Zero Waste: A Stepping Stone to Sustainability

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AmericanHealthStudies.org

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Sao Paolo, Sept 19, 2014

Personal Introduction

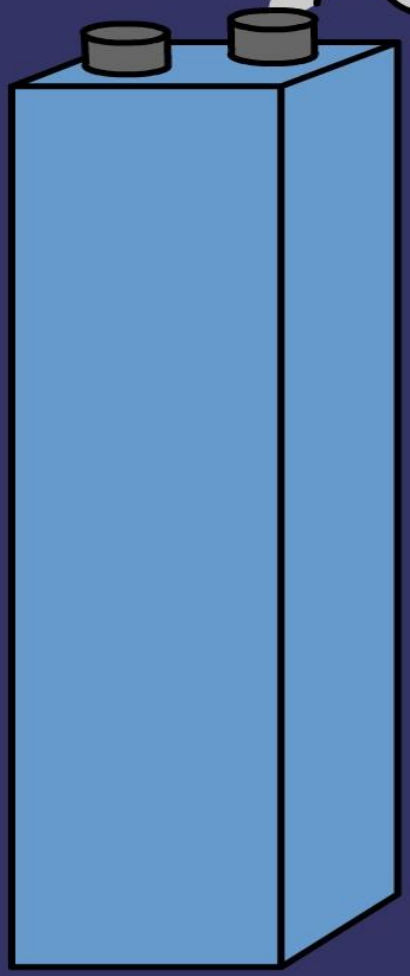
I first got involved in waste management 29 years ago when a trash incinerator was proposed for our area in Northern NY

I had little idea then that this issue would take me to 62 different countries

Personal Introduction

In the beginning we were most concerned about the toxic emissions

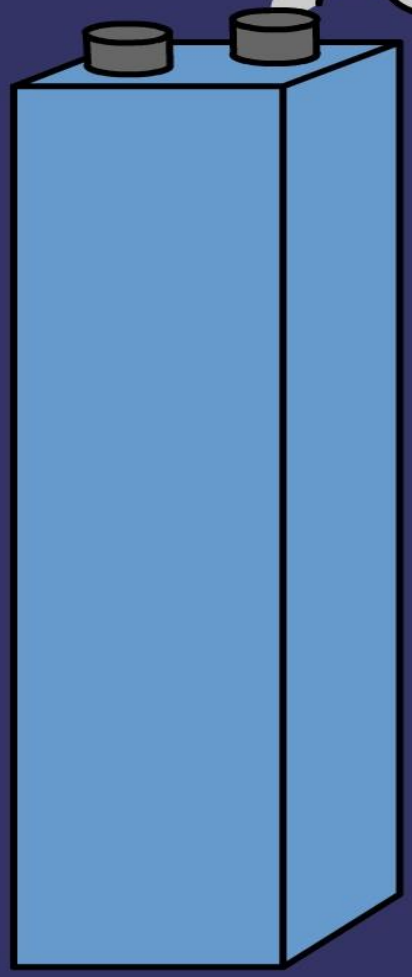
AIR EMISSIONS



- $CO_2 + H_2O$
- **ACID GASES:**
  HCl, HF, SO_2
  NO_x
- **TOXIC METALS:**
  Pb, Cd, Hg, As, Cr etc
- **NEW COMPOUNDS:**

  PCDDs (DIOXINS)
  PCDFs (FURANS)
  PCB's
  ETC

AIR EMISSIONS



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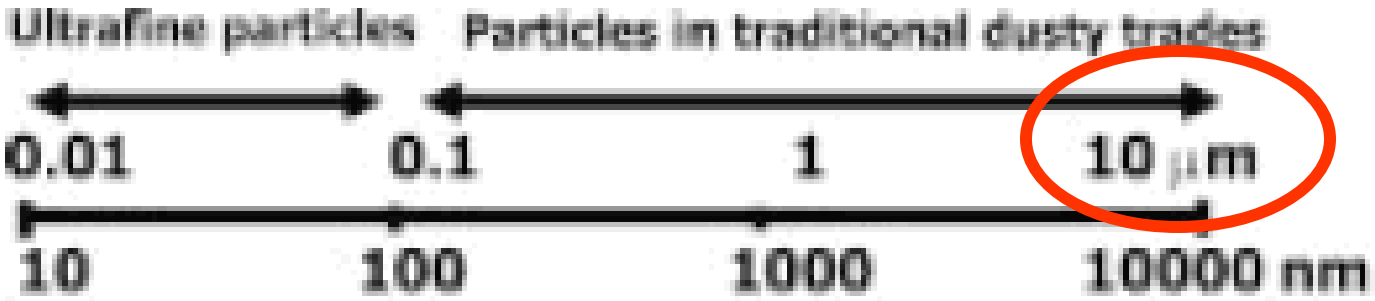
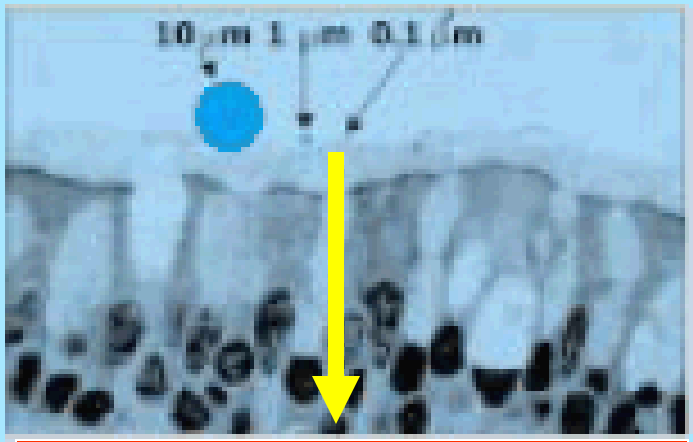
NANO PARTICLES



NANOPARTICLES

Size of Particle regulated in incinerator emissions

Figure 3 Relative size of ultrafine particles compared with particles in traditional dusty trades.



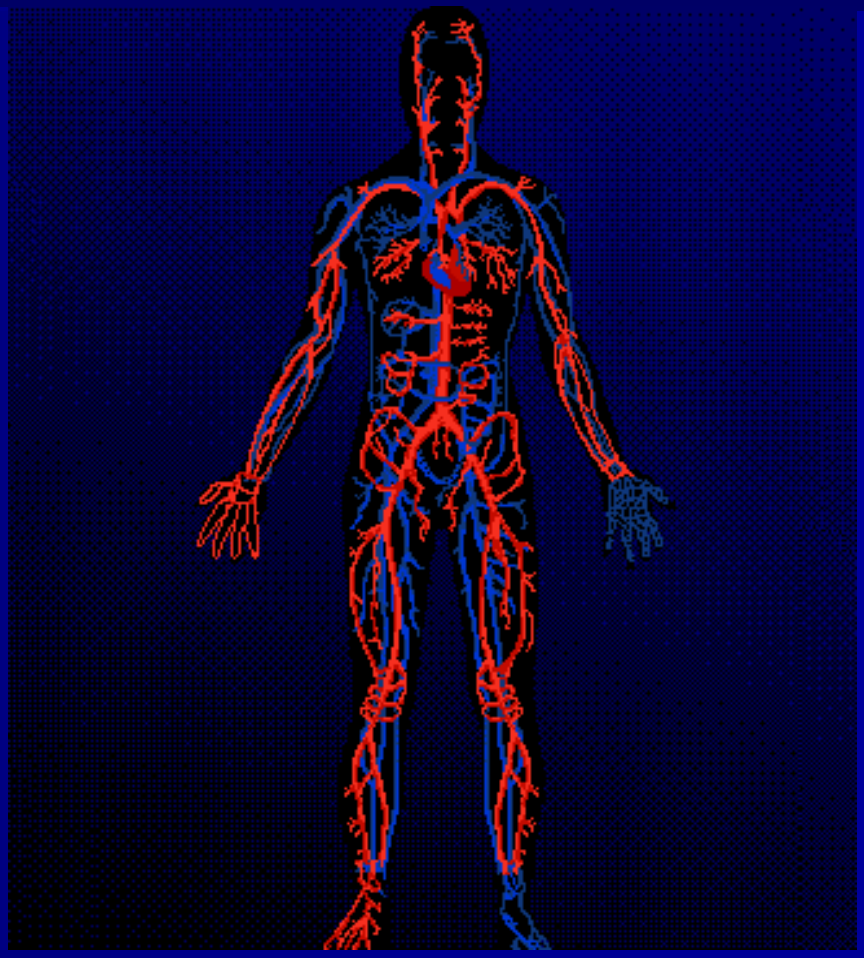
BLOOD

Nano particles are so small they can easily cross the lung membrane

Figure 1 Relation between ultrafine particles and cellular structures in the lung. Idealised particles of 10, 1, and 0.1 μm are shown compared with a bronchial epithelium; note that the top end of the range of ultrafine particles (0.1 μm, 100 nm) is not really visible. On the right are shown the same three particles relative to cilia.

Nano Pathology

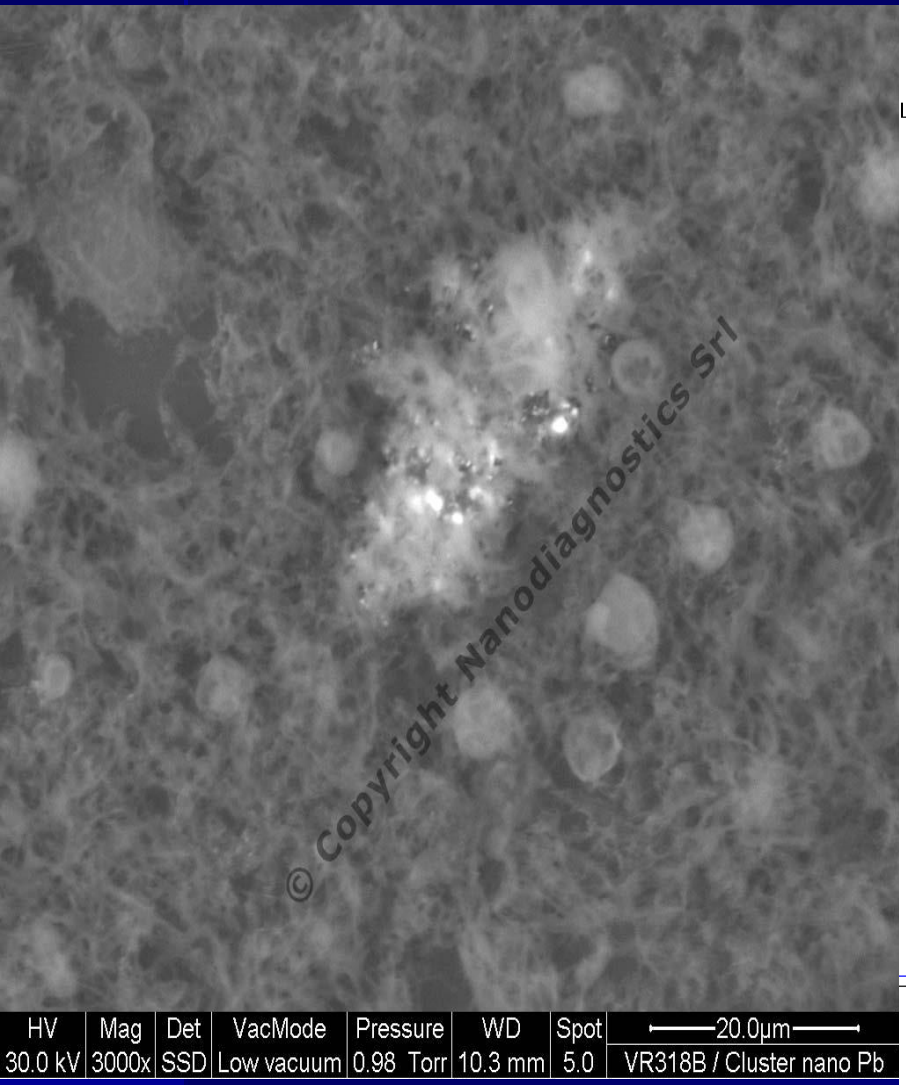
- Once nanoparticles have entered the bloodstream they can easily cross the membranes of every tissue in the body.

