



Zelená ekonomika – problematika separovania odpadov.

Doc. RNDr. Miroslav Rusko, PhD. – Ing. Marek Hrabčák





THE LANCET

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Offline: Science and the breakdown of trust

Richard Horton ✉

Published: October 03, 2020 • DOI: [https://doi.org/10.1016/S0140-6736\(20\)32064-X](https://doi.org/10.1016/S0140-6736(20)32064-X)

Offline: Science and the breakdown of trust

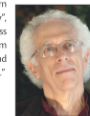
The COVID-19 pandemic is entering its most dangerous phase. There is a mounting breakdown of trust. Not only between politicians and the public. But also among politicians and publics with science and scientists. This breach of faith with science is far more threatening. For the public is slowly turning against those who have sought to guide the political response to COVID-19. As countries face a resurgence of coronavirus transmission, scientific advisers are recommending further restrictions to our liberties. There is now a palpable public reaction against these mandates. Whereas in March people were ready to stay at home to protect their health and health systems, the growing economic emergency that has followed national lockdowns is leading politicians to resist similar measures being applied once again. And it is scientists who are targets for public opprobrium. "Britain is in the grip of mad science", wrote one commentator last week. A UK Government minister was quoted as saying that "[Boris] Johnson has been totally captured by [Chris] Whitty and [Patrick] Vallance". "Boris is now a prisoner of the scientists", ran a newspaper headline. Robert Dingwall, a professor of sociology, wrote "we have found ourselves in the hands of a scientific and medical elite with limited understanding of humanity and its needs".

The reasons for this crisis in the science of COVID-19 are mostly self-inflicted. An early consensus about how to manage the spread of the virus has disintegrated. We see scientists splintering into factions. In the UK, the breach began with the formation of an independent Scientific Advisory Group for Emergencies (SAGE), chaired by a former Chief Scientific Adviser to the government. Independent SAGE holds weekly press briefings and produces reports that frequently differ from advice given by the official SAGE. The rupture continued with increasingly personalised attacks. Oxford University's Carl Heneghan and Tom Jefferson wrote that "it is unfortunate that Mr Johnson is surrounded by mediocre scientific advisers". Heneghan, Jefferson, and others went on to publish an open letter to the Prime Minister arguing that his existing policies, based on the advice of the current Chief Medical Officer (Chris Whitty) and Chief Scientific Adviser (Patrick Vallance), were causing "significant harm across all age groups". A counter-letter

expressed strong support for the policy "to suppress the virus across the entire population". The motives of government scientists are now being questioned in ways that are sure to erode public trust still further. Dingwall has suggested self-interest—"Laboratory scientists...need to justify their research funding". Another commentator has written that "the priority for the Government's army of boffins is to safeguard themselves". And it seems that some scientists advising the government have substantial financial interests in diagnostics and pharmaceutical companies working on COVID-19. The Mail on Sunday's headline last week was "Government test tsar has £70k shares in firm that sold us £3m of 'pointless' kits".

What are politicians and publics to do when they see scientists disagree? They will likely be perplexed that the evidence causing such catastrophic economic consequences seems so uncertain. That perplexity may quickly turn into mistrust when they hear scientists vigorously criticising one another or see scientific advisers with lucrative financial connections to industries likely to profit from the pandemic. For most scientific disagreements, time usually provides an answer as more evidence is accrued. But time is exactly what we don't have. What is the solution? First, it is not constructive for scientists engaging in debate to vilify colleagues with whom they disagree. The scientists advising government are certainly not "mediocres". Second, scientists with financial relationships to industries that are part of the COVID-19 response should consider either divesting those interests or removing themselves from their roles as advisers. And finally, when disputes about evidence do arise, scientists should do more to explain why those disagreements exist. Tzvetan Todorov, in his book *Defence of the Enlightenment* (2006), was surely right that "debate rather than consensus" characterises our modern era. We should not be afraid of disagreement. "Humanity", he wrote, "is condemned to seek truth rather than possess it". But Todorov also warned that "Too much criticism kills criticism." And worse, "Indiscriminate scepticism and systematic mockery have only an appearance of wisdom."

Richard Horton
richard.horton@lanet



„Vedci často nemajú jednotný názor na problém.“

(napr. COVID)

„Vedci v poslednej dobe stratili dôveru verejnosti.“

„Čo teraz s tým ?“

(R. Horton – The Lancet)



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„Vedci stratili dôveru verejnosti.“

Čo teraz s tým ?

- „Neurážať sa navzájom !“
- „Objasňovať odlišné koncepty“
- „Dôležitejšia je diskusia ako konsenzus“

(R. Horton – The Lancet)

Komu teda máme dôverovať ???



Aj skúsený kapitán narazí.

Ale ani nadšenie aktivistov
nestačí na riadenie.



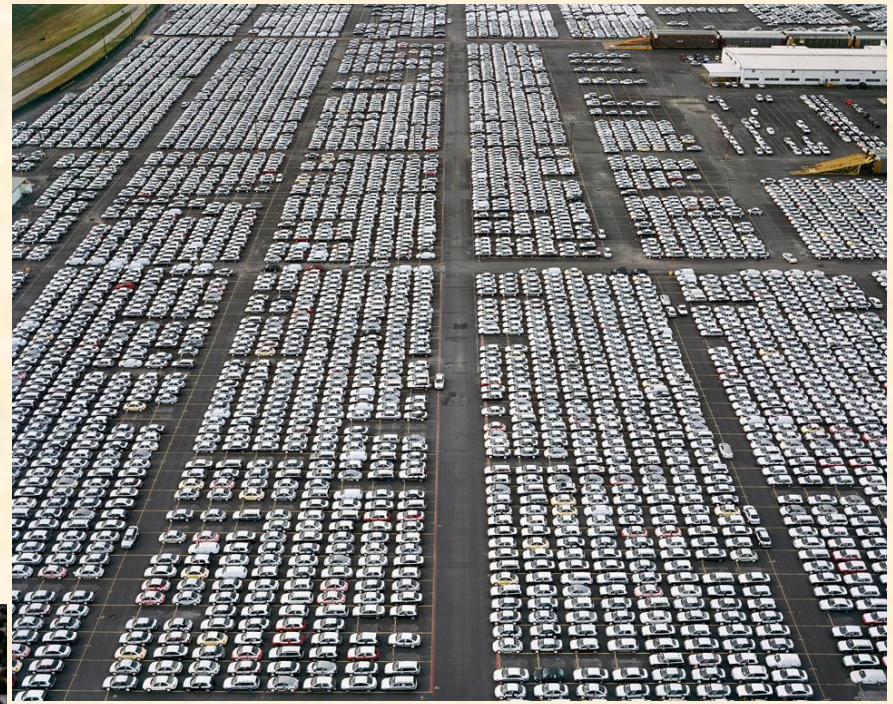


**Ekonomická situácia
v Európe XXI. st.
nám umožňuje
relatívne vysoký
blahobyt.**



PARADIGMY XX. storočia:

- Doprava
- Bývanie
- Infraštruktúra



Dôsledky XX. storočia :

- znečistenie
- odpady
- nedostatok surovín



Foto: E. Burtynsky



Waste hierarchy.

Ekológia a ekonomika.

Smernica 2008/98/ES ustanovila hierarchiu nakladania s odpadmi – „Waste hierarchy“ pričom zohľadňuje predovšetkým environmentálne aspekty tohto nakladania.

*Platí v reálnom živote známa fráza ? „**Čo je ekologické, je aj ekonomické !**“*

ZÁKLADNÉ OTÁZKY :

- sú nákladnejšie systémy OH aj efektívnejšie ?*
- prispievajú vyššie poplatky za OH k redukcii množstva TKO ?*
- povedie zavedenie skládkovej dane k zvýšeniu recyklácie ?*
- **prispela vysoká miera recyklácie k surovinovej bezpečnosti ?***



16.II.2020

EURACTIV

Nový plán pro oběhové hospodářství chce množství komunálního odpadu snížit na polovinu

„Množství komunálního odpadu by se mělo v nadcházejících 10 letech omezit o polovinu,“ slibuje dokument. O polovinu by se mělo snížit také užívání materiálových zdrojů, nicméně takový cíl je v dokumentu uveden v závorce, a bude tak ještě předmětem další debaty.



- 50%

???



16.2.2020

Evropská komise zamýšlí ve svém očekávaném akčním plánu pro oběhové hospodářství zcela oddělit ekonomický růst od využívání přírodních zdrojů. Samotný návrh by měl být oficiálně předložen v březnu.

???



8 July 2010

Breaking the link between economic growth and waste generation

High levels of waste production must be tackled as part of the move towards sustainable living. Recent research has used Sweden as a case study to assess the strength of suitable policies and strategies that are required to break the link between economic growth and waste generation.

Over the past few decades the amount of solid waste has grown alongside growth in Gross Domestic Product (GDP). For example, in the EU-15 the total quantity of municipal waste grew by 54 per cent per person between 1980 and 2005. In Sweden, manufacturing waste increased by 60 per cent over the same time.

8.7.2010

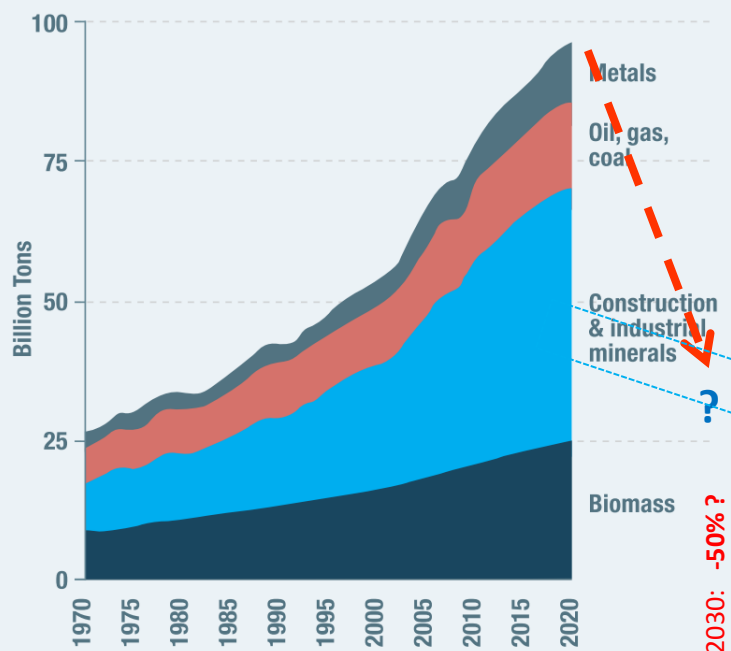


„Množství komunálního odpadu by se mělo v nadcházejících 10 letech omezit o polovinu,“ slibuje dokument. O polovinu by se mělo snížit také užívání materiálových zdrojů, nicméně takový cíl je v dokumentu uveden v závorce, a bude tak ještě předmětem další debaty.



FIGURE 2.

Global Use of Materials



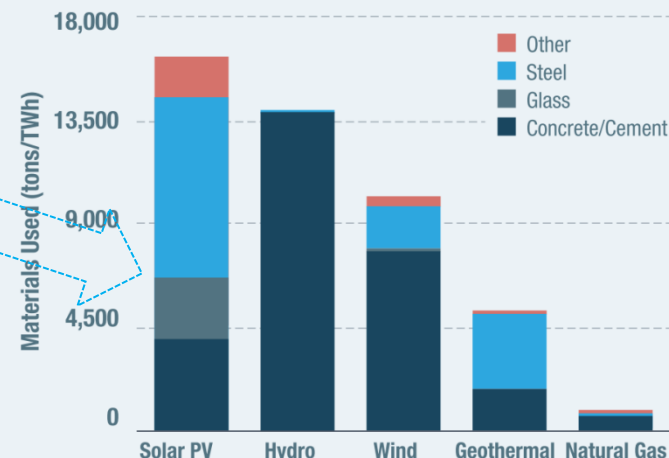
Source: Gillian Foster et al., "Sustainable Consumption and Production," in Stephan Lutter, Fred Luks, and Sigrid Stagl, eds., *Towards a Socio-Ecological Transformation of the Economy*, Institute for Ecological Economics / Vienna University of Economics and Business (January 2019); Circle Economy, "Circularity Gap Report 2020"

Chart: Manhattan Institute

Substitutes fossil energy

FIGURE 1.

Materials Requirements to Build Different Energy Machines



Source: U.S. Department of Energy (DOE), "Quadrennial Technology Review: An Assessment of Energy Technologies and Research Opportunities," September 2015, p. 390

Chart: Manhattan Institute





Emerging Challenges of Waste Management in Europe

Limits of Recycling

Key messages

The following key messages can be drawn from this report:

- There is **potential to increase the percentage of material collected for recycling** in the C&DW, MSW and WEEE waste streams. In absolute terms, the largest potential appears to exist in the MSW stream, calculated at approximately **111 or 139 million tonnes** (depending on the method used). In relative terms, WEEE shows the highest increase in potential recycling (**+103% or +112%**, depending on the method used);

Rotterdam, 6th March 2020

Client: European Environment Agency (EEA)
Direct Service Contract No EEA/HSR/19/003

Table 0-1 Current recycling rates versus estimated recycling potential, per waste stream

Waste stream	Current recycling rate	Recycling potential (bottom-up)	Change from current recycling (%)	Recycling potential (top-down)	Change from current recycling (%)
C&DW ³	74% ⁴	96%	+30%	96%	+29%
MSW	43%	80%	+88%	90%	+110%
WEEE	37%	78%	+112%	75%	+103%

Source: Own development.

Vyseparovat' ešte neznamená recyklovať !

