

A Sustainable Waste Solution for the 21st Century

Oshawa, January 10, 2008

Dr Paul Connett

Professor Emeritus of Chemistry,
St Lawrence University, Canton, NY

paul@FluorideAlert.org

www.FluorideAlert.org

End Water Fluoridation

- The National Research Council review (NRC, 2006), "Fluoride in Drinking Water," 507 pages, 1000 references.
- Scientific American article, "Second Thoughts on Fluoride," January, 2008.
- The Professionals' Statement calling for an end to fluoridation worldwide, see www.FluorideAlert.org - a copy is in your packet. Now signed by over 1280 professionals from over 40 countries.

**Congratulations to
Durham region for
winning the PUBLIC
WORKS PROJECT OF THE
YEAR 2006
(Environmental category
2-10 million \$)**

Diverting 44% of waste from landfill in 2006, and more in 2007 (some communities up to 65% diversion). Achieving this so cost effectively, and so quickly, is a major achievement

Congratulations to Markham

- For reaching 70% diversion in two years
- Markham is a world leader

Congratulations to Ward 1 Pickering

- For reaching 73% diversion in a pilot project
- Pickering could be a world leader, but...

But York-Durham-Anderson region has shot itself in the foot by including an incinerator in its plan, which will cost over 10-100 times what you are currently spending on your diversion program

A fraction of this money could be spent on a **residual screening and research facility** built in front of a interim landfill and continue the move towards sustainable waste management (**Zero Waste 2020**) which you have so splendidly started

**Source
Separation
Reduce
Reuse
Repair
Compost
Recycle
Toxic waste
collection**

The Anderson option

Let's compare:

**Source
Separation
Reduce
Reuse
Repair
Compost
Recycle
Toxic waste
collection**

The Anderson option

**Trash
incinerator**

+

**Ash
landfill**

Let's compare:

**Source
Separation
Reduce
Reuse
Repair
Compost
Recycle
Toxic waste
collection**

The Anderson option

Trash
incinerator

+

Ash
landfill

The Alternative option

Source
Separation
Reduce
Reuse
Repair
Compost
Recycle
Toxic waste
collection

Let's compare:

The Anderson option

Trash
incinerator

+

Ash
landfill

The Alternative option

Residual
Screening &
Research
Facility

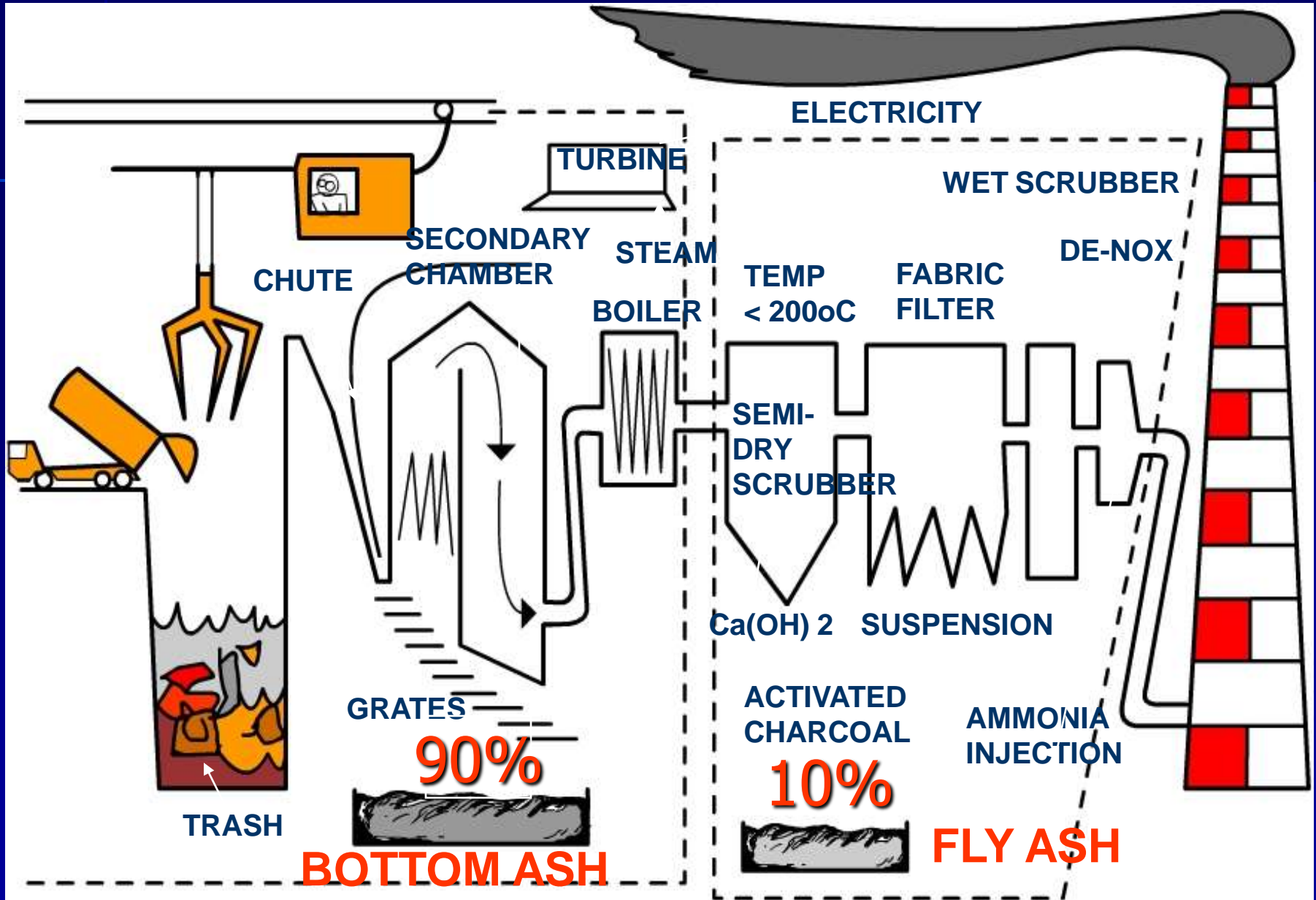
+

Stabilized
Interim
landfill

Source
Separation
Reduce
Reuse
Repair
Compost
Recycle
Toxic waste
collection

Let's compare:

For every 3-4 tons of trash you get about one ton of ash



Ash management

- In Germany & Switzerland fly ash put into nylon bags and placed in salt mines
- In Japan some incinerators vitrify the ash
- In Denmark...
- They send all the ash to Norway
- In Ontario...
- they send the fly ash to Sarnia and the bottom ash to regular landfills
- So where is the landfill in Durham to receive the bottom ash?

The central contradiction of the Anderson plan

- The two political drivers behind this plan:
 - 1) Durham won't build new landfills
 - 2) Durham won't export its waste
- So what happens to the ash? - either you are going to have to build an ash landfill or you are going to have to export the ash
- Either way you are violating one of the driving forces behind the Anderson plan

The Incinerator will be an Economic Disaster for the York-Durham-Anderson Region

- Incinerators are hugely expensive
- At least \$250 million capital costs
- Even more when you include interest over 25 years pay back plus retrofit after 20 years
- A few people will make a lot of money upfront, but taxpayers - however the plant is financed - will be paying for this plant for over 25 years in very high tipping fees and the extra cost of electricity

The Economic Disaster

- The people who make money upfront on this plan:
 - 1) The middle men who have brokered the deal
 - 2) The consultants who have designed and defended the plan (and who will prepare environmental impact assessments)
 - 3) The financiers who will draw up the loan agreements
 - 4) The lawyers etc who will draw up the contract
 - 5) The PR companies who promote the plan
 - 6) The contractors and sub-contractors who build the plant
 - 7) The companies who supply the steel, concrete etc
- For these people the incinerator is a gravy train

The Economic Disaster

- For the taxpayer this is a nightmare
- For this huge investment very few permanent jobs are created
- There is no stimulation of sustainable businesses in the region
- The only thing incinerators successfully burn is taxpayers' money!

Incineration is a poor investment in the future

- **Most of the money spent on incinerators goes into complicated machinery and leaves the community, whereas**
- **The money spent on the alternatives goes into jobs and stays in the community.**
- **After 25 years or more the region will be no closer to sustainability . Incineration is not sustainable; the alternative strategy is.**

Incineration is a poor investment in the future

- **With the Anderson option, in 25 years, the region will**
- **Waste huge quantities of finite material resources**
- **Waste huge amounts of energy**
- **Waste a terrific opportunity to reduce the global warming impacts of primary processing and manufacture**
- **Waste the opportunity to pressure industry to stop making items we cannot reuse, recycle or compost**
- **And**
- **you will be left with a mountain of ash - 1 ton of ash for every 3-4 tons burned**

OUTLINE

- 1. Waste Management & the Big Picture
- 2. More arguments against incineration
- 3. The Zero Waste 2020 strategy
- 4. The Key Step Forward
- 5. Zero Waste Initiatives Around the World

1. Waste Management & the Big Picture

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



The McDonaldization of Society



New Century Edition

G E O R G E R I T Z E R

- Fast food
- Fast planet!

**We cannot run a throwaway society
on a finite planet**

**We are robbing our own children and
grandchildren**

This is colonialism in time!

Landfills **BURY the evidence**

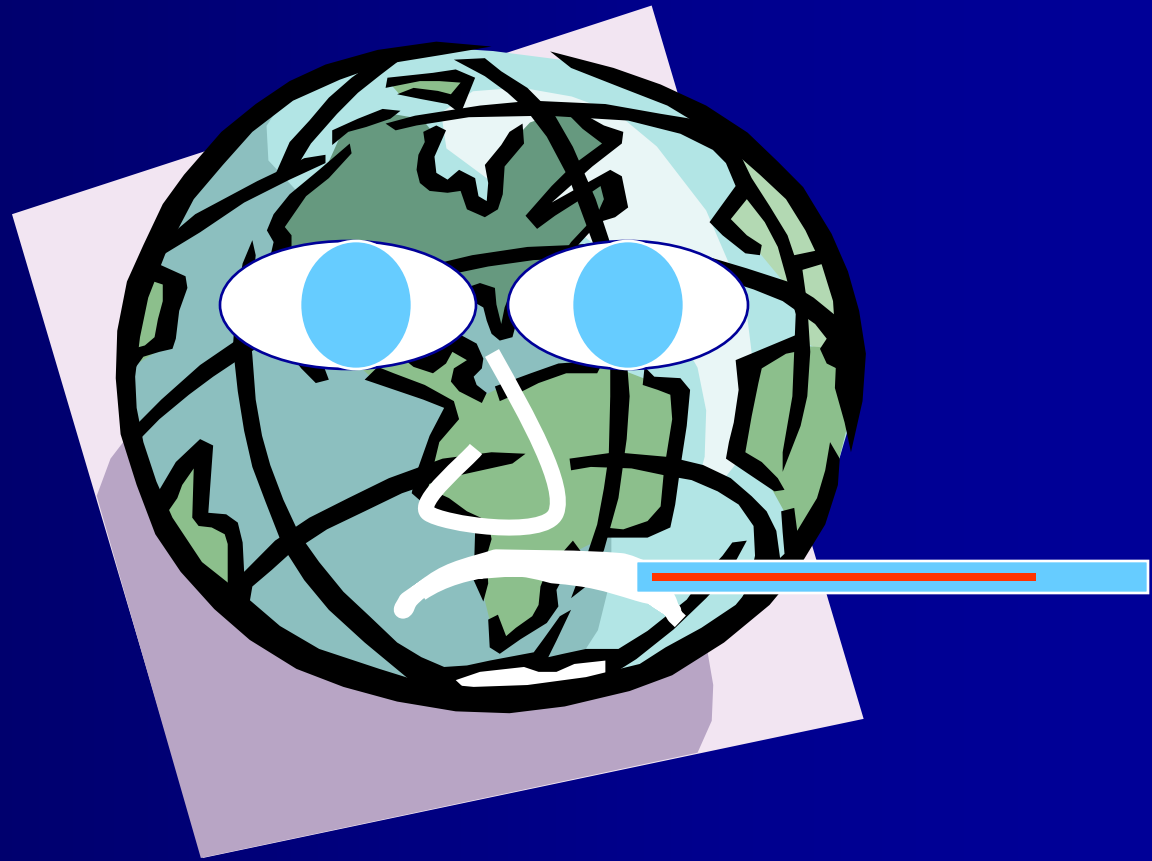
Incinerators **BURN the evidence**

We need to face the real problem...

**Our task is to fight the
throwaway ethic &
over-consumption**

Not only is
over-consumption
giving us a local waste crisis
but also...

... a Global crisis



The Global Crisis:

Since the Industrial Revolution we have imposed **a linear society** on a planet that functions in circles