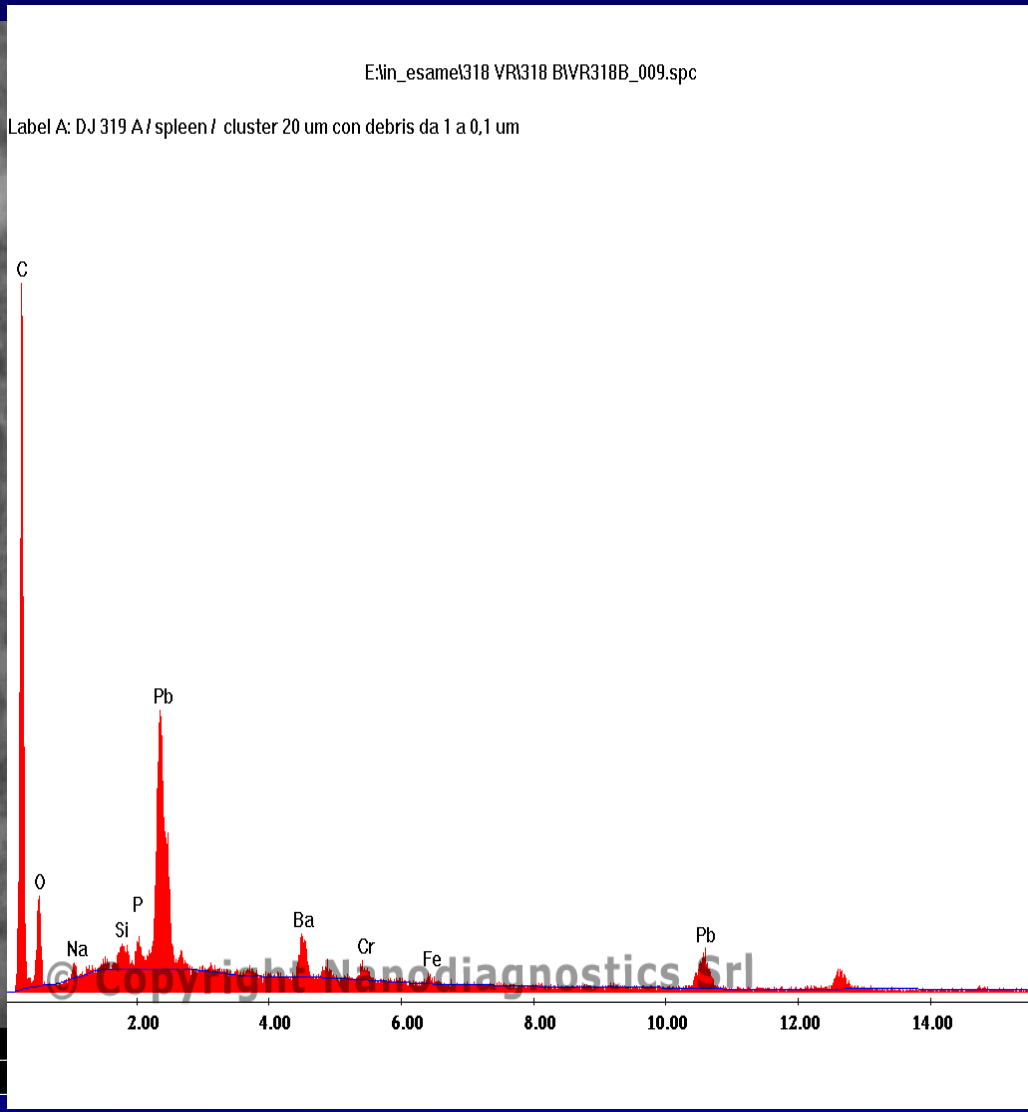


Nano Pathology

- They can even cross the blood brain barrier

Aggregati di Piombo, Bario, Cromo, Ferro **e** Silicio **in** Cervello**.**

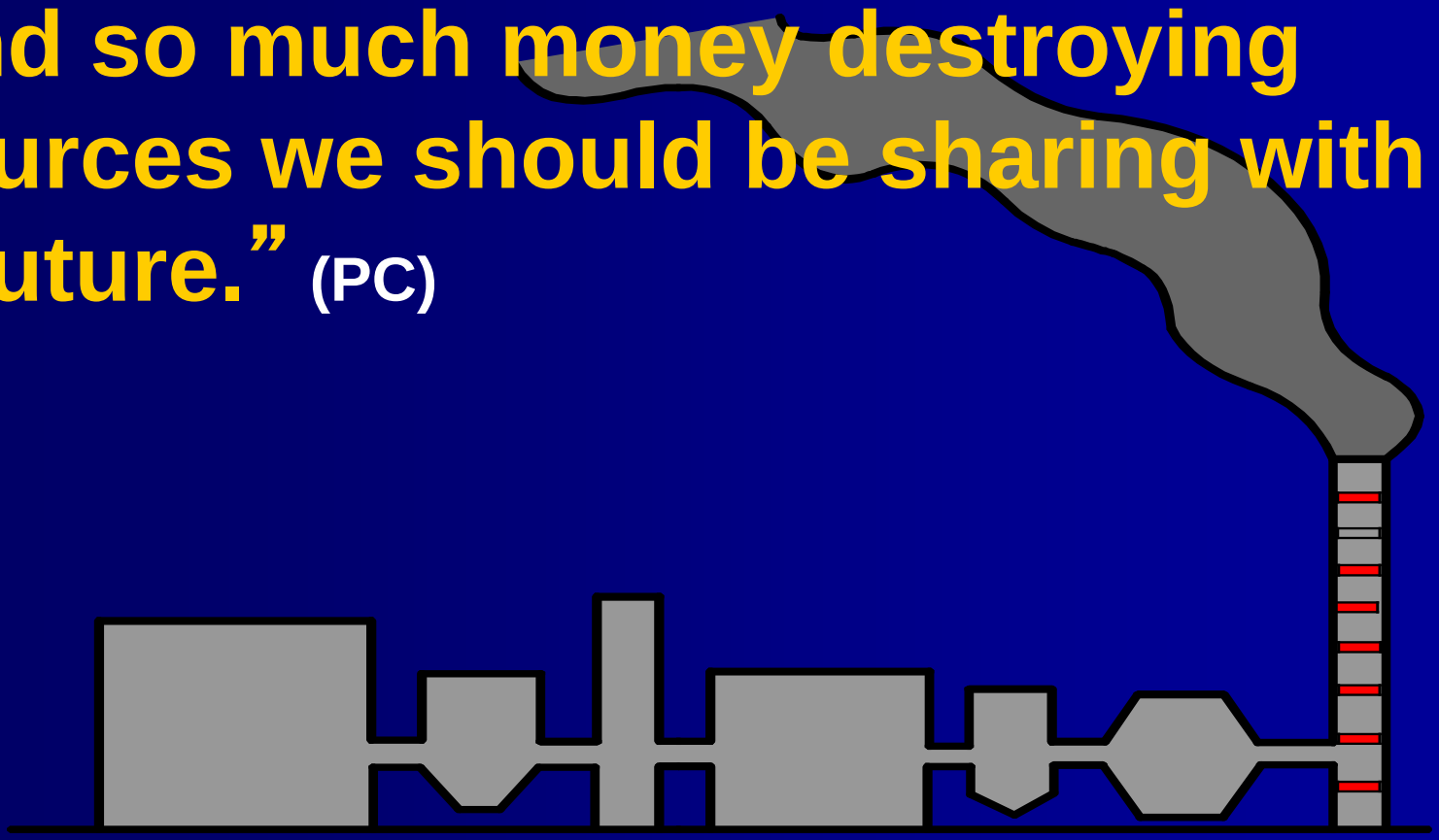




www.stefanomontanari.net

“Even if we made incineration safe we would never make it sensible.

It simply does not make sense to spend so much money destroying resources we should be sharing with the future.” (PC)



Personal Introduction

Then we realized that they

1) Were far too expensive (It takes approx. 25 years for taxpayers to pay off the huge debt incurred)

2) Created very few jobs for the huge capital investment

3) Didn't get rid of landfills

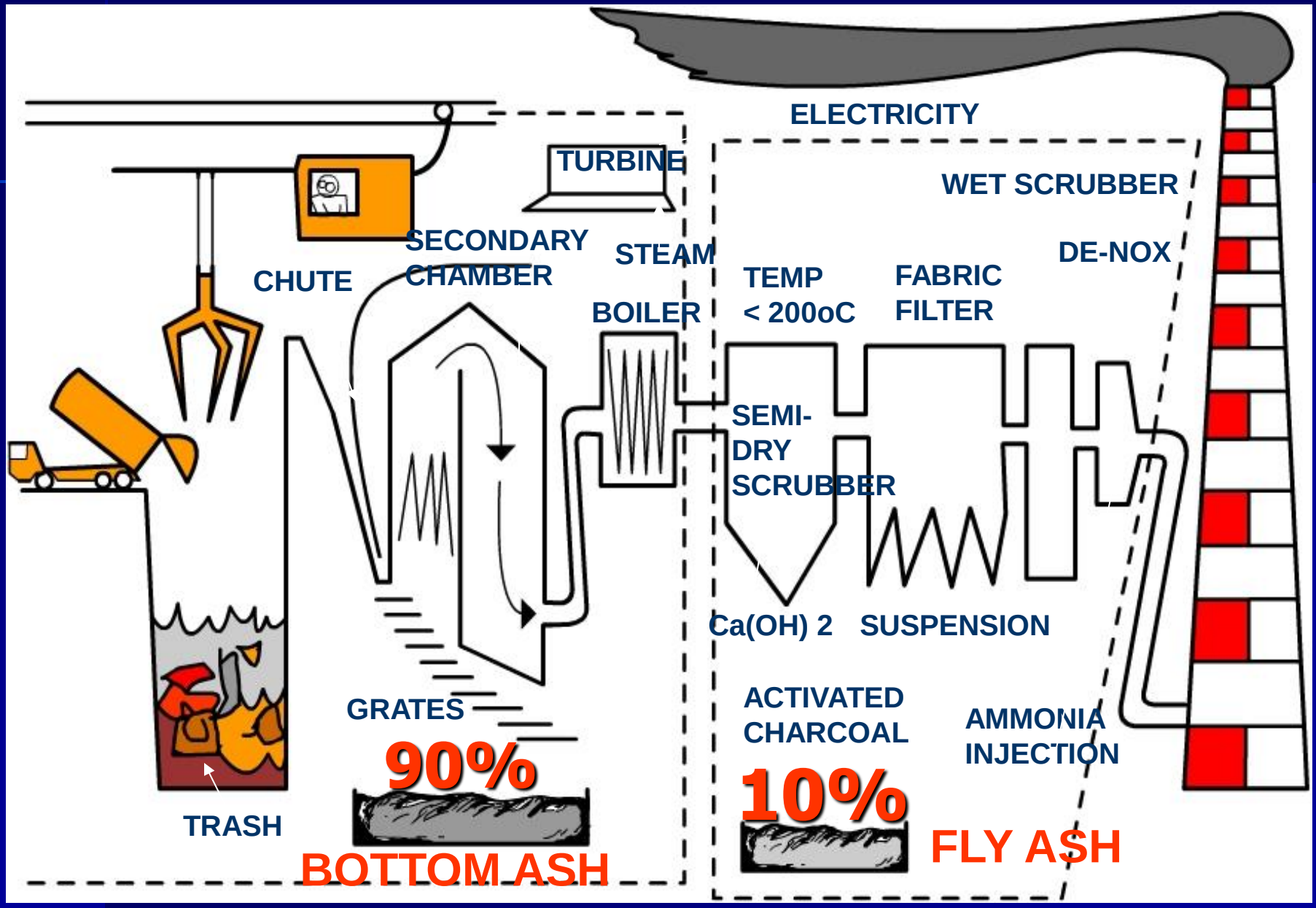
4) Are a waste of energy, and

There are FAR BETTER ALTERNATIVES

Incinerators produce a toxic ash

- For every four tons of waste burned you get one ton of ash (or more)
- That nobody wants!

