

ZERO WASTE EUROPE LIVE!

16 April 2019 - 2pm CET

THE TRANSITION STRATEGY TO DEAL WITH RESIDUAL WASTE

ENZO FAVOINO
Scientific Coordinator
at Zero Waste Europe



Setting the scene

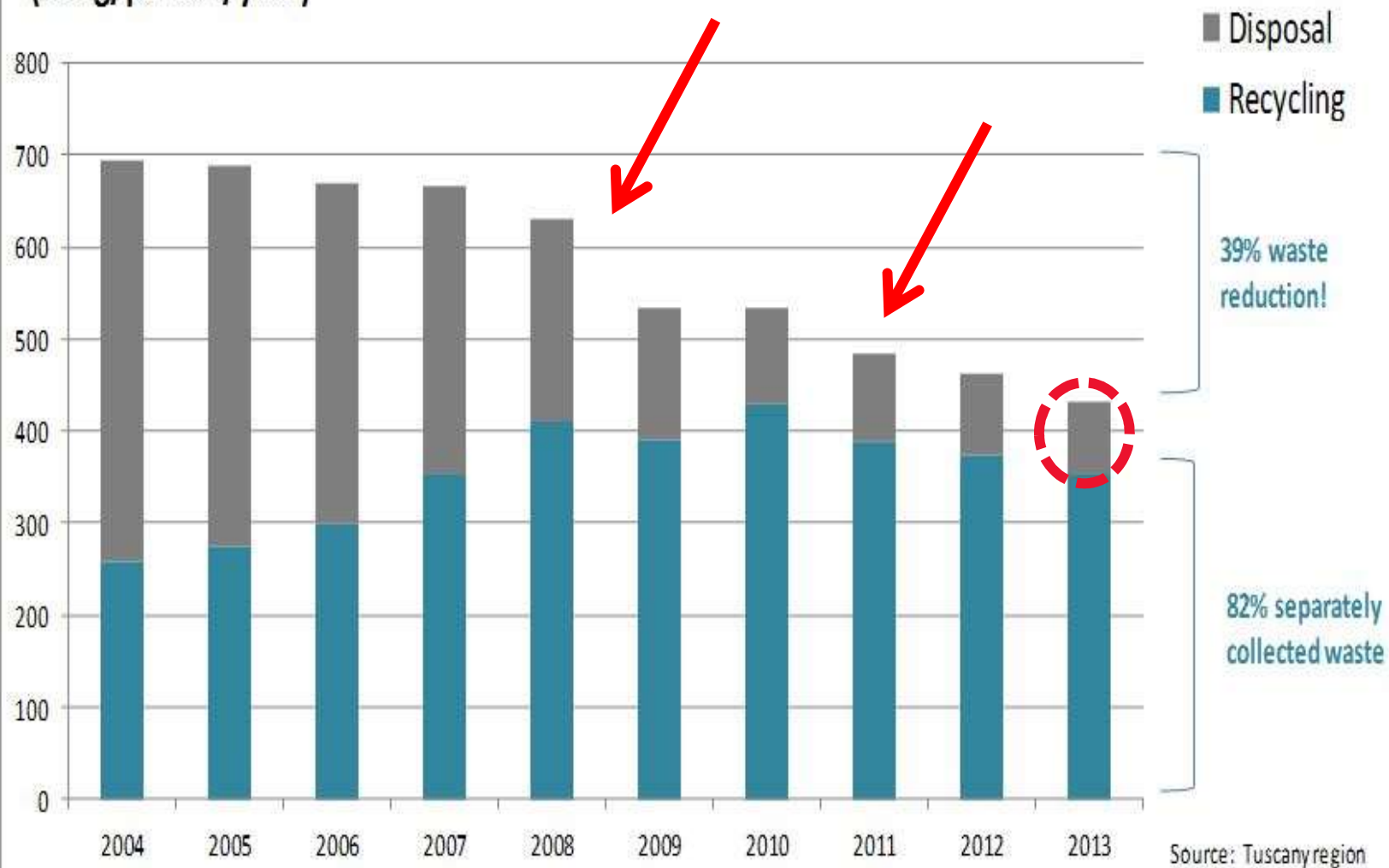
- The Circular Economy agenda setting the bar higher
- EC Communication on WtE in Circular Economy (Jan 2017)
- Plastic Strategy and SUP Directive pushing for redesigning
- Ongoing revision of mechanisms to allocate Regional Funds