A LINEAR SOCIETY

A LINEAR SOCIETY

Extraction

A LINEAR SOCIETY

Extraction

Production

A LINEAR SOCIETY

Extraction

Production

Consumption

A LINEAR SOCIETY

Extraction

Production

Consumption

Waste

Advertising/TV



Extraction

Production

Consumption

Waste

Over-advertising

produces

Over-consumption

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

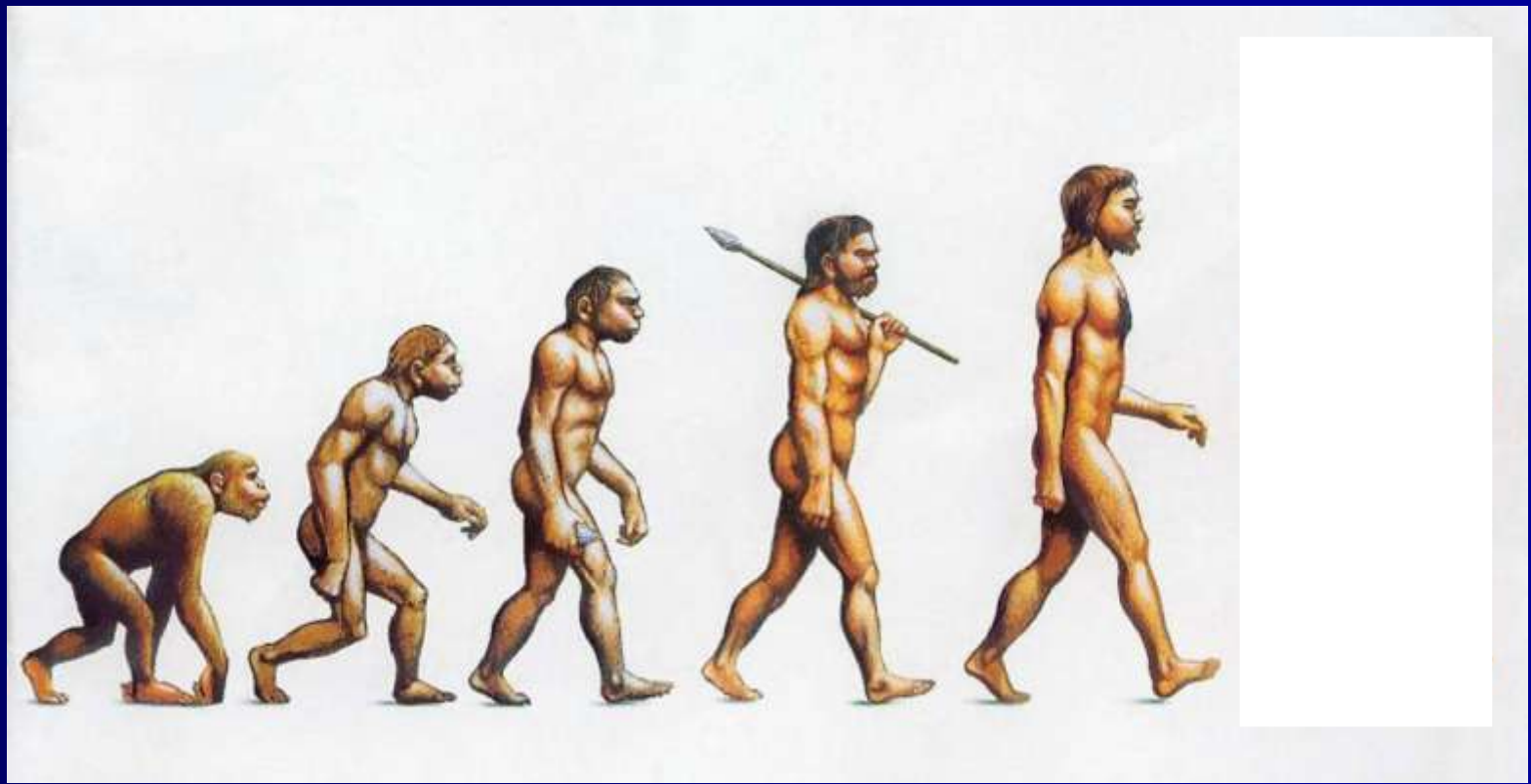
- **THE MYTH:**

- The more you consume the happier you become

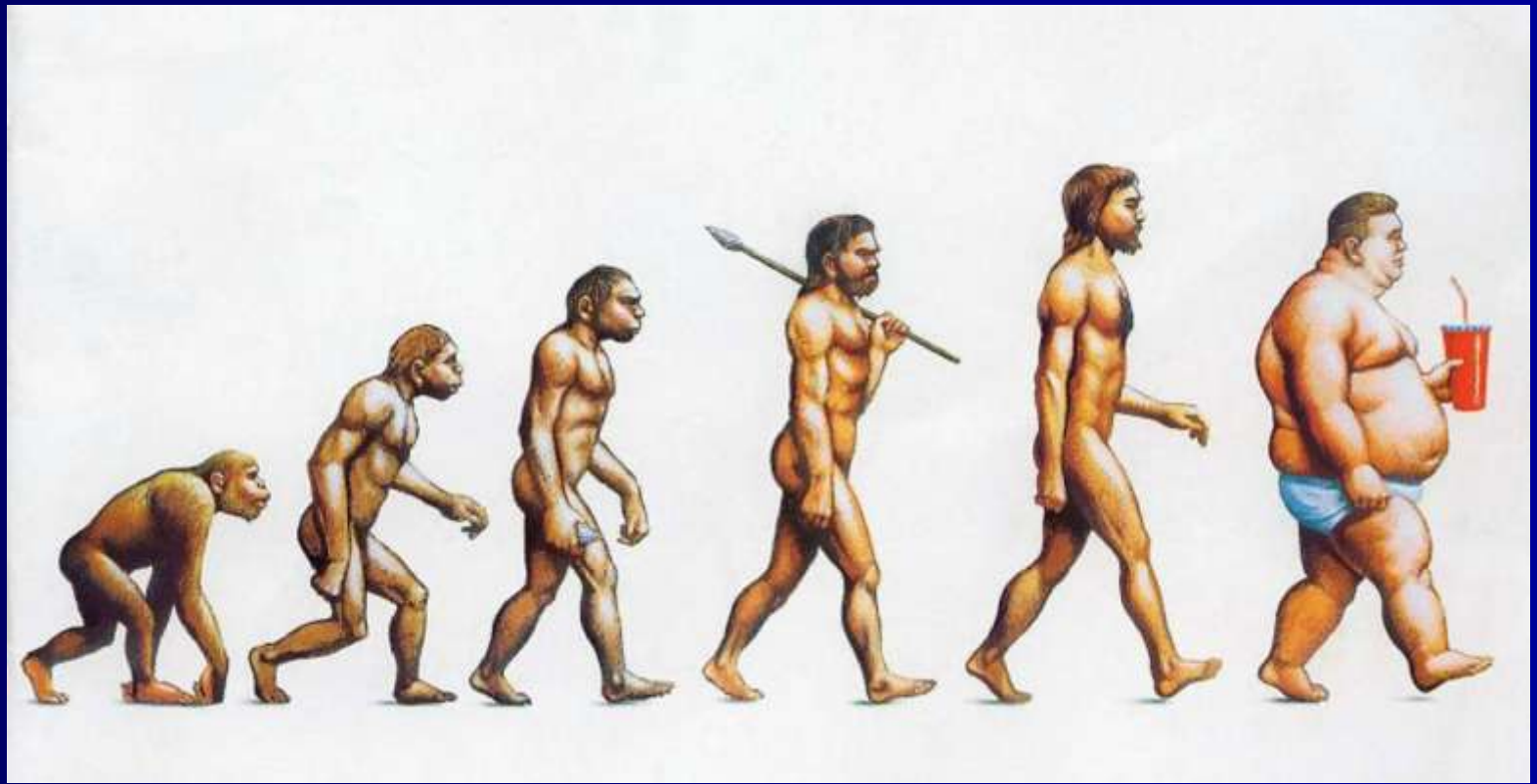
- **THE REALITY:**

- The more you consume the fatter you become!

From Ape to...



Modern man!



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

Mahatma Gandhi

A LINEAR SOCIETY

ENERGY

**Extraction of
Virgin
Materials**

**Production of
Manufactured
items**

Consumption

Waste

**Solid waste
Air pollution
Water pollution
Carbon dioxide**

ENERGY

**Extraction of
Virgin
Materials**

**Production of
Manufactured
items**

Consumption

Waste

**Solid waste
Air pollution
Water pollution
Carbon dioxide**

ENERGY



**Extraction of
Virgin
Materials**



ENERGY



**Production of
Manufactured
items**

Consumption

**Discarded
Materials**



**Solid waste
Air pollution
Water pollution
Carbon dioxide**



**Solid waste
Air pollution
Water pollution
Carbon dioxide**

ENERGY

ENERGY

**Extraction of
Virgin
Materials**

**Production of
Manufactured
items**

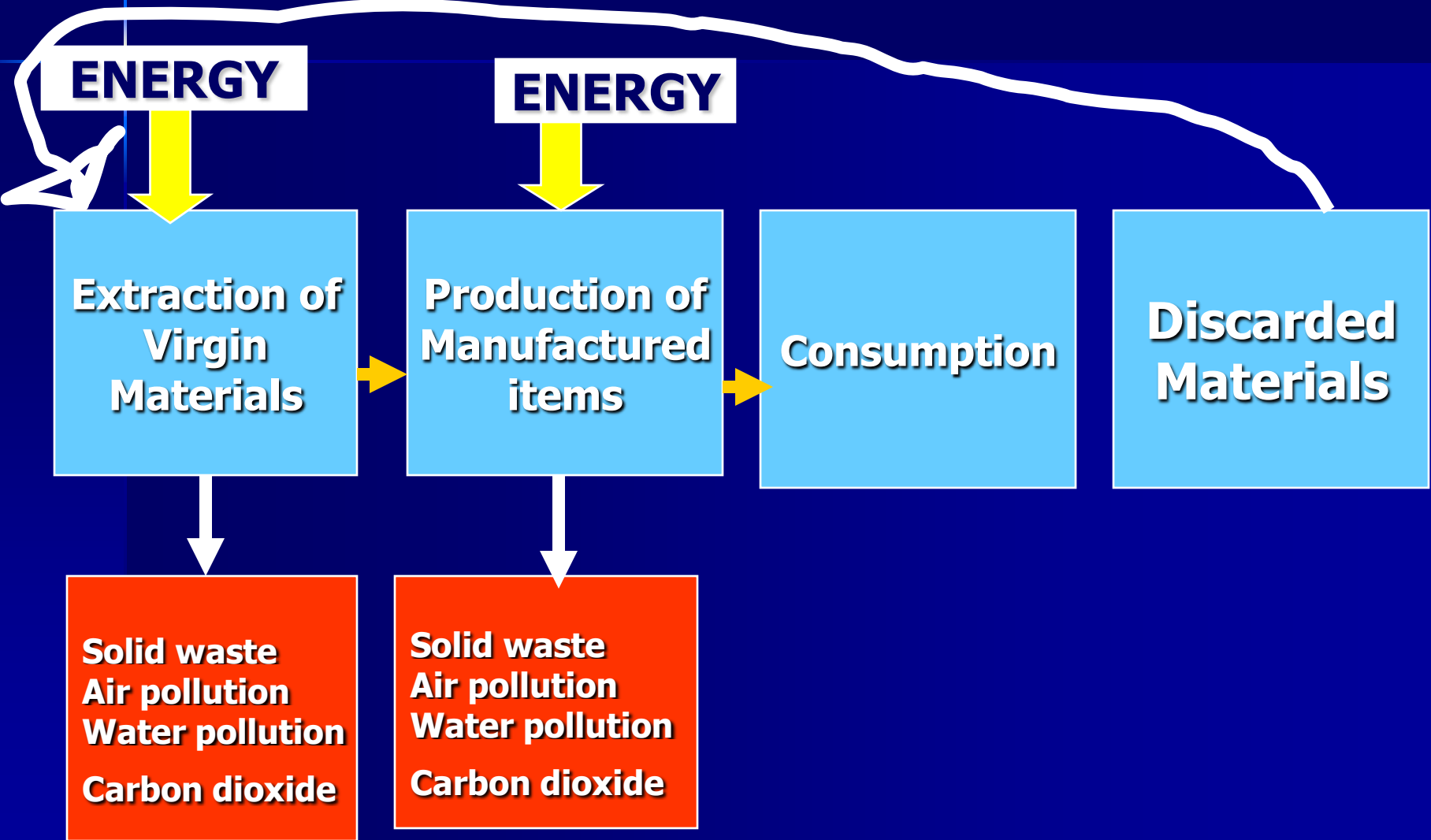
Consumption

**Discarded
Materials**

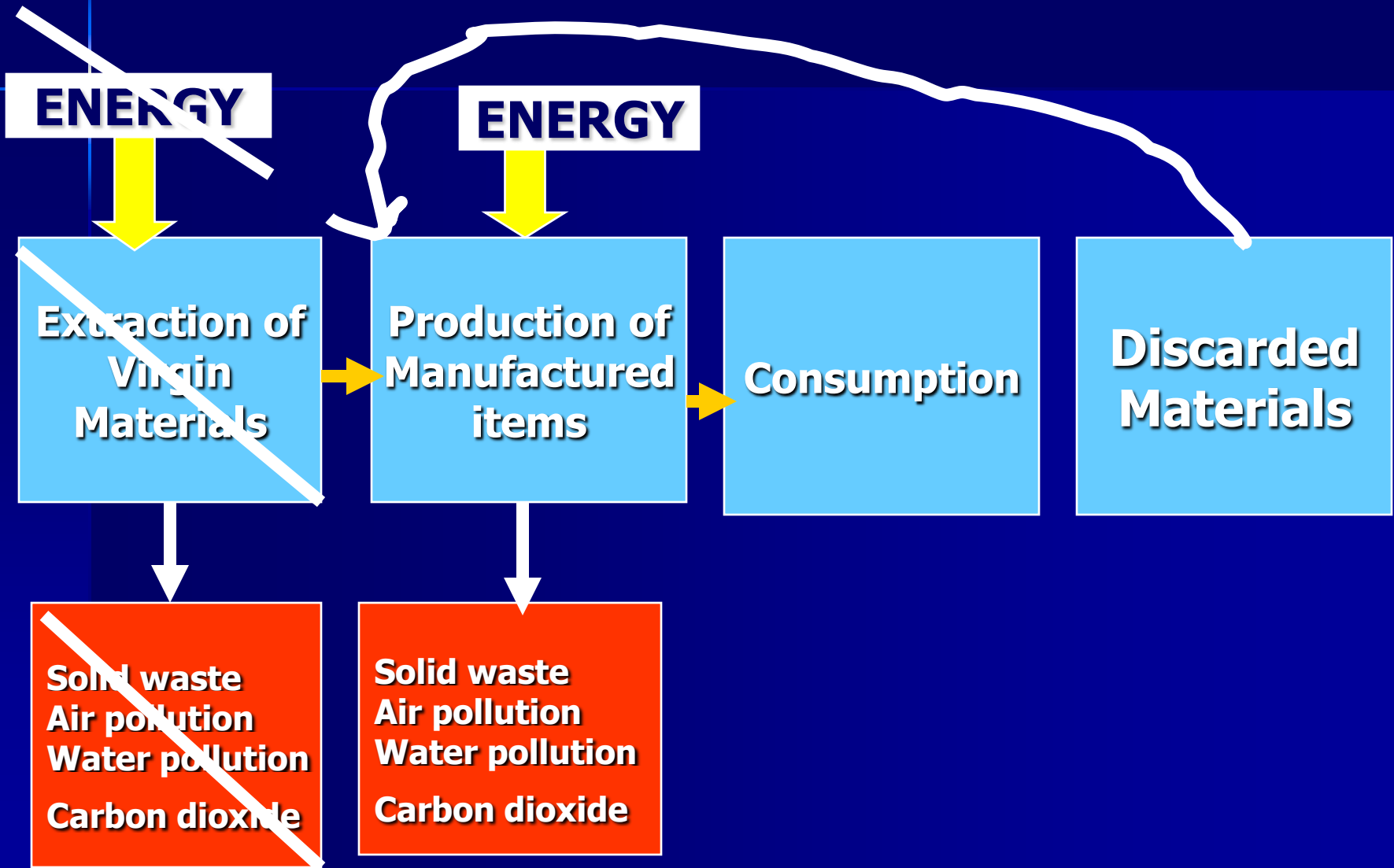
**Solid waste
Air pollution
Water pollution
Carbon dioxide**