For every 4 tons of trash you get about one ton of ash



A “combined ash” landfill in Haverhill, Massachusetts

Incineration is a waste of energy!

- About 4 X more energy saved by reusing, recycling and composting the various components in the discard stream – than burning them to create electricity
- Dr. Jeffrey Morris, jeff.morris@zerowaste.com

Energy Comparison: Recycling versus incineration (ICF consulting, 2005)

material	Energy savings from recycling GJ/tonne	Energy output from incineration GJ/tonne	Energy savings recycling versus incineration
Newsprint	6.33	2.62	2.4
Fine paper	15.87	2.23	7.1
Cardboard	8.56	2.31	3.7
Other paper	9.49	2.25	4.2
HDPE	64.27	6.30	10.2
PET	85.16	3.22	26.4
Other plastic	52.09	4.76	10.9

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Much more goes up in incineration smoke than toxic pollutants!

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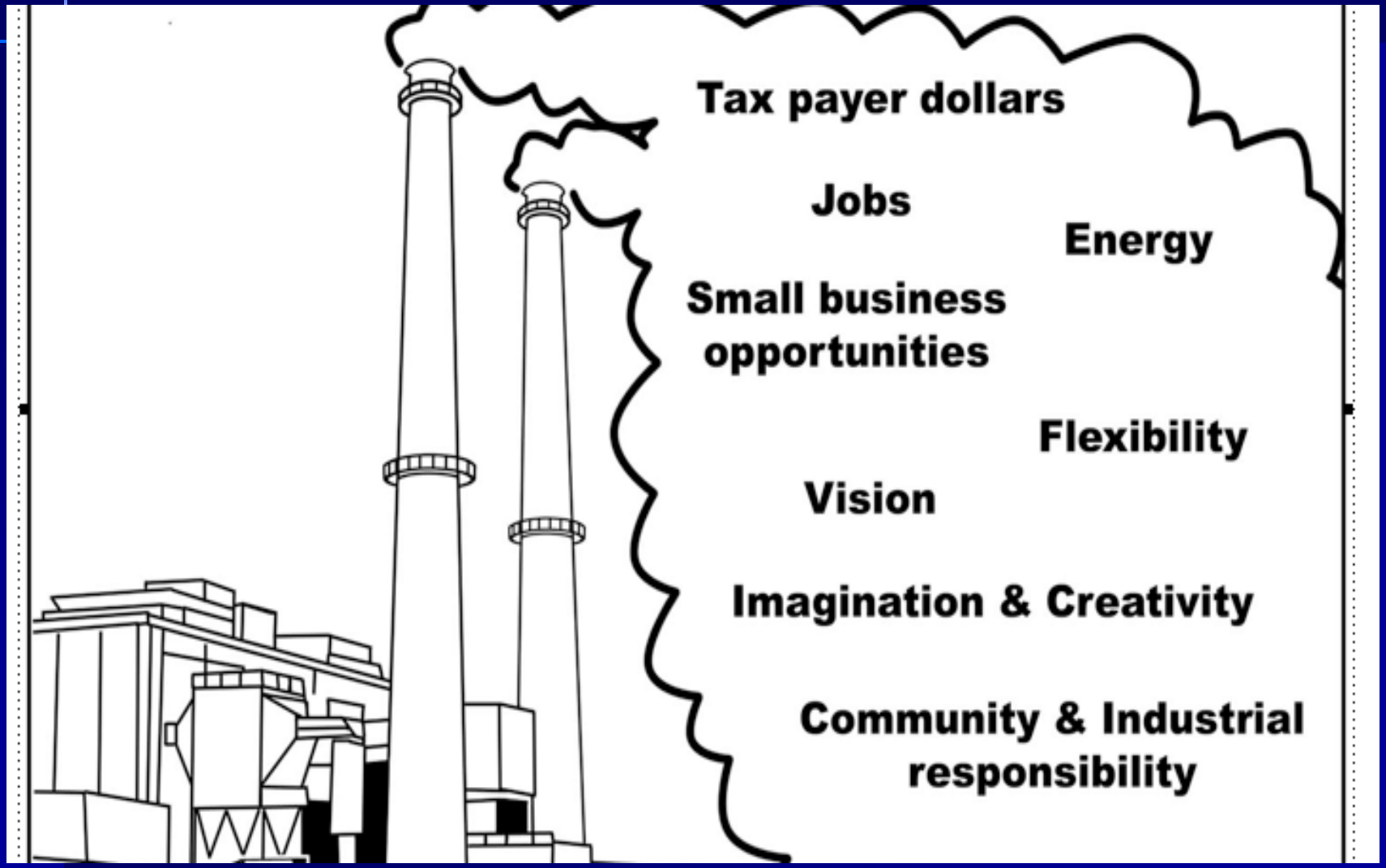


Personal Introduction

Between 1985 and 1995, over 300 incinerator projects were defeated in the U.S. and Canada.

A modern incinerator looks better, but…

It is attempting to perfect a bad idea

- Our task in the 21st Century is not to get better at destroying discarded materials
- But to stop making packaging and products that have to be destroyed!

Incineration is simply NOT sustainable

INCINERATION

Every time you burn something you have to go back to square 1

Extraction | Production | Consumption | Waste

The Linear Society

Personal Introduction

In 2013 I published a book based upon these experiences…


THE
ZERO
Untrashing the Planet One Community at a Time
WASTE
How cities and towns around the world are saying no to incinerators and wasteful product design
SOLUTION
and yes to radical recycling, reuse entrepreneurs, and the jobs they create
PAUL CONNETT

Foreword written by Jeremy Irons

TRASHED
NO PLACE FOR WASTE

JEREMY IRONS & CANDIDA BRADY
INVITE YOU TO A PRIVATE SCREENING OF

TRASHED

ON FRIDAY, SEPTEMBER 7TH 2012

AT TRIBECA CINEMAS
54 VARICK STREET, NEW YORK, NY 10013
(NEAR CANAL STREET)

JOIN US AT 3PM FOR A SHORT Q&A SESSION

SCREENING AT 3.30PM

AND AFTERWARDS FOR A PANEL DISCUSSION ON WASTE SOLUTIONS

PLEASE RSVP TO HOLLY@BLENHEIMFILMS.COM BY AUGUST 10TH

SUPPORTED BY

NYLPI NRDC NYPIRG gaia ALION

OFFICIAL SELECTION
FESTIVAL DE CANNES
2012

WINNER
AUDIENCE AWARD
MOVIES THAT MATTER
HAUE FILM FESTIVAL
2012

Subtitle of the Book:
"Untrashing the Planet One Community at a Time."

OUTLINE

1) A few words about Sustainability
2) Ten Steps to Zero Waste (including the 4th R)
3) Zero Waste Initiatives around the world
4) Fighting over-consumption

1. A few words about Sustainability

We are living on this planet as if we had another one to go to!

Sustainability

- We would need FOUR planets if every one consumed as much as the average American
- We would need TWO planets if every one consumed as much as the average European
- Meanwhile, India, China etc. are copying our consumption patterns
- Something has got to change and the best place to start is with waste

As far as sustainability is concerned

Every ton of waste that we landfill or incinerate takes us in the wrong direction

Whereas, every ton we

Compost,

Reuse,

Recycle, or

Avoid

Takes us in the right direction

The Waste problem will not be solved with better technology

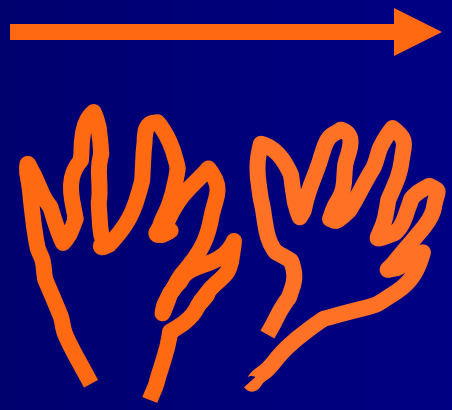
- But with
- Better organization
- Better education
- and better industrial design

2. TEN STEPS TO ZERO WASTE

STEP 1.

1. Source Separation

Waste



Resources

STEP 2.

1. Source Separation

2. Door to Door Collection

The San Francisco system

MULTI-MATERIALE

FRAZIONE ORGANICO

FRAZIONE RESIDUA

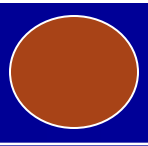
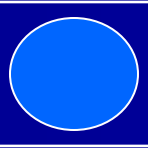
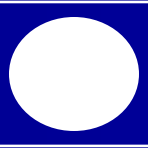
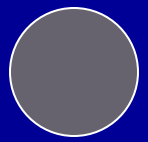
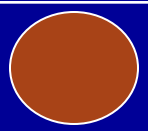
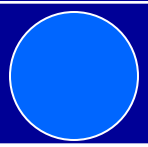
Once a week pick-up

In Wales, some communities are serviced by collection systems which sort at kerb ("slow recycling")

