



Confederation of European
Waste-to-Energy Plants

Waste-to-Energy Climate Roadmap: Path to Carbon Negative

Paul De Bruycker, President of CEWEP
21st June 2022, Brussels



CEWEP's Waste-to-Energy Roadmaps in the European Green Deal

■ Making a clean Circular Economy happen

Material and energy recovery are complementary solutions

→ [Waste-to-Energy Sustainability Roadmap 2019](#)

■ The Path to Carbon Negative

Energy substitution, landfill diversion, bottom ash recovery, CCUS

→ [Waste-to-Energy Climate Roadmap 2022](#)



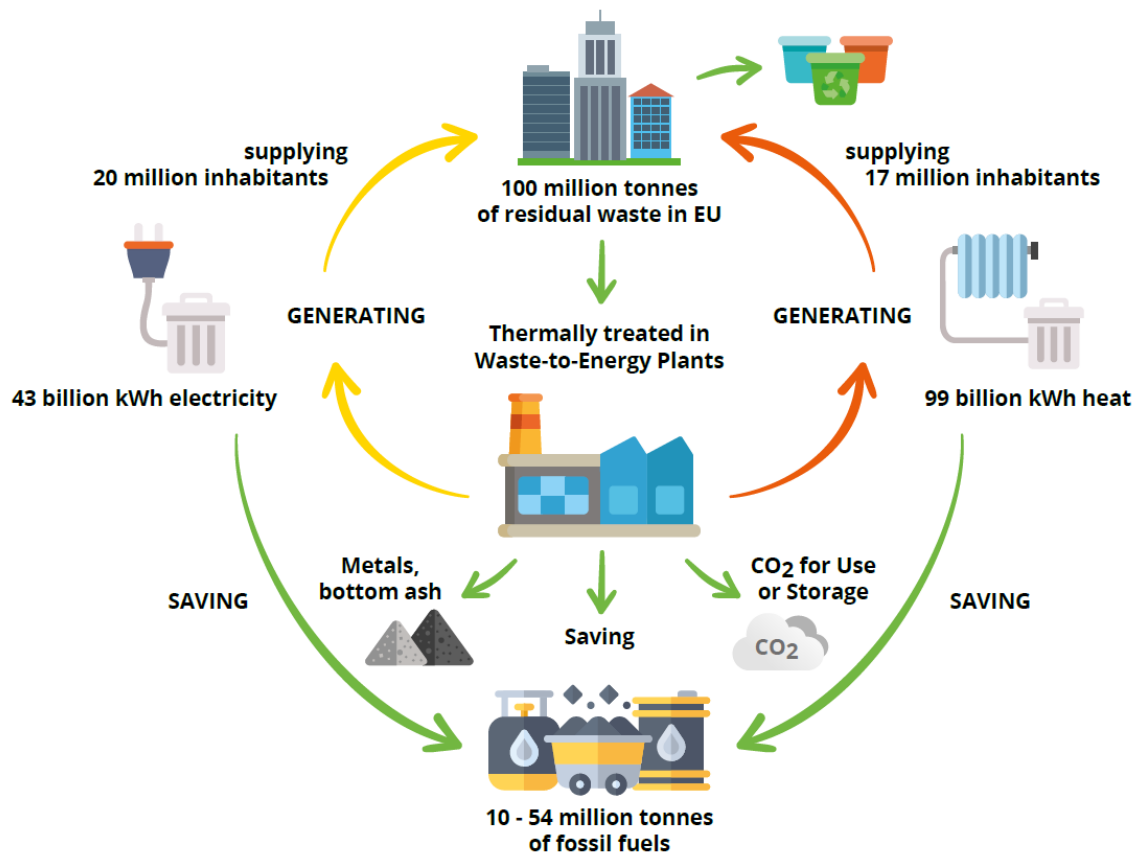
Waste-to-Energy - Enabler of Circular Economy

- ■ Turns non-recyclable waste in an environmentally safe way into secure energy and valuable raw materials;
- ■ Keeps the circle clean by dealing with unwanted organic components in the material cycles (act as a pollutant sink, fulfilling a hygienic task for the society).