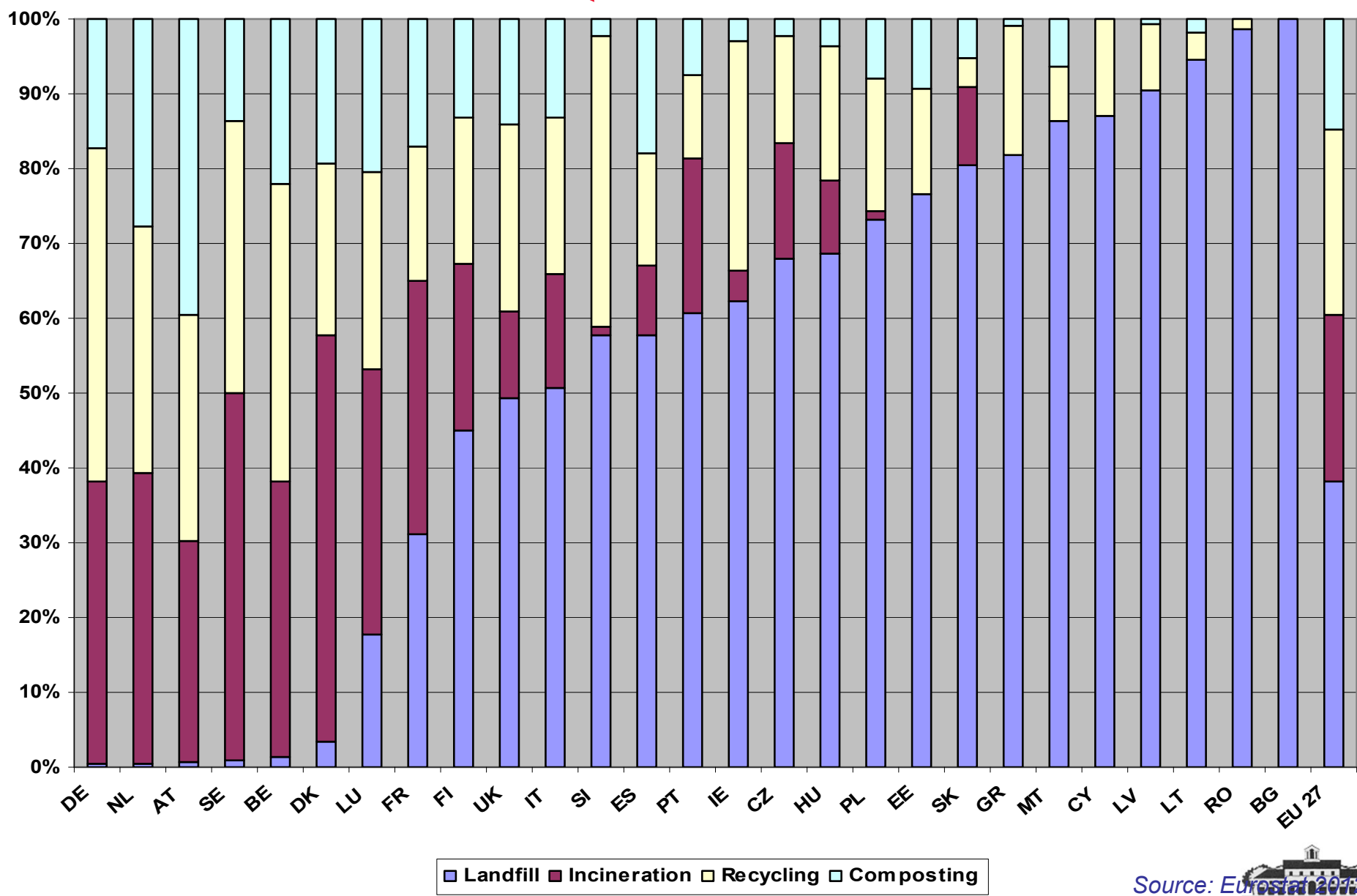
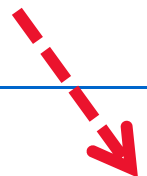


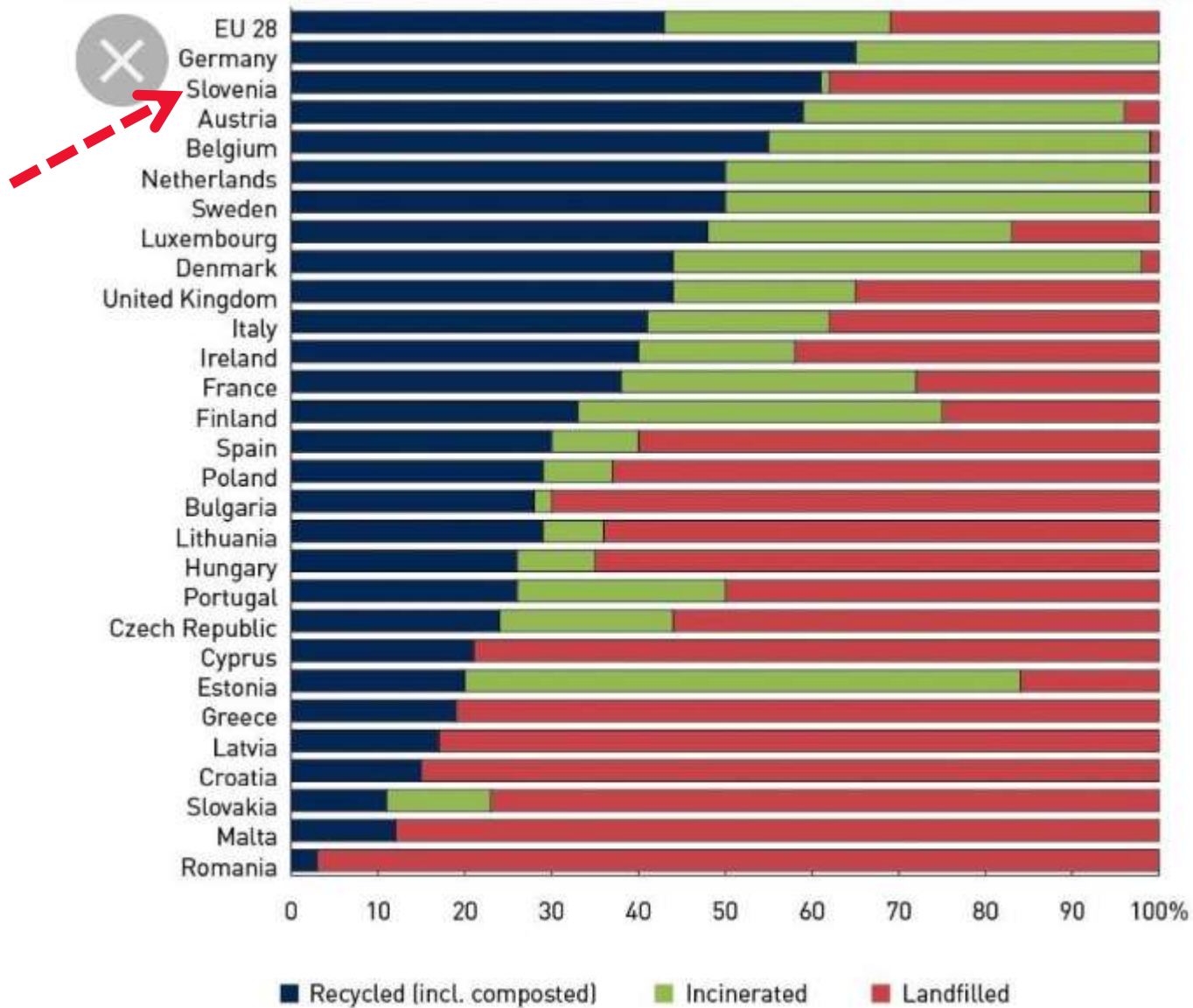
***"Zero waste
(and Circular Economy)
more the journey,
than the destination"***