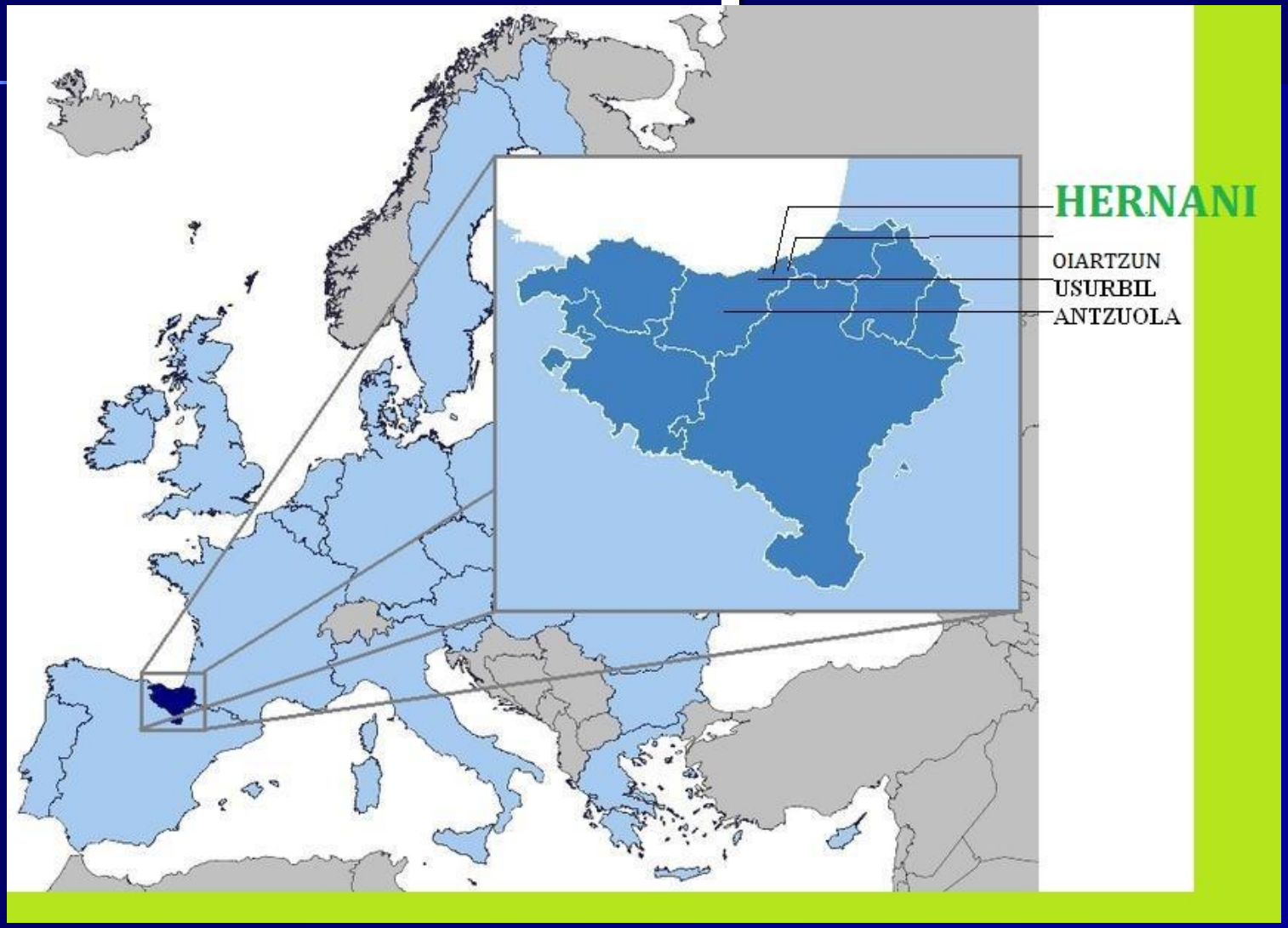
Intelligent - from kerb to depot.

The Romaquip Kerb-Sort

Capannori in Italy

LUNEDI	ORGANICO	
MARTEDI	MULTIMATERIALE	
MERCOLEDI	CARTA	
GIOVEDI	FRAZIONE RESIDUA	
VENERDI	ORGANICO	
SABATO	MULTIMATERIALE	

Hernani in Spain



Hernaniko Udala

HORARIO Y CALENDARIO DE RECOGIDA

	lunes	martes	miércoles	jueves	viernes	sábado	domingo
9:00					rechazo		
23:00	**envases ligeros**	papel-cartón	orgánico	envases ligeros	orgánico	rechazo	orgánico


Hernaniko
Udala


HER01870
hernani
osasuna atez ate
HER01870

Calidad del compost

Pureza del 99,76 %

Door-to-Door collection in Brazil organized by Waste pickers co-operative

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STEP 3.

1. Source Separation

2. Door to Door Collection

3. Composting

Discarded organics hierarchy

1) Feed people (see *The Stop* by Saul and Curtis)
2) Feed animals
3) Feed the soil

Composting (and vermiculture) Hierarchy

a) Backyard and onsite (institutions)
b) Community composting (e.g. Zurich)
c) On farms
d) Centralized facility (also anaerobic digestion)

The Composting plant

Serving San Francisco

Composting plant

In Brazil

Local farmers use compost

The fruit and vegetables go back to restaurants in San Francisco

Over 200 vineyards use the compost

For restaurants it is 25% cheaper to put out clean organics than mixed waste

We must involve restaurant owners

STEP 4.

1. Source Separation

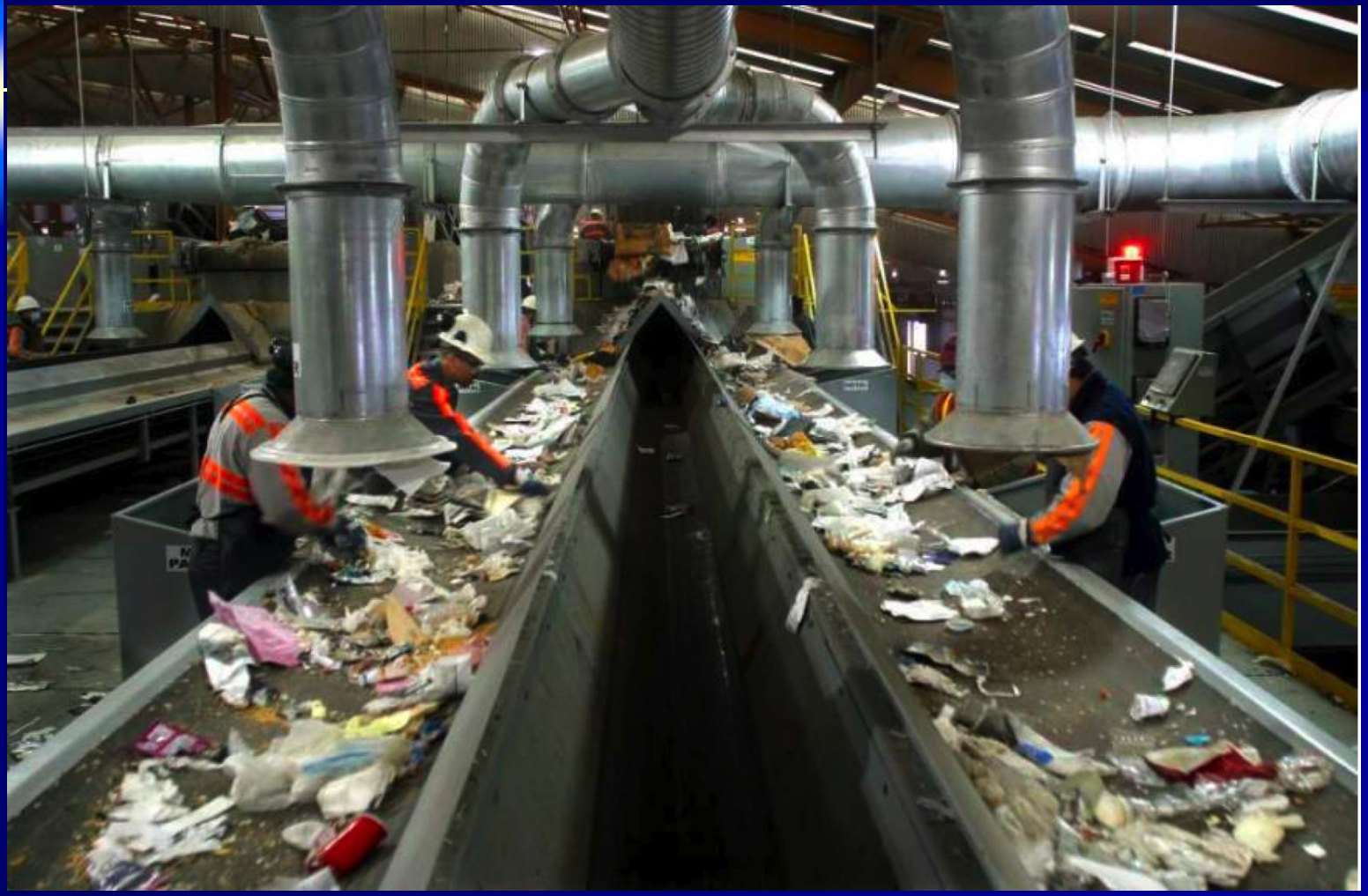
2. Door to Door Collection

3. Composting

4. Recycling

Recycling facility on Pier 96

The separation lines



Separation shed in Brazil operated by Waste pickers co-operative

Material baled and weighed – ready to be sent to secondary user

Recovered material ready to be sent to secondary user

STEP 5.

Reuse and Repair Centers (Community Centers)


URBAN ORE ECOPARK

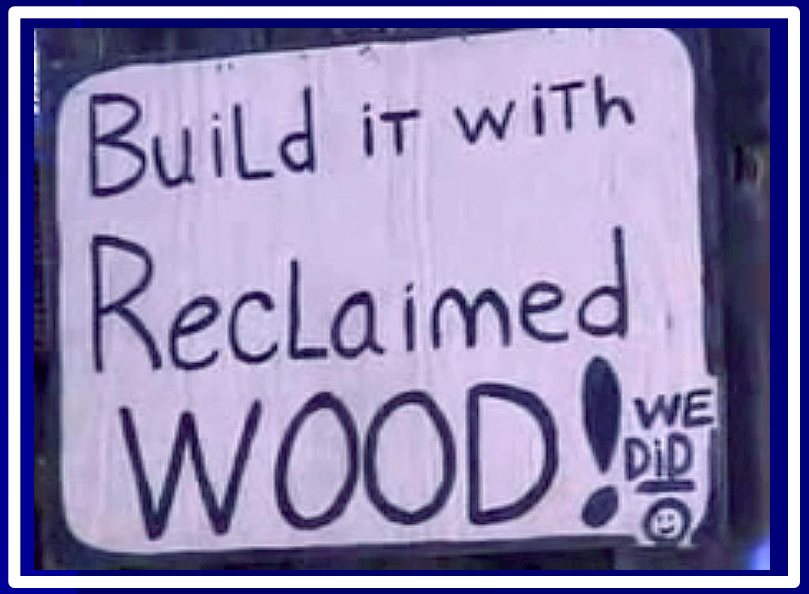
- Urban Ore operating for 30 years

- Grossing $3 million per year
- 27 full-time well-paid jobs


CIRCUS
1. SALE IS COM
A CASH REGISTE
2. NO REFUNDS WI
CASH REGISTER
3. NO REFUNDS AF
4. PLEASE BE REAL
YOUR CASH REG
UPON REQUES


URBAN ORE's
BUILDING MATERIALS
BOUGHT

ReSource, Burlington, Vermont



ReSource, Burlington, Vermont


ReSOURCE
EYE & EAR PROTECTION


ReSOURCE
RIDGID

VIDEOS ONLINE

On the Road to Zero Waste see

- www.AmericanHealthStudies.org

Kretsloppsparken – the Reuse Park in Gottenburg, Sweden.


Återbruket
Här kan du lämna hela och användbara:
Returhuset
Exempel
MYRORNA
18/09/2010 11:51


18/09/2010 12:21


GÖTEBORGAREN
15/04/2011 03:59


kan
Fa
xe
sor
te
ra
18/09/2010 11:24


07/06/2011 08:21


THE DELEGATION FOR
SUSTAINABLE CITIES
City of
Gothenburg
I
Kretsloppsparken
Alelyckan

STEP 6.

Waste Reduction Initiatives

We have to minimize the residual fraction with…

Ireland

- Government put a 15 cent tax on plastic shopping bags
- reduced use by 92% in one year!


AYAW ko ng PLASTIK!
Go Reusable!
July 03
Ayaw ko ng PLASTIK

In Ontario, Canada

- They have been REUSING glass beer bottles for over 60 years!

In Ontario, Canada

Italy

- Several supermarket chains are providing dispensers which allow customers to refill shampoo and detergent bottles…

Effecorta, A food store in Capannori, Tuscany, Italy

L'esperienza effecorta

www.effecorta.it

60 taps


EFFECORTA
Filiera Corta di prodotti sfusi e alla spina
tel. 0583 764332
www.effecorta.it
REFILL SYSTEM FOR DETERGENTS


EFFECORTA
Filiera Corta di prodotti sfusi e alla spina
tel. 0583 704332
www.effecorta.it
OLIVE OIL


1
2
3
4
5
6
7
8
WINE

No plastic bags used


TAP WATER INSTEAD OF BOTTLED WATER
GLASS INSTEAD OF
PLASTIC BOTTLES

REUSABLE PAMPERS

ecobimbi

Pannolino Ecologico Lavabile

STEP 7.

$$$
Economic Incentives

The “ Pay by bag” system

free

free

The “ Pay by bag” system

free

free

The more you make the more you pay!


