

The Climate Calculator of Tel-Aviv Metropolitan for Reducing GHG Emitted by WM Actions



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**Dan Region Association of Towns
Hiriya Recycling Park, Tel-Aviv, Israel**

Background:

- Six members – Local Authorities
- 27 other Local Authorities
- 3 facilities (+C&D)
- Receiving > 3,800 tons/day MSW
- >1.2 million tpa
- Entries: 1000 Trucks/day



→ 2 millions inhabitants

→ 33 municipalities

→ 3,800 tons/day = 1,000 trucks!

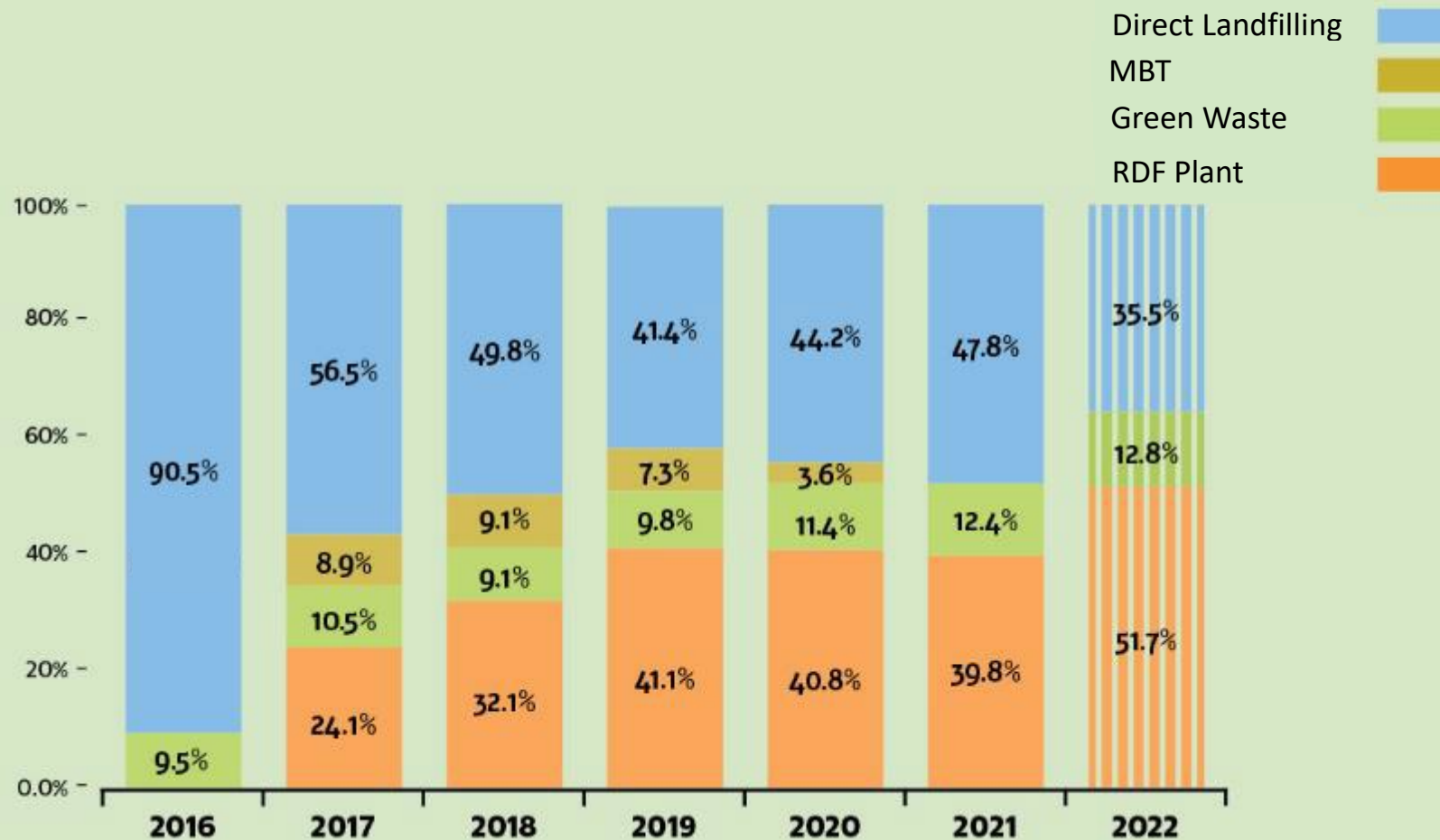
Milestones

- 1952 - Tel Aviv started dumping waste
- 1998 - The Hiriya dumpsite was closed
- 2000 - Transfer station
- 2001 – Planning the Recycling Park
- 2003 – Arrow-bio & educational program
- 2006 – C&D & Green waste facilities
- 2016- Operating RDF plant -1500 t/d