Politici + Aktivisti - Odborníci

Emerging Challenges of Waste Management in Europe



Table 3-3 MSW material fractions and their recycling potential (EEA-32), as found in literature

Material fraction	Share of the waste stream (kt, %)	Maximum recycling potential (%)	Maximum recycling potential (kt)	Evidence base or assumptions
Food waste	73,793 (25%)	95%	70,103	World Economic Forum (2019).
Paper and board	53,131 (18%)	96%	50,894	IMPACTPaperRec (2016).
Plastic	35,421 (12%)	70%	24,794	Nordic Council of Ministers (2014).
Other combustible	29,517 (10%)	43%	12,646	<i>The make-up of this material fraction is unknown and no definition could be found. The current recycling rate of EEA-32 countries was used as a proxy.</i> ²²
Other	23,614 (8%)	43%	10,117	<i>The make-up of this material fraction is unknown and no definition could be found. The current recycling rate of EEA-32 countries was used as a proxy.</i> ²³
Garden waste	17,710 (6%)	100%	17,710	Danish Environmental Agency (1999).
Glass	14,759 (5%)	77%	11,305	Dutch Waste Management Association (2015).
Rubble	14,759 (5%)	96%	14,192	The maximum estimated potential recycling rate of mineral C&DW (as found in section 3.1.3) was used.
Textiles	11,807 (4%)	74% ²⁴	8,737	Bartl (2018)
Nappies and other sanitary products	8,855 (3%)	70%	6,199	EC (n.d. ²⁵).
Steel	5,903 (2%)	95%	5,608	Deloitte (2018)
Aluminium	2,952 (1%)	97%	2,863	Green Alliance (2018)
White goods	2,952 (1%)	75%	2,215	Estonia's national household waste (WEEE), the same as such applied as a proxy for WEEE. Eurostat, 2018.
Total	295,171 (100%)	80%	237,383	

Limits of Recycling



“... NOT EVERYTHING THAT CAN BE COUNTED COUNTS, AND NOT EVERYTHING THAT COUNTS CAN BE COUNTED.”
 Albert Einstein

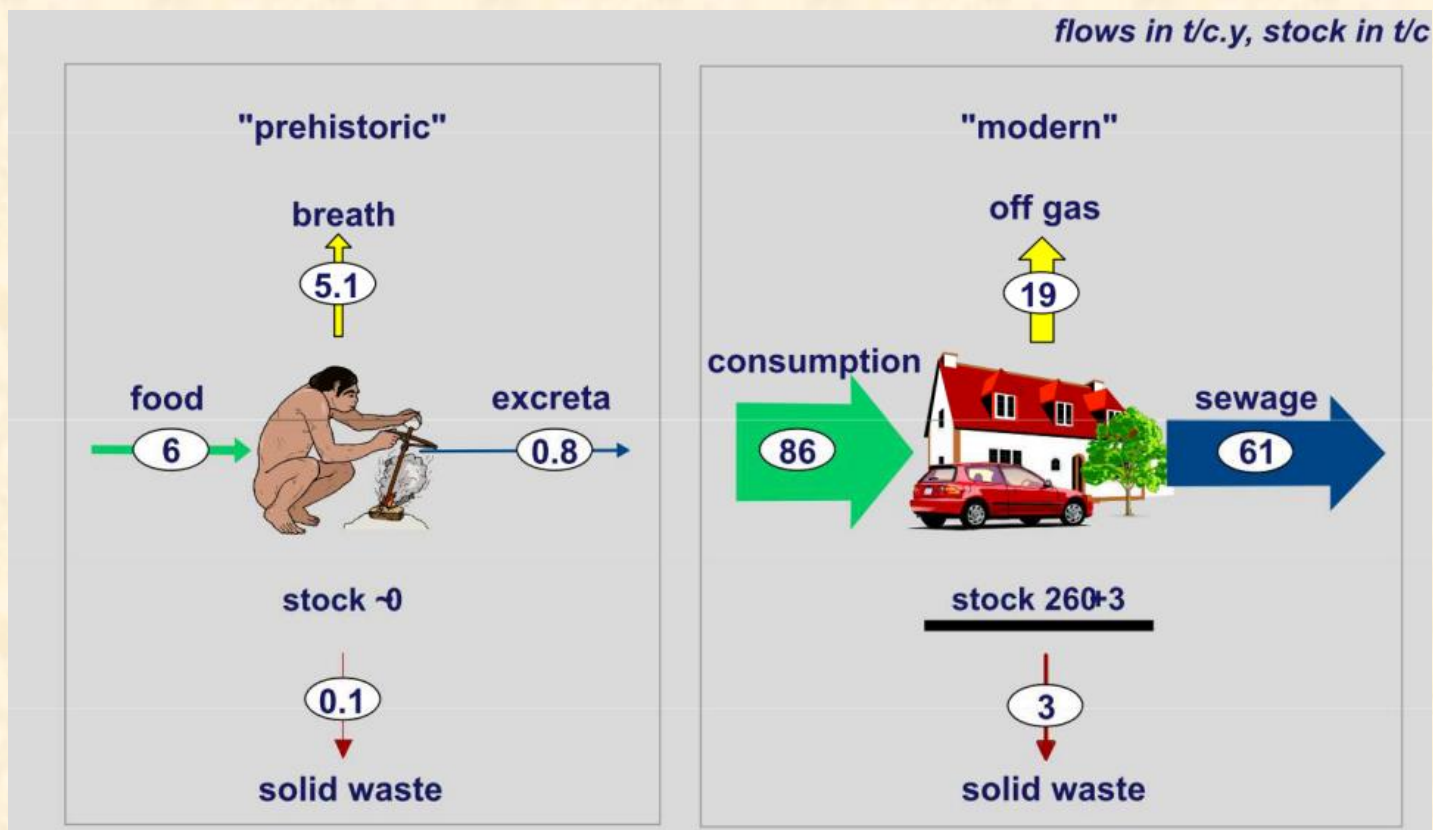


Politici - Aktivisti - Odborníci:



Odpady ako prirodzená súčasť URBAN METABOLISM :

- čím väčšia ekonomická aktivita,
- tým bohatšie statky,
- (ale aj produkcia odpadov...)





Politici - Aktivisti - Odborníci:



Lifestyle Germany
example food (source: Menzel, So isst der Mensch, 2005)



"Lifestyle" Ecuador
example food (source: Menzel, So isst der Mensch, 2005)

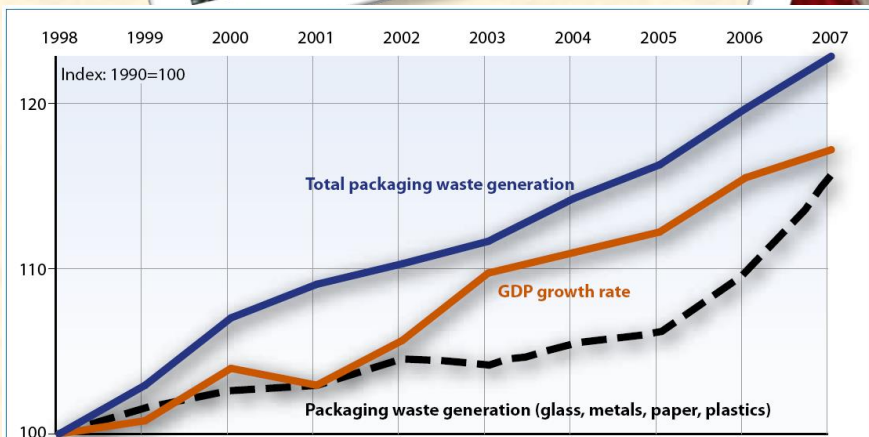
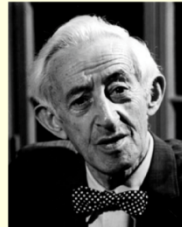


Figure 6: Trend in GDP and packaging waste growth from 1998 to 2007 in EU15

Source: EEA (2009)

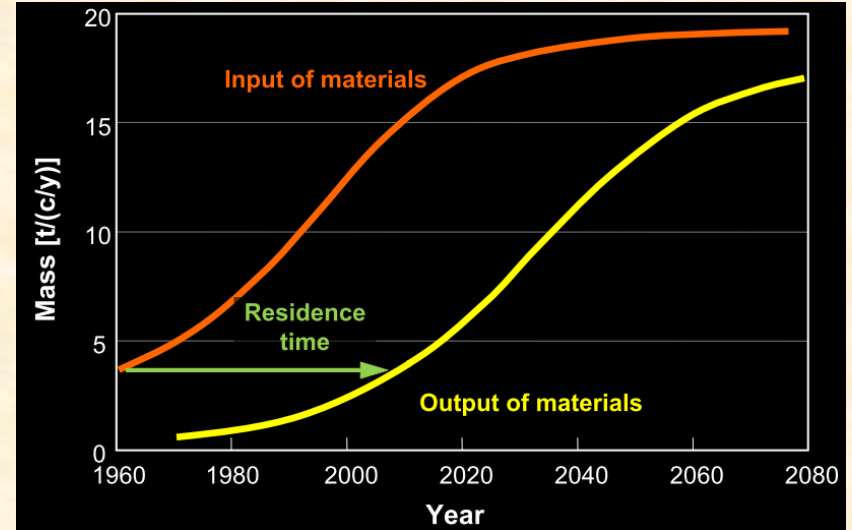
Urban Metabolism

Urban metabolism might be defined as *the sum total of the technical and socioeconomic processes that occur in cities, resulting in growth, production of energy, and elimination of waste.*



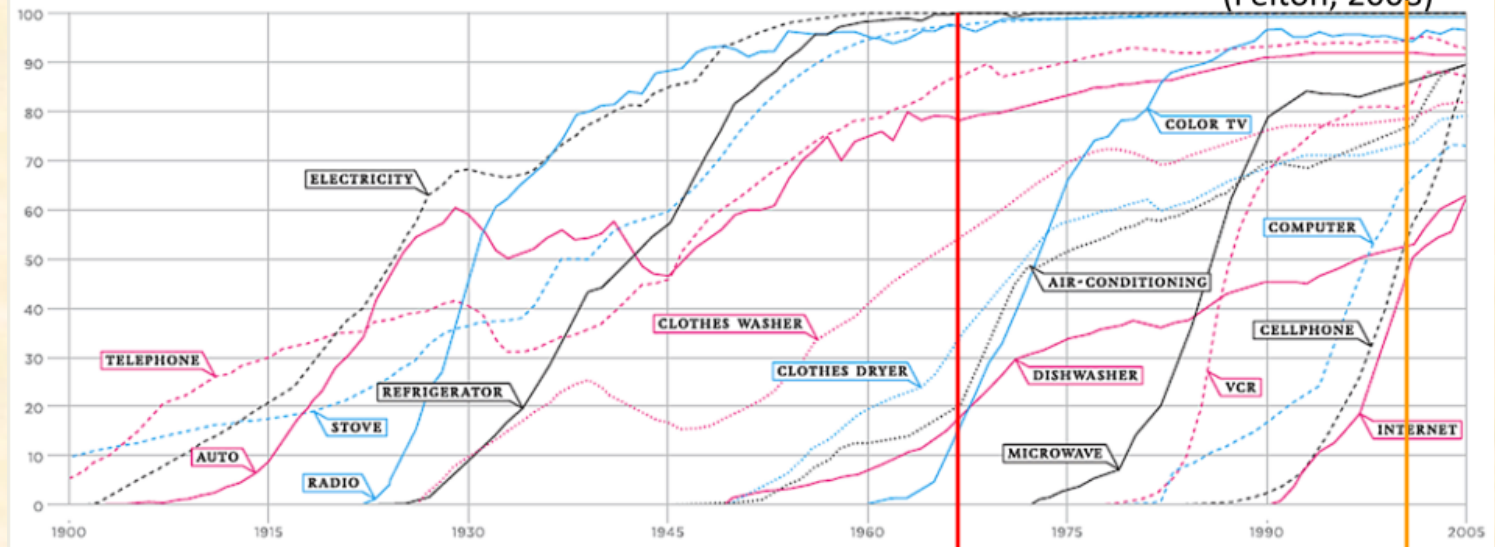
ABE WOLMAN
1892-1989

Ecological analogy – the city as a “superorganism”



PERCENT OF U.S. HOUSEHOLDS

CONSUMPTION SPREADS FASTER TODAY (Felton, 2008)



Travis Wagner, Ph.D.
Department of Environmental Science
University of Southern Maine

The Great Acceleration = growth & adoption of technology and consumption unprecedented



Politici - Aktivisti - Odborníci:



TABLE I: MSW PRODUCED IN 1995 AND 2016(KG/CAPITA) ADOPTED FROM [10] AND SHARE OF LANDFILL DISPOSAL (%) ADOPTED FROM [11]

Country	1995	2016	2017	Waste treatment – landfill, 2016 (share of landfill disposal)
Austria	480	552	570	3%
Belgium	446	414	409	1%
Bulgaria	831	404	416	64%
Cyprus	593	592a	637	81%
Czech Republic	312	339	344	50%
Denmark	521	777	781	1%
Estonia	370	327	390	12%
Finland	437	504	510	3%
France	476	510	513	22%
Germany	621	625	633	1%
Greece	331	498	-	52%
Hungary	377	380	385	51%
Ireland*	430	615	-	22%
Italy	468	436	489	28%
Latvia	184	367	438	72%
Lithuania	542	422	455	31%
Luxemburg	587	614	607	17%
Malta	387	584	604	92%
Netherland	509	518	513	1%
Poland	284	307	315	37%
Portugal*	351	483	487	49%
Romania	254	228	272	80%
Slovakia	294	344	378	66%
Slovenia**	469	434	471	24%
Spain	365	443	462	57%
Sweden	386	442	452	1%
United Kingdom*	501	476	-	28%