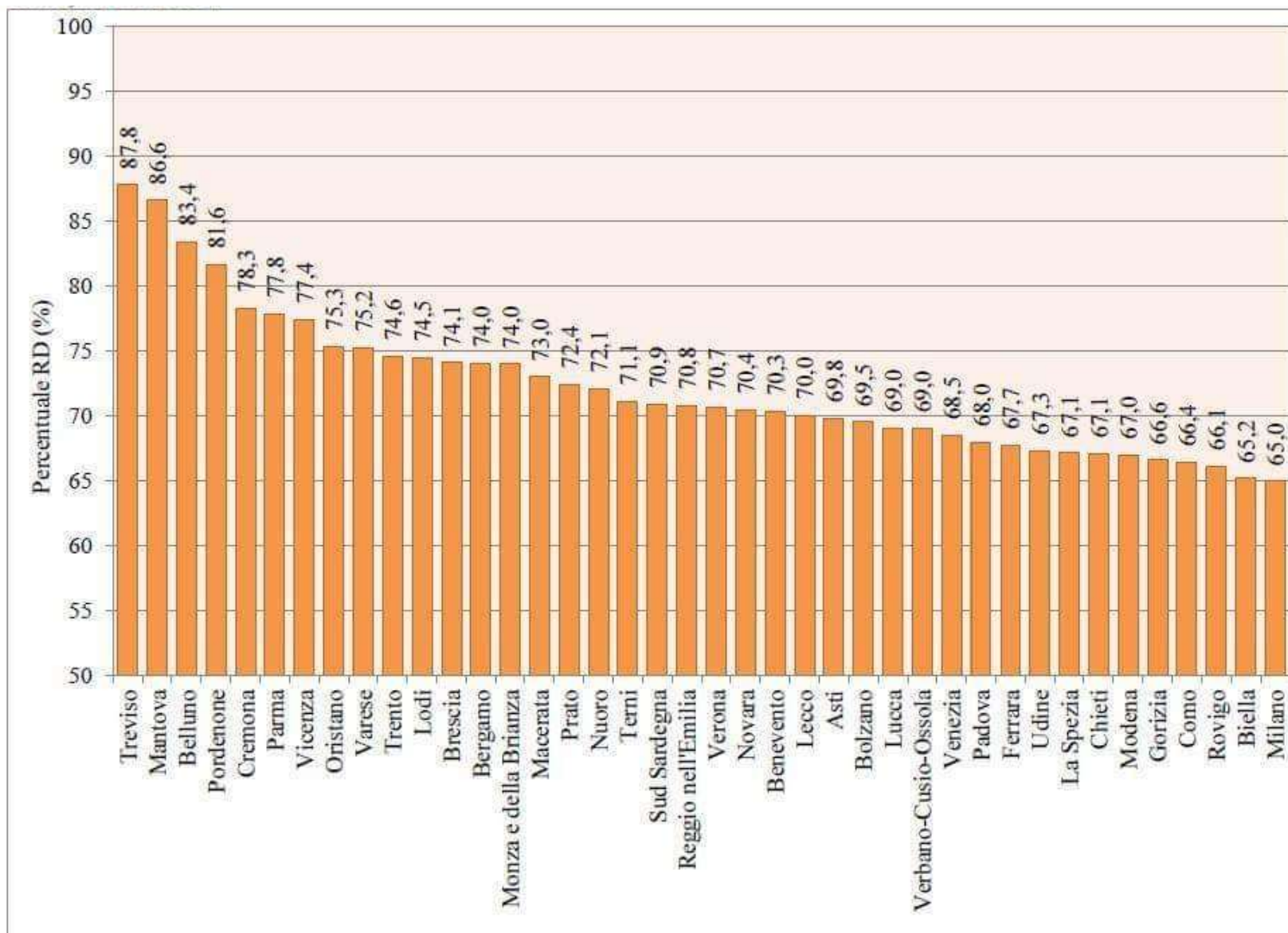
Evolution of separate collection and waste generation in Capannori 2004-2013 (in Kg/person/year)







Topmost provinces



...WHAT ABOUT RESIDUAL WASTE?