**Solid waste
Air pollution
Water pollution
Carbon dioxide**

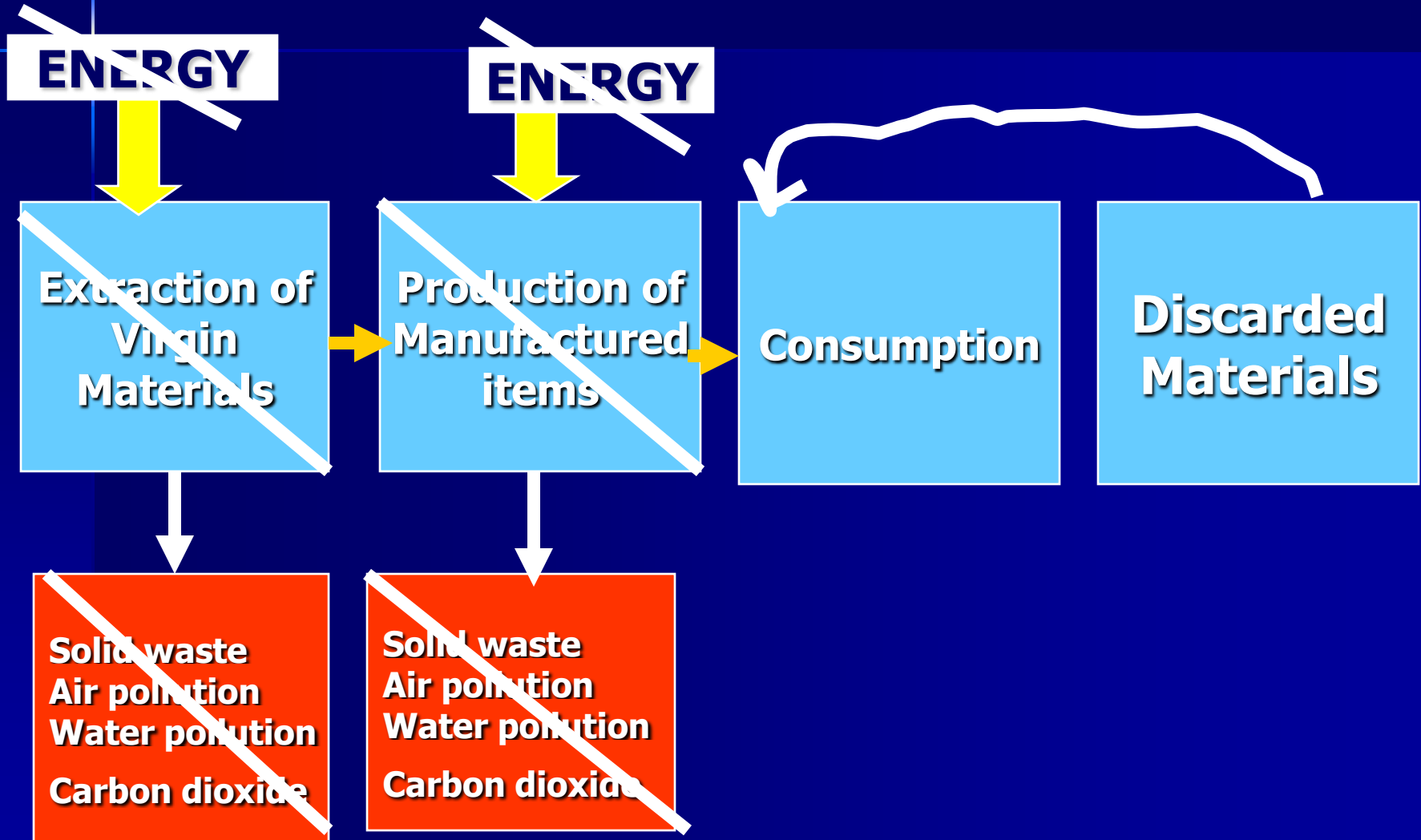
INCINERATION & LANDFILLS



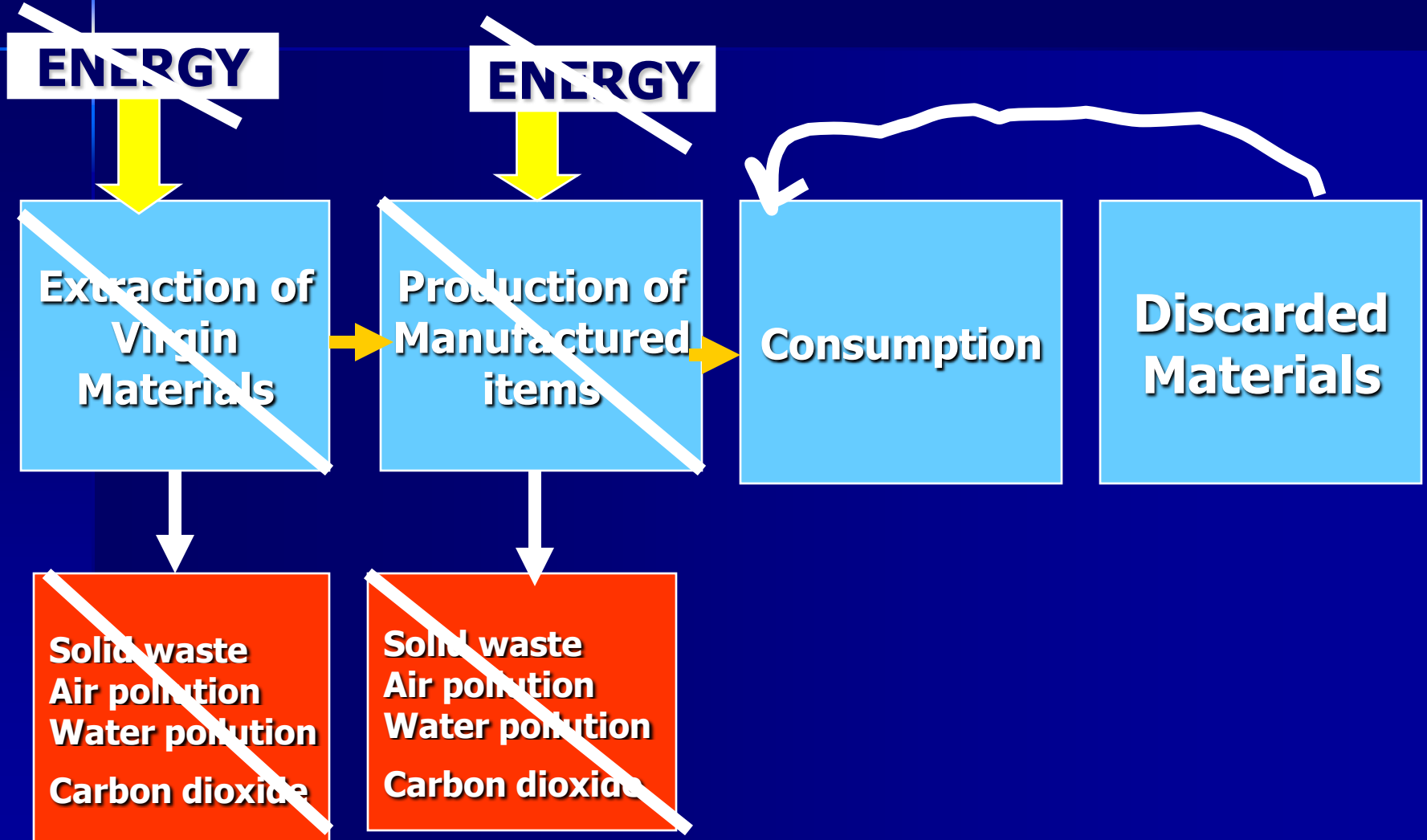
RECYCLING OF MATERIALS



REUSE OF OBJECTS



COMPOSTING



Incineration is a waste of energy!

- Despite the deceptive name “Energy from Waste”
- Incinerators waste **3-4 times more energy** than can be saved by a combination of reuse, recycling and composting
- Contact: 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

Waste Management Options and Climate Change. AEA 2002

- “Overall, **source segregation** of MSW, followed by **recycling** (for paper, metals, textiles and plastics) and **composting/AD** (for putrescible wastes) **gives the lowest net flux of greenhouse gases** compared to other forms of treatment of bulk MSW”

Kg Greenhouse gas/tonne Municipal Waste

<i>Riciclaggio e compostaggio</i>	-461
<i>Trattamento Meccanico-Biologico e stoccaggio</i>	-366
<i>Termovalorizzazione</i>	-10

Waste Management Options and Climate Change. AEA 2002

Slide from Attilio Tornavacca

2. More arguments against incineration

Incineration is extremely unpopular

- In the US over 300 incinerator proposals defeated since 1985
- US has not permitted a new trash incinerator since 1995.

**A modern incinerator
makes handling discarded
materials a very
complicated, expensive
and dangerous procedure**

Think of an incinerator as three boxes

1.

The **Furnace** which
Converts 100's of
Tons of trash into
Trillions of tiny
particles
and gases.

Think of an incinerator as three boxes

1.

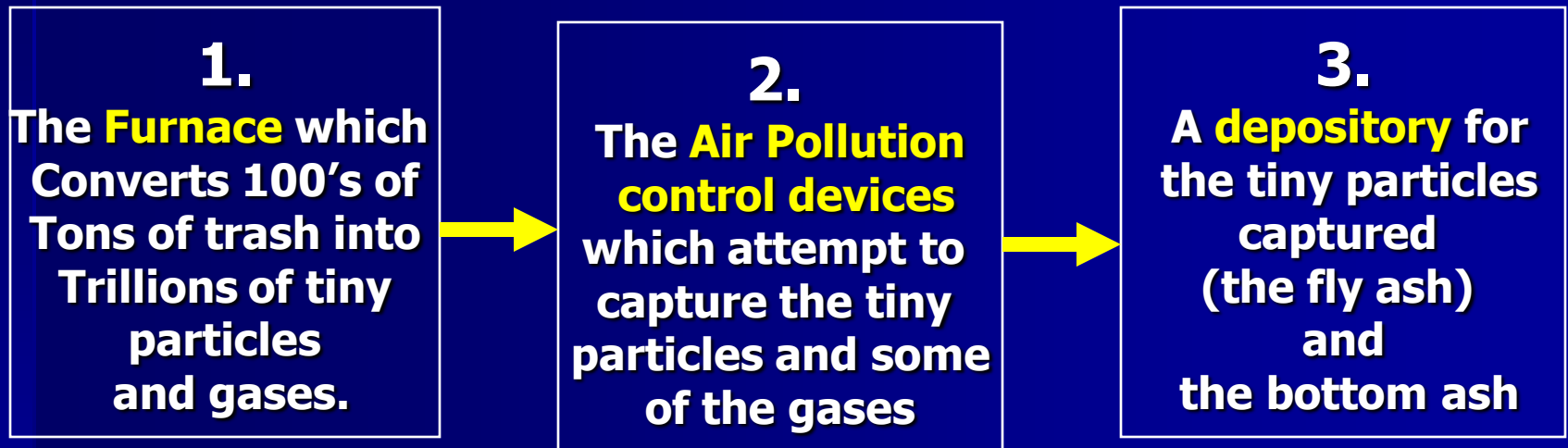
The **Furnace** which
Converts 100's of
Tons of trash into
Trillions of tiny
particles
and gases.



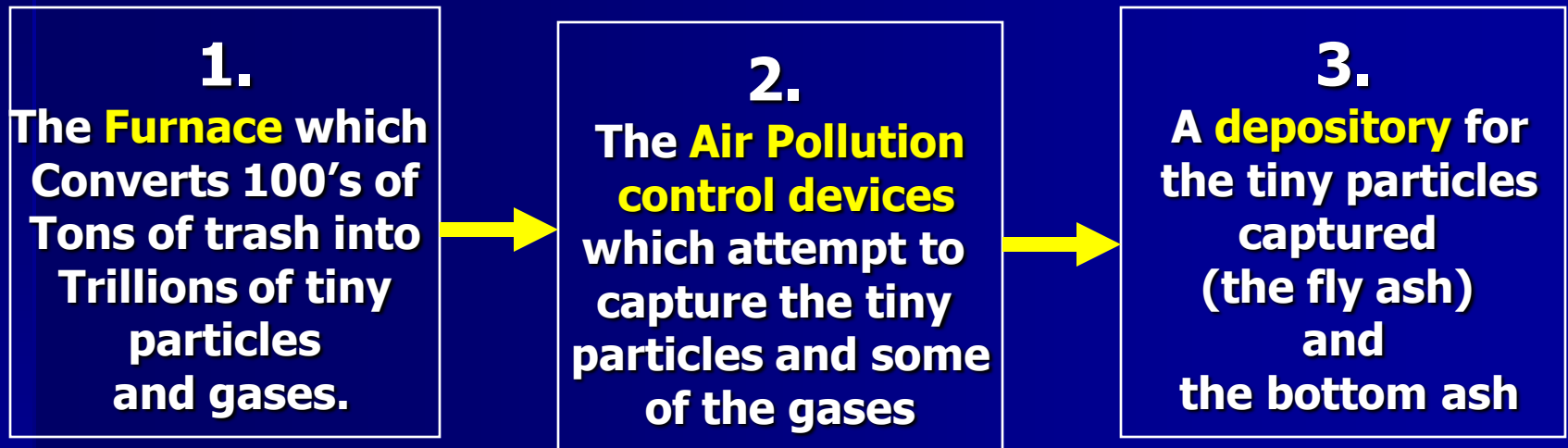
2.

The **Air Pollution
control devices**
Which attempt to
capture the tiny
particles and some
of the gases

Think of an incinerator as three boxes



Think of an incinerator as three boxes

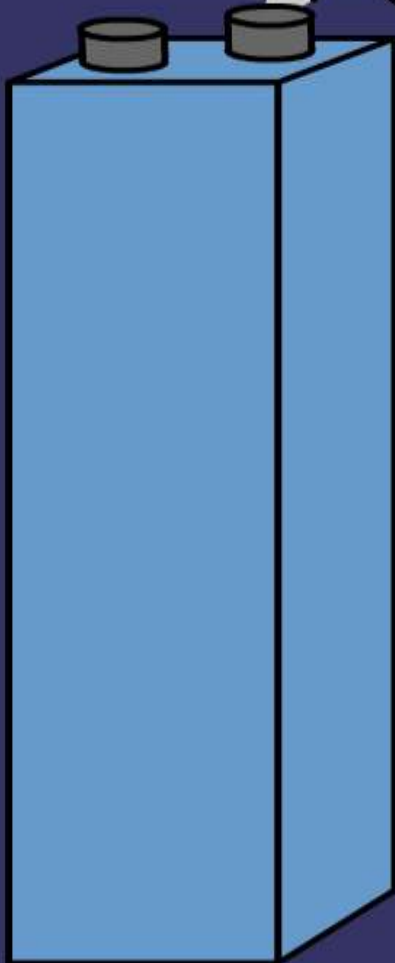


For every three - four tons of trash you get one ton of toxic ash!

Incinerators put many highly toxic and persistent substances into the air

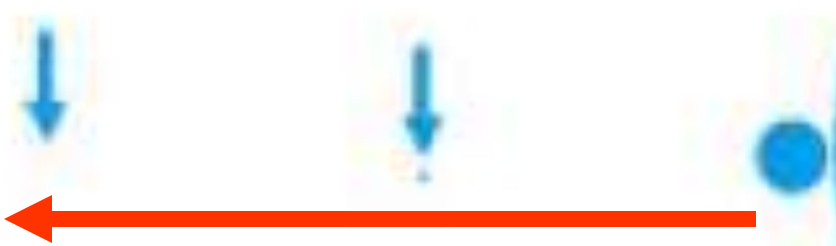
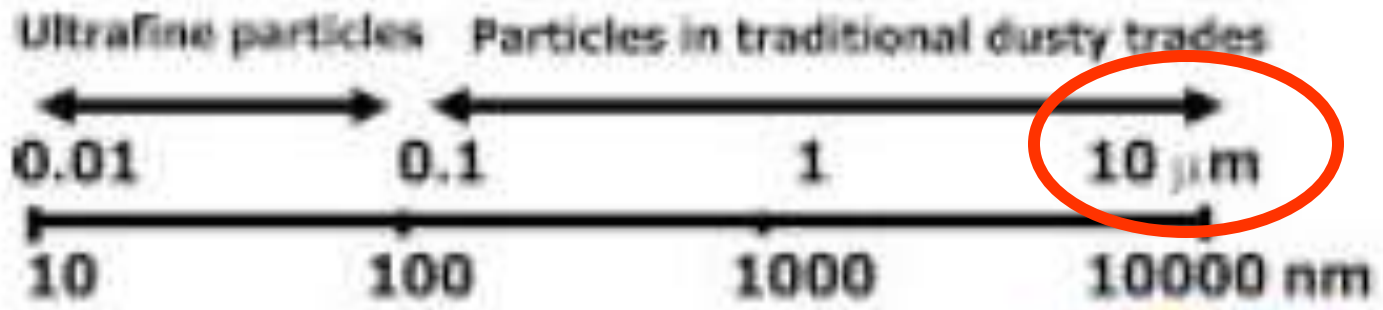


AIR EMISSIONS



- CO₂ + H₂O
- ACID GASES:
HCl, HF, SO₂
NO_x
- TOXIC METALS:
Pb, Cd, Hg, As, Cr etc
- NEW COMPOUNDS:
PCB's
PCDDs (DIOXINS)
PCDFs (FURANS)
ETC

**NANO
PARTICLES**



NANOPARTICLES

Size of Particle regulated in incinerator emissions

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

Review

Origin and Health Impacts of Emissions of Toxic By-Products and Fine Particles from Combustion and Thermal Treatment of Hazardous Wastes and Materials

Stephania A. Cormier,¹ Slawo Lomnicki,² Wayne Backes,³ and Barry Dellinger²

¹Department of Biological Science, and ²Department of Chemistry, Louisiana State University, Baton Rouge, Louisiana, USA;

³Department of Pharmacology, Louisiana State University Health Sciences Center, Baton Rouge, Louisiana, USA

VOLUME 114 | NUMBER 6 | June 2006 • Environmental Health Perspectives

Comment of Lesbia F. Smith, MD

(Environmental & Occupational Health Plus)

- Referring to the Cormier et al. 2006 paper, she wrote:
- “It should be noted that these ultrafine and nanoparticles are emissions of concern from hazardous waste incineration, as opposed to municipal EFW facilities”

(Communication with Dr. Robert Kyle)