Dal PORTA A PORTA
alla TARIFFA PUNTUALE
LAMMARI
da mercoledì
25 luglio 2012
ASCIT
Comune di
Capannori

Italia

- Villafranca d'Asti (population = 3,000) went from 70% to 85% using "pay by bag" system

1. Source Separation

2. Door to Door Collection

3. Composting

4. Recycling

5. Reuse, Repair & Deconstruction

6. Waste Reduction Initiatives

7. Economic Incentives

Step 8
Is the most important step For Zero Waste

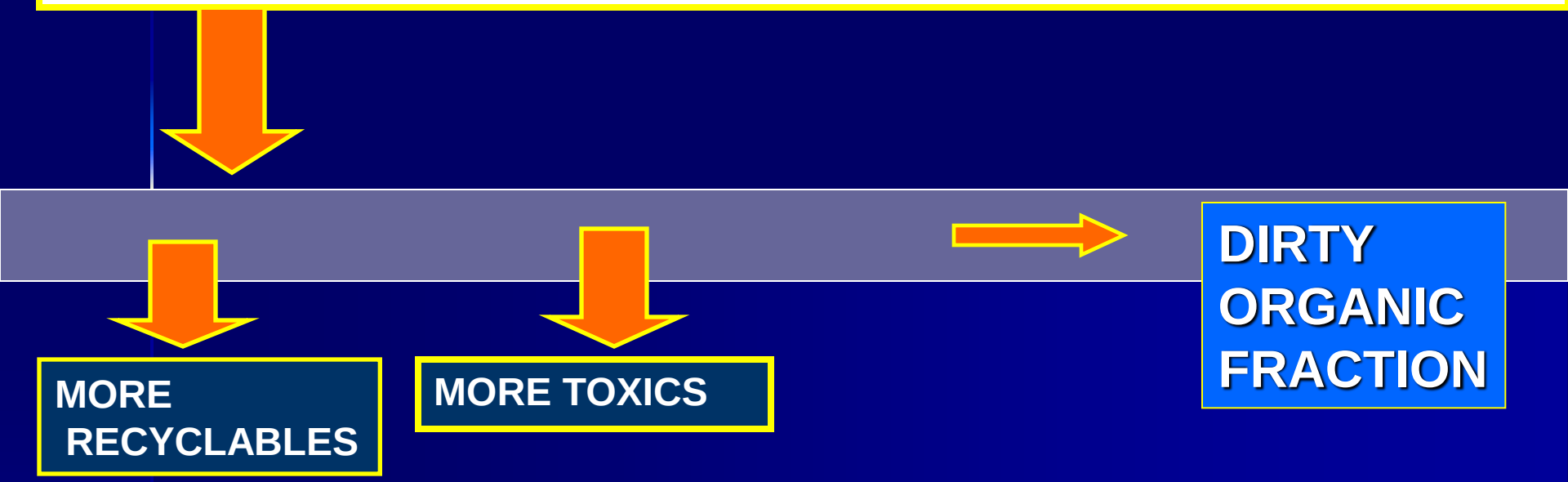
8A. The Residual Screening Facility

Nova Scotia, Canada

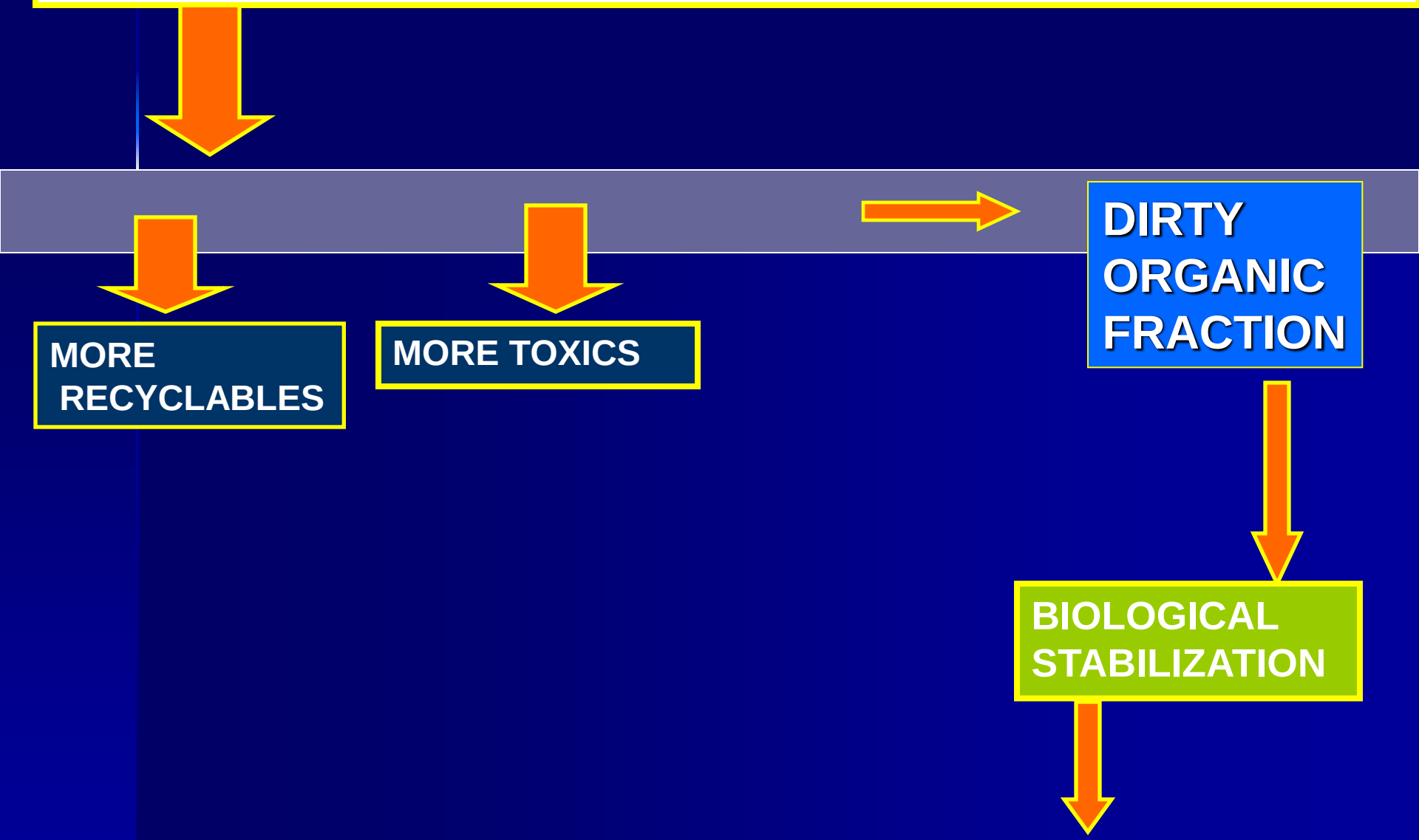
- These are built IN FRONT of the landfills
- No waste can go directly to the landfill. It must first go through the screening facility


sundancerphoto

RESIDUAL SCREENING FACILITY

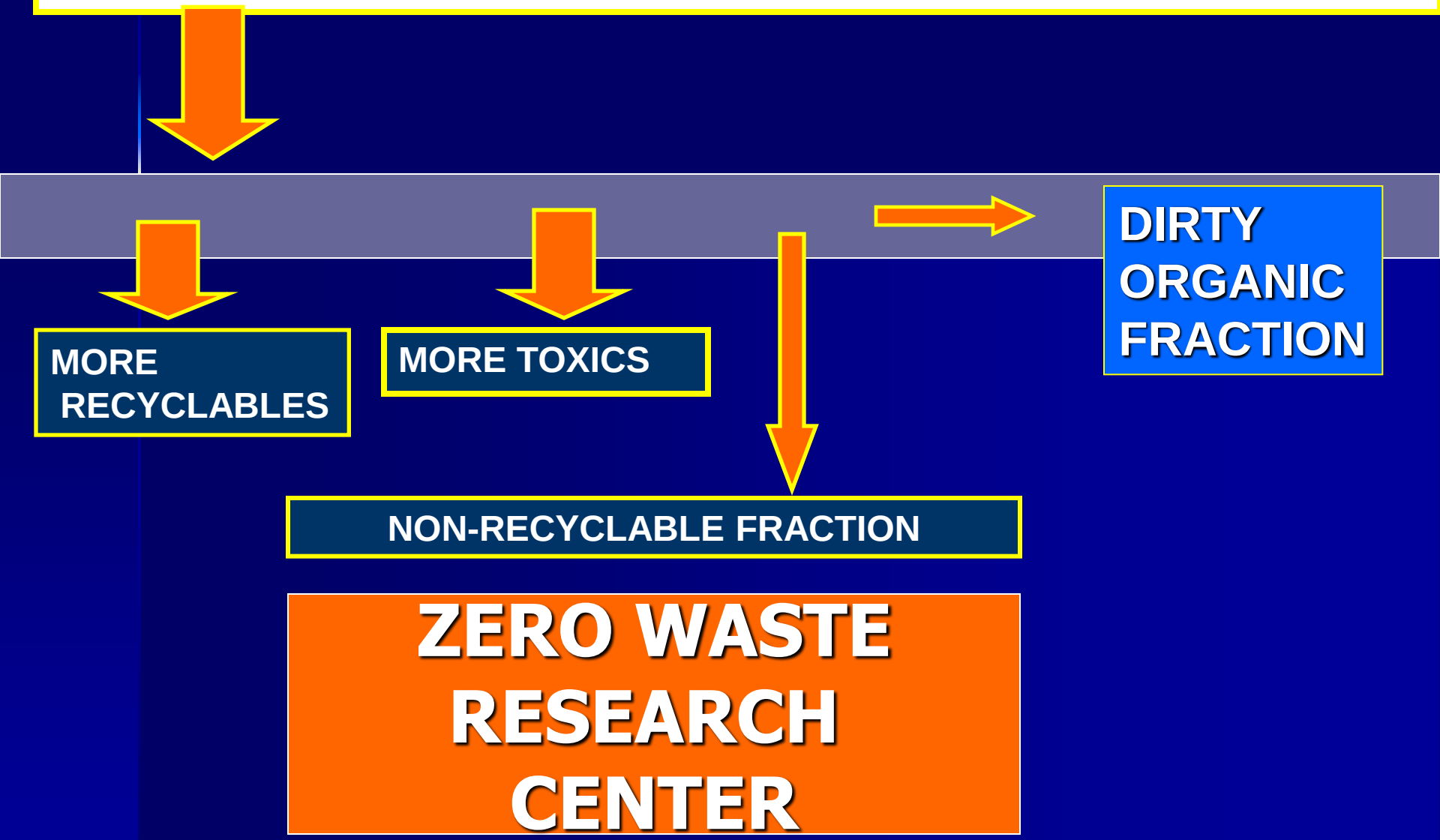


RESIDUAL SCREENING FACILITY



8B.
THE ZERO WASTE RESEARCH CENTER

RESIDUAL SCREENING & RESEARCH FACILITY



NON-RECYCABLE MATERIALS

Local University

Or Technical College

ZERO WASTE RESEARCH CENTER

RESEARCH CENTER

- Recommend better designs to industry on packaging and products

THE RESIDUAL SEPARATION AND ZERO WASTE RESEARCH CENTER

The Message to Industry:

- If we can't reuse it, recycle it or compost it,
- Industry shouldn't be making it
- We need better industrial design for the 21st Century

On Jan 23, 2010 Capannori launched its Rifiuti Zero Research Center

Rossano Ercolini

Ambientefuturo@interfree.it

338-28-66-215

FRAZIONE RESIDUA - Capannori Porta a Porta

1.	Tessili e cuolo	16.52 %
2.	Pannolini	13.95 %
3.	Materiale organico da cucina	10.56 %
4.	Altra plastica: non imballo	9.98 %
5.	Imballaggi cellulosici poliaccopiati	8.05 %
6.	Imballaggi poliaccopiati in plastica	7.45 %
7.	Imballaggi flessibili in plastica	6.81 %
8.	Materiale organico da giardino	4.64 %
9.	Imballaggi rigidi in plastica (non bottiglie)	3.23 %
10	Giornali (quotidiani e riviste)	2.54 %

REUSABLE PAMPERS

ecobimbi

Pannolino Ecologico Lavabile

LETTERA APERTA ALLA LAVAZZA

Spettabile Lavazza

Dal giugno 2010, il Comune di Capannori (Lucca, popolazione 46.000 abitanti e sede del distretto cartario più importante d'Italia) ha promosso il progetto "Passi concreti verso rifiuti zero"fondato sulla costituzione del **CENTRO RICERCA RIFIUTI ZERO**.