Waste receiving distribution in Hiriya facilities 2016-2022



***Transfer station = without sorting & separation**

RDF Performance: 60% Landfill Reduction



2,000 tons/day

Producing 400 tons RDF per day

Sorting and Separating

Green energy for cement industry

600,000 t/yr → 100,000 t/yr RDF → 252,000 Compost → 3,000 t/yr metals

Green Waste Facility

500 Tons/Day

>40% Recycling & Recovery

- Recyclables
- Compost & agriculture use
- Shredded green waste for Steam Production



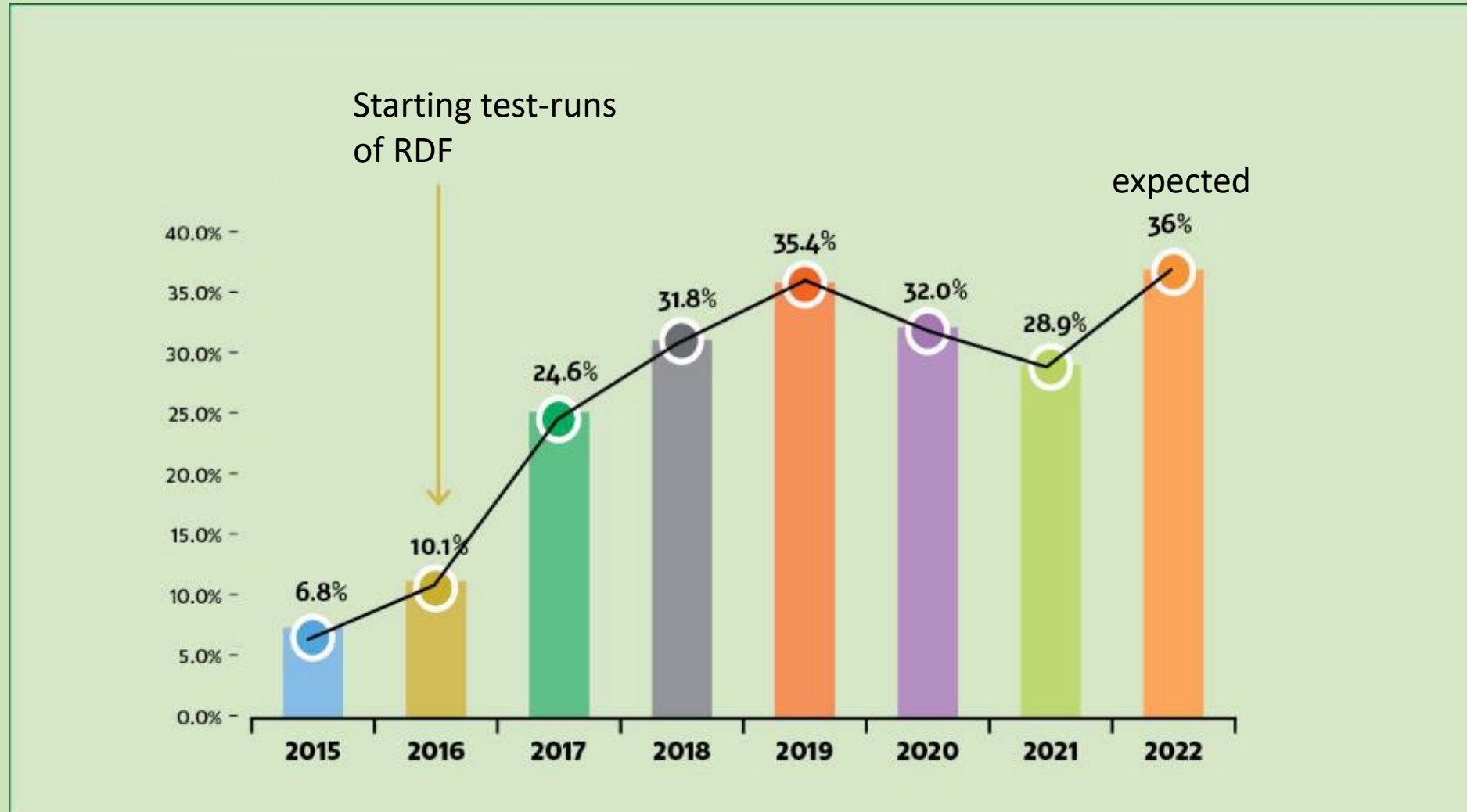
Common paradigm

“Success in waste treatment =
high recycling & recovery rates
(by weight)”





Rates of Landfill Reduction (Recovery + Recycling)



Common paradigm

“Success in waste treatment =
high recycling & recovery rates
(by weight)”



TRUE, BUT...