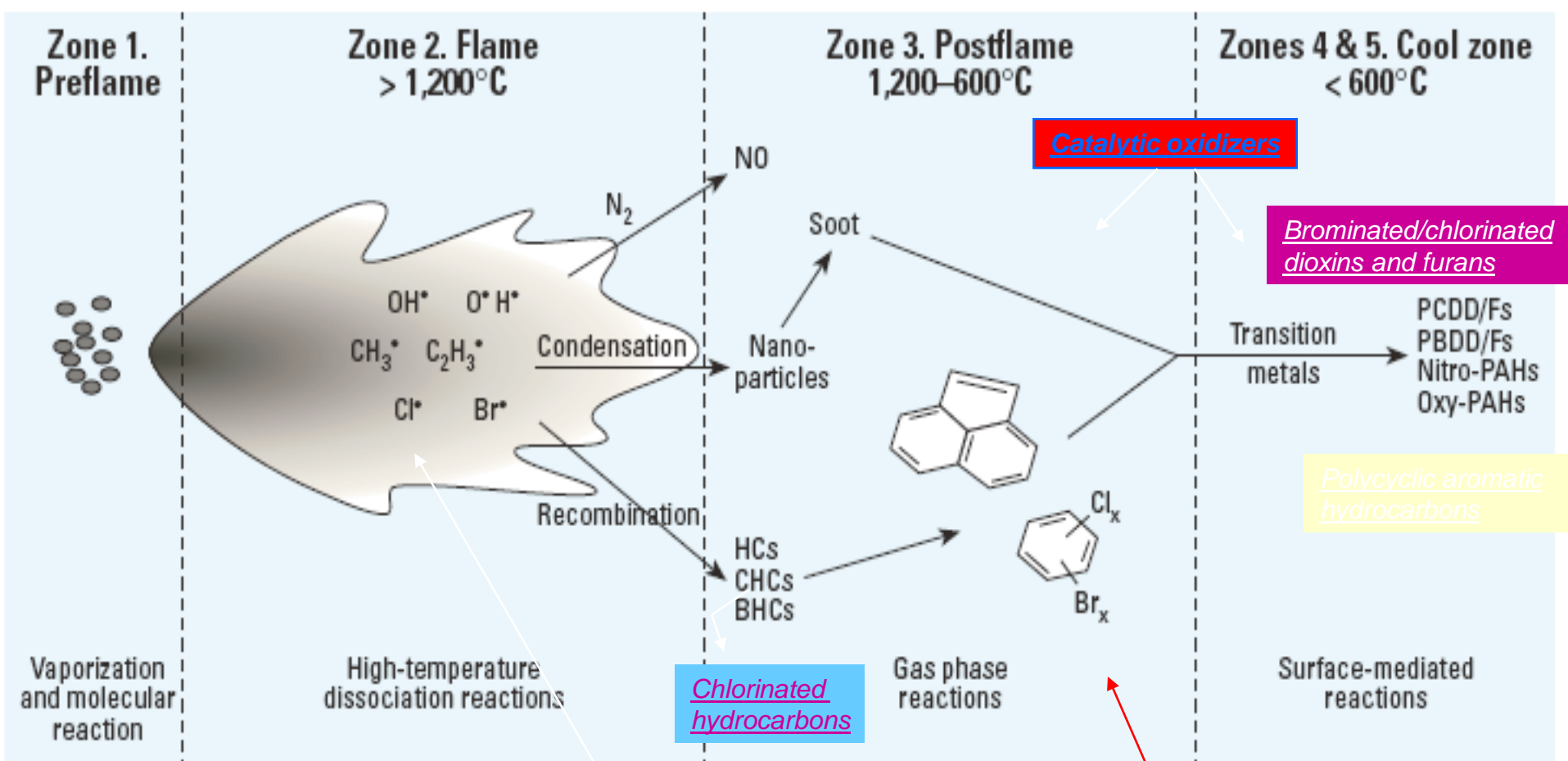


Figure 1. Combustor reaction zones. Zone 1, preflame, fuel zone; zone 2, high-temperature, flame zone; zone 3, postflame, thermal zone; zone 4, gas-quench, cool zone; zone 5, surface-catalysis, cool zone. PBDD/Fs, polybrominated dibenzo-*p*-dioxins and dibenzofurans. Reaction products from upstream zones pass through downstream zones and undergo chemical modifications, resulting in formation of new pollutants. Zone 2 controls formation of many “traditional” pollutants (e.g., carbon monoxide, sulfur oxides, and nitrogen oxides). Zones 3 and 4 control formation of gas-phase organic pollutants. Zone 5 is a major source of PCDD/Fs and is increasingly recognized as a source of other pollutants previously thought to originate in zones 1–4.

Incineration and nanoparticles

- The nanoparticles produced by incinerators are more dangerous than those from other combustion sources.
- They contain:
 - Neurotoxic metals
 - Free radicals
 - Dioxins and furans

Incineration and nanoparticles

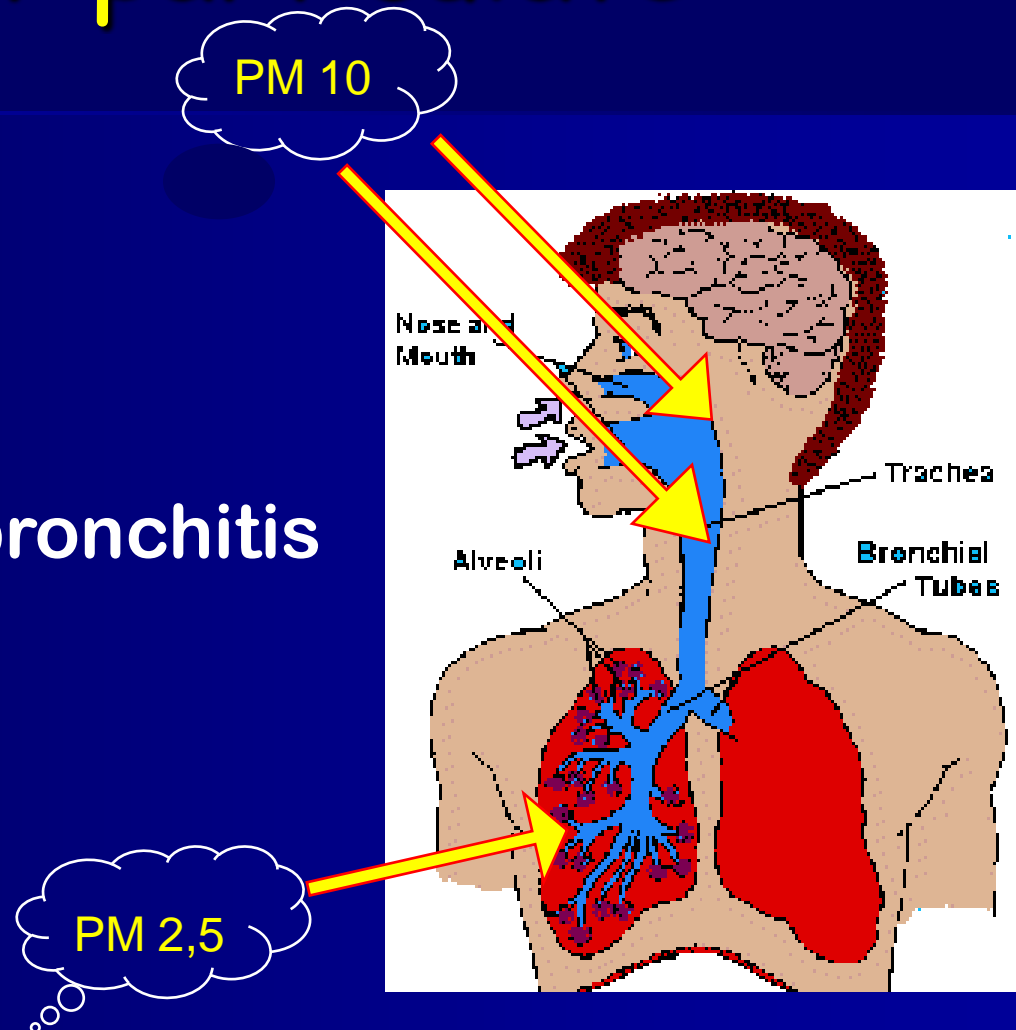
- **Nanoparticles are not efficiently captured by air pollution control devices**
- **Travel long distances**
- **Remain suspended for long periods of time (especially during air inversions over cities)**
- **Penetrate deep into the lungs**

**We already know that
air particulate matter
causes many health
problems**



RESPIRATORY PROBLEMS related to air particulate

- Allergies
- Asthma
- Acute and chronic bronchitis
- Emphysema
- lung Cancer



Slide from Dr. Ferninando Largi

Long-Term Exposure to Air Pollution and Incidence of Cardiovascular Events in Women



The NEW ENGLAND
JOURNAL of MEDICINE

This study examined **65,893 postmenopausal women** from **36 U.S. metropolitan areas** from **1994 to 1998**

The authors found: **“High levels of particulate pollution increases the risk of dying from heart disease or stroke, having a heart attack or stroke, or requiring a bypass.”**

N Engl J Med 2007;356:447-58.

Comment of Lesbia F. Smith, MD

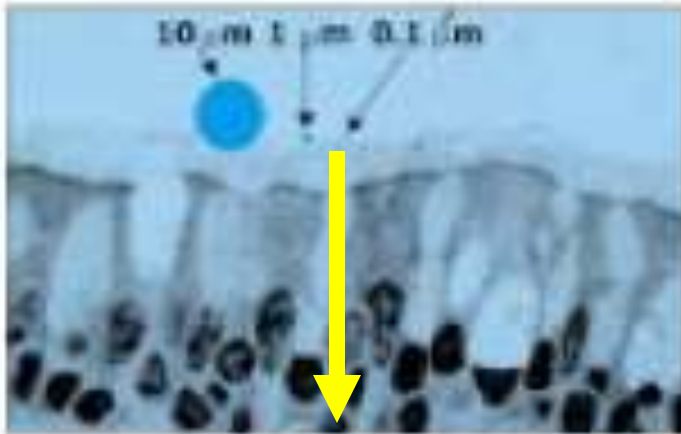
(Environmental & Occupational Health Plus)

■ Ultrafine particulates

- Being actively studied
- May have similar effects in humans as do PM 10 and PM 2.5
- Are not regulated or being actively measured in the environment

Nanoparticles are not new, but

- Nanopathology is
- This is the study of the exquisitely dangerous biological properties of these particles



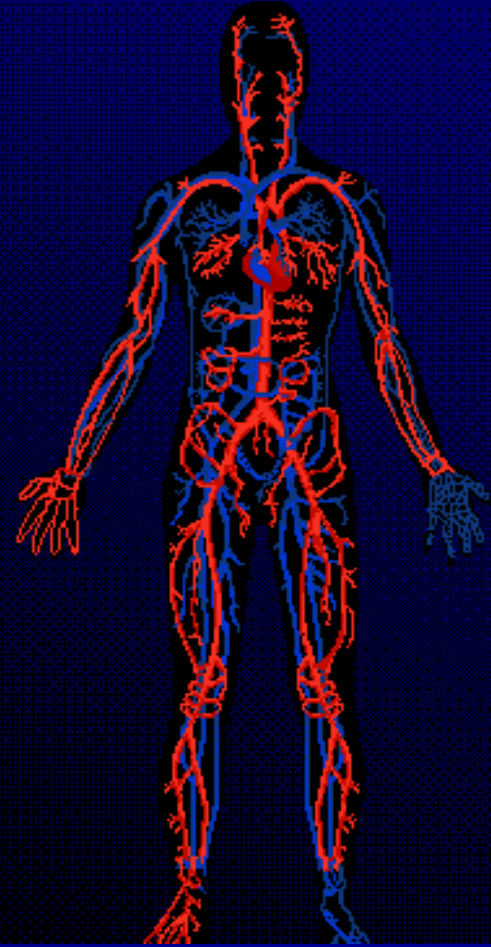
BLOOD

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

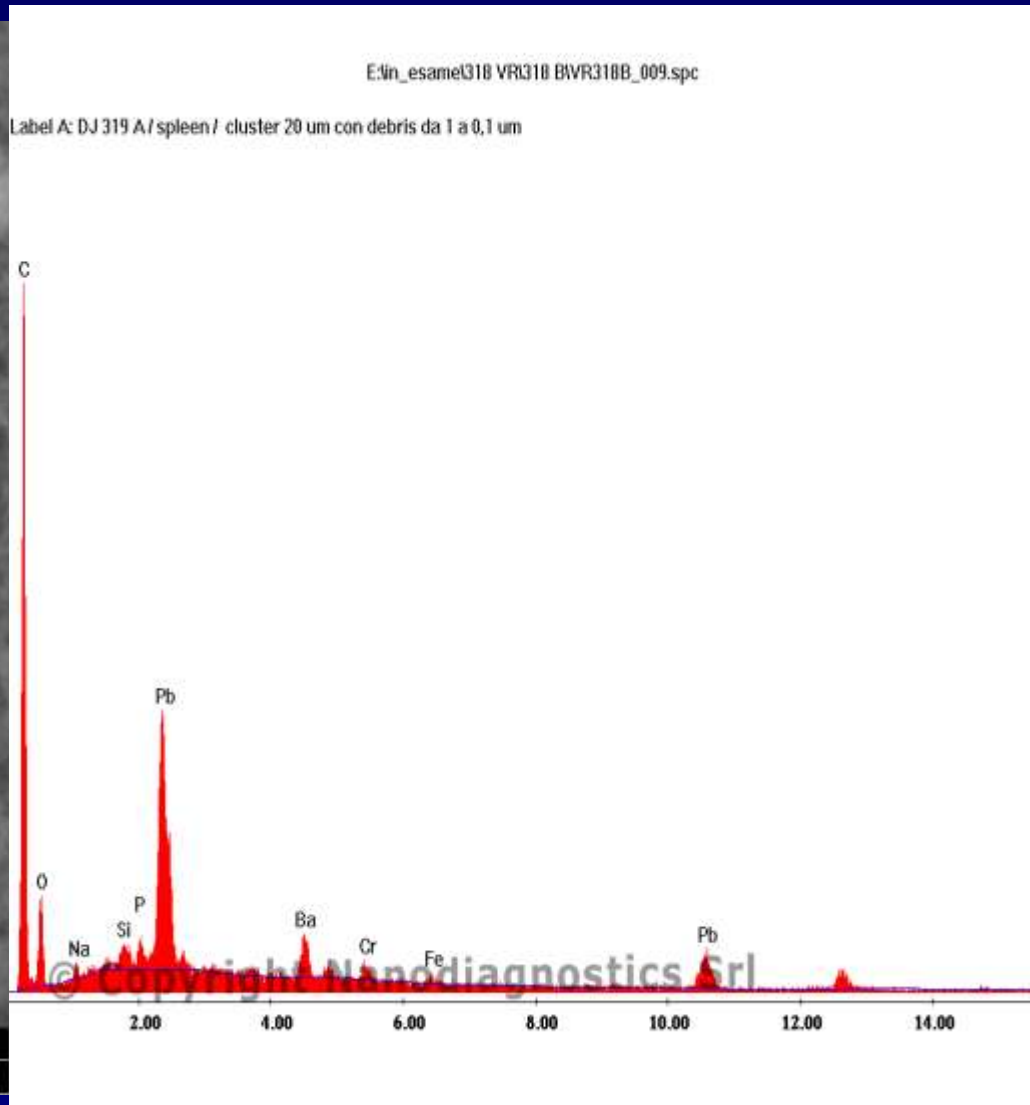
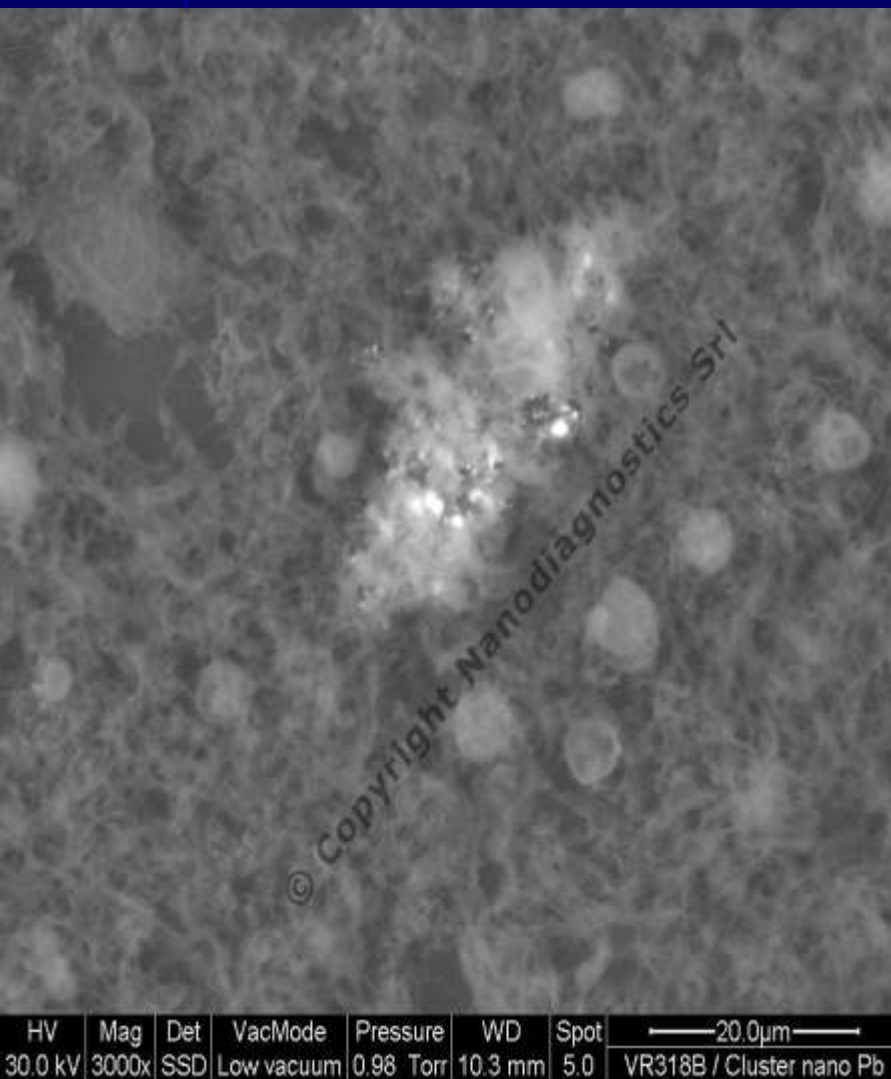
- Once nanoparticles have entered the bloodstream they can easily cross the membranes of every tissue in the body.



