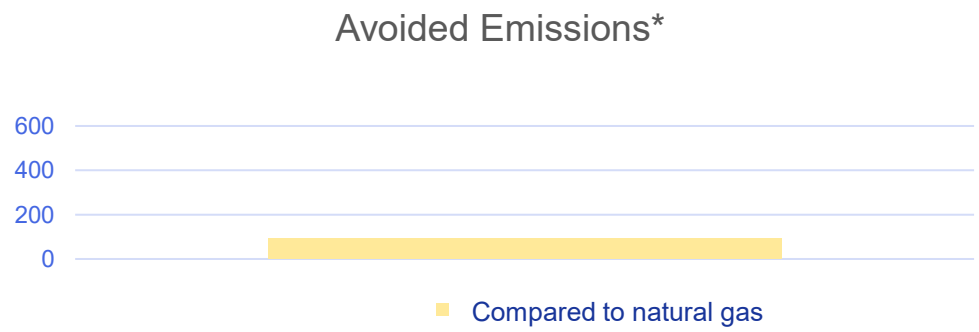
Partenariat français des déchets PFD FSWP French solid waste partnership

LANDFILLING of mixed waste,
THE UNIVERSAL FIRST STEP

State-of-the art landfills with gas capture

1 ton of mixed waste in ESM compliant landfills, assuming **75% gas capture**





* Expert calculation by FSWP, assuming a French waste mix (French average data). Avoided emissions calculated in reference to the IPCC2006 natural gas emission factor. Calculation can be made available on request.

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FSWP French solid waste partnership

Green Landfill to Energy



INTERNATIONAL MODEL

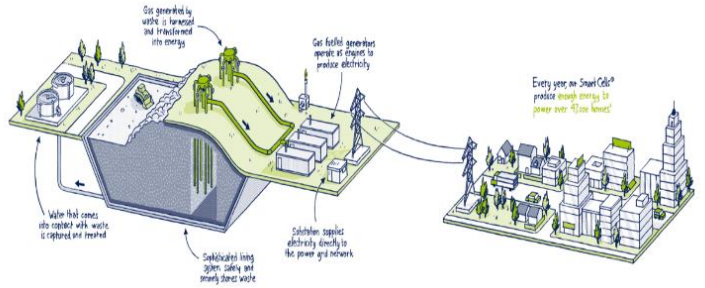
Integrated infrastructure to replace dumpsites

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 kt/y of waste safely managed
  - 70% reduction in emissions by 2033
  - 5,500 MWh/y production capacity



BENEFIT

- Methane capture.
- Production of renewable energy.

CO-BENEFIT

- Local value enhancement.
- Rediced pollution through leachate treatment.
- Improved energy autonomy.

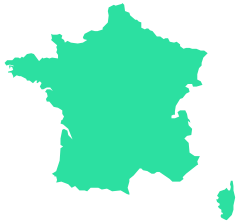
- A waste recovery centre in Meknès combines the fight against global warming with social innovation - SUEZ Group

Waste sector : 3–5% of global GHG emissions
Transitioning to circularity : up to 20% of global emissions.

Four governance levers to support action!

1. ***Regulation, public policy and planning***
2. ***Inclusion of all stakeholders***
3. ***Sustainable financing***
4. ***Monitoring, reporting, verification and traceability***

How Can France Reduce its Emissions?



FRANCE

Transitions 2050 – Choose Now, Take Action for the Climate

WASTE & CLIMATE CHANGE

1 **Regulation, public policy and planning**

CARBON NEUTRALITY

Prospective thinking on possible ambitious and varied pathways to achieving our climate targets by 2050

- Four coherent technical, economic and social scenarios for a low carbon future: moderation, cooperation, technology and restoration.
- Support local and national dialogue across stakeholder groups to define priority actions.
- Beyond GHG reduction, the 2026 edition will include biodiversity, water, gas, digital tools, and AI dimensions.



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ADEME
AGENCE DE LA TRANSITION ÉCOLOGIQUE

BENEFIT

- Risk analysis specifying the conditions and impacts of each scenario.
- Technical, economic and social knowledge gathered in one place.
- Developing knowledge to better plan the transition.

CO-BENEFIT

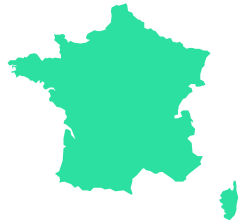
- Open dialogue between public decision-makers, businesses and citizens.

- Les futurs en transition - ADEME

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FSWP French solid waste partnership



Standardising Packaging at National Level



FRANCE

The Reuse Network RVR facilitates and coordinates a working group

WASTE & CIRCULAR ECONOMY

1 **Regulation, public policy and planning**

REUSE ECONOMY POLICY

Working group members are reuse operators actively involved in container collection and/or washing.