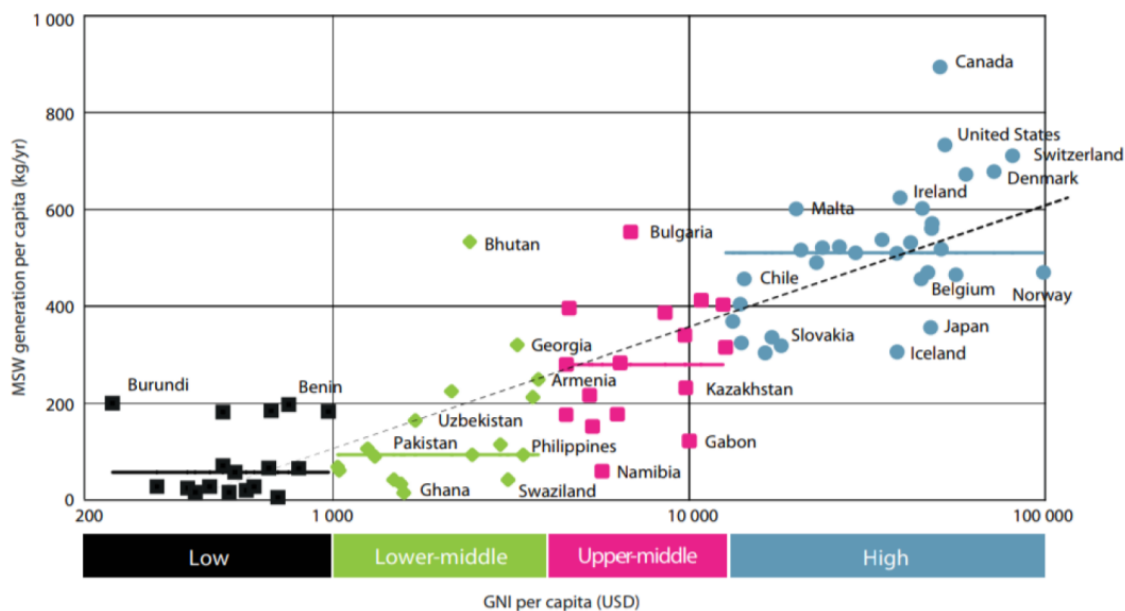
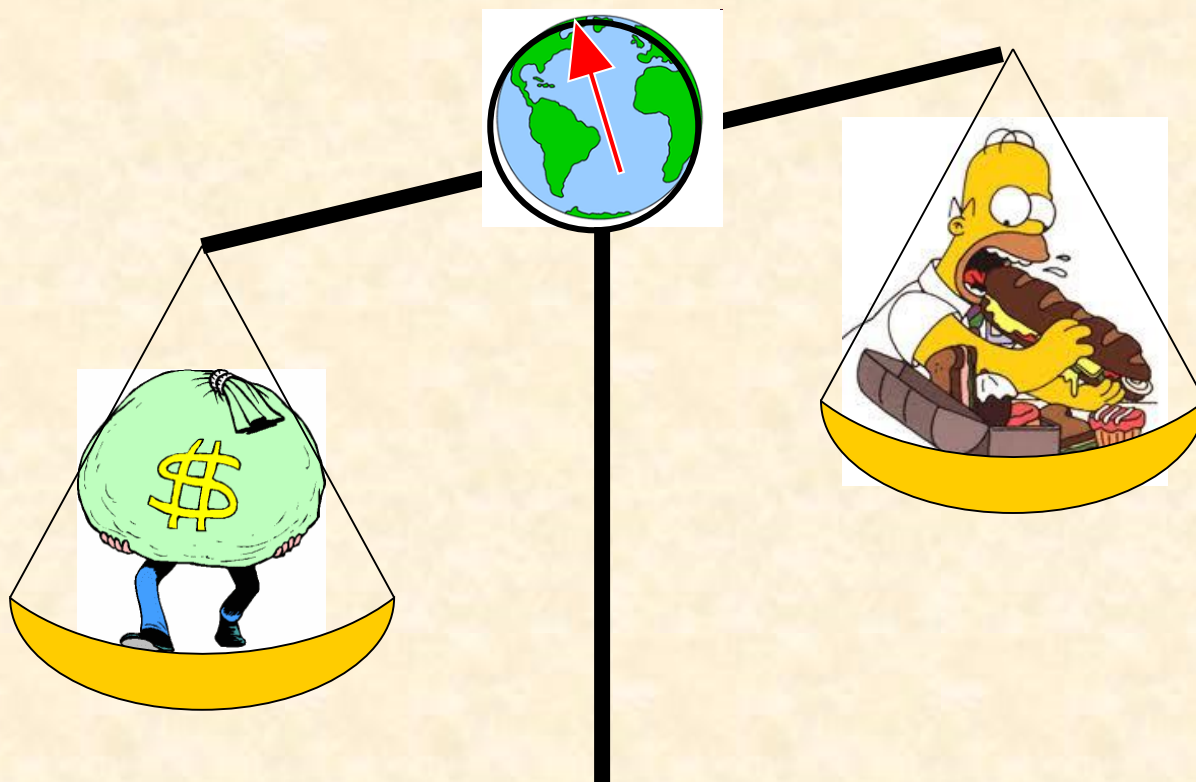


Figure 2. Relation of municipal solid waste generated per capita (kg/year) with the income level of the country in US dollars [5].



$$\text{Consumption} = a \cdot \text{Income}^b$$

Income elasticity = b



Ministry of Finance Alena Schillerová. |
Foto: [Petr Topič](#), [MAFRA](#)

"Podpořme chuť utrácet,
což pomůže znovu roztočit kola
české ekonomiky....."
(17.9.2020 – A. S.)

When income increases by 1% - consumption increases by b%

When **GDP** increases by 1,0% - **MSW** increases by 0,7%

(A. Mavropoulos, 2010)

- Julia K. Steinberger, Fridolin Krausmann
- Marina Fischer-Kowalski, Nina Eisenmenger
- International Society of Ecological Economics
- Oldenburg/Bremen, Germany
- August 22-25 2010



Ecology, 85(7), 2004, pp. 1771-1789
© 2004 by the Ecological Society of America

TOWARD A METABOLIC THEORY OF ECOLOGY

JAMES H. BROWN,^{1,2,4}

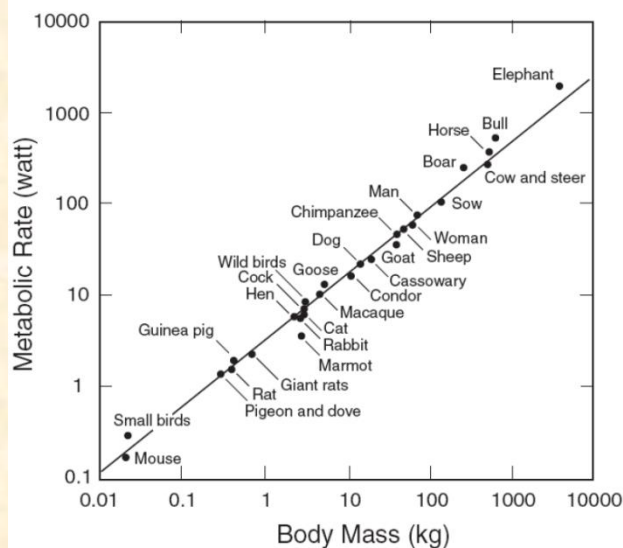
with JAMES F. GILLOOLY,¹ ANDREW P. ALLEN,¹ VAN M. SAVAGE,^{2,3} AND GEOFFREY B. WEST^{2,3}

¹Department of Biology, University of New Mexico, Albuquerque, New Mexico 87131 USA

²Santa Fe Institute, 1399 Hyde Park Road, Santa Fe, New Mexico 87501 USA

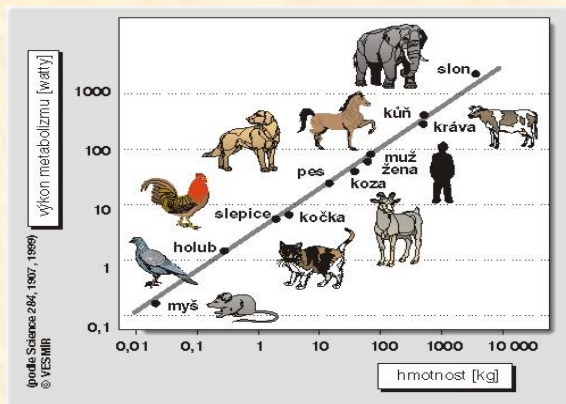
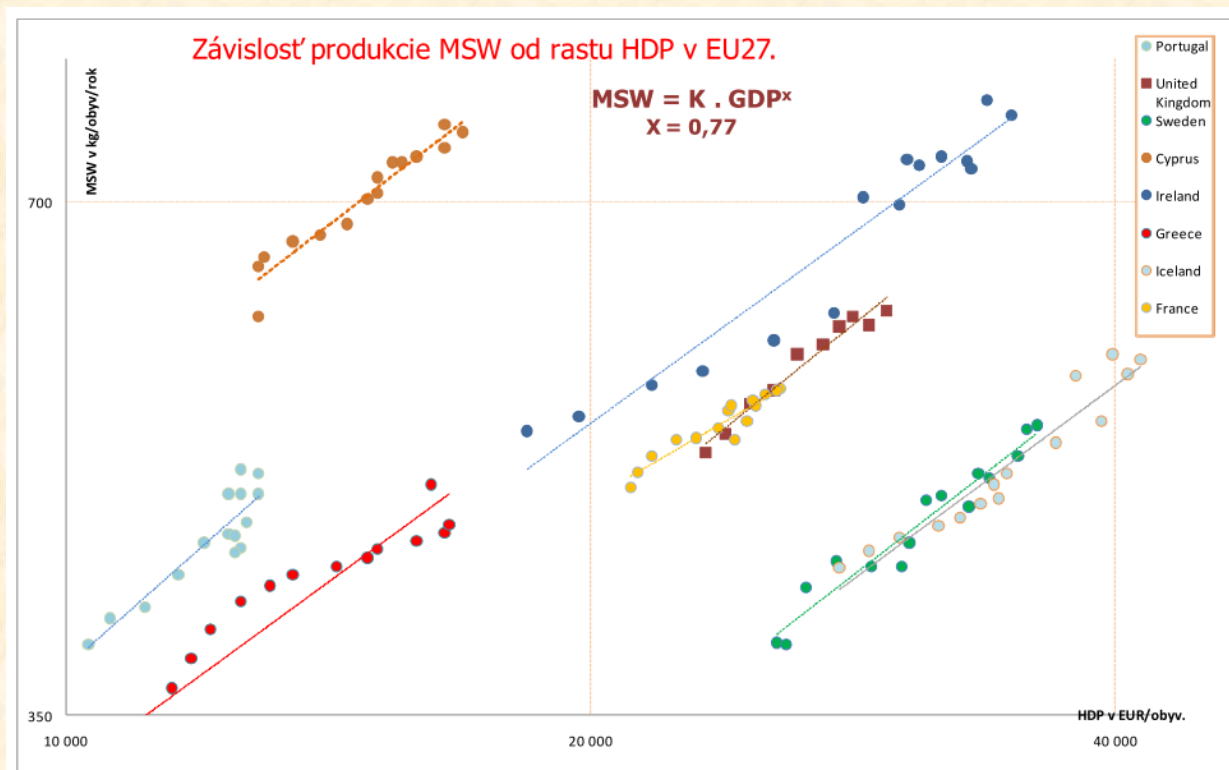
³Theoretical Division, MS B285, Los Alamos National Laboratory, Los Alamos, New Mexico 87545 USA

$$\text{Consumption } n = a \cdot \text{Income}^b$$



$$B \sim M^{3/4}$$

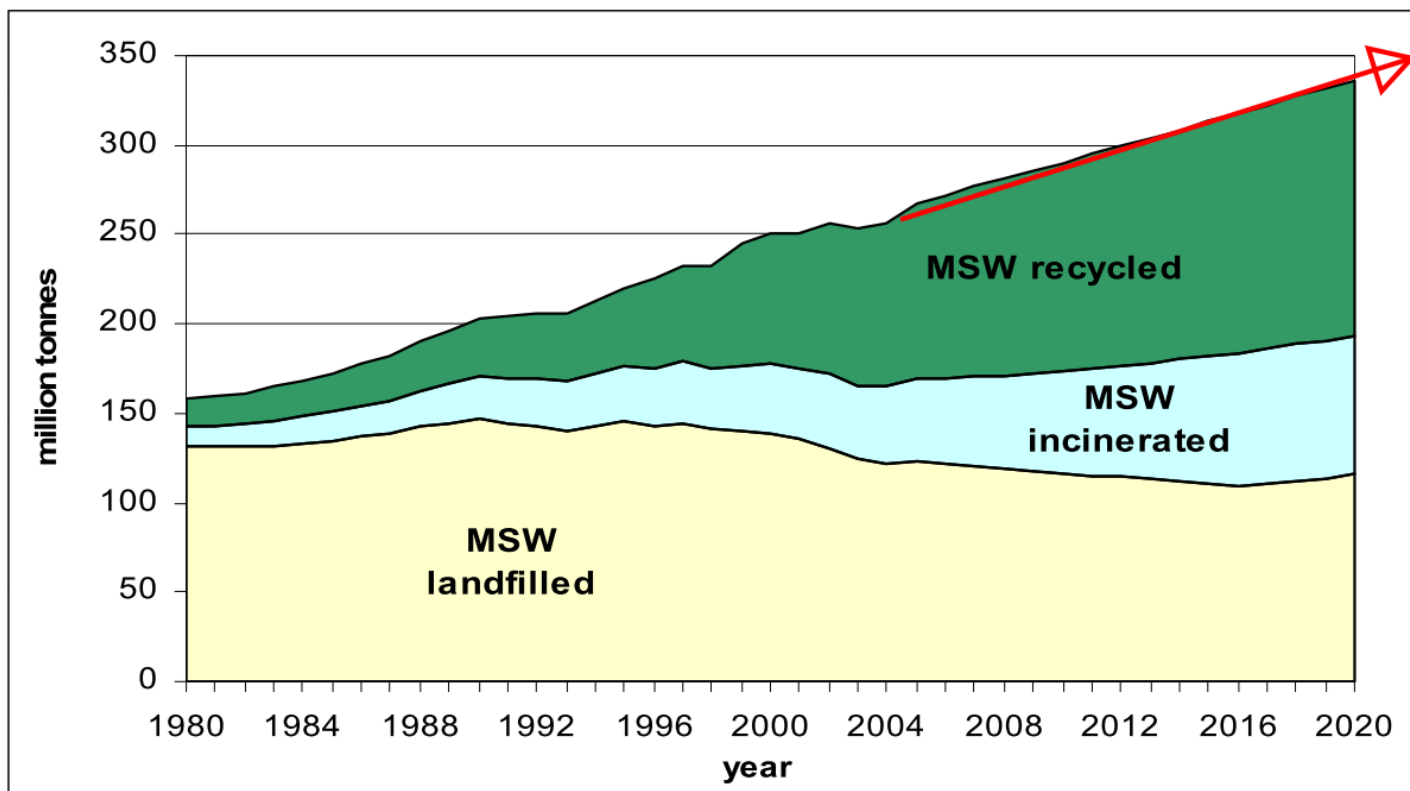
$$\text{Waste} = a \cdot \text{Consumption}^b$$