The problems of incineration in an ever-changing context

- Increasing importance of secondary raw materials
 - “resource scarcity crisis”, circular economy
- Drivers and directions coming from International policies
 - Increasing importance of reduction/recycling
 - Increased targets (likely to be) adopted
- Decarbonisation of energetic production → decreasing “marginal value” of WtE
- Dwindling amounts of residual waste
- *Financial risks connected to incineration*



The Landfill Directive, 99/31

- mandates reduction of biodegradable municipal waste to be landfilled
- mandates pretreatment of the waste to be landfilled



What does residual waste look like in a Municipality at 80% separate collection

organics ↑

	Prov. Lucca		Capannori	
Categorie merceologiche	% (peso/peso)		% (peso/peso)	
Materiale organico da cucina;	25,12%	↑	14,84%	}
Materiale organico da giardino;	9,16%		4,36%	
Giornali (quotidiani e riviste);	5,09%		0,95%	
Cartone ondulato;	6,12%		0,06%	
Cartone teso;	2,49%		0,27%	
Imballaggi cellullosici poliaccoppiati;	0,98%		1,46%	
Altra carta (non imballaggio e non giornali e riviste);	5,68%		9,77%	}
Imballaggi flessibili in alluminio;	0,28%		1,07%	
Imballaggi rigidi in alluminio;	1,00%		0,00%	
Imballaggi in acciaio;	1,20%		9,35%	
vetro;	2,11%		1,26%	
Imballaggi flessibili in plastica;	8,76%		1,60%	}
Imballaggi rigidi in plastica (bottiglie e flaconi);	2,08%		0,61%	
Imballaggi rigidi in plastica (non bottiglie e flaconi);	1,96%		1,17%	
Imballaggi flessibili in plastica;	0,64%		1,91%	
Altra plastica: sacchi neri;	4,83%		0,61%	
Altra plastica: non imballo;	2,88%		8,05%	
Imballaggi in legno;	0,72%		5,75%	
Tessili e cuoio;	9,08%		17,30%	
Materiali inerti,	0,22%		2,64%	
Pannolini;	6,07%		13,65%	
RUP;	0,30%		0,30%	
Sottovaglio < 20mm.	3,25%		3,05%	
TOTALE	100%		100%	

10-15% paper

15-25% plastics



Goals

- Maximise material recovery
- Minimise reliance on landfill
- Minimise impacts of landfilling
- Keep the system **ADAPTABLE!**



What's best to do with the "Leftovers" on the way to Zero Waste?

By

Dr. Jeffrey Morris

Dr. Enzo Favoino

Eric Lombardi

Kate Bailey



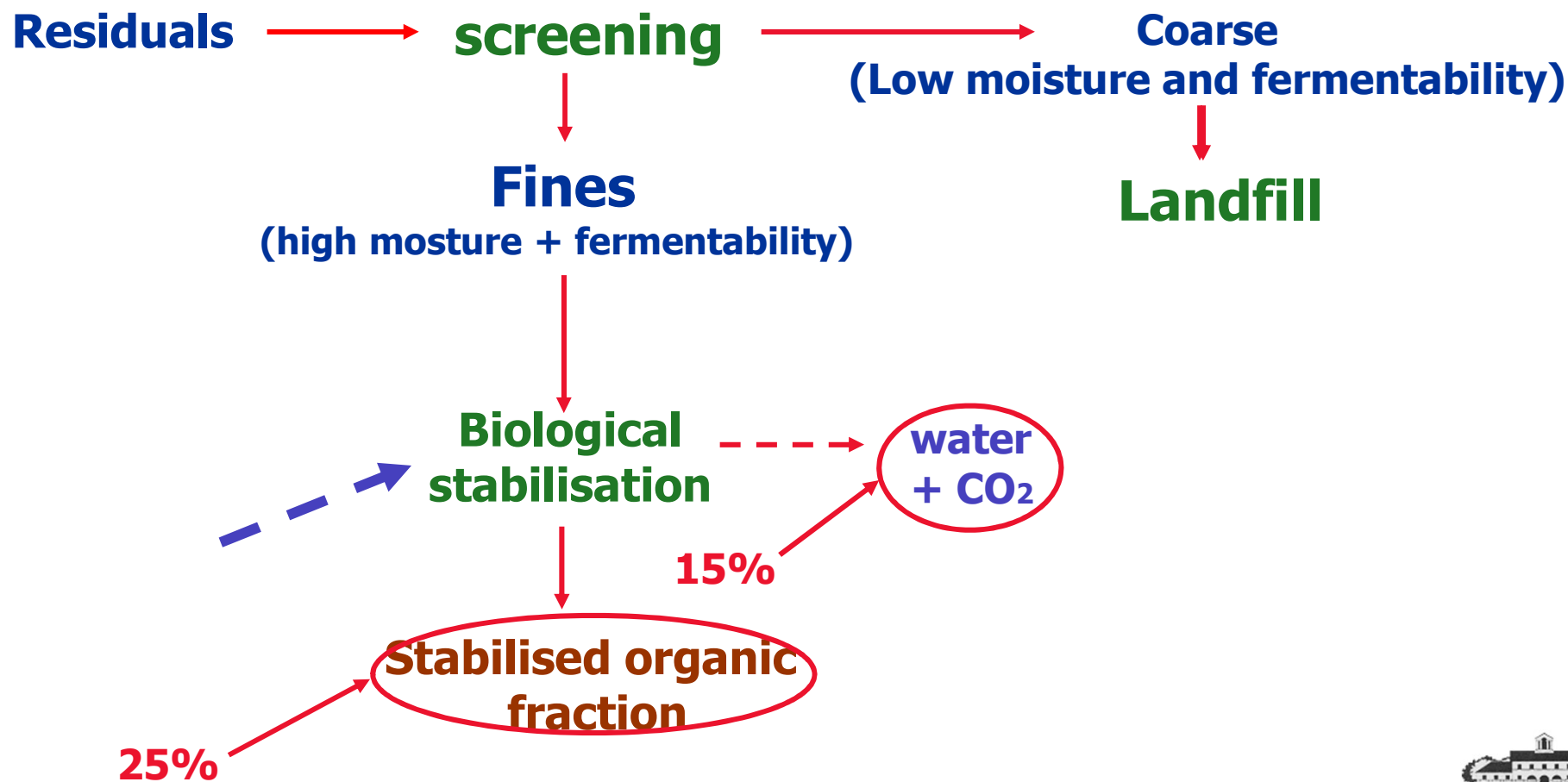
www.ecocycle.org/specialreports/leftovers