Tale Centro di Ricerca, dotato di un team operativo e di un Comitato Scientifico presieduto dal professor **Paul Connett**, ha lo scopo di STUDIARE la composizione del RIFIUTO RESIDUO "a valle" di raccolte differenziate che hanno raggiunto la media (certificata dalla Regione Toscana) dell'81%. A partire dallo scorso luglio il team operativo del Centro di Ricerca al cui interno operano sia esperti di gestione dei **rifiuti** che progettisti sono stati effettuati diversi sopralluoghi presso la stazione di trasferimento dei rifiuti del comune dove viene conferito il "rifiuto non riciclabile". Attraverso questi sopralluoghi condotti in collaborazione con il soggetto gestore ASCIT si è riscontrato una grande quantità di **CAPSULE DA CAFFE**. In merito il soggetto gestore ci ha confermato che l'indicazione che viene data alle utenze circa la gestione di tale imballaggio è quella della collocazione nel contenitore del "residuo" da inviare a smaltimento in quanto trattasi di plastica parzialmente contaminata dalla residua polvere di caffè.

Poiché il comune di Capannori nel **2007** è stato il primo in Italia ad approvare una DELIBERA RIFIUTI ZERO entro il 2020 collocandosi tra le numerose municipalità che a livello internazionale (soprattutto in California ed in USA cosi' come in Canada, Australia, Sud America ed adesso anche in Europa) perseguono questo obiettivo; poiché, altresi' la RD nel comune raggiunge livelli ottimali che testimoniano un alto livello responsabilizzazione dell'intera comunità *APPARE DI ESTREMA ATTUALITA' E NECESSITA' ACQUISIRE LA COLLABORAZIONE DELLE IMPRESE* PRODUTTRICI. Tanto più se la conseguenza dei loro prodotti è rappresentata da scarti non aventi alcuna alternativa alle operazioni di smaltimento.

Per questo il CENTRO DI RICERCA ha aperto un "caso studio" su questa tipologia di imballaggio muovendo dalla constatazione DI UN **ERRORE DI PROGETTAZIONE** DELLO STESSO (vedi su www.rifiutizerocapannori.it) per aprire senza alcun spirito polemico un "percorso condiviso" per un suo "ripensamento" in grado di superare le *"criticità"* attualmente evidenziate dai sopralluoghi . Già, nel corso di un seminario nazionale tenutosi a Capannori il 20-21 novembre scorsi è stato avanzato un *"ventaglio"* di **ALTERNATIVE** a cui, cortesemente, VORREMMO COINVOLGERVI considerando anche la necessità da parte dei produttori di avviarsi sempre più nella direzione di **farsi carico dei propri prodotti** dalla "*culla alla tomba*".

In questo percorso di RESPONSABILIZZAZIONE risiede o meno la possibilità di vincere la "sfida della sostenibilità ambientale" a cui tutti (cittadini, imprese e enti pubblici) siamo chiamati a rispondere. **Una disponibilità vostra ad aprire un confronto costruttivo** sarebbe di grande rilevanza non solo per contribuire a risolvere una "criticità" relativa ad una corretta gestione dei materiali di scarto ma anche per avviare un processo positivo nella applicazione di una **RESPONSABILITA' ESTESA DELLE IMPRESE** legata a criteri di *sostenibilità ambientale* e di *eticità* .

Capannori …

RIFIUTI ZERO
"Passi concreti verso Rifiuti Zero"
Comune di Capannori

Il responsabile del Progetto
Rossano Ercolini

ZERO WASTE

ZERO WASTE

Community Responsibility = Reduce, Reuse, Recycle/Compost

The 4th R

The 4th R =

RE-DESIGN

ZERO WASTE

Community Responsibility = Reduce, Reuse, Recycle/Compost

Industrial Responsibility = Re-Design

STEP 9.

9. Better Industrial Design

10. An interim landfill for biologically stabilized dirty organic fraction

1. Source Separation

2. Door to Door Collection

3. Composting

4. Recycling

5. Reuse, Repair & Deconstruction

6. Waste Reduction Initiatives

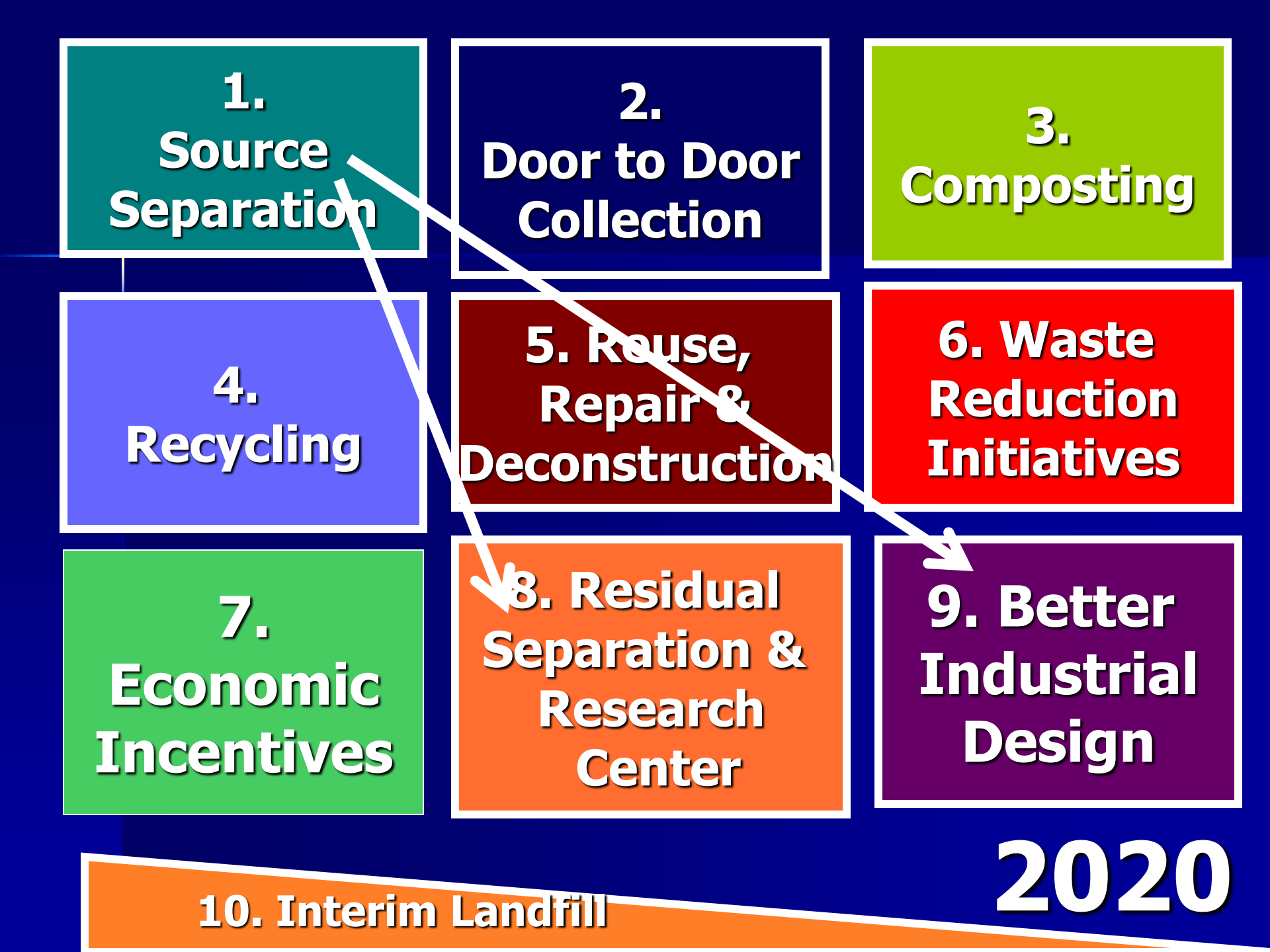
7. Economic Incentives

8. Residual Separation & Research Center

9. Better Industrial Design

10. Interim Landfill

2020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2020


Sustainable Agriculture
Education For Sustainability
Sustainable Architecture
Sustainable industries & Jobs
Zero Waste 2020
Sustainable Energy
Sustainable Community development
Sustainable Economic development

This plan

1) Is better for the Economy…

MORE JOBS

2) Is better for our HEALTH…

LESS TOXICS

3) Is better for our UNIVERSITIES

MORE MEANING

4) Is better for the PLANET…

MORE SUSTAINABLE

5) Is better for our CHILDREN…

MORE HOPE

We need 5 C's to underpin the 4 R's of Zero Waste

1) Common Sense

Don't let the experts take your common sense away

2) Community

We need to empower communities to protect their air, water, food, resources, their land

3) Creativity

We can't expect to outmatch corporate looters for money, but we can beat them on creativity

We need 5 C's to underpin the 4 R's of Zero Waste

4) Children

We need to involve children early in public service and the struggle for sustainability

5) Communication

When we achieve any success – large or small –we must communicate it around the country and the world (video/internet)

Information – communication –motivation-action

3. Zero Waste Initiatives around the world

San Francisco

- Population = 850,000
- Very little space
- 50% waste diverted by 2000
- 80% waste diverted by 2011
- **ZERO WASTE by 2020 (or very close!)**

In Berkeley, California

- They are using comic books to get the message out


BE CAREFUL, LONE RECYCLER!
WHEN YOU FOLLOW THE WASTE STREAM
MANY DANGERS AWAIT YOU !!!
WILL YOU BE FRIED TO A CRISP IN ASHLY BURNS' INCINERATOR? WHAT WILL YOUR FATE BE AT THE HANDS OF THE POSSESSED GENIUS, DR. FRIGHTENSTEIN? WHAT WILL HAPPEN WHEN YOU FALL VICTIM TO THE CHARMS OF THE VAMPISH POLYVINYL? WHEN ALL YOUR HOPES ARE DASHED, WILL YOU ABANDON ALL YOUR IDEALS & FRIENDS AND LEAVE SLOBBERG FOREVER? WILL DIRTY POLITICS DEFEAT YOU? READ ON!
BURN
BUY! BUY! BUY!
R
THE LONE RECYCLER'


THE LONE RECYCLER
A BIG ENUF PILE OF ANYTHIN IS WORT SOMETH
©Nancy Gorrell

Italy

- Over 200 communities in Italy have endorsed Zero Waste
- Many have achieved over 70% diversion-
- and some very quickly

Italy

- Salerno (near Naples, pop 145,000) 18% to 72% in two years!