Projection for management of municipal waste in the EU

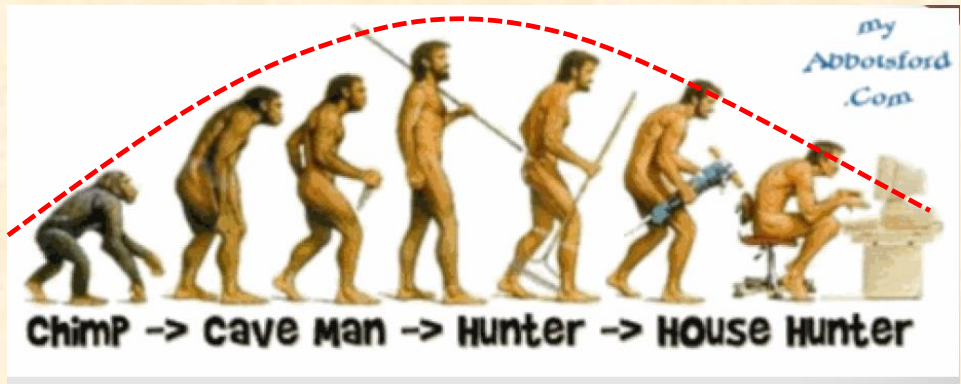
In 2020: landfilling 34%, incineration 23%



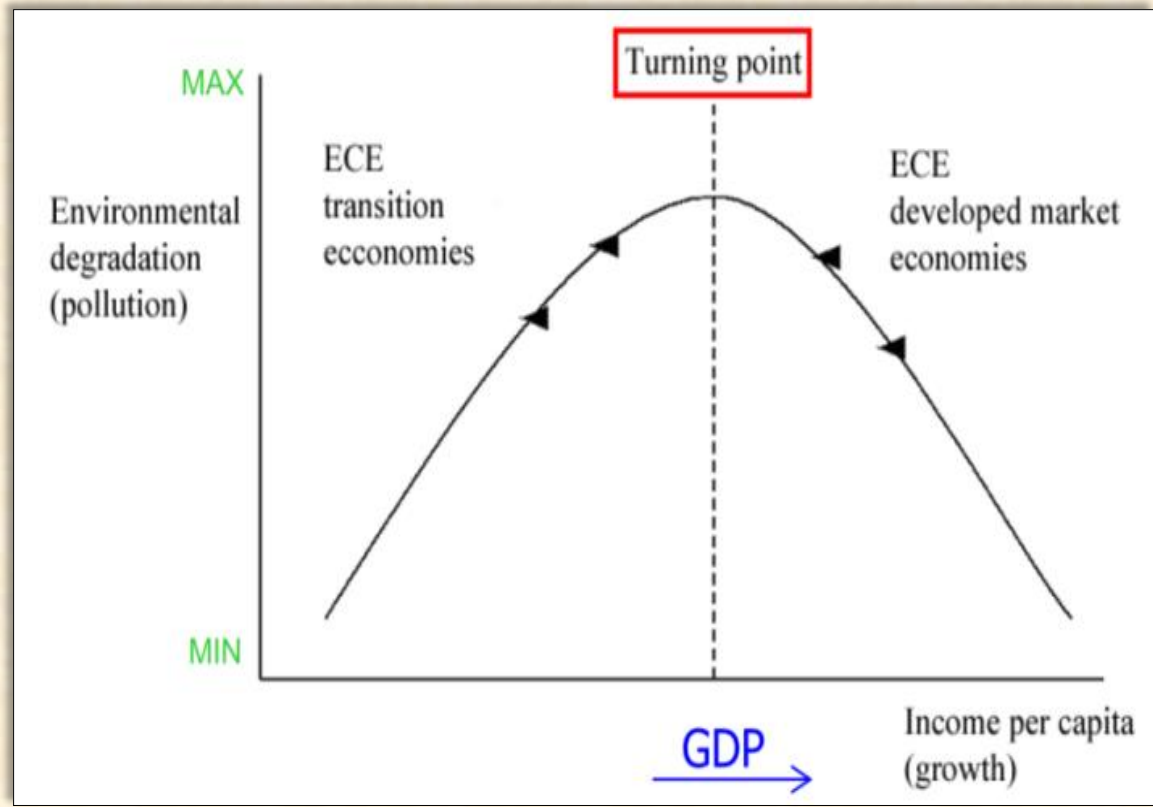
„Facts do not cease to exist because they are ignored...”



Politici - Aktivisti - Odborníci:



Kuznetes environmental curve (EKC).





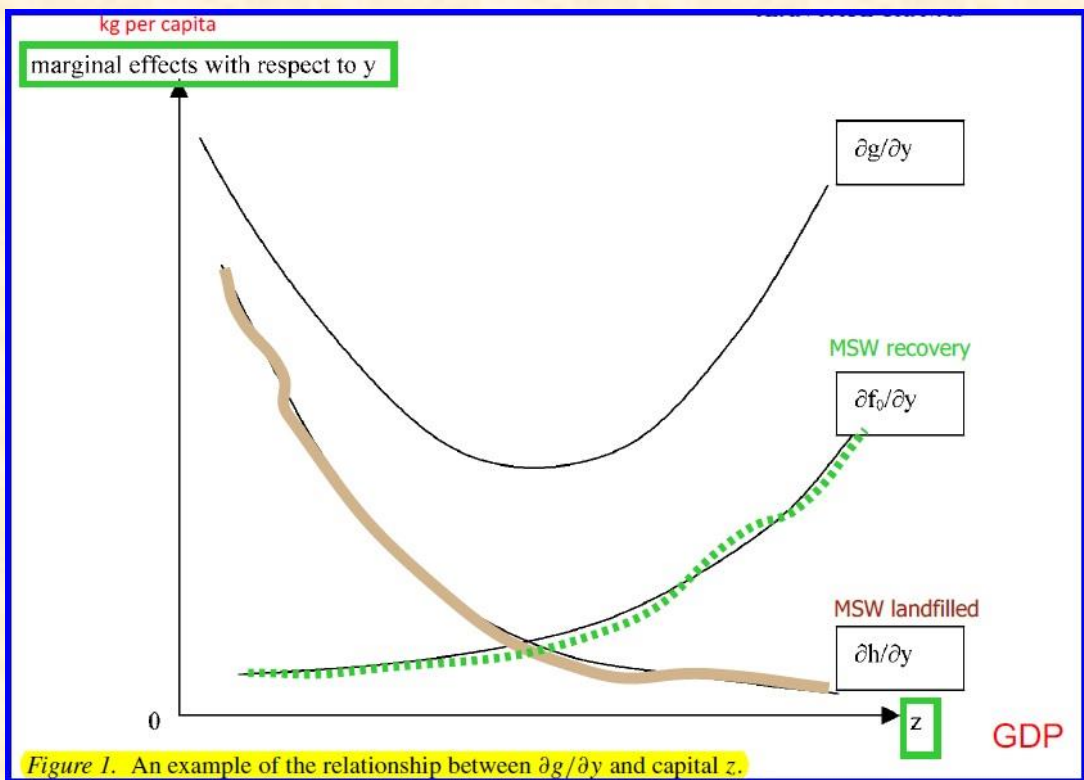
Politici - Aktivisti - Odborníci:



The Determinants of MSW Generation,
Disposal and Recycling:
A Note on OECD Inter-Country
Differences

Katia Karousakis
University College London (UCL)

- Countries with higher GDP per capita perform better in terms of diverting waste away from landfill disposal, and achieve higher recycling rates for both paper/cardboard and glass

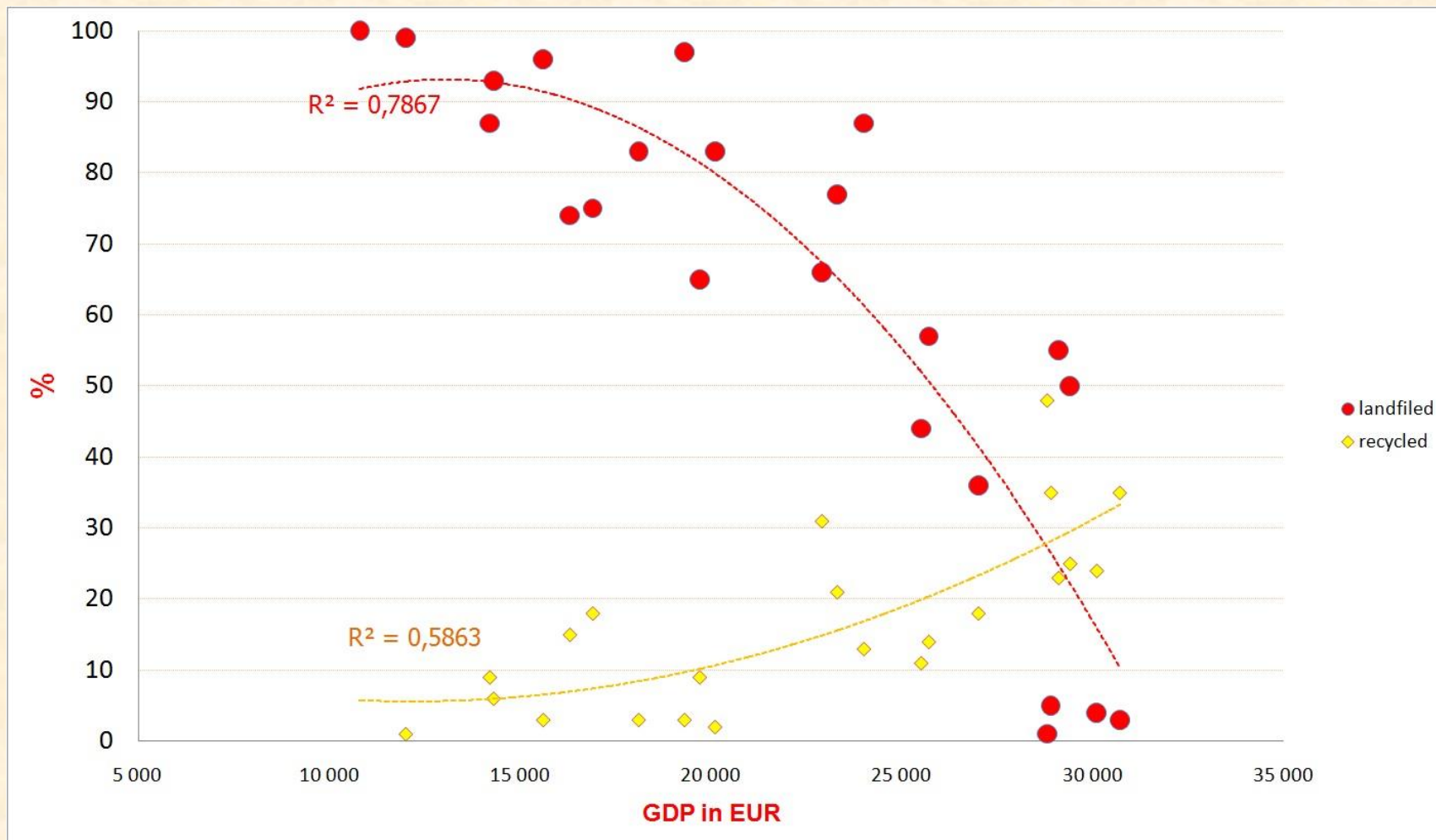




Politici - Aktivisti - Odborníci:



Landfilled and recycled in EU 27 (EUROSTAT 2008)



„Countries with an advanced waste treatment system produce **more** waste.“

(Kloek, V. Eurostat 2010)



Utopistické predstavy enviro-aktivistov

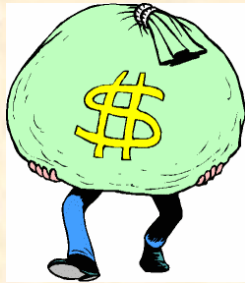
„Spoločnosť priateľov Zeme navrhla konkrétne znenie novely zákona o odpadoch, ktorá by zvýšila poplatok za uloženie odpadov na skládku.