Real Environmental Impact



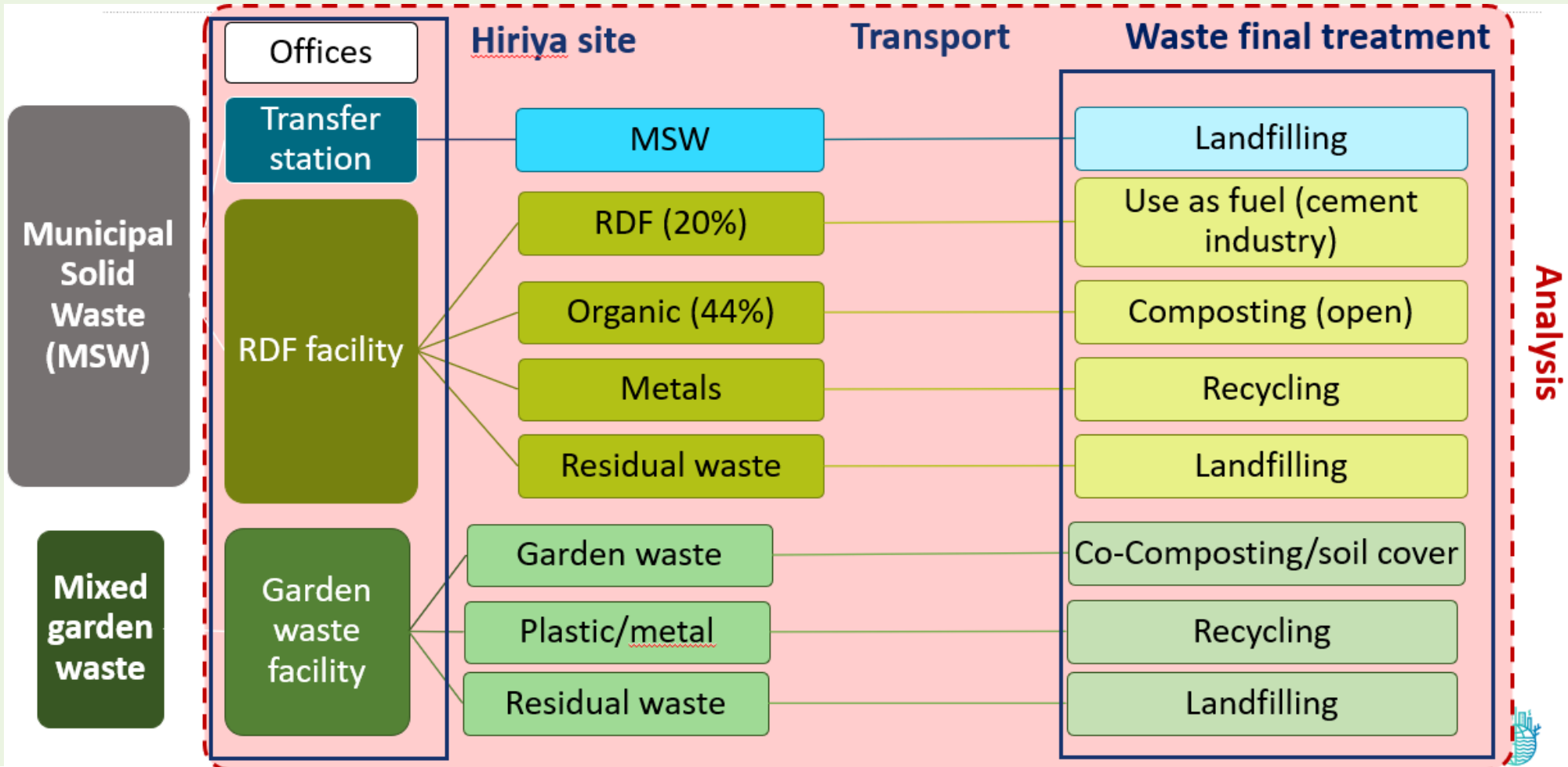
Hiriya's WM climate calculator



Double objectives:

- Calculation of Hiriya's total emissions
- Comparison of waste treatment alternatives as a basis for decision-making