WtE's Double Role: Sustainable Waste Management + Energy and Climate



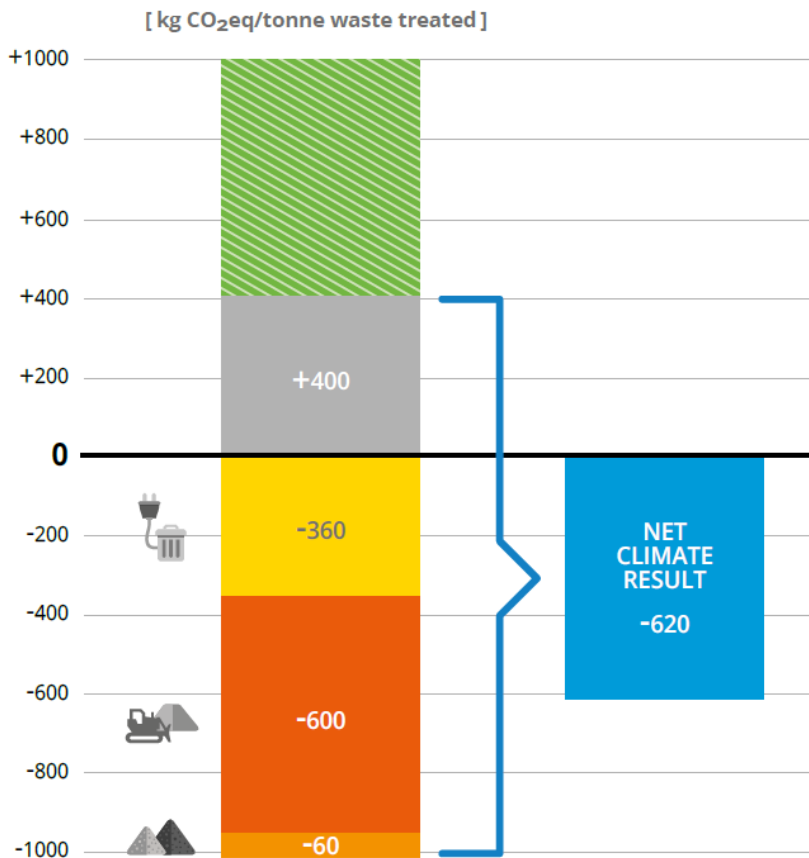
- Some **500 WtE plants** in Europe provide a continuous **hygienic task** to society
- Treating **100 M tonnes** of residual, non-recyclable waste from municipal + commercial and industrial activities
- The amount of primary energy generated by WtE in 2019 corresponds to approximately **9% of the natural gas imports to the EU from Russia**

Plastic – the main source of WtE's fossil CO2 emissions

- Significant number of plastic products put on the market are still non-reusable and non-recyclable.
- **Consumer behaviour and producer responsibility:** the entire waste and product value chain must take part in the effort to reduce fossil residual waste.
- Source separation is key to enable quality recycling.
- **Non-recyclable plastic waste can be effectively treated in Europe by WtE**
 - It would otherwise be landfilled or exported to other countries (with lower environmental and social standards)
- The WtE sector has, apart from its hygienic task, a pivotal role towards a resource-efficient, clean circular economy and carbon neutral future.