Operational goals

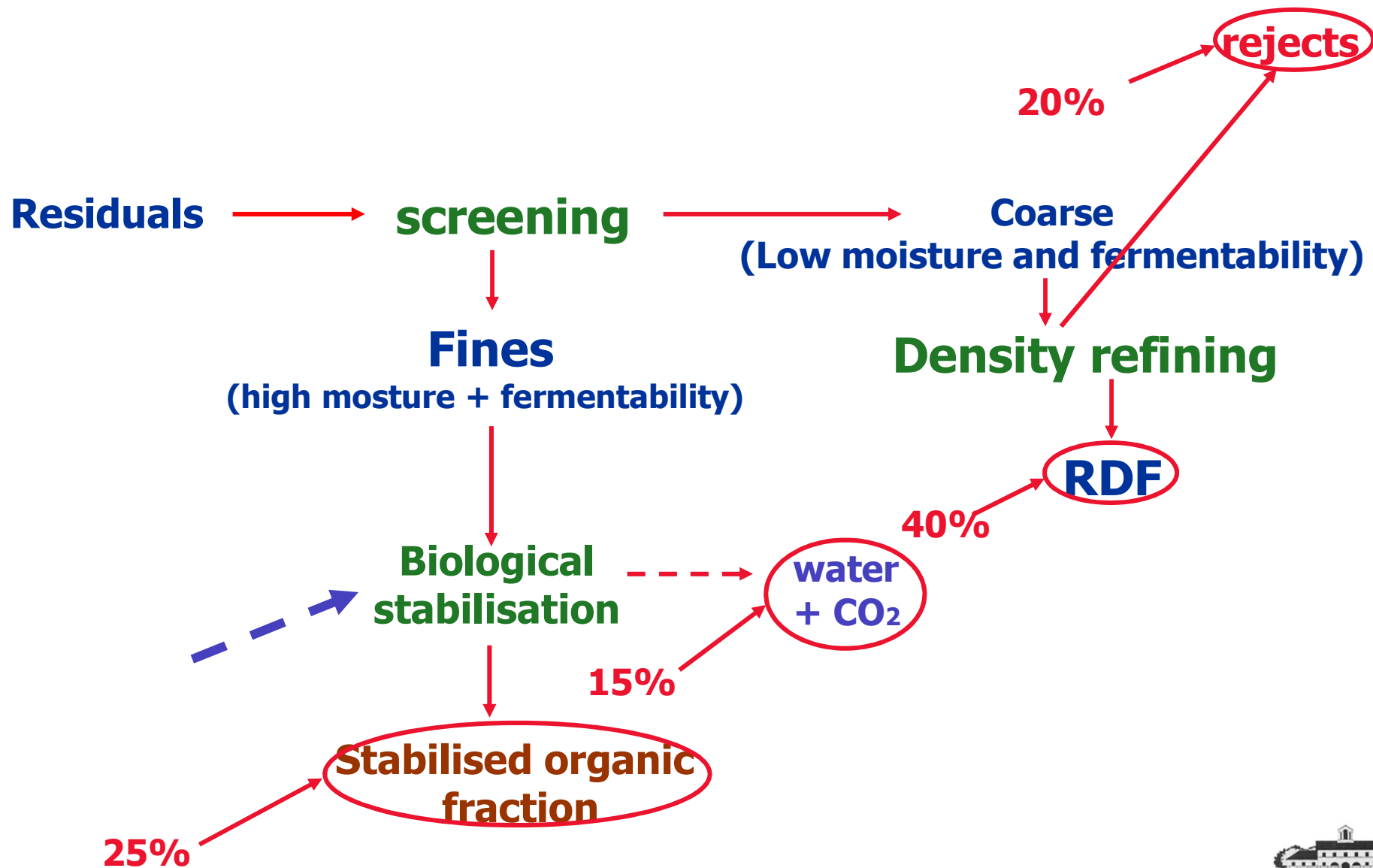
- Recover Fe and non-Fe metals
- Recover high-value polymers (HDPE, PET...)
- Recover board / paper
- Stabilise organics before landfilling