Boundaries – Mapping of existing processes



Boundaries – Emissions

On-site emissions

- Fuel consumption
- Electricity consumption



Hiriya's site

Transport emissions



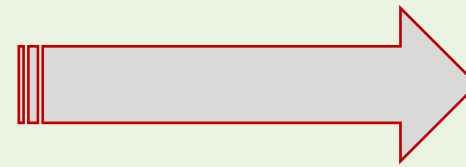
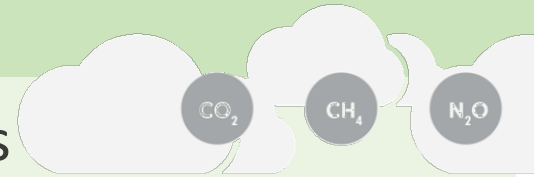
Transport

Treatment process emissions



Waste final treatment

- 1) Avoided emissions from landfilling
- 2) Additional avoided emissions

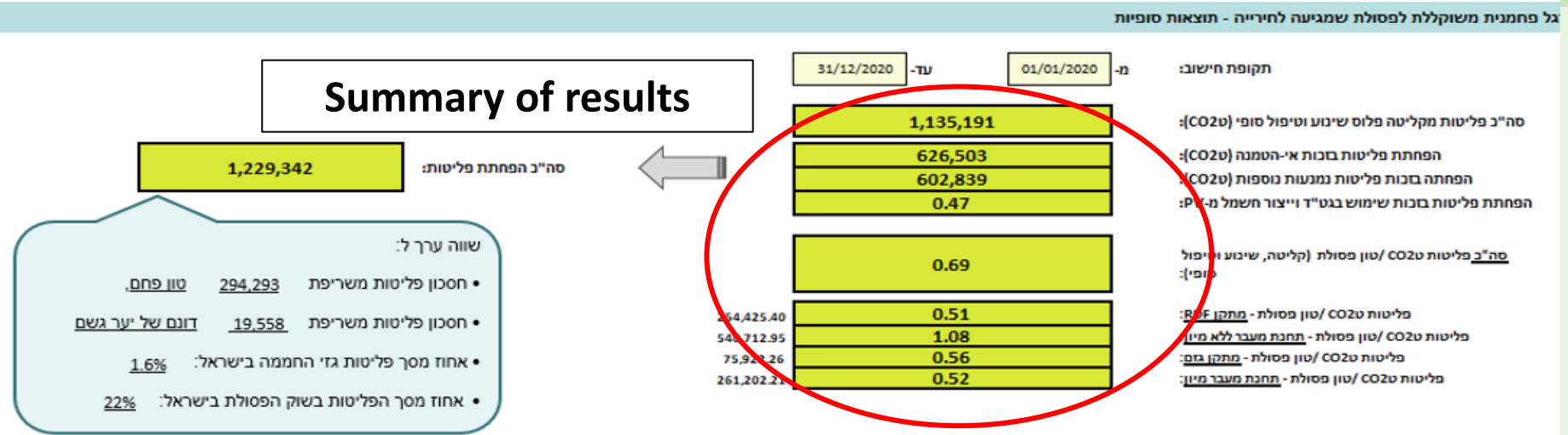


EMISSIONS DUE TO HIRIYA'S STRATEGY/ACTIVITY



EMISSION REDUCTIONS DUE TO HIRIYA'S STRATEGY/ACTIVITY

The climate calculator dashboard (in Hebrew...)



Input – products per facility per final treatment

סך הפלי (טCO2e)	פליטות נמנעות נוספות (טCO2e)	פליטות מטיפול בפסולת (טCO2e)	פליטות משינוע (טCO2e)	ק"מ	טון	טיפול סופי
-87,153	-148,702	61,493	56	20.0	95,247	RDF - Use in the cement industry
-137,734	-153,335	15,295	307	85.8	214,131	Organic - open composting
-	-	-	-	100.0	-	אורזי - קומפוסטציה סגורה
-	-	-	-	-	-	אורזי - טיכול אבאורי
-9,802	-13,461	3,659	-	-	1,957	Metals - recycling
160,858	-	160,476	382	133.1	143,844	Waste residue - landfilling
-	-	-	-	-	-	שאריות מיון RDF שריפה
539,116	-	537,999	1,117	135.0	500,000	הטמנה ישירה מועדפת
-	-	-	-	-	-	שריפה מועדפת
-10,332	-12,758	2,417	9	23.1	17,817	בום גרום - קומפוסטציה פתוחה
-	-	-	-	-	-	בום גרום - קומפוסטציה סגורה
-1,191	-1,433	239	2	50.0	2,000	בום גרום - קו-קומפוסטציה עם בוצה