Každý rok by jeho výška narastala až do času, pokiaľ by skládkovanie bolo ekonomicky nevýhodnejšie ako separovaný zber a recyklácia alebo kompostovanie bioodpadov.

K nárastu poplatkov za odpady by nemuselo dôjsť vôbec, resp. len minimálne, lebo zvýšenie cien za skládkovanie by kompenzoval bezplatne zabezpečený separovaný zber veľkej časti domového odpadu.

Taktiež sa nepotvrdili obavy z výrazného nárastu divokých skládok v krajinách, kde tzv. skládkovú daň zaviedli.“

L.Hegyí, Spoločnosť priateľov Zeme, Košice – časopis ODPADY č. 1/2001



Contents lists available at ScienceDirect

Resources, Conservation and Recycling

journal homepage: www.elsevier.com/locate/resconrec



Issues and options in waste management: A social cost-benefit analysis of waste-to-energy in the UK

Tooraj Jamasb*, Rabindra Nepal¹



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Resources, Conservation and Recycling

journal homepage: www.elsevier.com/locate/resconrec

PRIVATE PRODUCTION (VERSUS?) COOPERATION AND COSTS OF SOLID WASTE SERVICES

Germà Bel, Universitat de Barcelona

Xavier Fageda, Universitat de Barcelona & Barcelona Graduate School of Economics

Melania Mur, Universidad de Zaragoza

Empirical analysis of solid management waste costs: Some evidence from Galicia, Spain

Germà Bel*, Xavier Fageda

Departament de Política Econòmica - Universitat de Barcelona, Avd. Diagonal 690, 08034 Barcelona, Spain



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journal homepage: www.elsevier.com/locate/resconrec

**THE COSTS OF DISPOSAL AND RECYCLING
AN APPLICATION TO ITALIAN MUNICIPAL
SOLID WASTE SERVICES**

The costs of municipal waste and recycling programs[☆]

Robert A. Bohm^a, David H. Folz^b, Thomas C. Kinnaman^{c,*}, Michael J. Podolsky^d

Politici - Aktivisti - Odborníci:



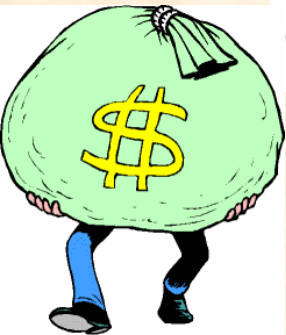
Official aim of the Regulation on waste statistics

... for monitoring the implementation of waste policy

The economics of waste management

No information on:

- Costs and benefits of different treatment types
- The financing of waste management
- The market of secondary raw materials (volumes and prices)



**Karin Blumenthal, Wim Kloek,
Eurostat**

Training on Waste Statistics
Oslo, 13 to 15 May 2009

Politici: - Aktivisti - Odborníci

Waste hierarchy.



J. P. Hannequart :

(konferencia WASTE AND LIFE CYCLE THINKING, Bruxelles 5.VII.2011)

„Je poradie v článku 4 smernice 2008/98/EC správne ?“

Nepotrebujeme v súlade s odst. 2 tohto článku pre niektoré prúdy odpadov

najprv spracovať **LCA** ???

aby sme okrem **environmentálnych dopadov** (*CO₂ balance, Ecological Footprint...*)
poznali aj **ekonomické dopady** (*Cost-Benefit Analysis, Social LCA, Life Cycle Costing*)

„Hodnota za peniaze“ – platí len pre dopravné stavby ?

„Ekologické“ stavby nepotrebujeme ekonomicky posudzovať ?!

Politici: - Aktivisti - Odborníci



Waste hierarchy.

R. Zoboli :

(konferencia EAERE v Ríme 2011 o ekonomike nakladania s odpadmi)

„ Prispieva recyklácia k dosiahnutiu redukcie množstva odpadov ?“

Prevenia vzniku odpadov je totiž hlavnou prioritou v odpadovej politike EU.

Aktuálny rozvoj RRR je veľmi dynamický, avšak prispieva k prevencii vzniku odpadov ?

„Countries with an advanced waste treatment system produce **more** waste...“

(Kloek, V. Eurostat 2010)



Politici: - Aktivisti - Odborníci



Efektivnost' ekonomickych nástrojov v ekológii.

„Je hlavným zmyslom platieb občanov za odpady:

1. podporovať environmentálne šetrné nakladanie s odpadom

alebo

2. podieľať sa na financovaní obecného systému nakladania s komunálnym odpadom ?

Alebo by mali tieto poplatky plniť obidve uvedené funkcie ?





Efektivnost' ekonomick'ych nástrojov v ekológii.

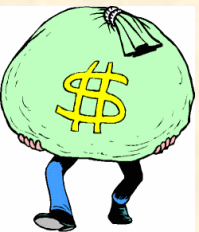
„Meranie efektívnosti verejných výdavkov je obtiažne a to zvlášť v oblasti životného prostredia.

Meranie kvality životného prostredia má svoje špecifiká.

Nie je možné konštatovať že:

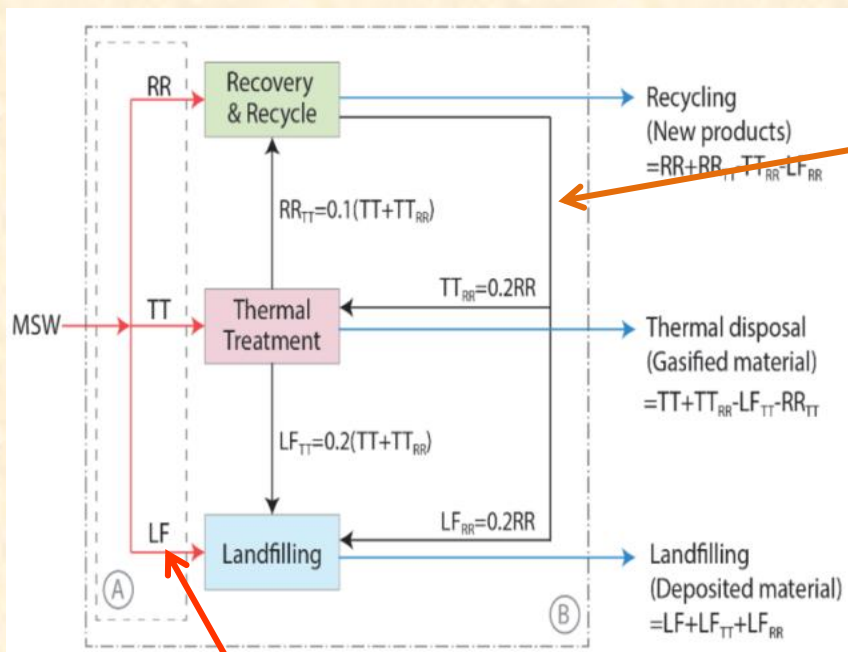
*medzi výškou výdavkov do jednotlivých oblastí životného prostredia
a
zvýšením kvality životného prostredia v tejto oblasti*

existuje jednoznačná priama úmera.“



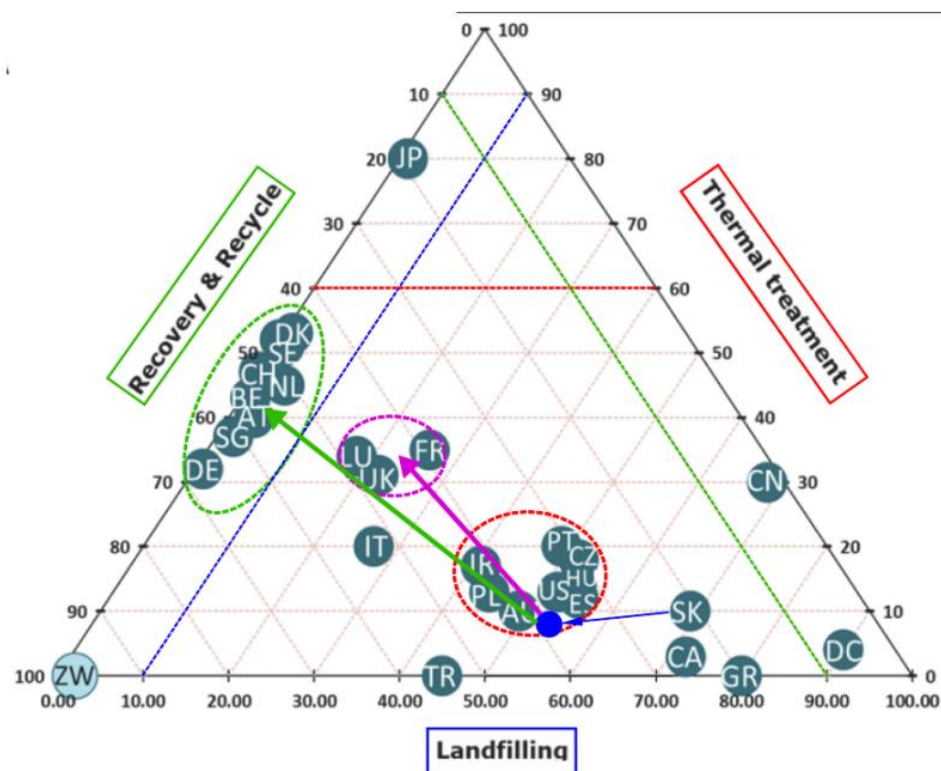


Politici - Aktivisti - Odborníci:



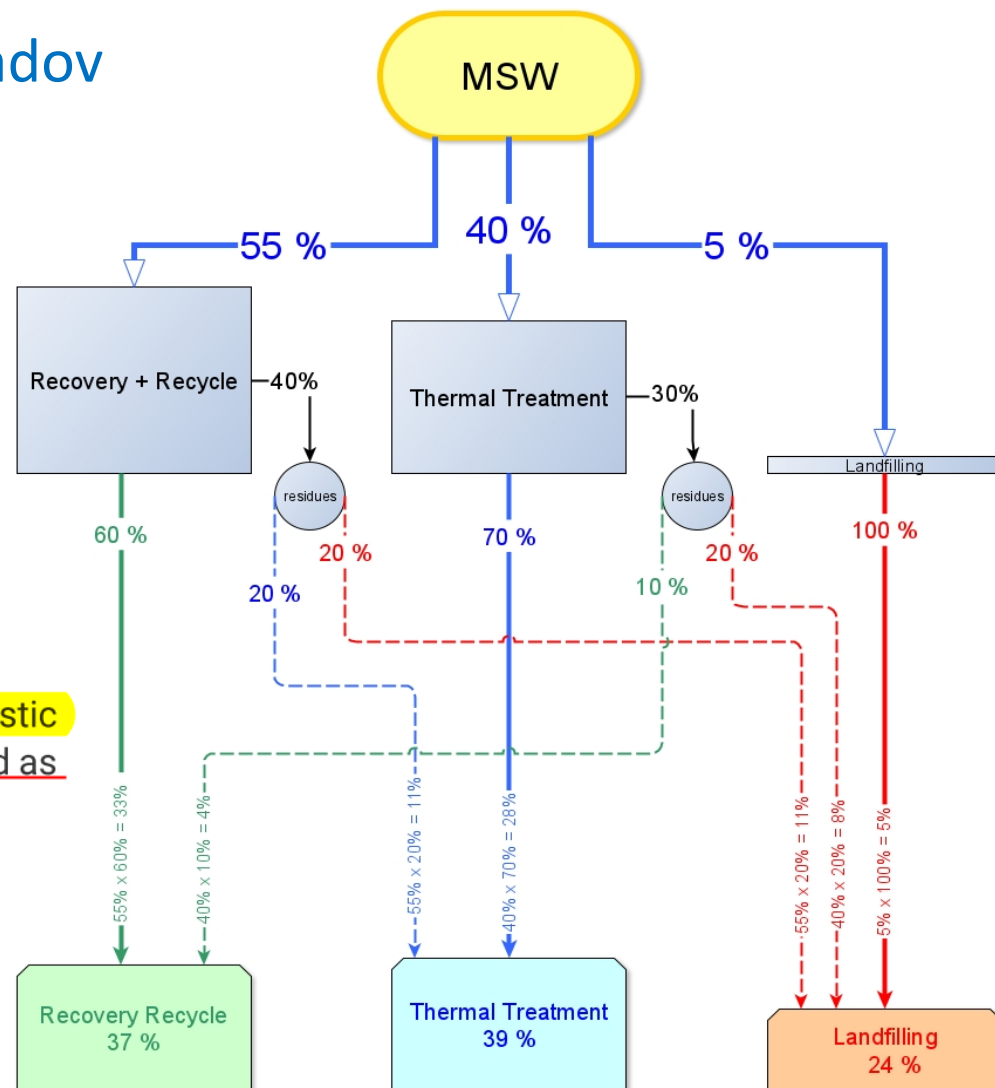
Výstupy nie sú nikde zohľadňované.

Oficiálne prezentované materiálové toky si všimajú len **VSTUPY** do procesov.





Skutočné materiálové toky odpadov sú iné ako uvádzajú politici.