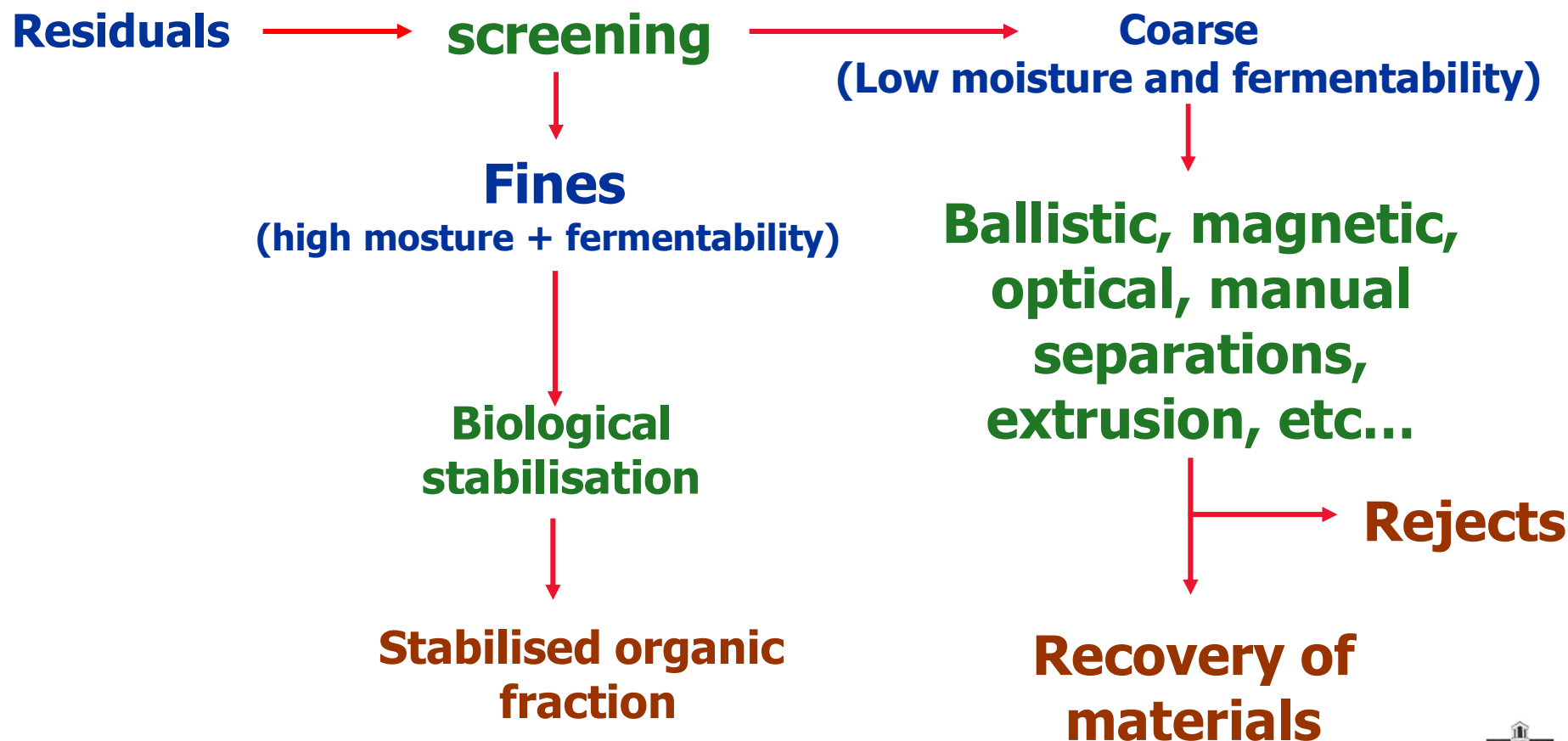
Flow-sheet – traditional MBT



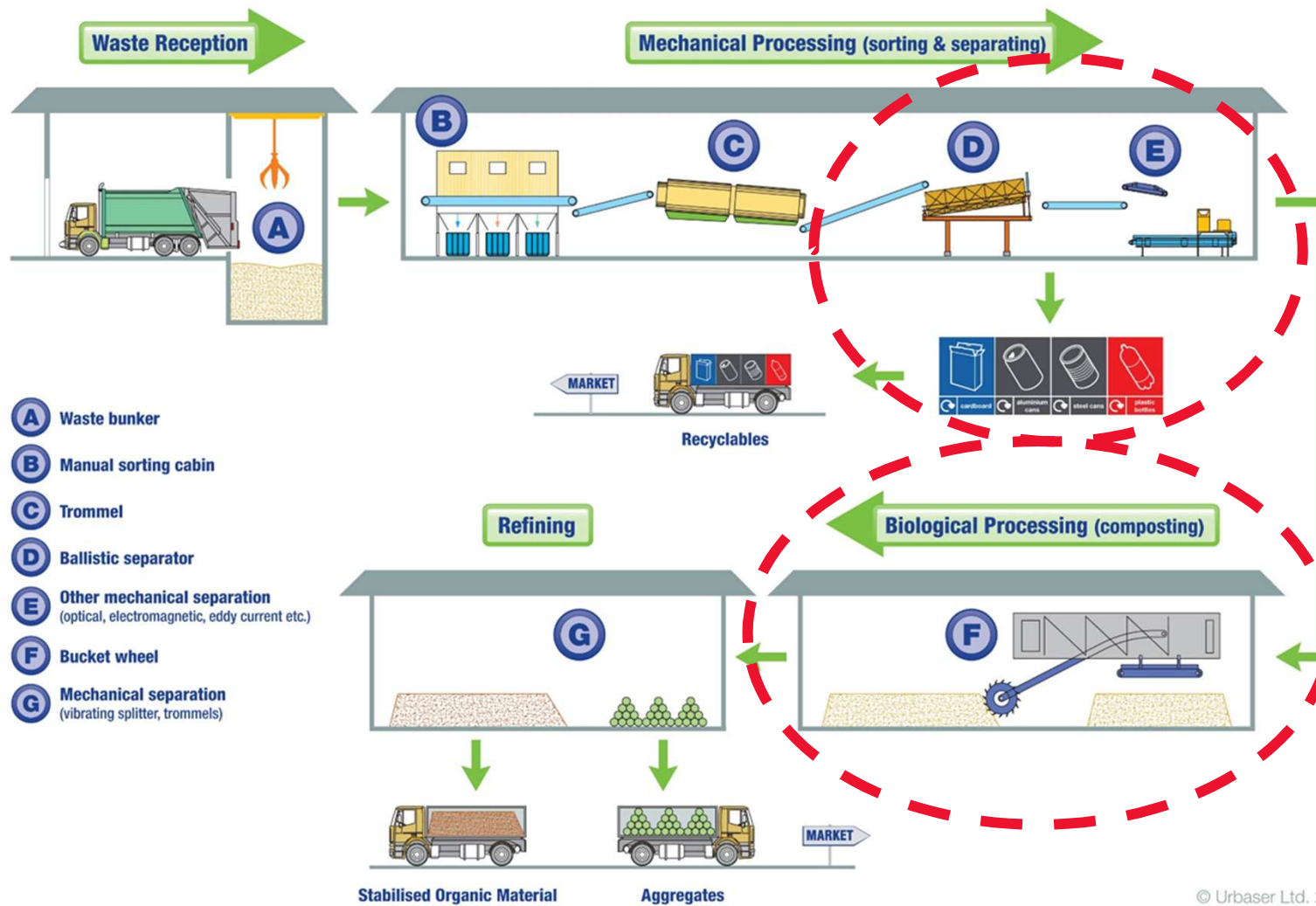