- Nearly 40 participants.
- Over 50 packaging references standardised the anti-waste and circular economy (AGEC) law.
- Nearly 20 common references in the standards developed by Citeo, in REuse activation.
- Mainstreaming of the Reuse pictogram.





BENEFIT

- Improve the economic viability of reuse schemes.
- Help producer responsibility organisations (PROs) standardise reusable packaging.

CO-BENEFIT

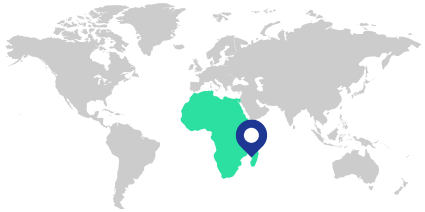
- Improved collaboration between reuse stakeholders.
- Increased public awareness on waste minimisation.

- Catalog of RVR Standards

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Planning wastewater and solid waste treatment

Concerted, viable sanitation and solid waste services



MADAGASCAR – AMPITATAFIKA

The SEPTA project strengthens sector governance and planning.

Market-based activities are developed across collection, treatment and recovery – for both liquid sanitation and solid waste.



WASTE & LOCAL GOUVERNANCE

1 Regulation, public policy and planning

PLANNING ACCES TO PUBLIC SERVICES

- **Concerted municipal planning** and activities.
- **Support to "sanimarket" operators** to promote toilet access; faecal sludge collection and treatment services.
- **Support to operators** for an efficient waste collection and treatment service.
- **Household awareness** of good hygiene practices.

BENEFIT

- Integrated sanitation and waste services
- Source separation collection and landfill diversion.
- Access to private and public toilets, waste disposal services, and sanitation products.

CO-BENEFIT

- **Local jobs** along the sanitation and waste chains.
- **A commercial network** for products from waste and sludge recovery.
- **Better hygiene practices** in household.

Diotontolo

Madacompost

PARIS

GRET

AGENCE eau seine NORMANDIE

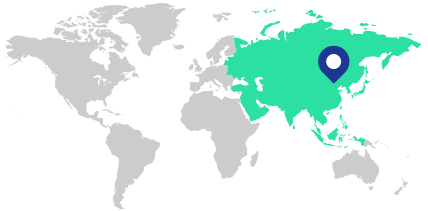
- Fiche-projet_SePTA.pdf

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FSWP French solid waste partnership

A Women-led Informal Waste Collection System in Hà Nôi

Waste collection and recycling in a city overwhelmed by waste



VIÊTNAM - Hà Nôi

WASTE & SDGs

2 Inclusion of all stakeholders

BEHAVORIAL SCIENCE

Main highlights of this comprehensive study:

- 20% of urban waste is collected informally, mainly by women.
- The informal sector is complex and composed of street collectors, waste deposit managers and recyclers.
- Recycling practices are highly polluting for the environment and health.



BENEFIT

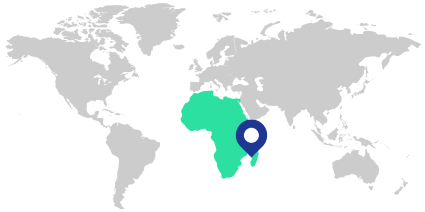
- Baselines for future policy development in order to:
  - Reduce the pollution and GHG emissions by improving the recycling techniques.

CO-BENEFIT

- Baselines for future policy develpment to:
  - Improve working conditions of women collectors.
  - Recognize and support the informal recycling system.

- Collecter et recycler les déchets à Hà Nôi - Acteurs, territoires et matériaux - (EAN13 : 9782709929660) | Un éditeur pour le développement (ird.fr)

Financing compost



MADAGASCAR – MAHAJANGA & ANTANANARIVO

Turning household waste into compost and carbon credits

WASTE & CLIMATE CHANGE

3

COMPOSTING /SUTAINABLE FINANCE / CARBON FINANCE

The social enterprise Madacompost sorts household waste and composts it, offering cities a sustainable treatment solution. It is Gold Standard certified with GoodPlanet Foundation.

- **Business model** integrating carbon credit revenues.
- **Technical assistance** on composting treatment and recovery.
- **Institutional support:** relations with local authorities, public service financing, territorial waste management plans.
- **Carbon credit monitoring and audit.**



BENEFIT

- Cutting methane emissions.
- Reduced treatment costs for cities.
- Amendment to soils.

CO-BENEFIT

- Carbon revenues on the voluntary market, via the GoodPlanet Foundation, for a viable social enterprise.
- Compost marketed as a local product.
- Improved local waste management and fewer environmental impacts.