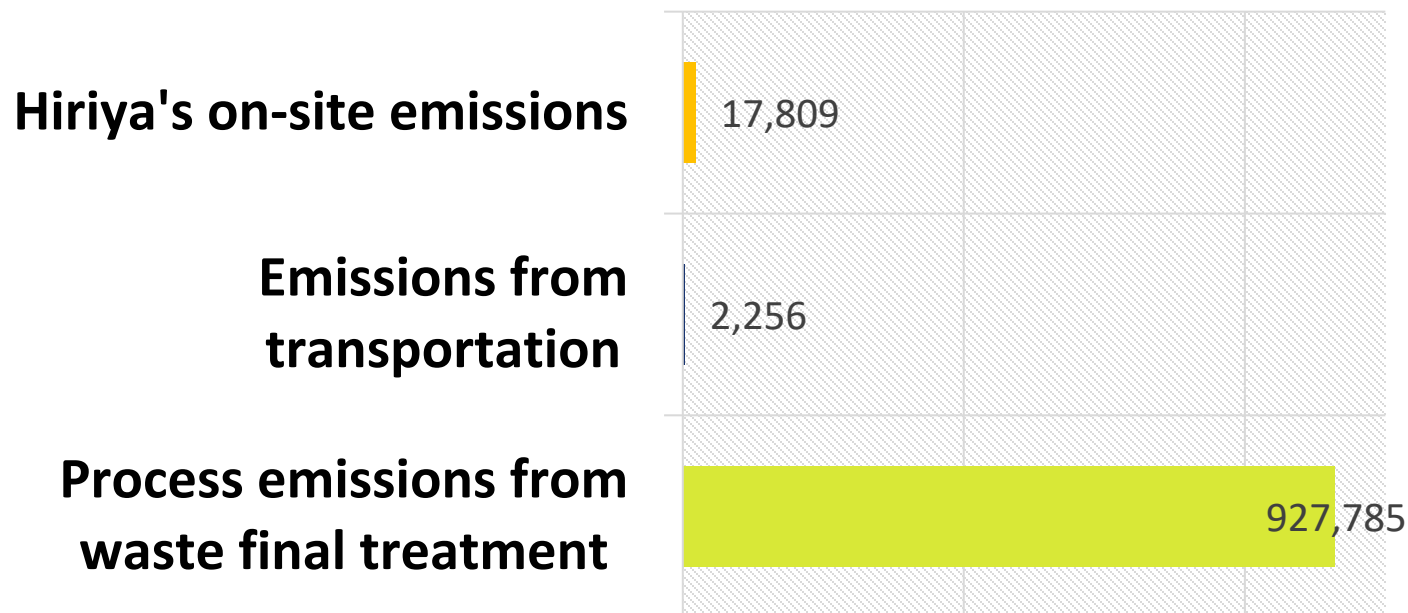
Input – received waste per facility

הפרש כמות פסולת שנכנסת - כמות פסולת לשינוע (טון)	סה"כ טון שינוע	פליטות מצריכת אנרגיה (טCO2e)	כמות פסולת שנכנסת למתקן (טון)	קליטת אשפה
44,821	455,179	12,757.75	500,000	RDF מתקן
-	500,000	1,597.24	500,000	תחנת מעבר ללא מיון
1,274	134,507	688.06	135,781	מתקן בום

Results – examples from 2020 data – 1

2020: 1,189,150 tons of waste

Total emissions per emissions source (tCO₂e)



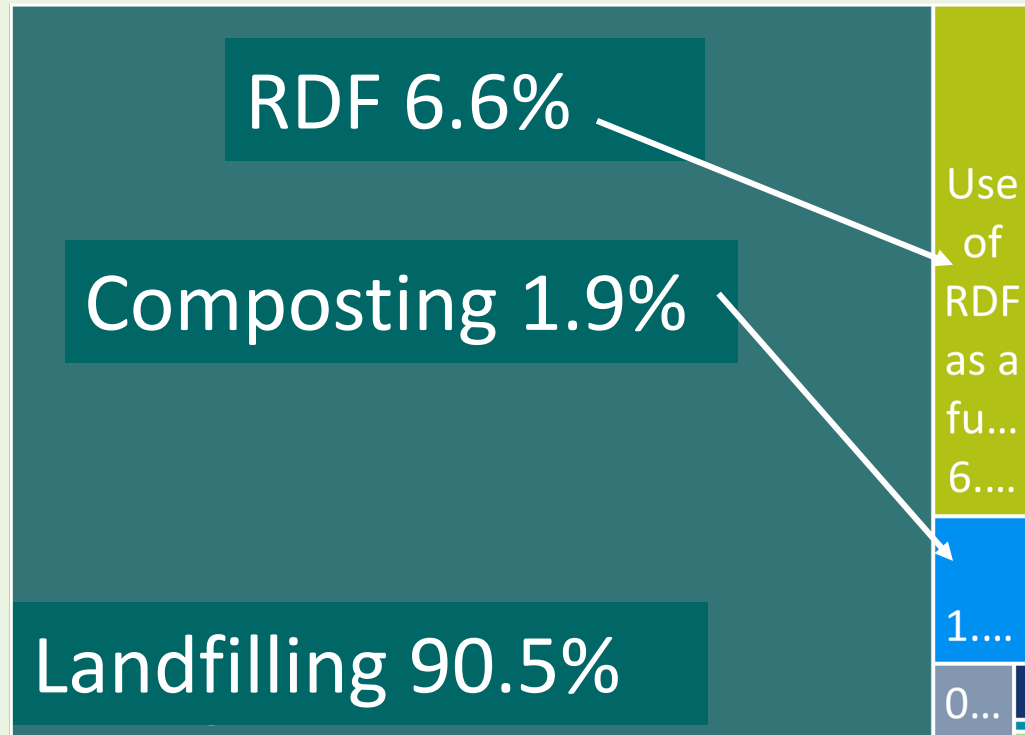
- Total emissions: 947,849 tCO₂e
- Final waste treatment = 97%
- Electricity and fuel consumption on site: < 3%