Flow-sheet – traditional MBT



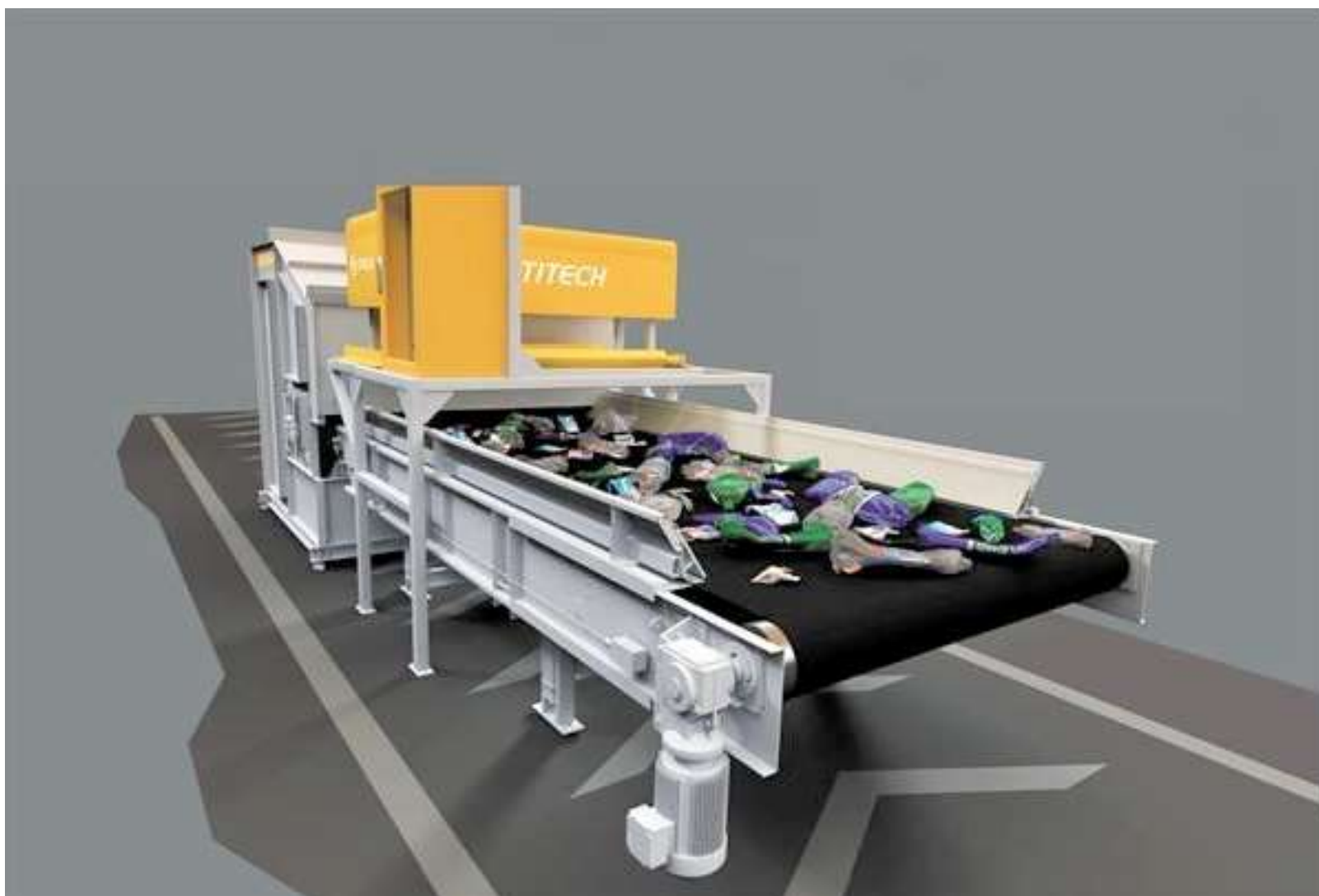
Flow sheet - MRBT



What is MRBT







Rejects?