Italy

The hotel industry is very involved in the promotion of Zero Waste

They too are using comic books and graphics artists to get the message out…

rifiuti?

Guida alla raccolta differenziata dei Rifiuti Solidi Urbani

Flanders

This whole province in Belgium (population 6 million people) is getting 73% diversion

In Castelmonte in Sicily…

They are using donkeys
to collect the recyclables


ECOLOGIA AMBIENTE
PASSA AVOIE DA QUI

In Presteigne Wales…

They are using a low-tech community based program


KING'S
COURT
SG05 DWL


WASTE
IN YOUR FACE!
Landfill isn't pretty
REFUSE ONLY
KING'S
RECYCLING
45 RESIDENTS
COURT
RECYCLING
42 TAKE PART

In the Philippines

they are organizing at the Barangay level…


MATERIALS RECOVERY FACILITY
MRF
BARANGAY
MRF


MATERIALS RECOVERY FACILITY
MRF
BARANGAY BALAYANG
ALAMINOS CITY, PANGASINAN

In the Kamakatsu, Japan

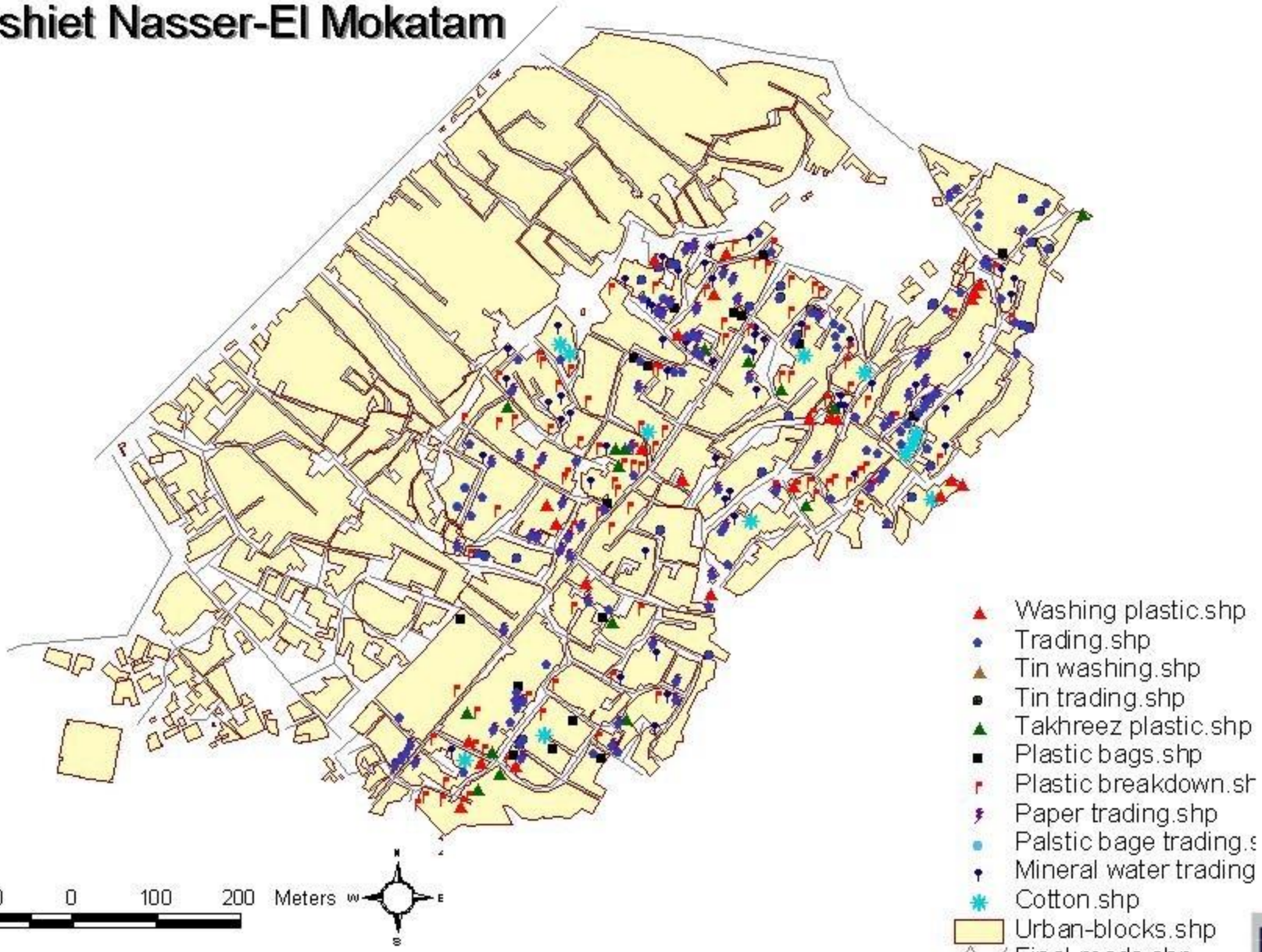
At their recycling center the citizens separate into 28 different categories

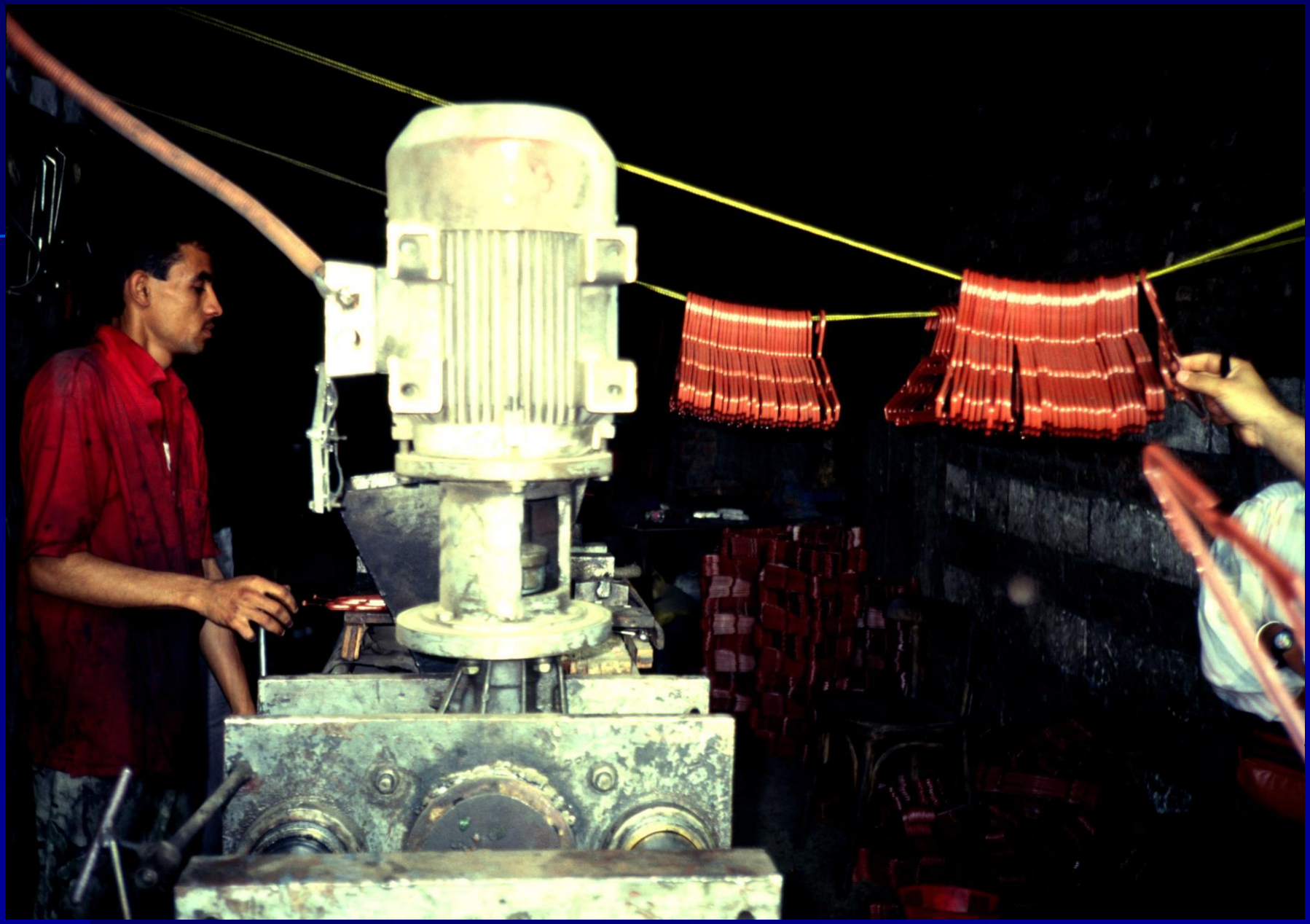
In Cairo, Egypt

The Coptic Christian community (the Zabbaleen) have organized their community around the collection, separation, re-processing and remanufacture of simple products


CHEVROLET

Waste Recycle Facilities
Manshiet Nasser-El Mokatam





Fighting Overconsumption

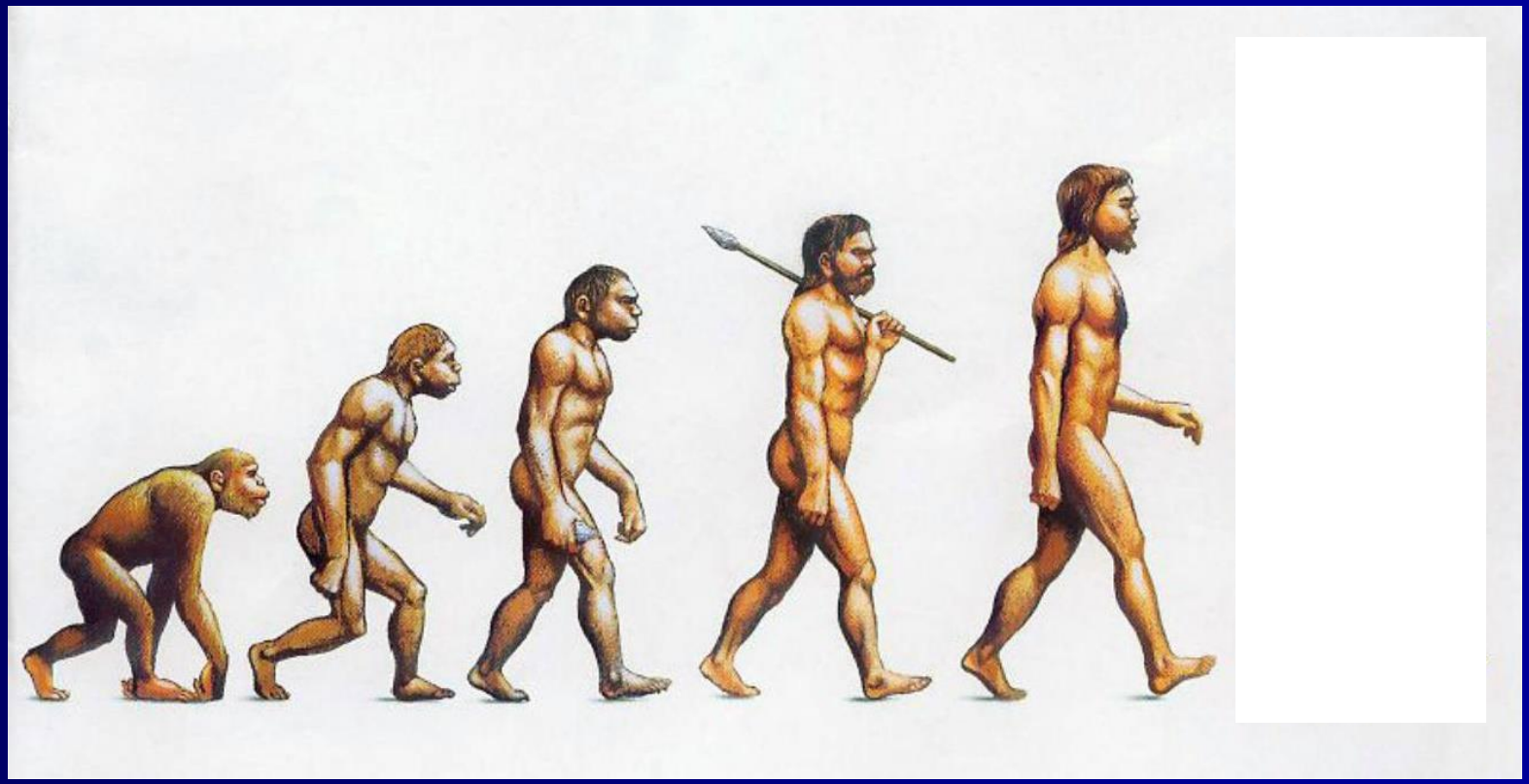
By the time a high school student leaves school, he or she will have watched over 350,000 TV commercials.