Nano Pathology

- They can even cross the blood brain barrier

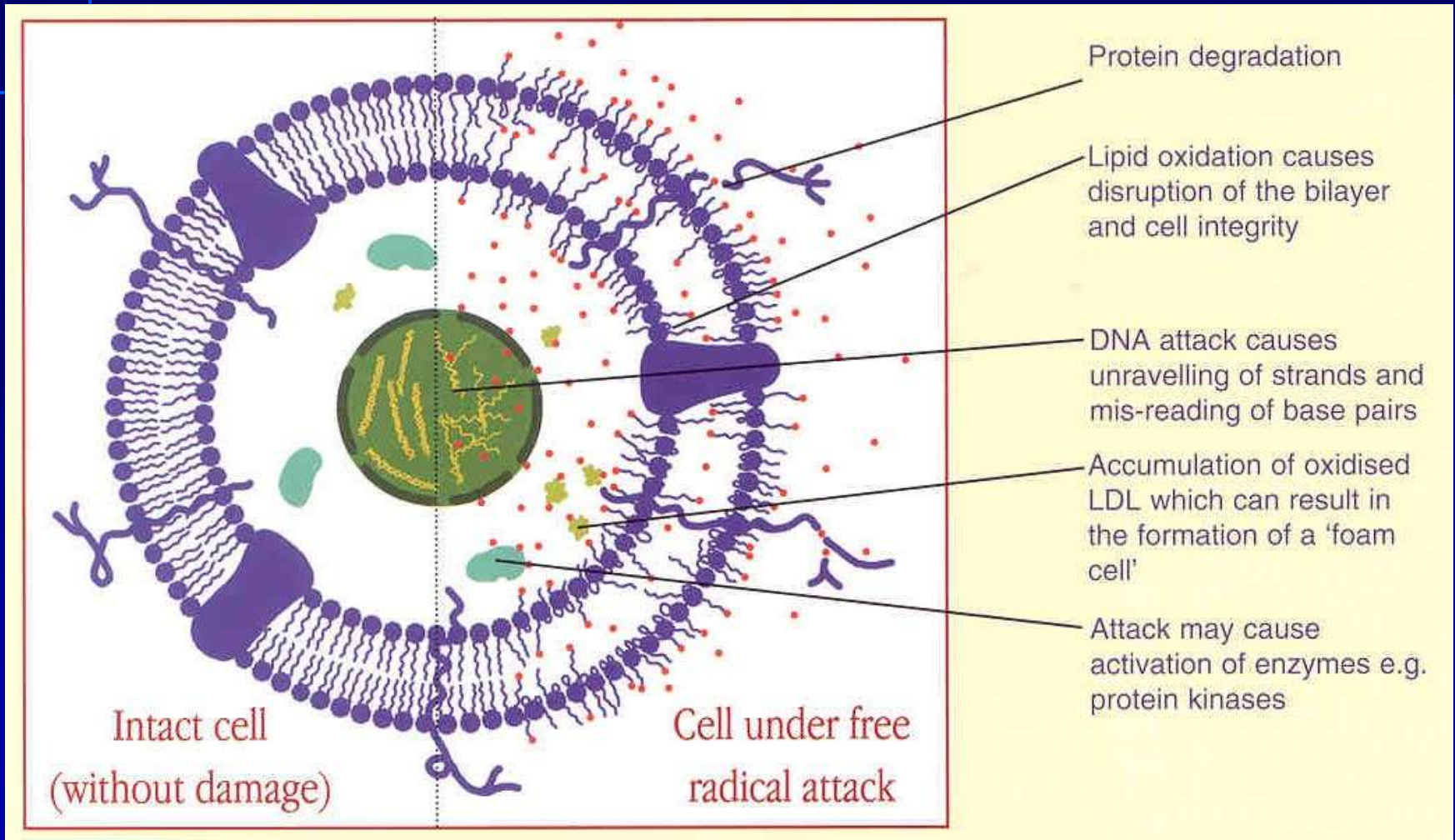
Aggregati di Piombo, Bario, Cromo, Ferro e Silicio in Cervello.



Nanopathology

- The body is equipped with anti-oxidants like vitamin C, E etc and glutathione to mop up the free radicals generated in the body each day from the use of molecular oxygen
- But an excess of external free radicals could overwhelm this natural defense system
- **Free radicals** can cause:
 - **oxidative stress** - leading to
 - **inflammation** - leading to
 - **many degenerative diseases**

Attack by Free radicals



Aus: "Free Radicals
Radox Ltd.

The Health Effects of Waste Incinerators

4th Report of the British Society for
Ecological Medicine

Moderators: Dr Jeremy Thompson and Dr Honor Anthony

Dioxins and Incineration

Dioxins - major concerns

- **Dioxins accumulate in animal fat.**
- **One liter** of cows' milk gives the same dose of dioxin as breathing air next to the cows for **EIGHT MONTHS** (Connett and Webster, 1987).
- Dioxins steadily accumulate in human body fat. The man cannot get rid of them **BUT A woman can...**
- **...by having a baby!**
- Thus the highest dose of dioxin goes to the fetus and then to the new born infant via breastfeeding...

Dioxins: the highest dose goes to the fetus



In nine months
much of the
dioxin which has
accumulated in
the mother's fat
for 20-30 years
goes to the fetus

Dioxins can disrupt fetal and infant development

- Dioxins act like fat soluble hormones
- Disrupt at least 6 different hormonal systems:
 - male and female sex hormones;
 - thyroid hormones;
 - insulin; gastrin and glucocorticoid.

Developmental Effects of Dioxins

Linda S. Birnbaum

Health Effects Research Laboratory, US
EPA

Environmental Health Perspectives,

103: 89-94, 1995

Our Stolen Future

**How Man-made Chemicals are
Threatening our Fertility,
Intelligence and Survival**

Theo Colborn

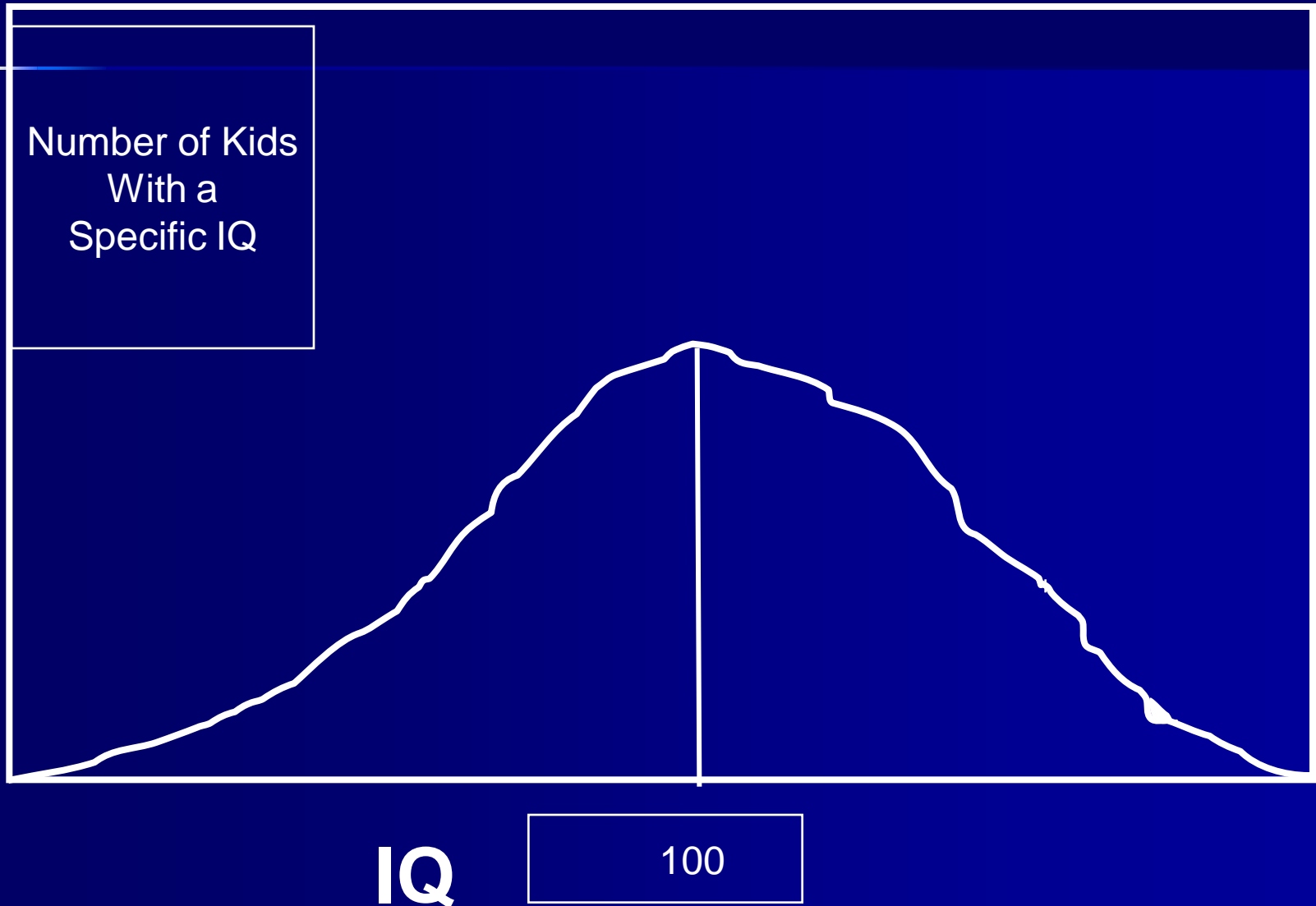
John Peterson Myers

Dianne Dumanoski

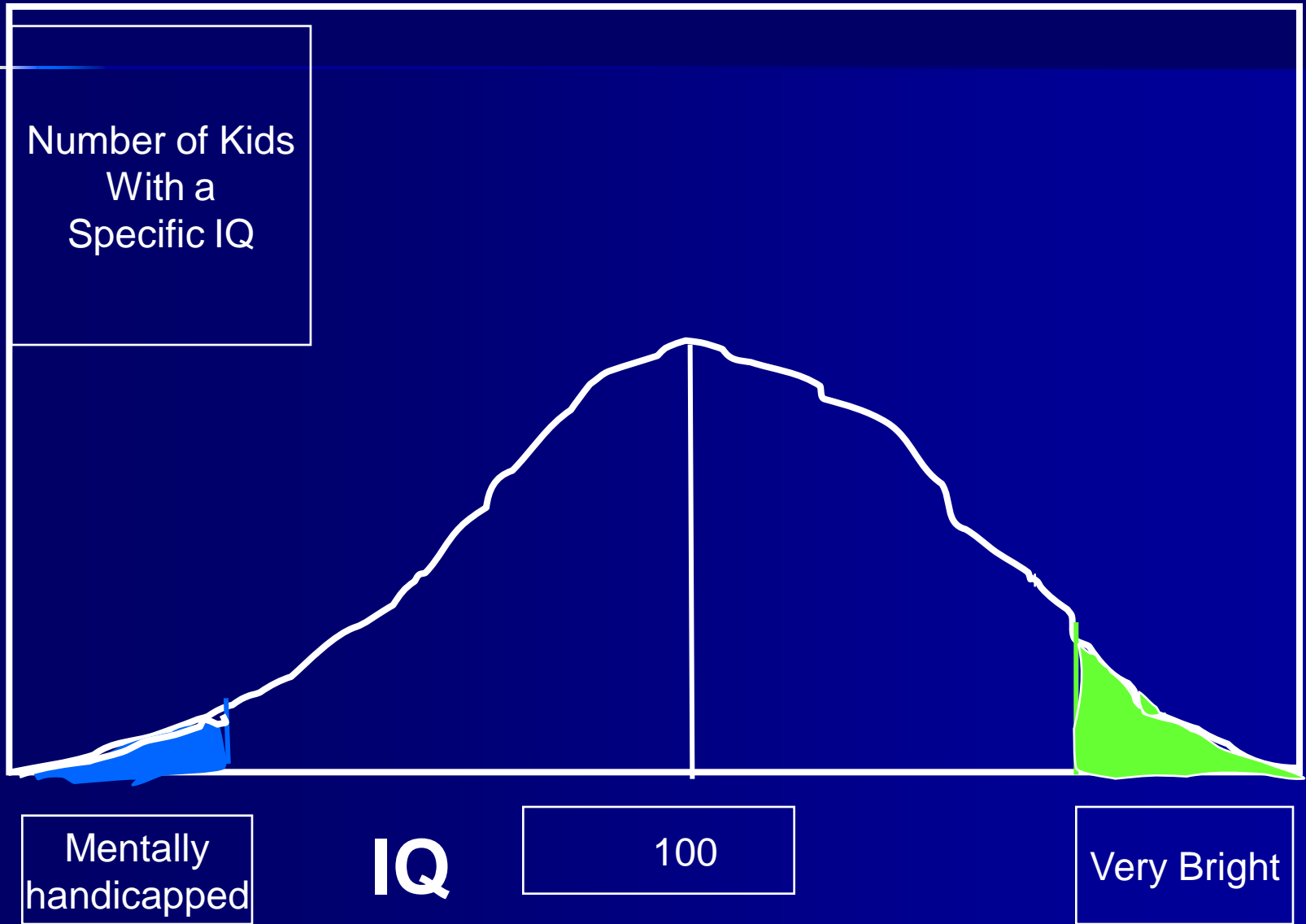
1994

The most worrying environmental pollutants are those which cause a subtle shift in the whole population