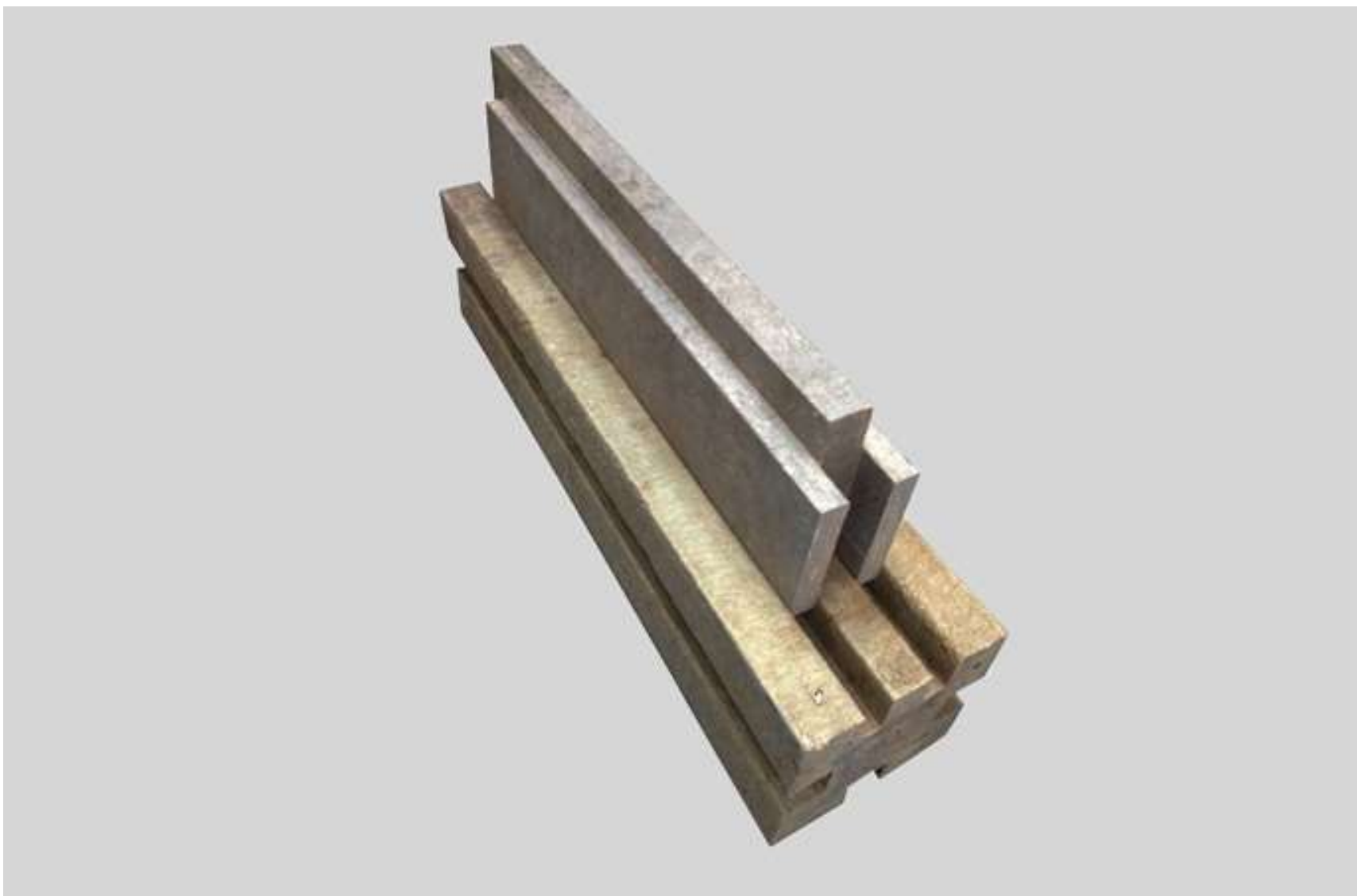
Densification / extrusion











MRBT - Potential recovery rates

Material	Recovery rates (%)
Corrugated Board, mixed paper	75%
PET, coloured HDPE and opaque HDPE	90%
Ferrous and non-ferrous metals	95%
Glass	Easily 25%; higher rates possible



Foodstuffs in residual waste after kerbside collection

Municipality	% Food waste
Altivole	7,82
Arcade	8,24
Breda di Piave	7,61
Casale sul Sile	9,42
Castello di Godego	8,05
Cessalto	6,30
Conegliano	9,40
Cornuda	7,19
Giavera del Montello	6,88





Mass balances – a few remarks

- Recovery of materials already diffused at MBT sites
 - From easiest/least recovery (typically, metals) to more ambitious ones (metals, plastics, paper)
 - Drainage of organics disclosing opportunities
- Amount of rejects remarkable (50-60%)
 - (this is why we prioritise separate collection...)
 - Waste to landfills is stabilised!
 - We landfill tonnages, not percentages







A comparison

777 kgs/person.yr



**52% incinerated
= 405 kgs/person.yr**



**25% slags/ashes
= 101 kgs/person.yr**

350 kgs/person.yr



**85% recycled
Residual waste = 50 kgs/person.yr**



**Committed to reduce residuals
by a further 80%
= 10 kgs/person.yr
(before processing)**



Benefits of “cool” treatment (MRBT)

- Scalable
 - Already affordable in the magnitude of a few tens of thousands t/y (e.g. 20.000 tpy)
- Cost competitive
 - 250-300 EUR/t installed capacity (BAT) vs. 1000+ EUR/t
- Fast to implement → prompt compliance with the obligation stipulated by the Landfill Directive
- Flexible / Adaptable



Work-in-progress

- Minimise organics in residual waste
 - Art 22 new WFD
- Improve recovery rates
 - Extrusion for low-grade plastics
- Consolidate markets
 - Green Public Procurement
 - MRC





Enzo Favoino



335 355446
favoinoenzo@gmail.com