Results – examples from 2020 data – 2

Process emissions from waste final treatment (97% of total emissions)

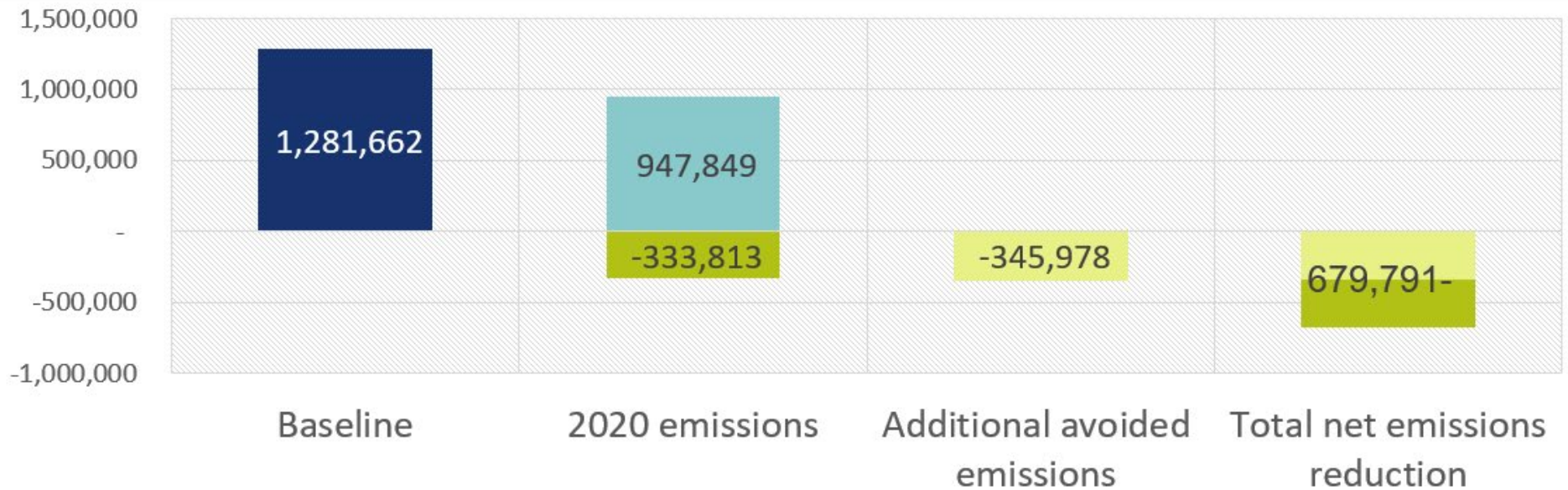
Process emissions per type of treatment (%)

- Agriculture use of shredded garden waste
- Open composting
- Co-composting
- Use of RDF as a fuel
- Recycling - plastic
- Landfilling
- Recycling - metals



Sources	% of process emissions	% of waste quantity
Landfilling	90%	≈ 68%
RDF	6.6%	8%
Composting	1.9%	20%
Other treatment options	(< 1.5% each)	