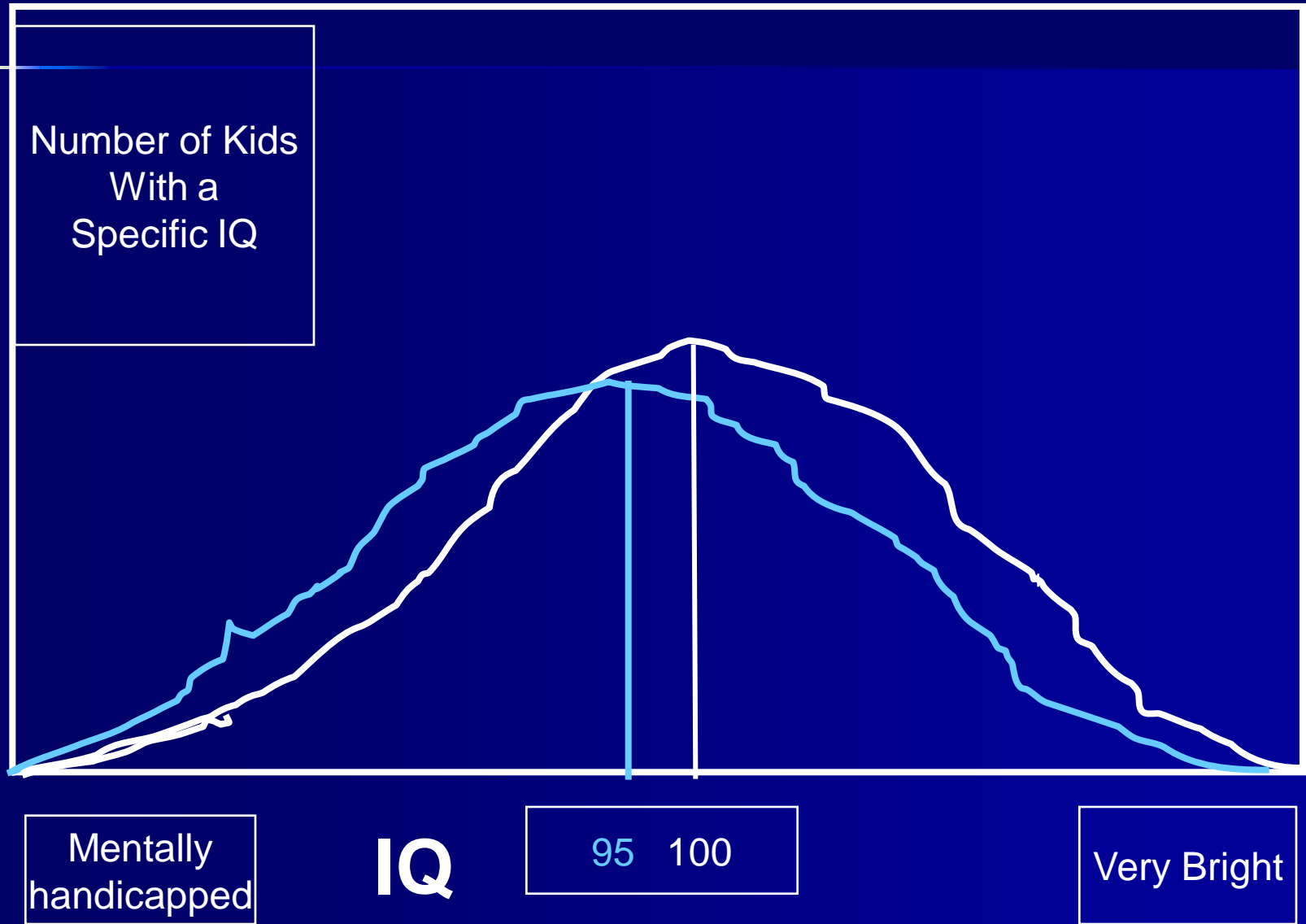
IQ and population



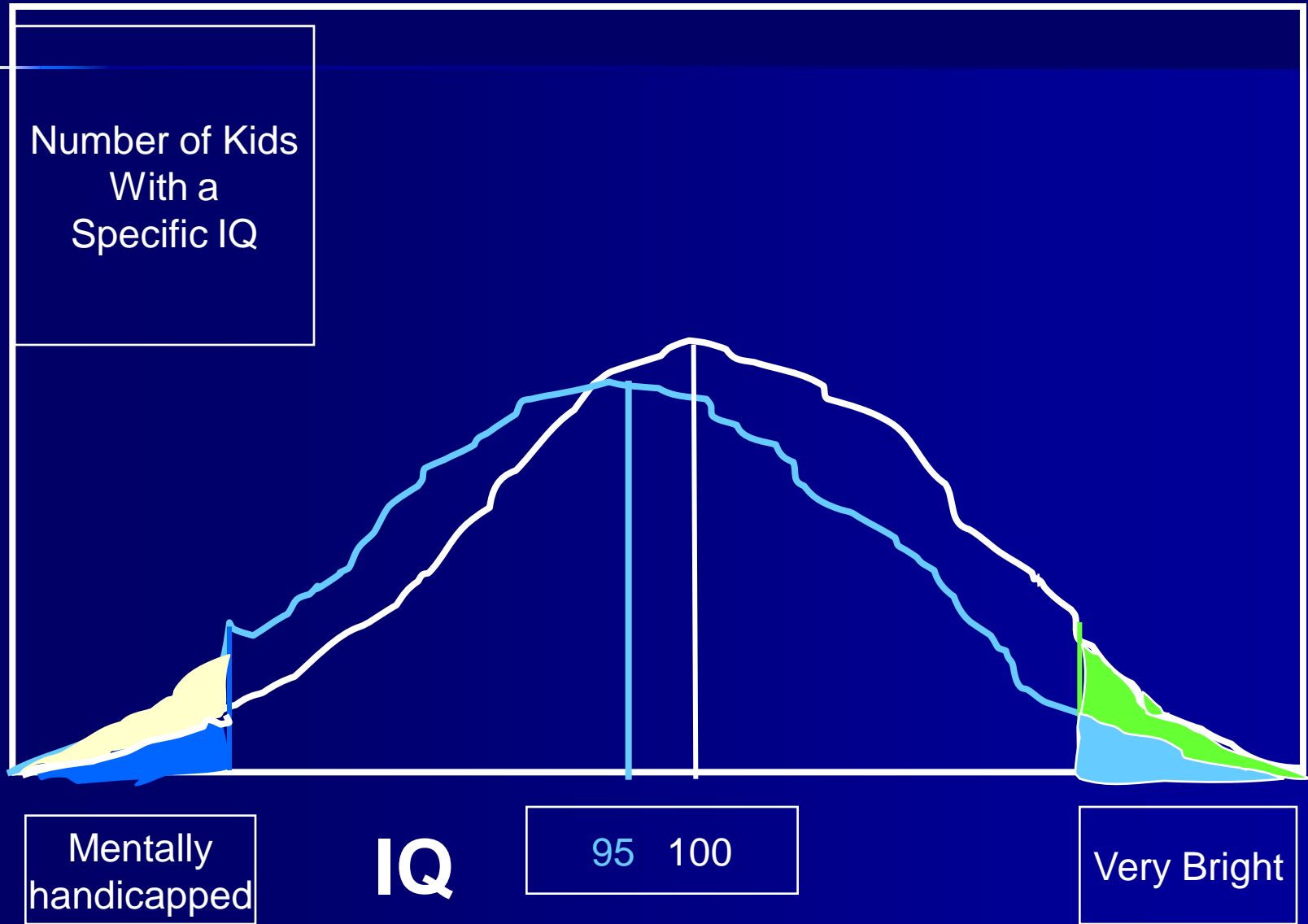
IQ and population



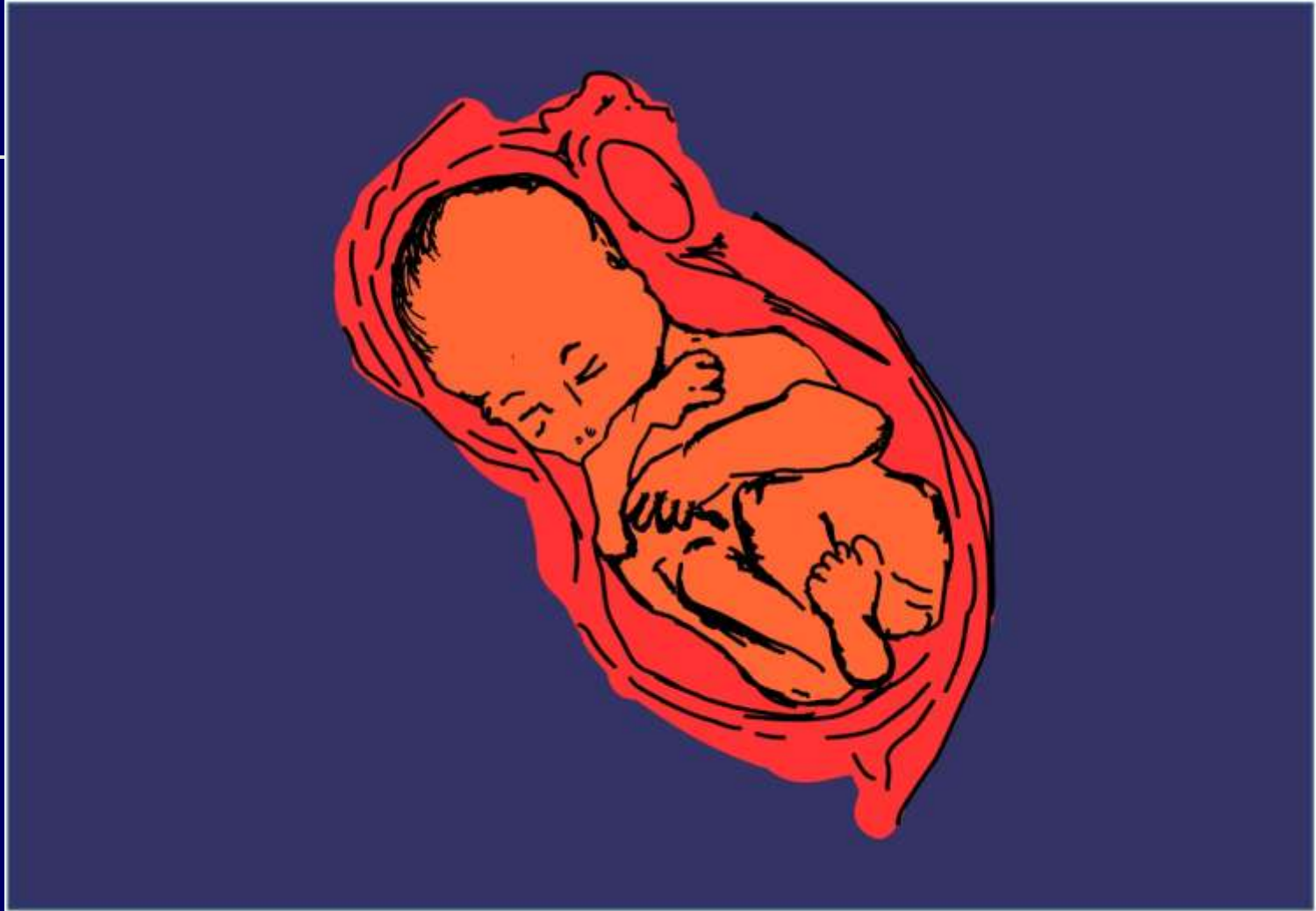
IQ and population



IQ and population



WE WANT DIOXIN



OUT OF OUR BABIES!

Institute of Medicine, 2003

**Dioxins and Dioxin-like Compounds in
the Food Supply**

Strategies to Decrease Exposure

July 1, 2003

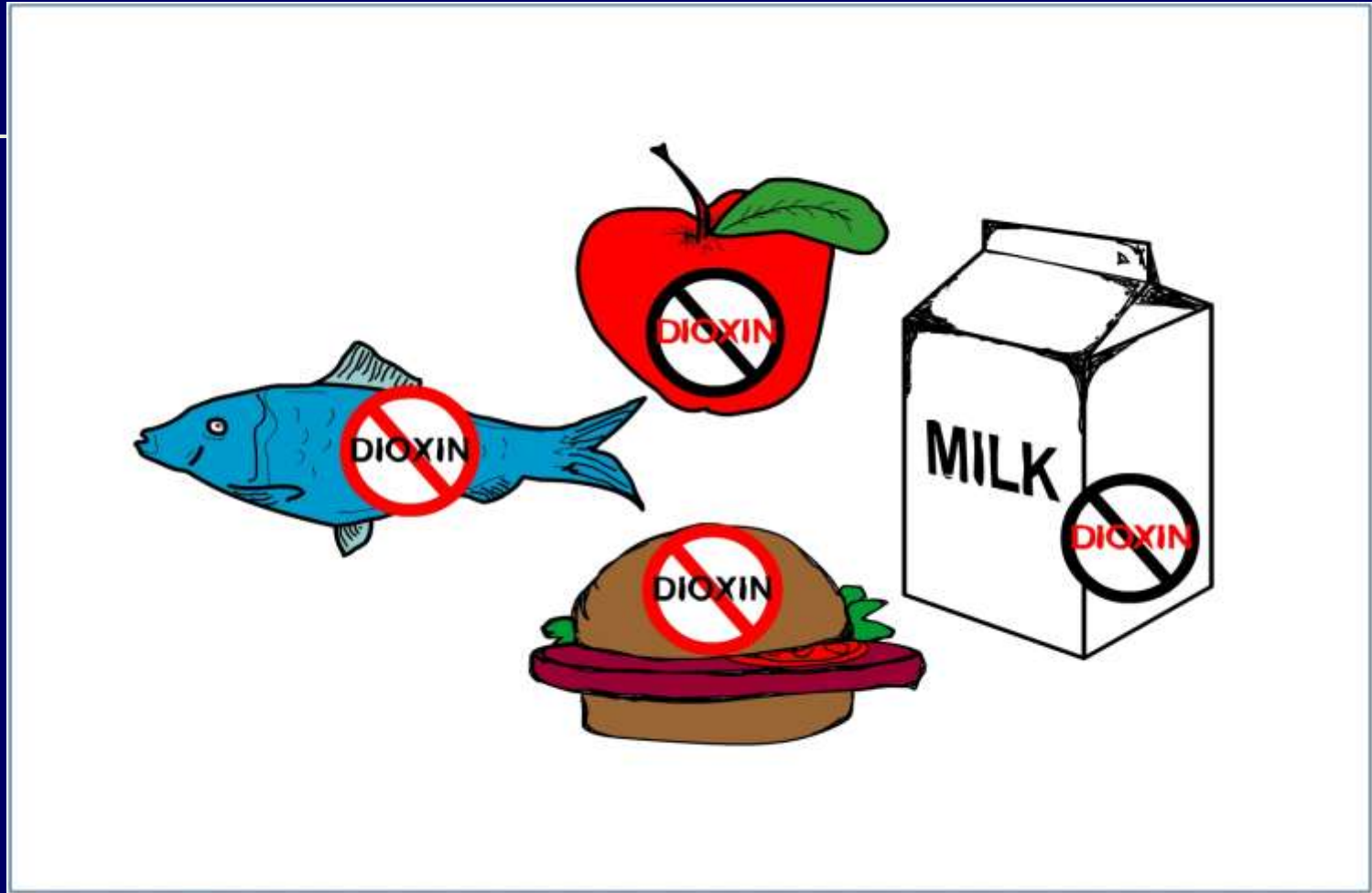
Institute of Medicine, 2003

- “Fetuses and breastfeeding infants may be at particular risk from exposure to dioxin like compounds (DLCs) due to their potential to cause adverse **neurodevelopmental**, **neurobehavioral**, and **immune system** effects in developing systems...”