Madacompost

FONDATION GoodPlanet

GRET

- Madacompost

Partenariat français des déchets PFD FSWP French solid waste partnership

Cométha Innovation Partnership

Co-treatment of wastewater sludge and household organic waste

FRANCE – Paris

WASTE & CLIMATE CHANGE

3 Sustainable financing

INNOVATIVE PARTNERSHIP / PUBLIC PROCUREMENT FINANCING

How the innovation partnership works:

- Several consortia are invited to tender for one innovation contract
- Public buyers fund R&D and own the results
- Patents developed and filed by the consortia are owned by the public buyers
- Three phases: lab research, pilot unit, industrial rollout



BENEFIT

- No re-tender needed after R&D.
- Competition drives motivation.
- Transferable to other public bodies.

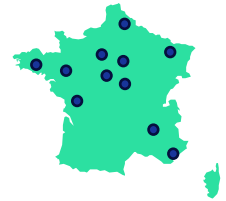
CO-BENEFIT

- Protects public R&D and intellectual property.
- Pooled waste and wastewater expertise from two public authorities (Syctom & SIAAP).

- Cométha (cometha.fr)

MassBio$_2$ the CO_2 Dashboard

Assessing biogenic and fossil carbon fractions in incineration waste and energy from waste



FRANCE – 11 locations

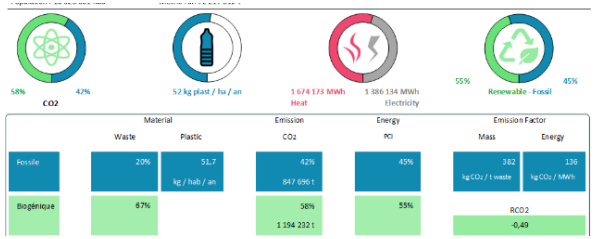
WASTE & CLIMATE CHANGE

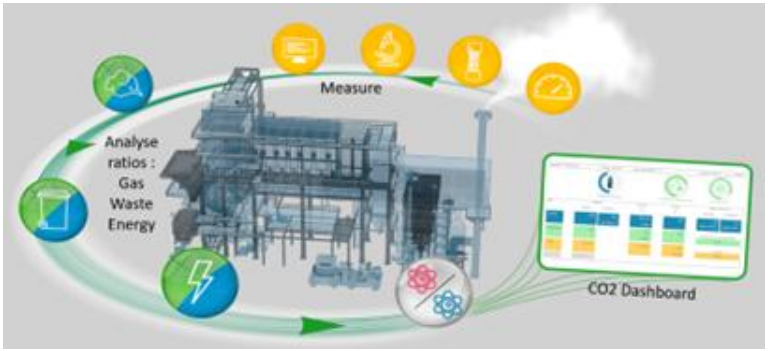
4 **Monitoring, reporting, verification and traceability**

WASTE TO ENERGY

From flue gas to waste composition… by measuring the origin of CO_2 (^{14}C analysis):

- An algorithm assesses biogenic and fossil CO_2, the waste composition, and the renewable energy fraction





BENEFIT

- Measure CO_2 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 dive action.

Groupe MERLIN

- Nos innovations -R&D | Groupe Merlin (cabinet-merlin.fr)

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FSWP French solid waste partnership

Assessing the GHG Emissions of a Waste Collection and Treatment Service



GHG assessment, a tool for understanding carbon impact and identifying emission reduction levers

FRANCE

WASTE & CLIMATE CHANGE

4 Monitoring, reporting, verification and traceability

HOLISTIC WASTE MANAGEMENT

Targeted action plan to reduce CO_2 emissions:

Objective: Achieve a 3% annual reduction in emissions, totaling 16 ktCO2e, broken down as follows:

- 70% through CO_2 capture and recovery from the WtE plants.
- 8% by improving residents' sorting habits.
- 7% with a sustainable purchasing policy.
- 7% by expanding the fleet of electric machines.
- 5% by using biofuel for the vehicle fleet.



Sitcom
Côte sud des Landes AU SERVICE DE SON TERRITOIRE

BENEFIT

- Sequestration of biogenic CO_2
- 58kg CO_2 eq reduction per capita in 5 years.

CO-BENEFIT

- Reduce the use of fossil fuels through improved recycling.
- Develoment of innovative approaches and processes.
- Identify emissions avoided through waste recycling and recovery operations.

- Bilan Carbone Sitcom Côte sud des Landes

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Let’s work together to mobilise and take action towards a circular economy that increases wellbeing, protects health and the environment, reduces fossil dependencies and strengthens economic resilience.



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suez

syctom
l’agence métropolitaine des déchets ménagers

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