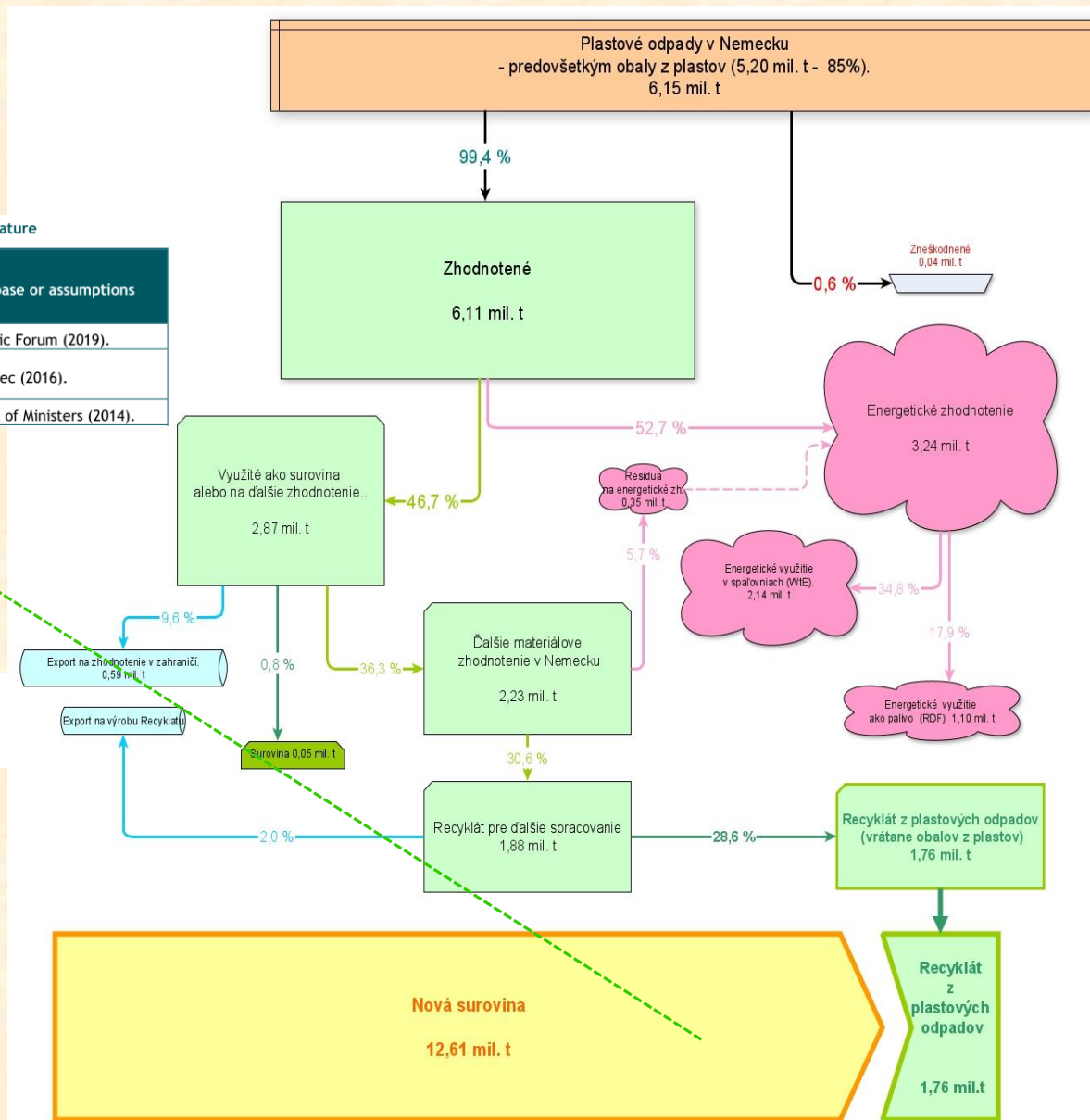
• “zero waste” (ZW) appears **an even more unrealistic proposal**, and can be considered solely when viewed as a conceptual trend;



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Table 3-3 MSW material fractions and their recycling potential (EEA-32), as found in literature

Material fraction	Share of the waste stream (kt, %)	Maximum recycling potential (%)	Maximum recycling potential (kt)	Evidence base or assumptions
Food waste	73,793 (25%)	95%	70,103	World Economic Forum (2019).
Paper and board	53,131 (18%)	96%	50,894	IMPACTPaperRec (2016).
Plastic	35,421 (12%)	70%	24,794	Nordic Council of Ministers (2014).



Kunststoffsartierung im Recycling



Rizika z recyklovaných materiálů.

Biedermann, M., & Uematsu, Y. (2011). Mineral Oil Contents in Paper and Board Recycled to . *Packaging Technology & Science* , 24(2): p. 61-73. .

XII/2012 – aféra s kontaminací potravinářských výrobků (čokoláda, ryža, cerealie) PAH a dalšími ropnými látkami zřejmě z recyklované lepenky. Zdroj: RECYCLINGmagazin.de 12/2012 „Mineralöl in Lebensmittelverpackungen: Werden alarmierende Studienergebnisse verschwiegen?“, „Neue Untersuchung der Adventskalender bestätigt erste Testergebnisse“, „Belastung von Lebensmitteln durch Mineralölbestandteile“ ...

Američané nechtějí potraviny balit do recyklátu, říká šéf kartonové firmy

<https://www.idnes.cz/zlin/zpravy/cardbox-packaging-zadverice-karton...>

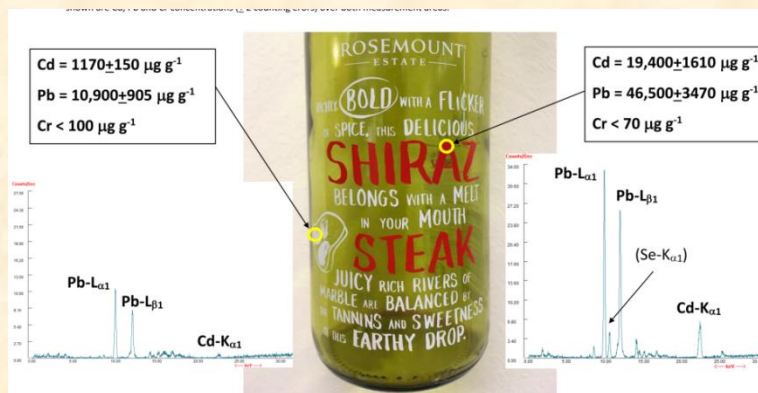
Sosnovcová, J. (2020). Jsou PET lahve vyrobené z recyklátu zdravotně bezpečné ? *Odpadové forum, ročník 21 číslo6 , 8.*

X/2018 – ARNIKA.CZ „Jedy z plastového odpadu se vrací do našich domácností kvůli špatné recyklaci“ Zdroj: <https://arnika.org/jedy-z-plastoveho-odpadu-se-vraci-do-nasich-domacnosti-kvuli-spatne-recyklaci>



Smarter, greener, more inclusive?

Indicators to support the Europe 2020 strategy



2019-07-16

Heavy Metals in the Glass and Enamels of Consumer Container Bottles

Turner, A

<http://hdl.handle.net/10026.1/14646>



Politici: - Aktivisti - Odborníci



Down, Down, Down: Recycling Markets 2012

Fri, 2012-08-10 16:44

[Waste Age](#)

Michael Fickes, Contributing Writer

Prices in the recycling commodity markets have generally fallen over the past 12 months.

The downward trend in volumes and prices for recovered newsprint has grown stronger with the proliferation of tablet computers and newspaper apps. Prices for other recycled fiber materials have fallen as well.

Booming business under threat

1 Dutch Waste Management Association September 2012



The market in secondary raw materials has rapidly become global, but is now under intense pressure. The worldwide economic crisis is leading to surpluses, falling prices and import/export restrictions imposed by countries to protect their own industries. Many of our colleagues will not survive.

Recyklacia ako cieľ ?



Recyklacia ako cieľ ?

Prosperujúci trh v ohrození.

Stojí vízia EK o tzv. „recyklačnej spoločnosti“ na tenkom ľade ?

Surendra BOARD (BIR plasty):

"Európa nemá dostatočné kapacity pre spracovanie svojich odpadových plastov."

ochranárskych opatrení : "V roku 2010 Európa vyseparovala asi 24 miliónov ton plastového odpadu. Ale len 6 miliónov ton z tohto množstva je materiálovo recyklované, polovica priamo v Európe a druhá polovica inde vo svete. Keďže Európa nemá dostatočnú kapacitu pre spracovanie odpadových plastov, podstatnú časť sme exportovali do zahraničia. Potom, ako ostatné krajiny vo svete uzavreli svoje hranice, (napríklad ako odplatu pre naše dovozné obmedzenia), musíme sa sami doma vysporiadať s gigantickou horou prebytočného vyseparovaného plastu. "

Christian Rubach (BIR železný šrot a kovy):

"EÚ je už zaťažená prebytkom vlastného ocelového šrotu."

EÚ je totiž zaťažená prebytkom ocelového šrotu okolo 20 až 30 miliónov ton

Randžit Baxi (BIR papier):

"Mnohí z nás asi neprežijú tento prebytok zberového papiera na trhu."

Podobne aj odvetvie zberového papiera v EU čelí podobnému problému: gigantické prebytky tejto druhotnej suroviny, ktoré už stúpili na 8 až 10 miliónov ton. Európa v súčasnosti totiž vyseparuje viac papierového odpadu ako sama spotrebuje. Príčinou tohto neduhu je hospodárska kríza a nízke ceny papiera. V mnohých krajinách EU totiž



Politici: - Aktivisti - Odborníci

„Critical raw materials for the EU 2010.“

EK analyzovala 41 minerálů a kovů -14 z nich je pro EU kritických:

antimon, berylium, fluorit, galium, germanium, grafit, indium, kobalt, Pt skupina, vzácné zeminy = REE, magnézium, niob, tantal a wolfrám

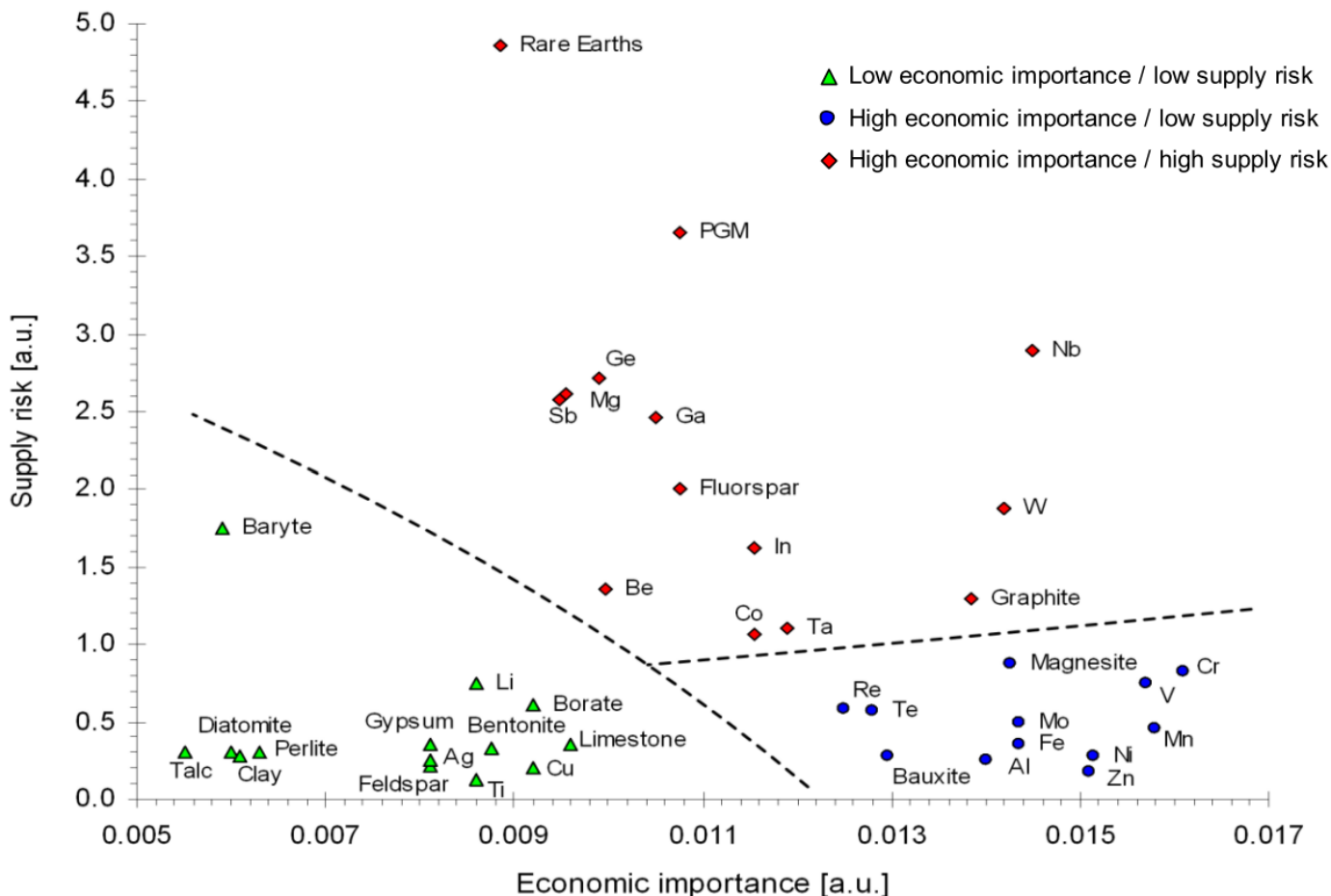


Figure 3: Economic importance and supply risk of 41 minerals and materials.