Institute of Medicine, 2003

- "...The committee recommends that the government place a **high public health priority** on reducing DLC intakes by girls and young women **in the years well before pregnancy is likely to occur.**"
- **"(by) Substituting low-fat or skim milk, for whole milk, (and)... foods lower in animal fat..."**

WE WANT DIOXIN



OUT OF OUR FOOD!

**Do not build incinerators
within 50 km of food
production - particularly
grazing animals**

**Incinerator stacks
disperse the dioxins**

**Incinerator stacks
disperse the dioxins**

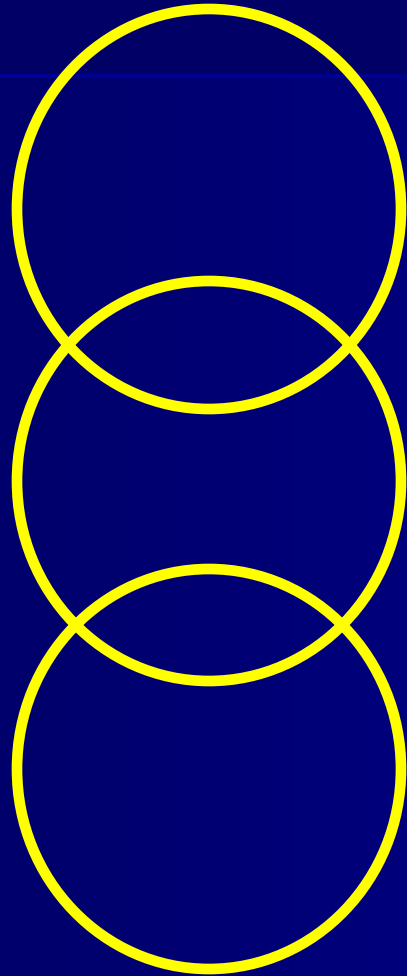
**Grazing animals and fish
reconcentrate them**

**Incinerator stacks
disperse mercury**

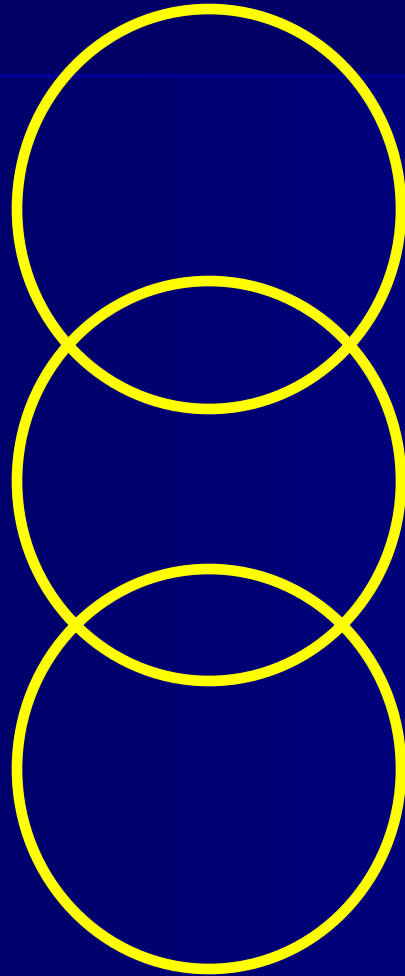
**Incinerator stacks
disperse mercury**

Fish reconcentrate mercury

**YOU NEED THREE THINGS TO PROTECT THE
PUBLIC FROM TOXIC EMISSIONS.**

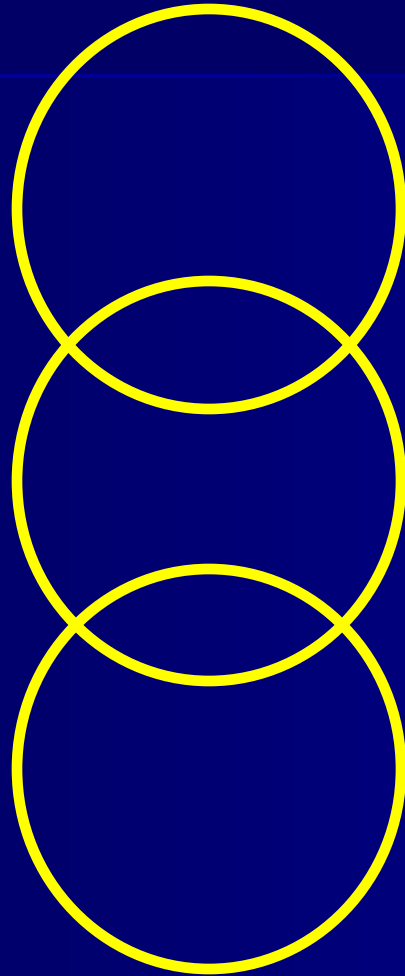


**YOU NEED THREE THINGS TO PROTECT THE
PUBLIC FROM TOXIC EMISSIONS.**



**STRONG
REGULATIONS**

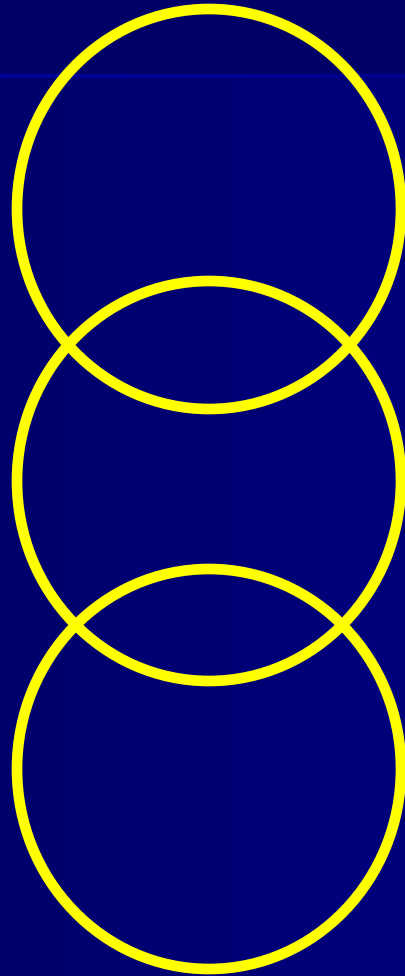
YOU NEED THREE THINGS TO PROTECT THE PUBLIC FROM TOXIC EMISSIONS.



**STRONG
REGULATIONS**

**ADEQUATE
MONITORING**

YOU NEED THREE THINGS TO PROTECT THE PUBLIC FROM TOXIC EMISSIONS.

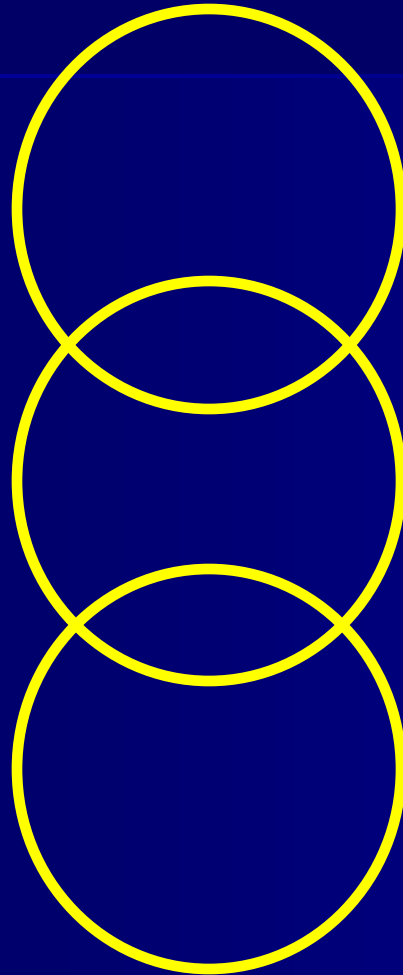


**STRONG
REGULATIONS**

**ADEQUATE
MONITORING**

**TOUGH
ENFORCEMENT**

**YOU NEED THREE THINGS TO PROTECT THE
PUBLIC FROM TOXIC EMISSIONS.**



**STRONG
REGULATIONS**

**ADEQUATE
MONITORING**

**TOUGH
ENFORCEMENT**

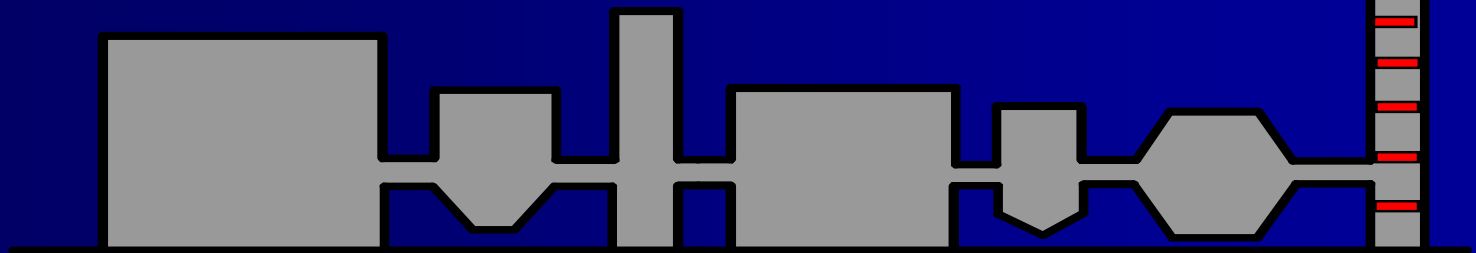
IF ANY LINK IS WEAK THE PUBLIC IS NOT PROTECTED

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



“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)



The modern incinerator is attempting to perfect a bad idea

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

DIFFERENT TIMES DEMAND DIFFERENT QUESTIONS

20th CENTURY

WASTE MANAGEMENT

*“ How do we get rid
of our waste
efficiently with
minimum damage to
our health and the
environment ?”*

21st CENTURY

RESOURCE MANAGEMENT

*“ How do we handle our
discarded resources in
ways which do not
deprive future
generations of some, if
not all, of their value ?”*

DIFFERENT TIMES DEMAND DIFFERENT QUESTIONS

20th CENTURY

**WASTE
MANAGEMENT**

The key issue
was **SAFETY**

21st CENTURY

**RESOURCE
MANAGEMENT**

The key issue is
SUSTAINABILITY

**Incineration is not
sustainable**

**Waste is not a technical
problem but**

a problem of
organization,
education and
industrial design

3.

**The Sustainable Alternative:
the ZERO WASTE 2020
strategy**

We have to copy nature

- Nature makes no waste!
- Waste is a human invention
- A sustainable society must be a zero waste society
- Zero Waste is an idealistic goal,
- but **Zero Waste 2020** puts this goal into a realistic time frame



NO to INCINERATORS



NO to LANDFILLS

**NO to a
THROWAWAY
SOCIETY**



**ZERO WASTE
2020**



**YES to a
SUSTAINABLE
SOCIETY**



NO to INCINERATORS



NO to LANDFILLS

**NO to a
THROWAWAY
SOCIETY**

ZERO WASTE



**ZERO WASTE
IS A
NEW
DIRECTION**

**RIFIUTI ZERO
2020**



**YES to a
SUSTAINABLE
SOCIETY**

**THE
BACK END
OF
WASTE
MANAGEMENT**

**THE
BACK END
OF
WASTE
MANAGEMENT**



**THE
FRONT END
OF
RESOURCE
MANAGEMENT**

To achieve Zero Waste

We need three things:

- 1) INDUSTRIAL RESPONSIBILITY (at the front end)
- 2) COMMUNITY RESPONSIBILITY (at the back end)
- 3) GOOD LEADERSHIP (to link the two together)

Industrial Responsibility

- 1. Design for sustainability
- 2. Clean production
- 3. Extended Producer Responsibility

Extended Producer Responsibility - packaging

- **The Ontario (Canada) Beer industry has been using refillable glass bottles for 50 years**
- **98% recovered**
- **Each bottle reused 18 times**
- **It saves the company money**
- **2000 jobs in collection and cleaning**
- **No cost to municipality**

Extended Producer Responsibility - products

XEROX CORPORATION EUROPE

- Recovers copying machines from 16 different countries
- Takes them to huge warehouses in the Netherlands, where the machines are stripped down for parts and materials
- **95% of materials recovered for reuse or recycling!**
- This is saving Xerox **\$76 millions a year!!**

**Solid waste is the visible
face of inefficiency!**

For more examples of Industrial Responsibility

- Contact Gary Liss at gary@garyliss.com
- For more information on EPR initiatives contact Bill Sheehan at
- Bill@productpolicy.org

COMMUNITY RESPONSIBILITY

- Community responsibility begins with **Source Separation**
- One container for compostables (i.e.the organic fraction)
- One (or more) containers for the recyclables
- One container for the residuals

“The Fantastic 3”



The San Francisco system





**Composting
Facility**

Composting Facility for San Francisco





Composting is critically important

- 1) It is the organic fraction which makes garbage STINK
- 2) It is the organic fraction which makes landfills so problematic (methane, odor, leachate)
- 3) We need the organics back into the soil
- 4) Composting sequesters much of the organic carbon and reduces global warming in several ways



**Composting
Facility**



**Composting
Facility**

**Materials
Recovery
Facility**

MATERIALS RECOVERY FACILITY



at Pier 96





The City

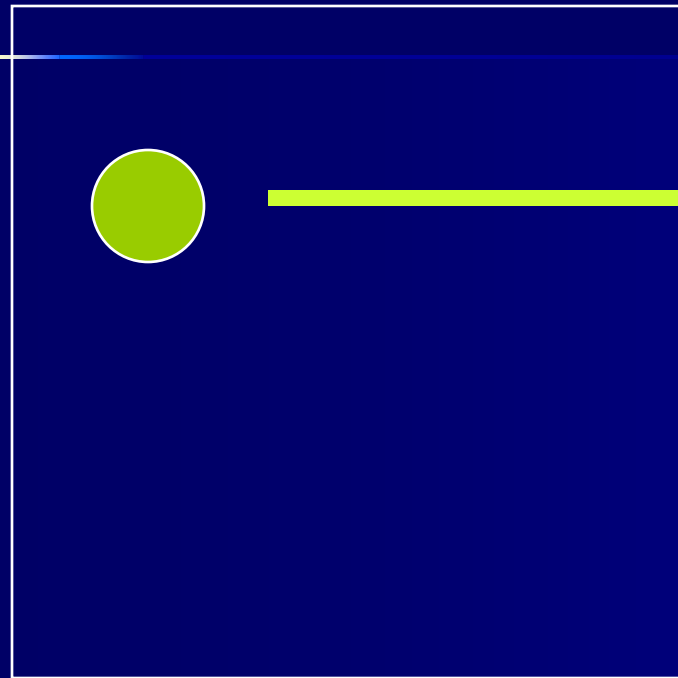
The Rural Areas



**Composting
Facility**

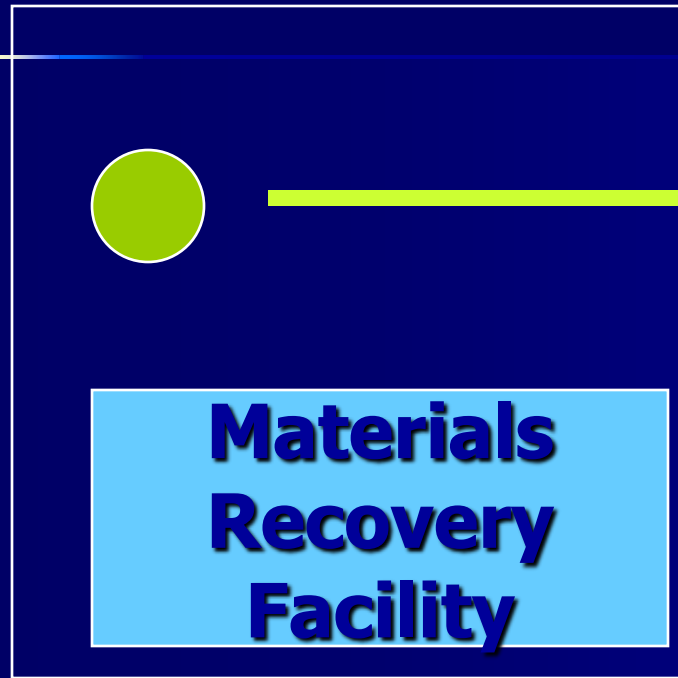
The City

The Rural Areas



The City

The Rural Areas





**Composting
Facility**

**Materials
Recovery
Facility**

**We have to minimize
what goes into container
3 - the residuals**



**Composting
Facility**

**Materials
Recovery
Facility**



Reuse & Repair



**Composting
Facility**

**Materials
Recovery
Facility**



**Reuse & Repair
& Deconstruction**

Burlington, Vermont

- Recycle North (27 employees, gross income over \$700,000) offers an excellent model of reuse, repair, **job training** and deconstruction - **see video**.
- www.recyclenorth.org
- See also Urban Ore, Berkeley
- Revolve, Canberra, Australia
- Waste Wise, Georgetown, Ontario
- EcoCycle, Boulder, Colorado
- Eureka Recycling, St. Paul, MN



**Community
Initiatives to
Reduce
waste**

**Composting
Facility**

**Materials
Recovery
Facility**



Italy

- A supermarket chain near Florence is providing dispensers which allow customers to refill **shampoo** and **detergent** bottles...
- Others **wine, water** and **milk**

Alcune iniziative italiane per la riduzione



ABBIAMO RIUTILIZZATO

IN ALCUNI PUNTI VENDITA GIÀ STIAMO UTILIZZANDO GRANDI DISTRIBUTORI
CHE CONSENTONO DI ACQUISTARE L'ACQUA

USANDO ALMENO 40 VOLTE LO STESSO CONTENITORE.