Results – examples from 2020 data – 3



Emissions reduction



Avoiding the use of 294,000 tons of coal



Conserving > 10,000 dunams of primary rain forest



of 0.9% Israel's total emissions

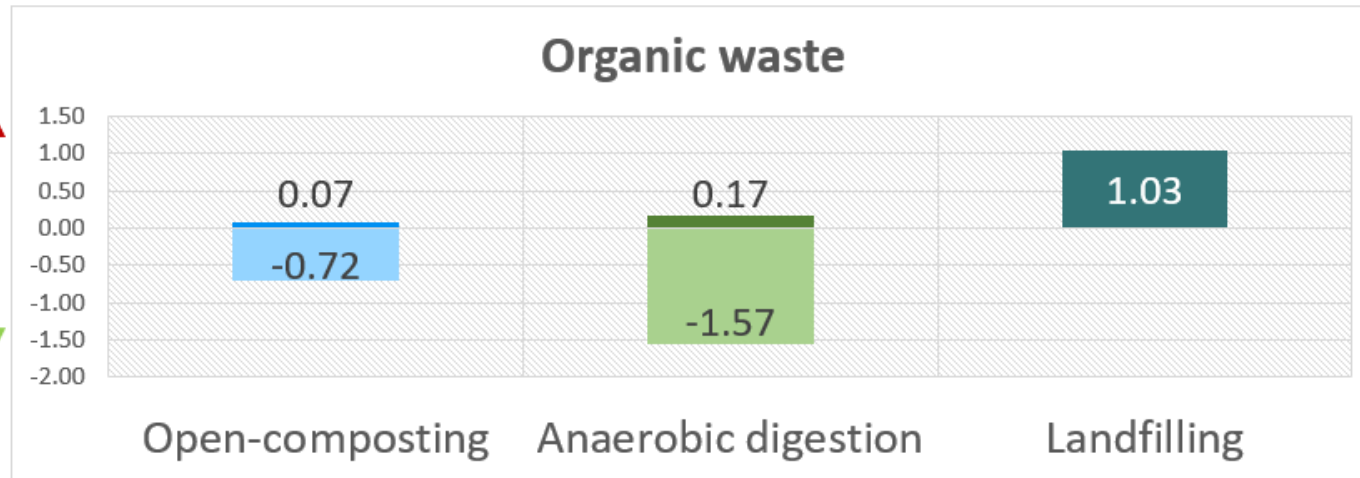


12% of the waste sector's emissions in Israel

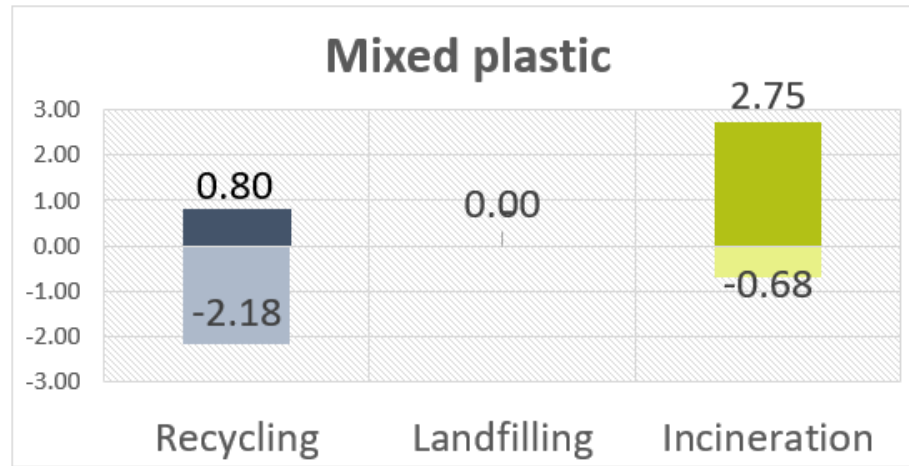
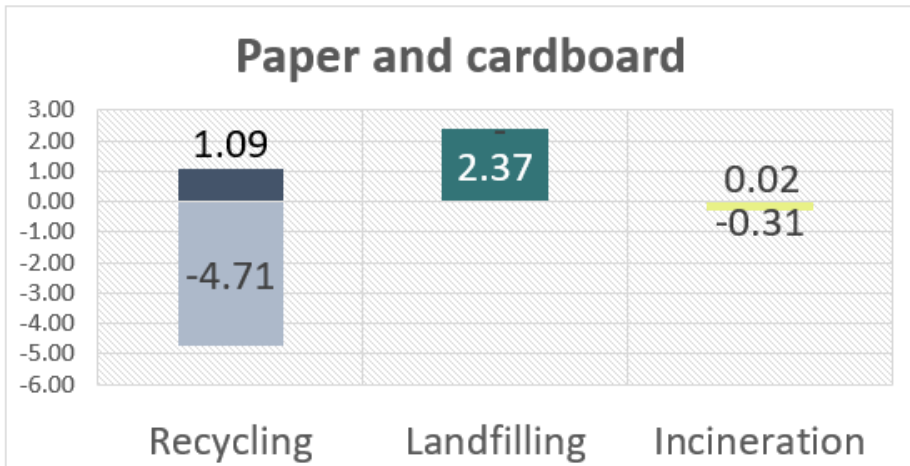