Politici: - Aktivisti - Odborníci



Element or element group	Symb ol	Risk	Leading producer	Element or element group	Symbol	Risk	Leading producer
antimony	Sb	8,5	China	cadmium	Cd	5,5	China
platinum group elements	PGE	8,5	South Africa	lithium	Li	5,5	Australia
mercury	Hg	8,5	China	calcium	Ca	5,5	China
tungsten	W	8,5	China	phosphorous	P	5,0	China
rare earth elements	REE	8,0	China	barium	Ba	5,0	China
niobium	Nb	8,0	Brazil	boron	B	4,5	Turkey
strontium	Sr	7,5	China	zirconium	Zr	4,5	Australia
bismuth	Bi	7,0	China	vanadium	V	4,5	Russia
thorium	Th	7,0	India	lead	Pb	4,5	China
bromine	Br	7,0	USA	potassium	K	4,5	Canada
carbon (graphite)	C	7,0	China	gallium	Ga	4,5	China
rhenium	REE	6,5	Chile	flourine	F	4,5	China
iodine	I	6,5	Chile	copper	Cu	4,5	Chile
indium	In	6,5	China	selenium	Se	4,5	Japan
germanium	Ge	6,5	China	carbon (coal)	C	4,5	China
beryllium	Be	6,5	USA	zinc	Zn	4,0	China
molybdenum	Mo	6,5	Mexico	uranium	U	4,0	Kazakhstan
helium	He	6,5	USA	nickel	Ni	4,0	Russia
tin	Sn	6,0	China	chlorine	Cl	4,0	China
arsenic	As	6,0	China	sodium	Na	4,0	China
silver	Ag	6,0	Peru	carb n (diamonds)	C	4,0	Russia
tantalum	Ta	6,0	Rwanda	sulphur	S	3,5	China
manganese	Mn	5,5	China	iron	Fe	3,5	China
magnesium	Mg	5,5	China	chromium	Cr	3,5	Canada
cobalt	Co	5,5	DRC	aluminium	Al	3,5	Australia
gold	Au	5,5	China	titanium	Ti	2,5	Australia

Index rizika pre kovy a prvky z hľadiska ich strategického významu

(zdroj Ohrlund, 2011)



Politici: - Aktivisti: - Odborníci



Podle Archerové a Jacobsona by instalace čtyř milionů turbín měla mít výkon až 7,5 TW,

Vítr má potenciál pokrýt polovinu světové spotřeby energie v roce 2030

Energie větru by mohla uspokojit až polovinu světové poptávky po elektřině v roce 2030. Přitom na její pokrytí stačí instalace čtyř milionů turbín, které by měly výkon 7,5 TW. Tvrdí to společná studie amerických vědců z univerzit v Delaware a Stanfordu, která vypočítala celkový potenciál větrné energie v planetárním měřítku.

1,5 MW větrná turbína vyžaduje asi 350 kg prvků vzácných zemín (REE)

Na **7,5 TW** potřebujeme cca **1 750 000 ton REE**

Súčasná celosvětová roční těžba je cca
124 000 ton.

To znamená 14 roků těžby REE len na turbíny !!!

Zelené sny...



Akcie išli dole.

Zisky z nehnuteľností sú hrozný.

Do čoho by som mal investovať ?

Skládky !

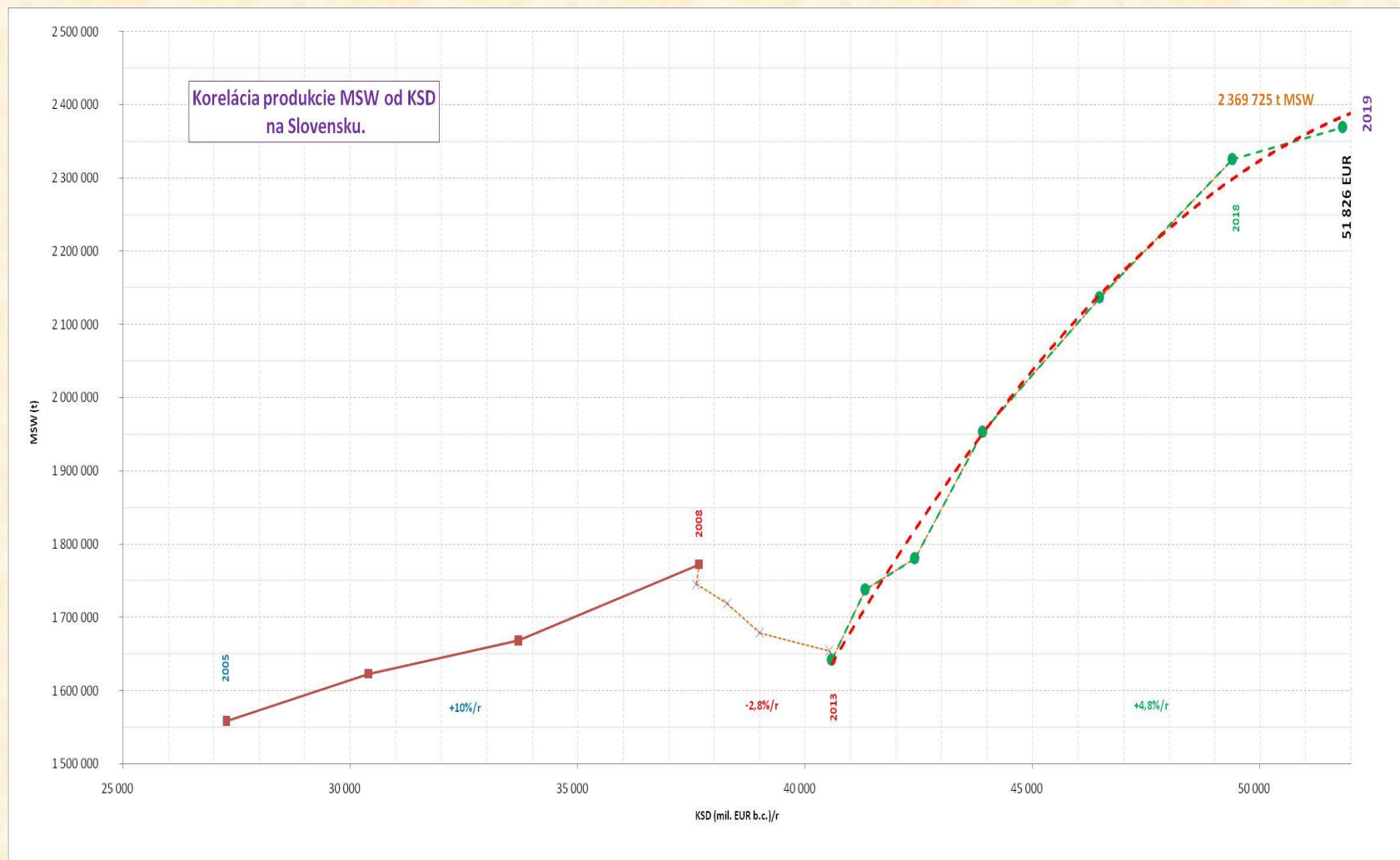
Jedného dňa dôjdu suroviny
a my začneme ťažiť naše
skládky, kam dnes ukladáme
odpadky...

Skládky ?

OK, píšem si.