Paul Hawken
The Ecology of Commerce.

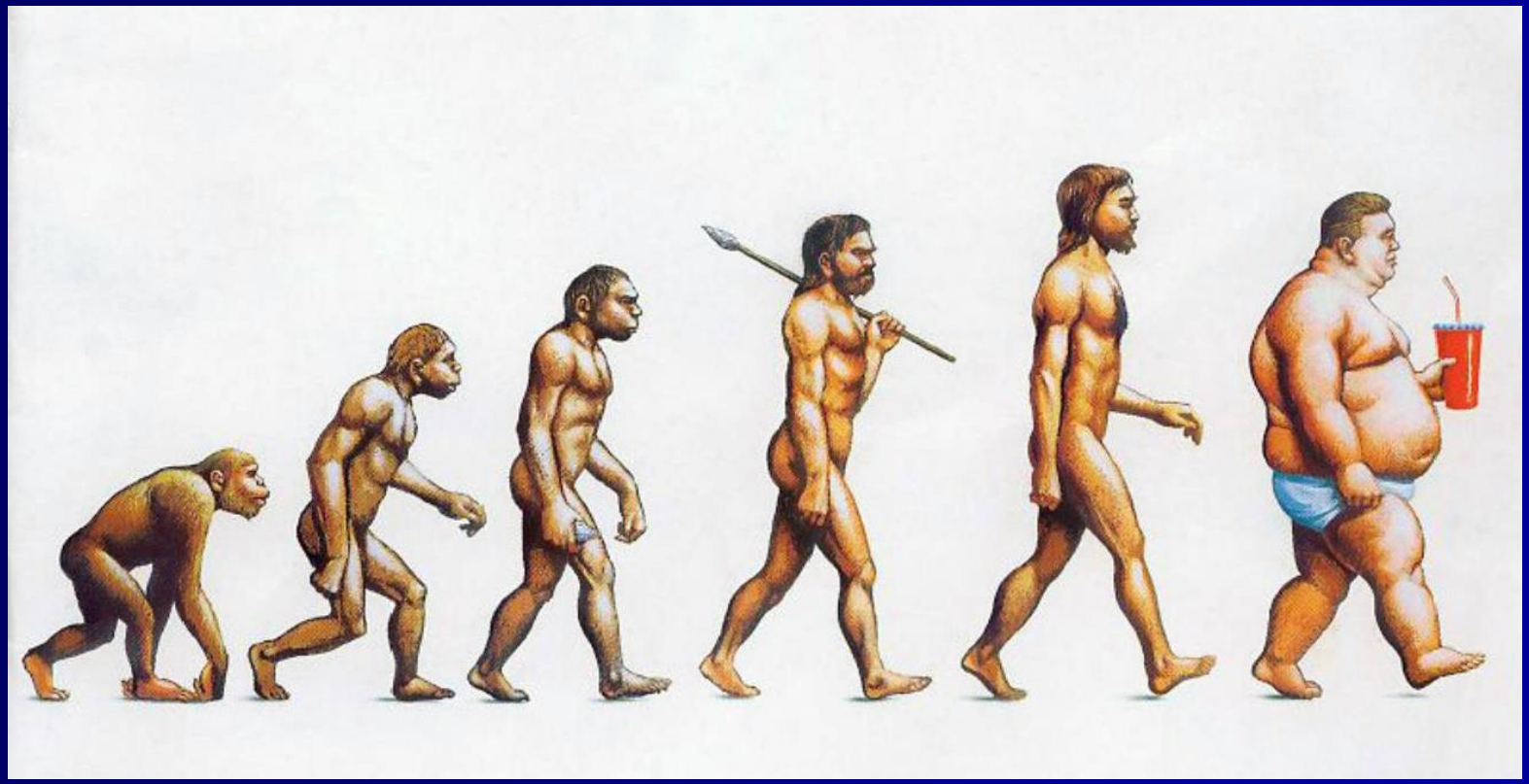
Myth versus Reality

- THE MYTH:
- The more you consume the happier you become
- THE REALITY:
- The more you consume the fatter you become!
- And the more waste you produce

Man



Modern Man!



“The world has enough for everyone’s need but not for everyone’s greed”

Mahatma Gandhi

We have to destinguish between the standard of living and the quality of life

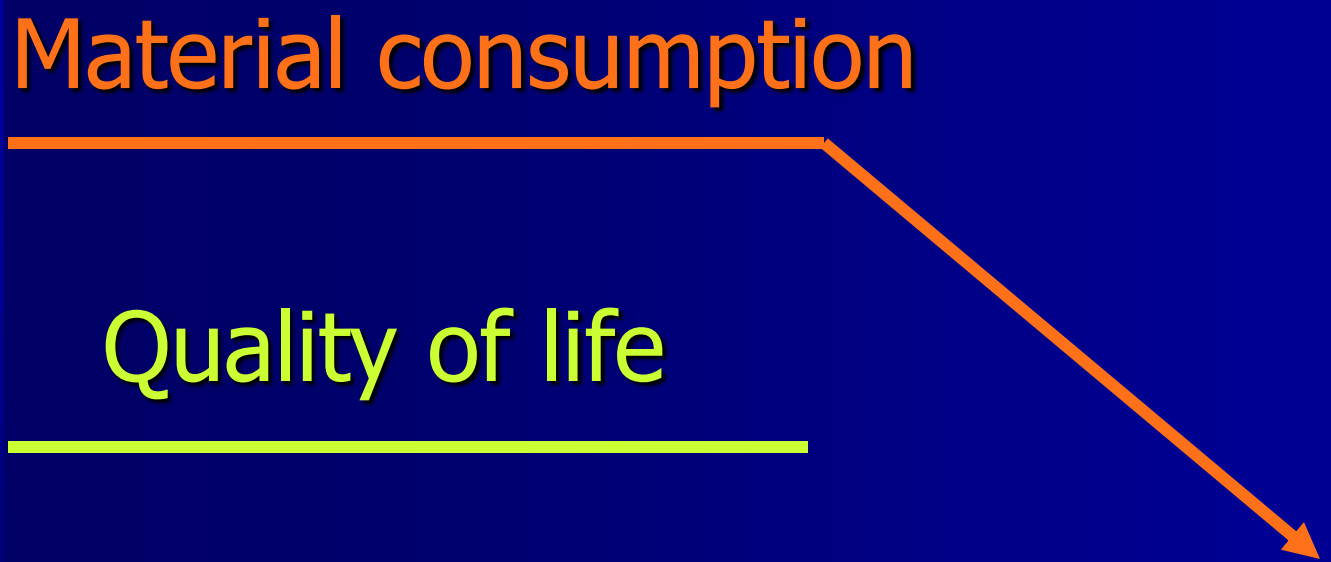
We have to separate the Quality of life from material consumption

We have to separate the Quality of life from material consumption

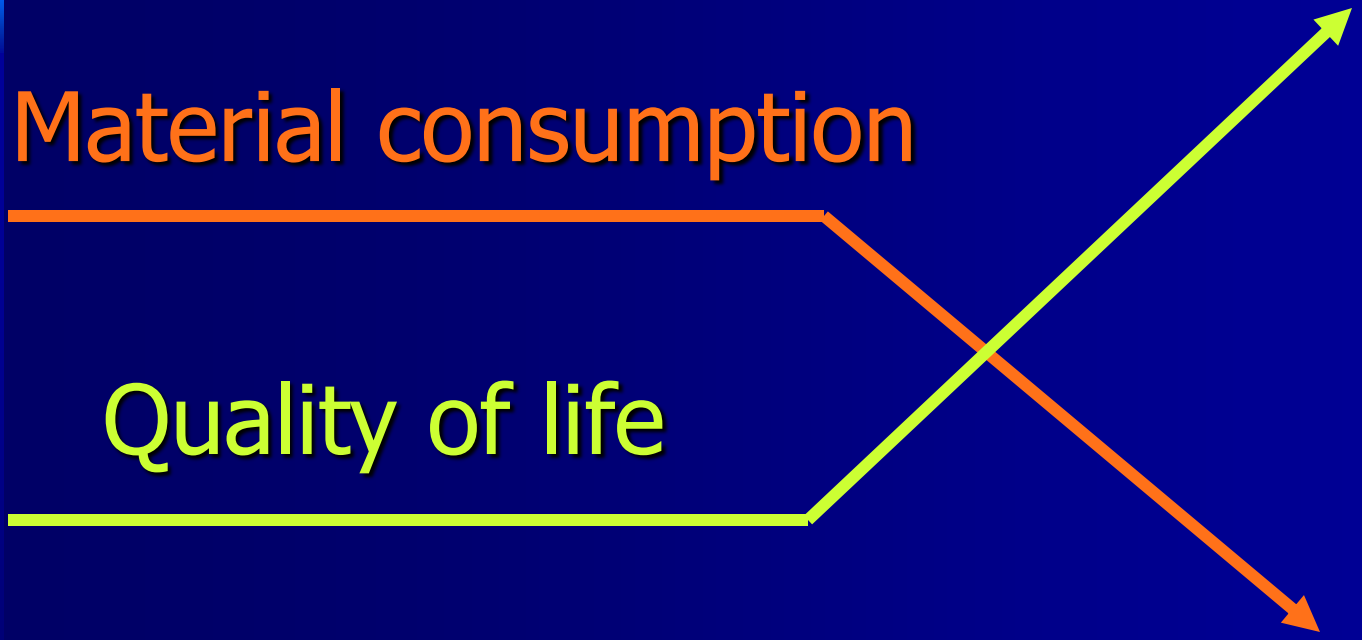
Material consumption

Quality of life

We have to separate the Quality of life from material consumption



We have to separate the Quality of life from material consumption



Consume less
Enjoy more!

Less money
More meaning!

To fight over-consumption

We need to swap a life built around acquiring a series of objects…

To a life built around a series of expanding human relationships

In the 1960's

"Make Love, Not War"

In the 2000's

"Make Love, Not Waste"


MAKE LOVE
NOT WASTE
PARI OPP
une di Capa
UN GIUSTO
Bene Comune
www.ref

In the 2000's

"Make Friends, Not Waste"


COOPER

Technology routes to attend Brazilian Waste Management Law

Seletive collection

Sheds of sorting

Cooperatives

Landfills

Composting

TECHNOLOGICAL ROUTE TO POPULAR RECYCLING OF URBAN WASTE (BRAZIL)

Sorting Sheds

Sellective Collection

Marketing and Pré-industrial recycling materials done by Solidarity Network of Cooperatives

Composting and Biodigestion of Organics

Landfill to refuse

Sellective Collection