Comparison of WM alternatives

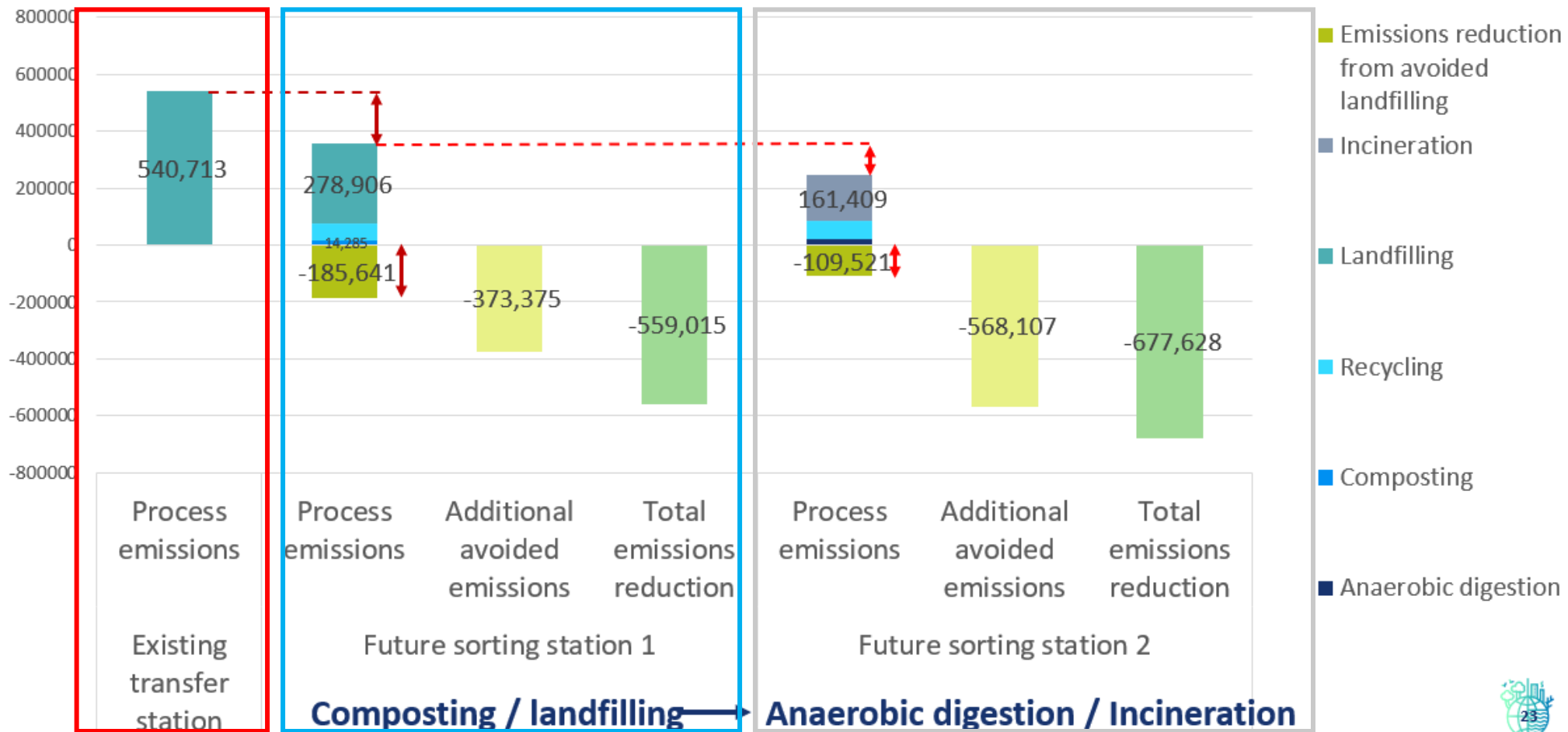
Process emissions ↑
Avoided emissions ↓



At the level of waste stream



Comparison of WM alternatives



At the level of facility & different final treatments

Hiriya's WM climate calculator - conclusions

1. Life-cycle GHG emissions as a basis for decision-making:
 - ✓ Comparison of alternatives by facility or waste stream
 - ✓ GHG impacts (reduction) within the supply chain
 - ✓ Indicative information on GHG impacts (reduction) beyond the supply chain
2. Flexible tool for monitoring of emission reductions over time
3. Planned waste sorting station will improve diversion of waste from landfilling, which is the key to emission reduction (~minimum of 50%) in the waste sector.



Thank you