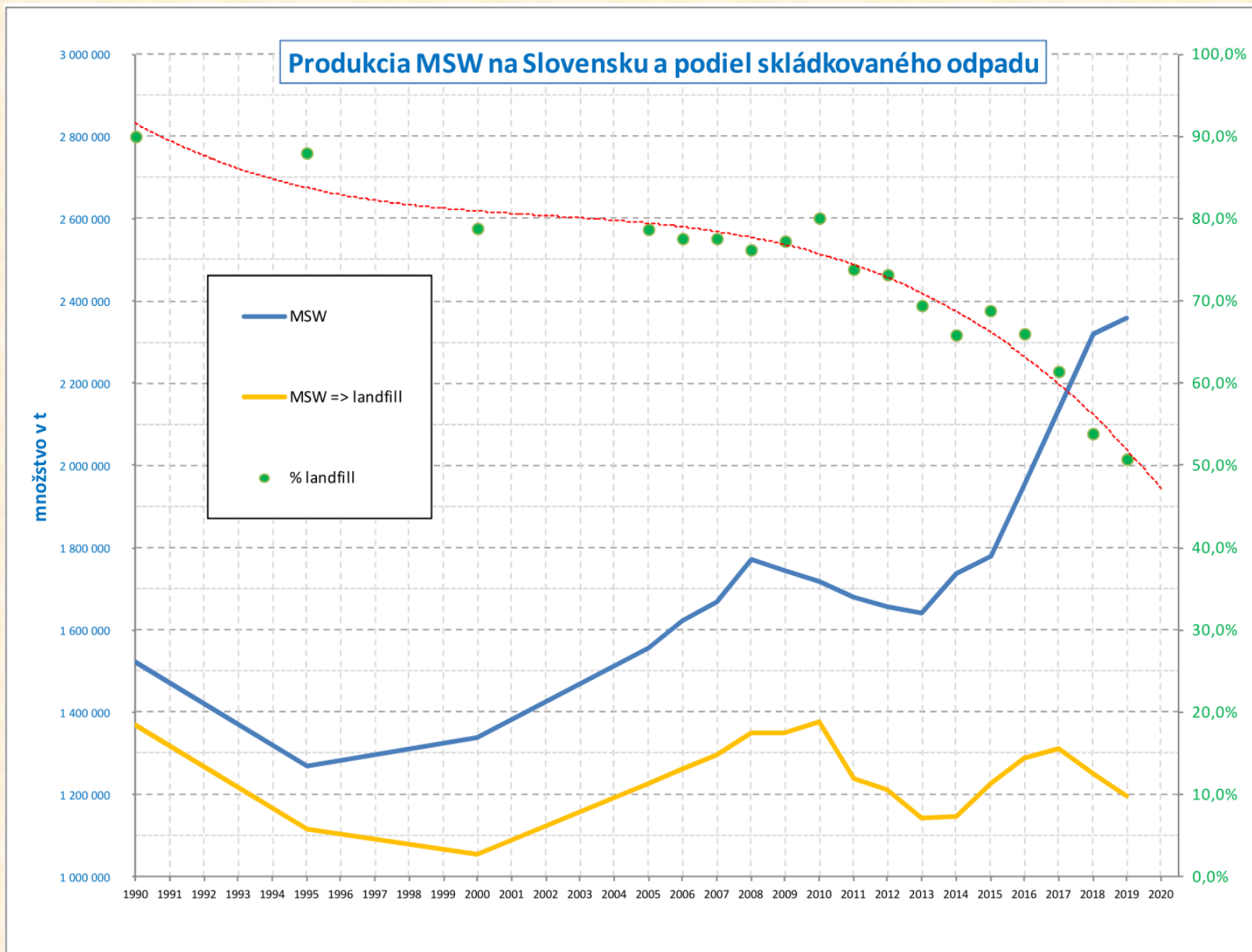


ODPADY na Slovensku



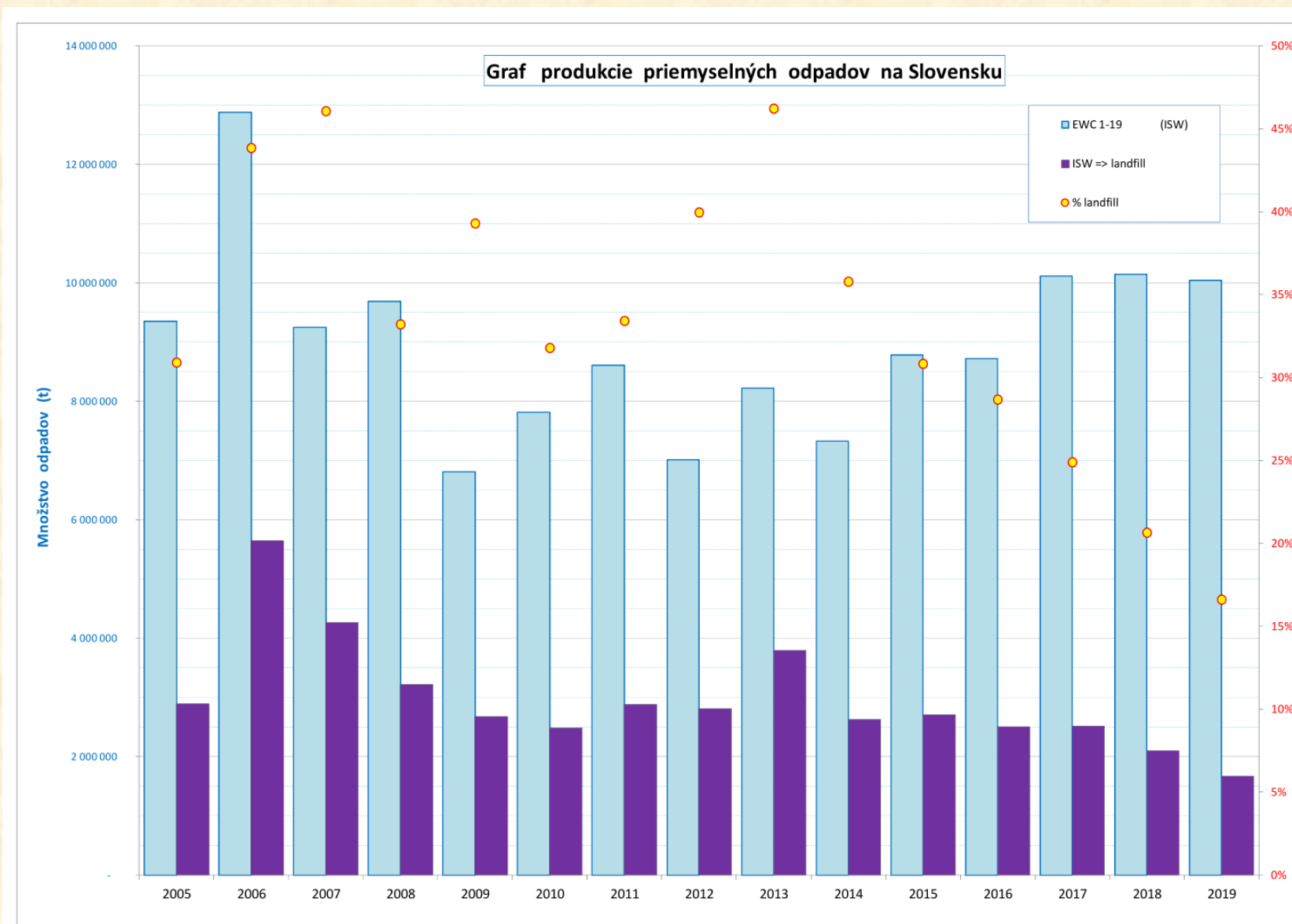


ODPADY na Slovensku





ODPADY na Slovensku





ODPADY na Slovensku

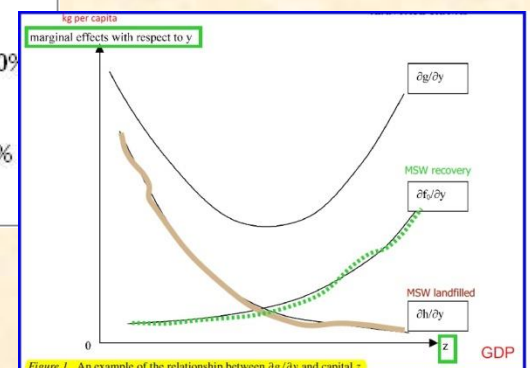
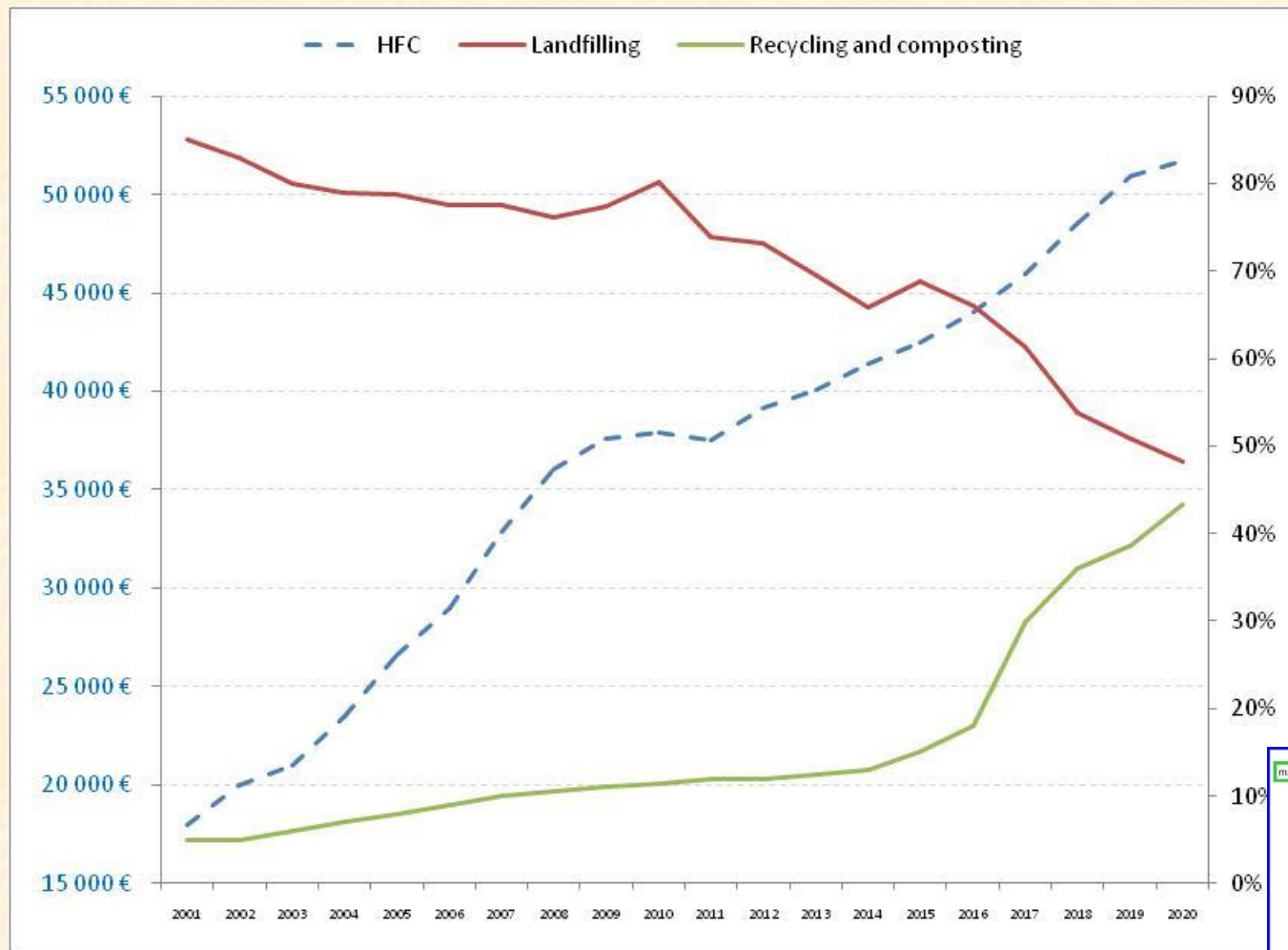
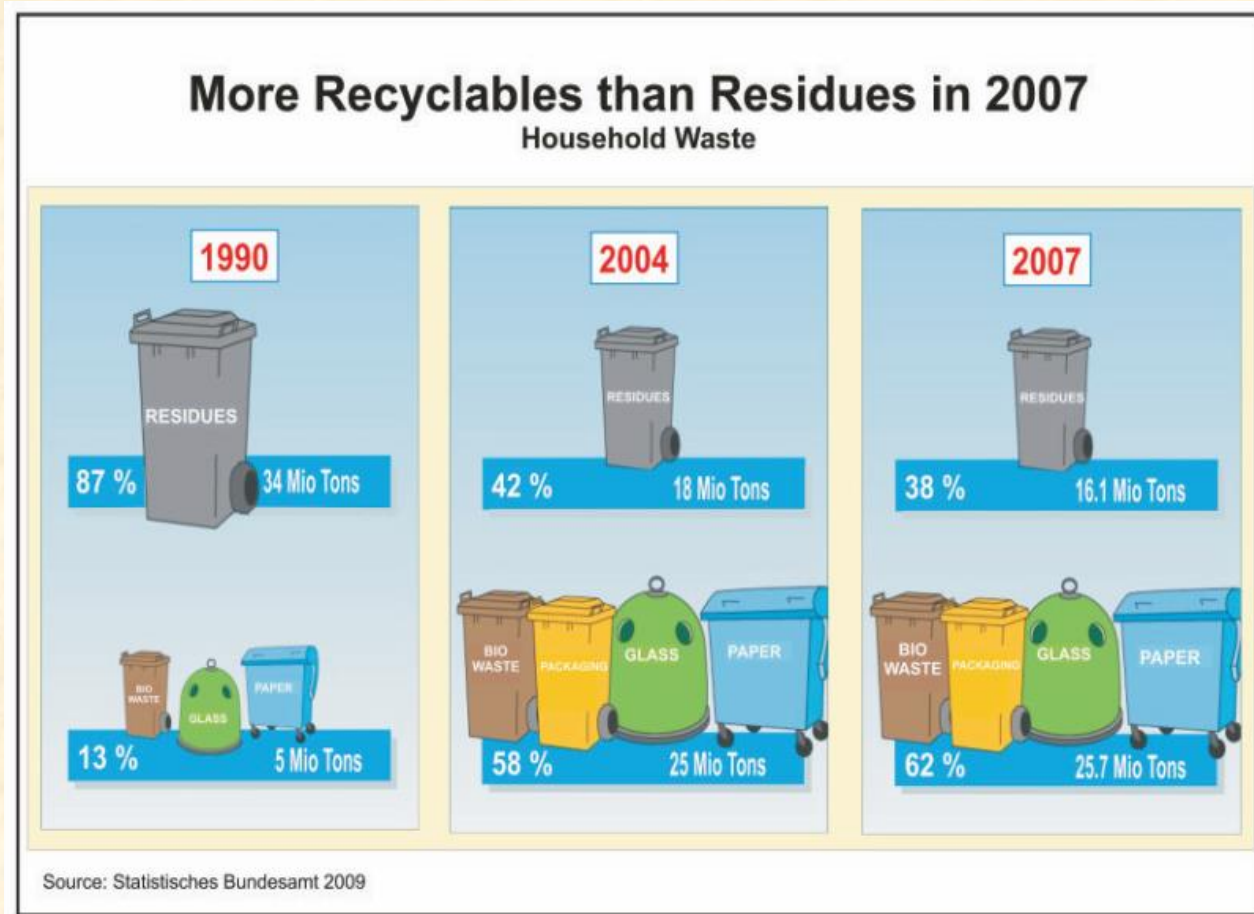


Figure 1. An example of the relationship between $\partial g/\partial y$ and capital z .



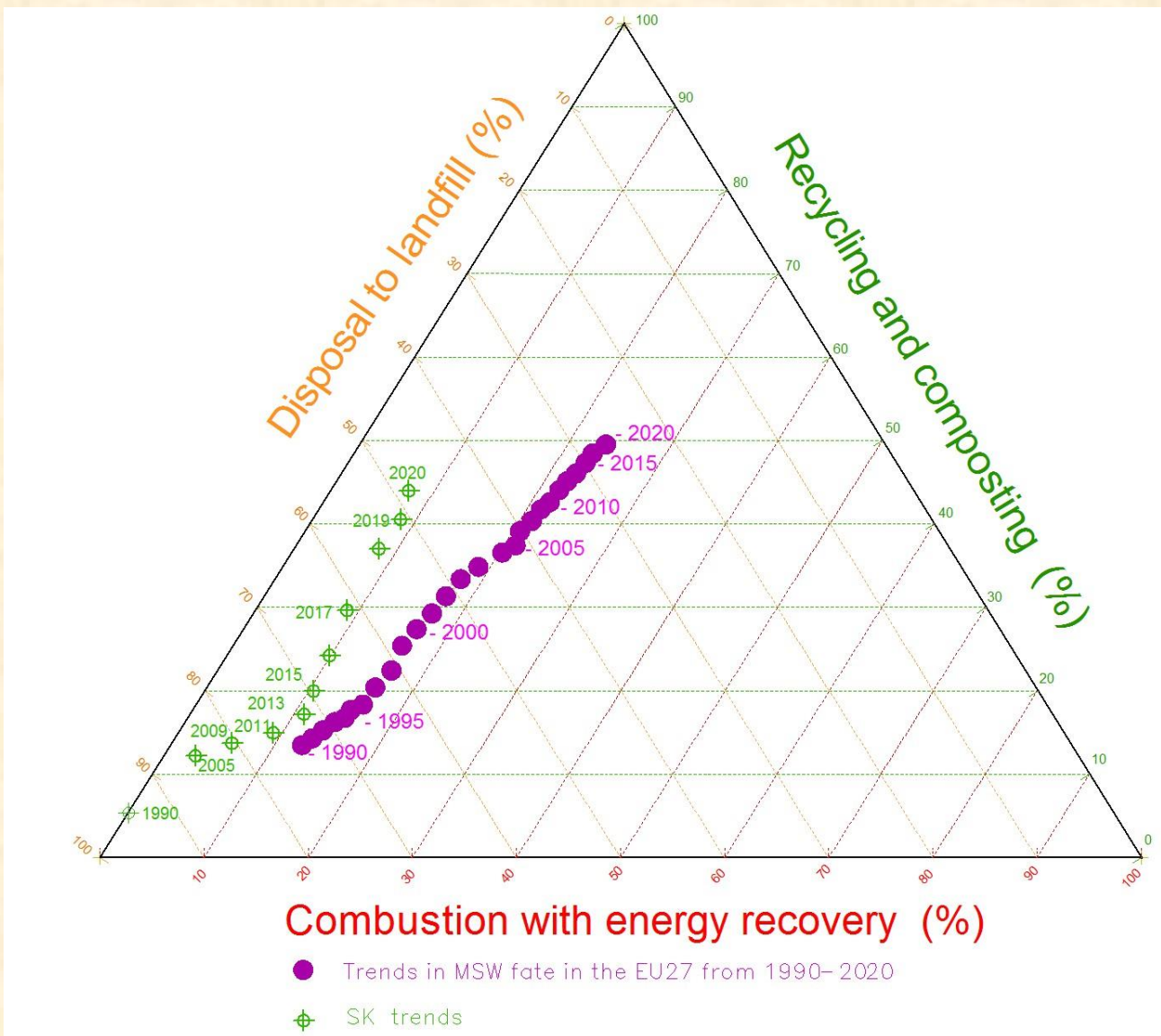
Waste Management in Germany

Odpadové hospodárstvo v Nemecku za rok 2009.





ODPADY na Slovensku





Ďakujeme za Vašu pozornosť



Doc. RNDr. Miroslav Rusko, PhD.
Trnava - Slovensko
mirorusko@centrum.sk

Ing. Marek Hrabčák
EIA, IPPC, odborné posudky
Prešov – Slovensko
m.hrabcak61@gmail.com