STATUS QUO: European WtE Sector's Current Climate Balance

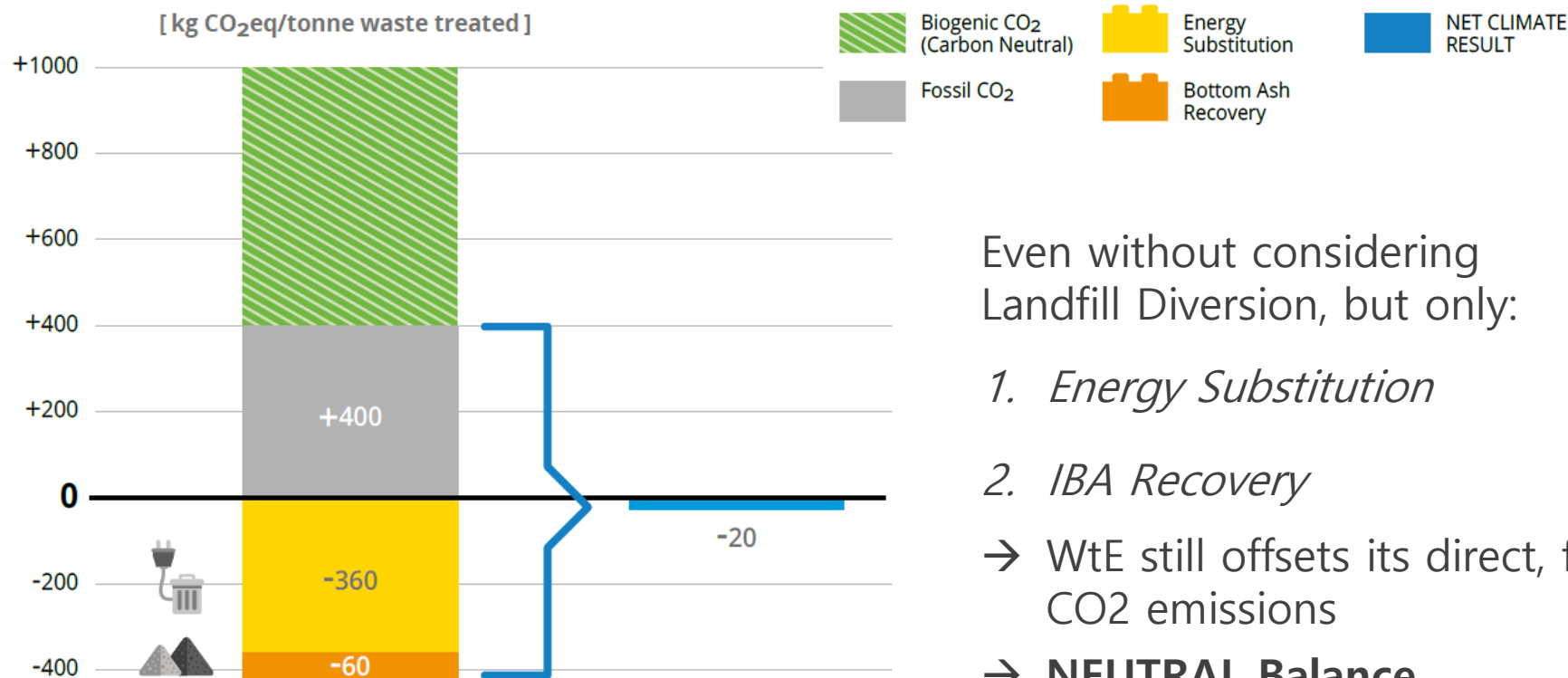


- Fossil CO₂ emissions: mainly due to **residual plastic input** to WtE plants
- WtE offsets its direct, fossil CO₂ thanks to:

- Energy Substitution*
- Landfill Diversion*
- Bottom Ash Recovery*

→ **NEGATIVE CO₂ Balance**
 = **POSITIVE Climate Balance**

STATUS QUO: European WtE Sector's Current Climate Balance



CCUS: Carbon Capture Utilisation and Storage



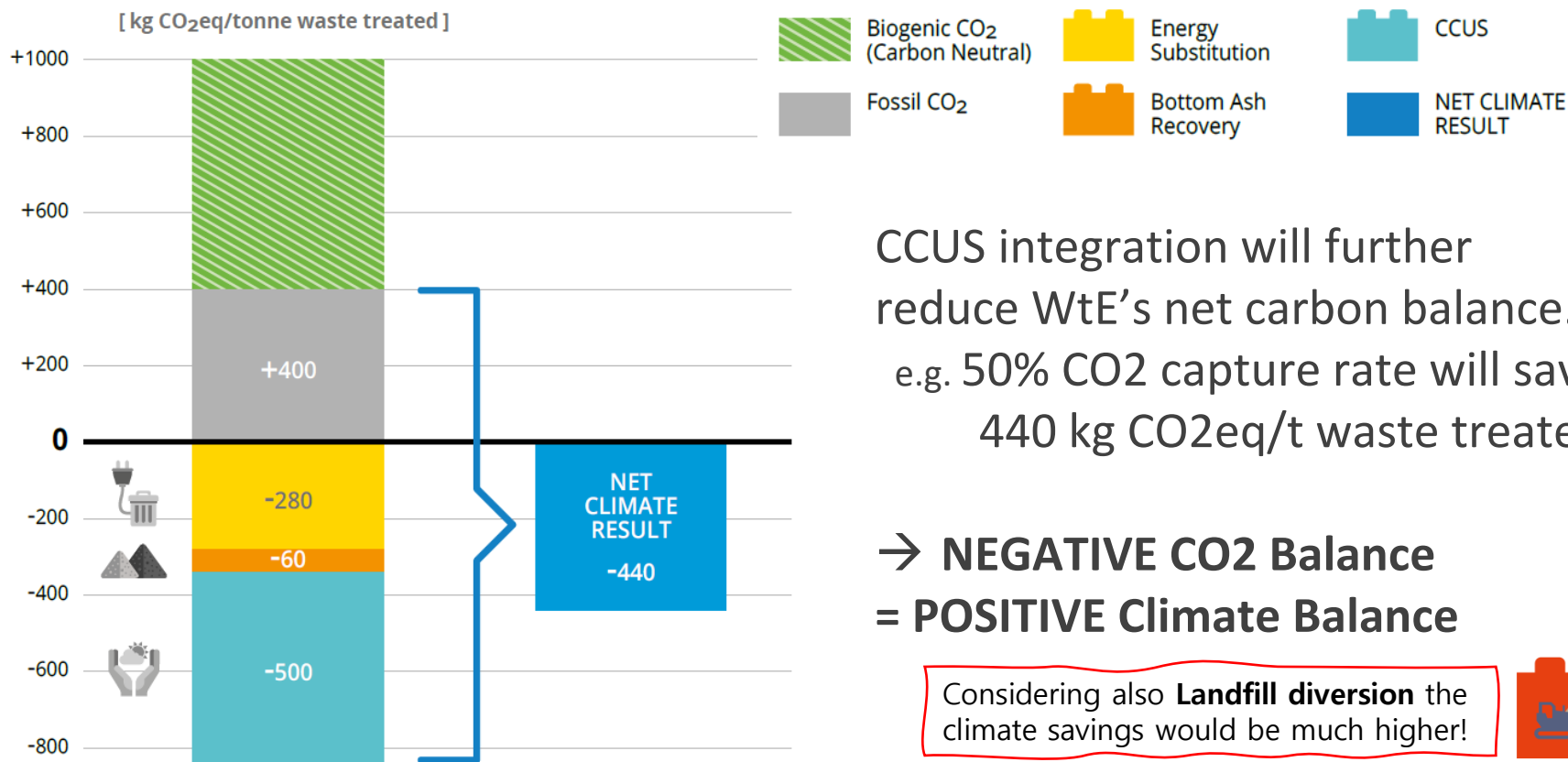
“The integration of WtE and carbon capture and storage (CCS) could enable waste to be a net zero or even net negative emissions energy source.”

UN Intergovernmental Panel on Climate Change (IPCC), AR6 WGIII, Mitigation of Climate Change, April 2022



Source and credits: AVR

FUTURE: European WtE Sector's Carbon Balance with CCUS



From Carbon Neutral to Carbon Negative

STATUS QUO

WtE is a climate neutral sector



BUILDING ON THE STATUS QUO

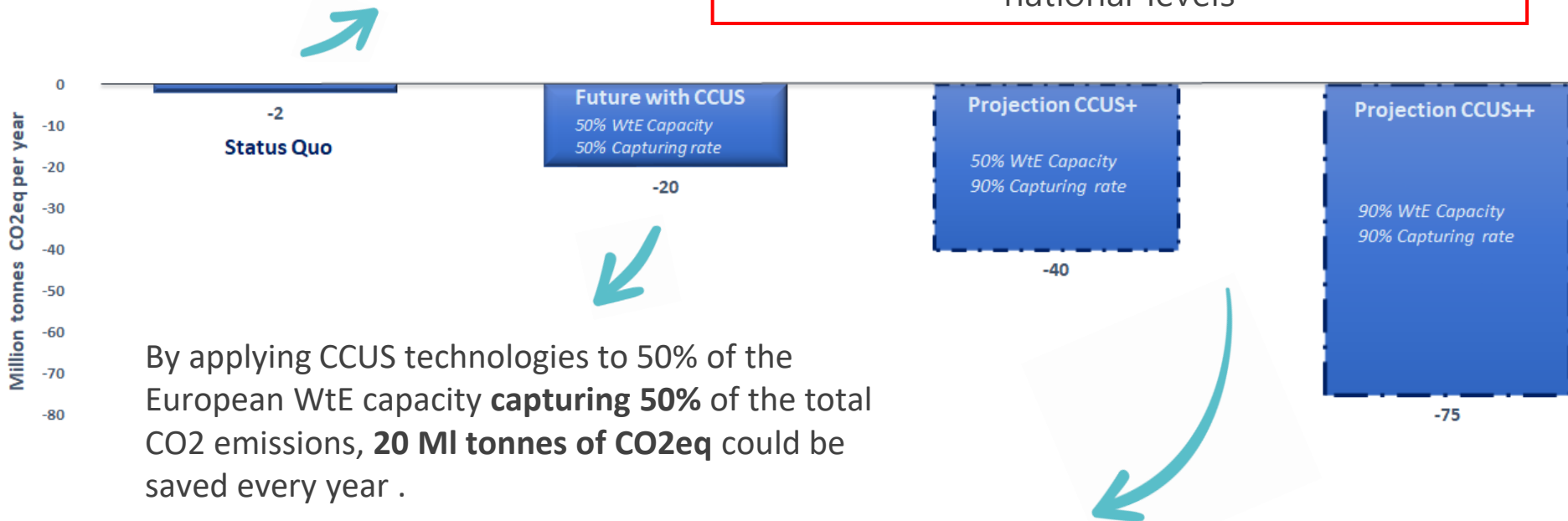
CCUS:
an extra but effective tool to reach
a negative CO2 emission balance



CO₂eq Reduction Potentials

WtE saves ca. **2 million tonnes of CO₂eq /Yr**

Progress only possible with **adequate political support** and a **business model** on the EU and national levels



Increasing ambition: With a broader integration of carbon capture equipment, greater reduction potentials can be foreseen as CCUS technologies will reach **full commercial maturity**.



Call to policymakers

Enabling conditions for CCUS:

- ☐ CO2 transport and storage infrastructure
- ☐ CCUS technology support
- ☐ Market mechanism and certification system for negative emissions
- ☐ CO2 market development

Enabling conditions for sustainable waste management:

- ☐ Minimising methane emissions from landfills
- ☐ Restricting landfills to waste not suitable for material and energy recovery
- ☐ Recognition of the role of WtE (incl. taxonomy)



Different CCUS projects in WtE kicked-off across Europe

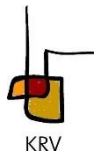
Belgium	Indaver Power-to-Methanol project (Antwerp@c, Port of Antwerp)
Denmark	Amager Resource Center (ARC) (Copenhagen)
Finland	Fortum Carbon2x pilot (Riihimäki), Westenergy's EnergySampo CCU project (Mustasaari)
Portugal	Lipor (Porto): CCU for the production of synthetic aviation fuels
Netherlands	Twence (Hengelo), AVR (Duiven), AVR (Rozenburg), AEB (Amsterdam), HVC (Alkmaar)
Norway	Celsio Klemetsrud (Oslo, part of Longship Project), Statkraft Varme, Returkraft, BIR, FORUS
Sweden	Renova (Gothenburg), SYSAB (Malmö)
UK	SUEZ (Haverton Hill, Teesside), Viridor (Runcorn, Dunbar, Cardiff Trident Park)
Switzerland	All 29 Swiss WtE plants committed to CCS in the long-term

...and many more on-going feasibility studies, pilot projects, etc. across Europe

WtE contributes to carbon neutrality by 2050. If supported by EU policies, WtE will be even a pivotal provider of negative CO₂ emissions.



CEWEP – Members





Thank you for your attention

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