•Un pizzico di
creatività a monte
può far risparmiare
milioni a valle

Ireland

- Has a 15 cent tax on plastic shopping bags - reduced use by over 90% in one year
- 80 towns in Australia have banned plastic shopping bags completely



Community
Initiatives to
Reduce
waste

Composting
Facility

Materials
Recovery
Facility

Residuals
?



The residual fraction is the key difference between waste disposal and Zero Waste 2020

- **Incineration** and **landfills** attempt to make the residuals disappear
- **Zero Waste 2020** needs to make the residuals VERY VISIBLE, because...
- **Residual Fraction** = bad industrial design and poor purchasing decisions



Community
Initiatives to
Reduce
waste

Composting
Facility

Materials
Recovery
Facility

Residuals
=
Our Current
Failures



4. The Key Step Forward

Residuals must not go directly to a landfill

- But to a screening (separating) facility in front of the landfill

RESIDUAL SCREENING FACILITY



**MORE
RECYCLABLES**

MORE TOXICS

**DIRTY
ORGANIC
FRACTION**



**BIOLOGICAL
STABILIZATION**



INTERIM LANDFILL

RESIDUAL SCREENING FACILITY

Built in front of landfill

MORE
RECYCLABLES

MORE TOXICS

DIRTY
ORGANIC
FRACTION

BIOLOGICAL
STABILIZATION

INTERIM LANDFILL

RESIDUAL SCREENING FACILITY



Built in front of landfill

**Operating in
Nova Scotia**



**MORE
RECYCLABLES**



MORE TOXICS

**DIRTY
ORGANIC
FRACTION**



**BIOLOGICAL
STABILIZATION**



INTERIM LANDFILL

**We need an important
addition**

RESIDUAL SCREENING FACILITY



Built in front of landfill

**Operating in
Nova Scotia**



**MORE
RECYCLABLES**



MORE TOXICS

**DIRTY
ORGANIC
FRACTION**



**BIOLOGICAL
STABILIZATION**



INTERIM LANDFILL

RESIDUAL SCREENING & RESEARCH FACILITY



**MORE
RECYCLABLES**

MORE TOXICS

**DIRTY
ORGANIC
FRACTION**

**NON-TOXIC, NON-BIODEGRADABLE
FRACTION**

**BIOLOGICAL
STABILIZATION**



**RESEARCH
CENTER**



INTERIM LANDFILL

RESIDUAL SCREENING & RESEARCH FACILITY

NON-RECYCABLE MATERIALS

Local
University

Or
Technical College

RESEARCH
CENTER

RESEARCH CENTER

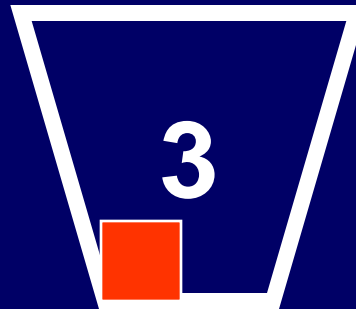
- Improve capture rate of reusables, recyclables and clean compostables (Captain Garbage - make it fun!)
- Recommend waste avoidance strategies for local businesses
- Develop some local uses for some materials
- Recommend better industrial designs to industry on packaging and products
- Develop alternatives to some of the toxics in products (batteries, paint, solvents etc)

Residuals - 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 %

The Residual Screening & Research Facility

- Is the key link between **Community Responsibility** and **Industrial Responsibility**
- We need a network of local research centers linked to state, regional and federal research institutes working on a **SUSTAINABLE FUTURE**



Community
Initiatives to
Reduce
waste

Composting
Facility

Materials
Recovery
Facility

Residual
Screening
& Research
Facility



Household toxics

WITH INCINERATION

WE CONVERT 3 TONS OF TRASH

into:

1 ton of ASH

That nobody wants!

WITH THE ZERO WASTE 2020 STRATEGY

WE CONVERT 3 TONS OF TRASH

into:

1 ton of compostables

1 ton of recyclables

and

1 ton of EDUCATION!

The Message to Industry:

- If we can't reuse it, recycle it or compost it,
- Industry shouldn't be making it and
- we shouldn't be buying it!!!

GOOD LEADERSHIP

We need leaders with

Big vision

imagination

and ...

WHO ARE NOT BORING!

**Boring experts think
with the wrong end of
their bodies !**

A BACK END THINKER...



1. A CUP
2. A BUCKET
3. A FOOT PUMP
4. AN ELECTRIC PUMP

A FRONT END THINKER...



5. Progress towards Zero Waste around the world

- www.zwia.org
- www.GRRN.org
- www.CRRA.org

New Zealand

- Over 50% of communities have declared a Zero Waste strategy

Prince Edward Island, Canada

- Whole island has door to door collection of recyclables and compostables

Nova Scotia

- 50% diversion in 5 years (Halifax ~ 60%)
- 1000 jobs created collecting and treating discarded materials
- Another 2000 jobs created in the industries handling the collected material
- Nearly all the separated materials are re-used in Nova Scotia's own industries.

Canberra, Australia

- Passed law “No Waste by 2010”
- Currently over 70% diversion
- Setting up a “Resource Recovery Park” to locate all the industries which can make products out of separated materials

Ontario

- The city of Markham (north of Toronto) has diverted 70% from landfill in 2 years.
- **Contact: Councillor Erin Shapiro**
- eshapero@markam.ca
- www.Markham.ca

San Francisco

- Population = 850,000
- Very little space
- 50% waste diverted by 2000
- 63% waste diverted by 2004
- 75% waste diverted by 2010 (goal)
- 100% (or very close!) by 2020 – Zero Waste

Italy

- Italy has pioneered new “door to door” collection systems to maximize the collection of clean organic material
- Important work done by Enzo Favorino from the Agricultural School in the Parco Monza, near Milan.

Italy

- Over 1000 communities in Italy are achieving over 50% diversion using “door to door” collection systems

Comunità in Lazio che hanno riciclato più del 50% dei rifiuti attraverso il sistema di raccolta **porta-a-porta** in un solo anno!

Comune	Popolazione	% rifiuto differenziato
Sonnino	7,154	54%
Sermoneta	7,000	64%
Lenola	4,200	65%
Monterosi	3,029	54%
Bassiano	1,670	50%
Castelforte	4,700	52%

Italy

- 4 communities near **Salerno** have achieved 70% diversion

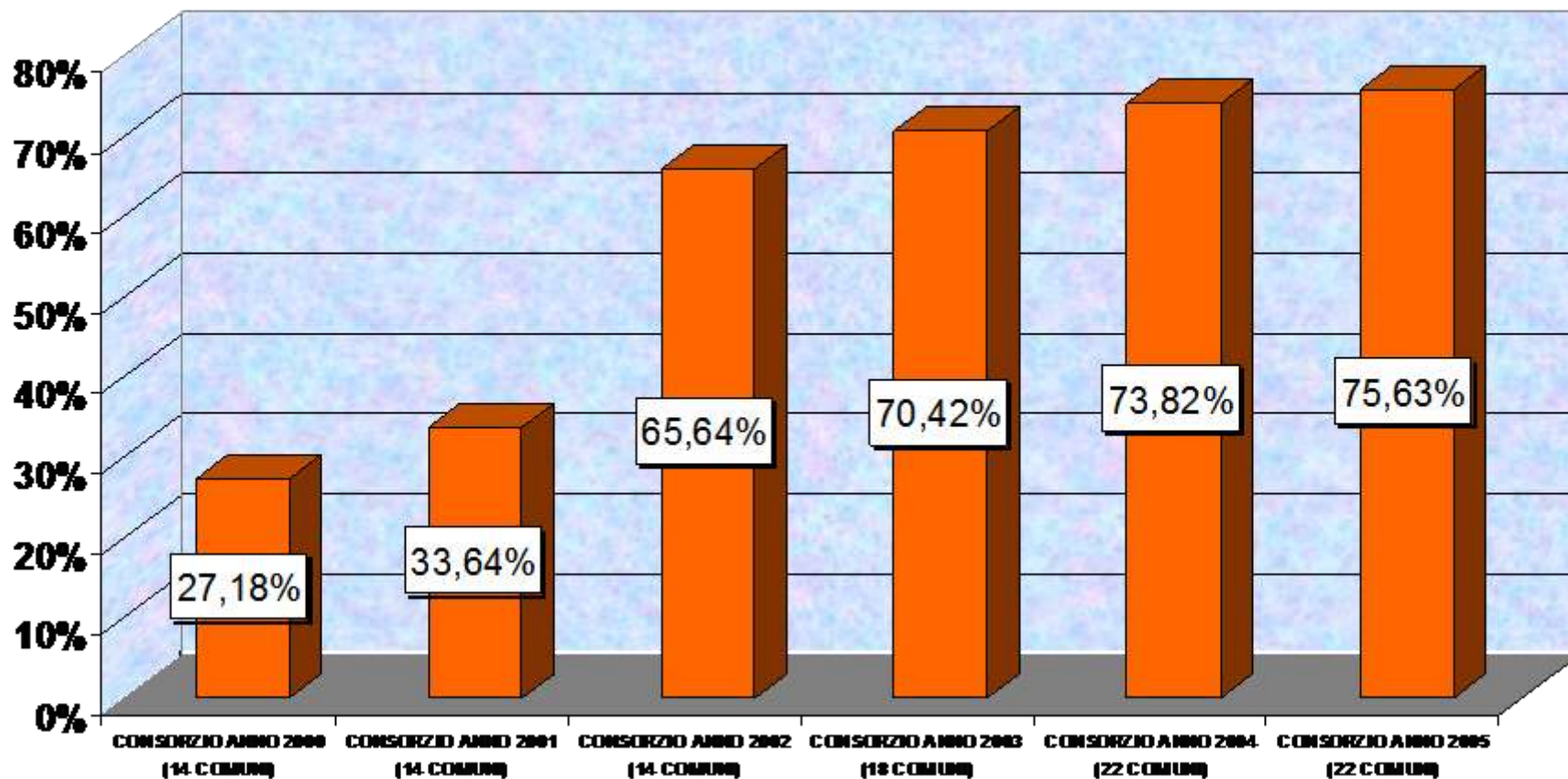
Italy

- **Novara** - (near Turin, population = 100,000) achieved 70% diversion in just 18 months!

Italy

- The Treviso region - 22 communities averaging 76% diversion

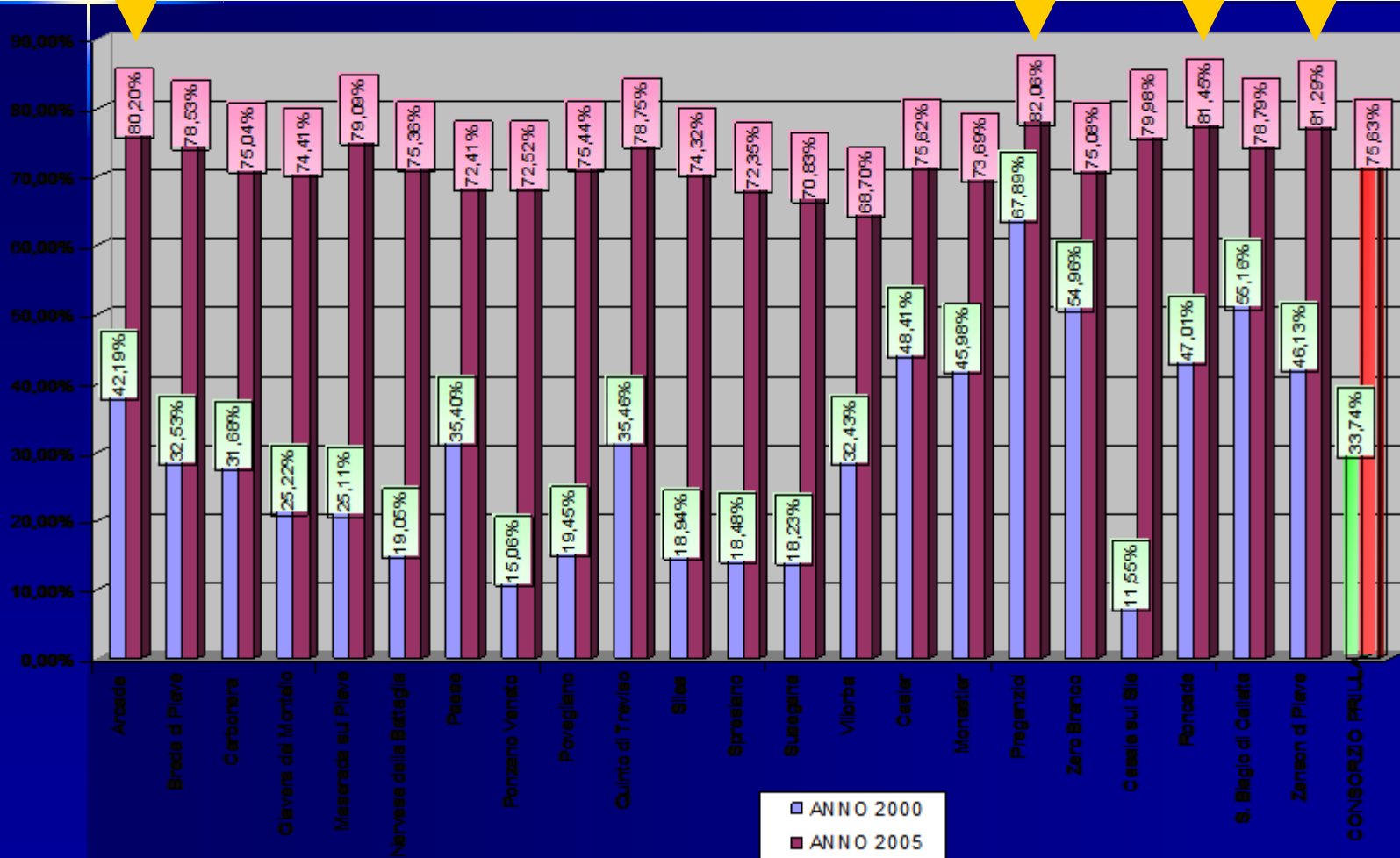
RISULTATI QUANTITATIVI AUMENTO % RACCOLTA DIFFERENZIATA



RISULTATI QUANTITATIVI

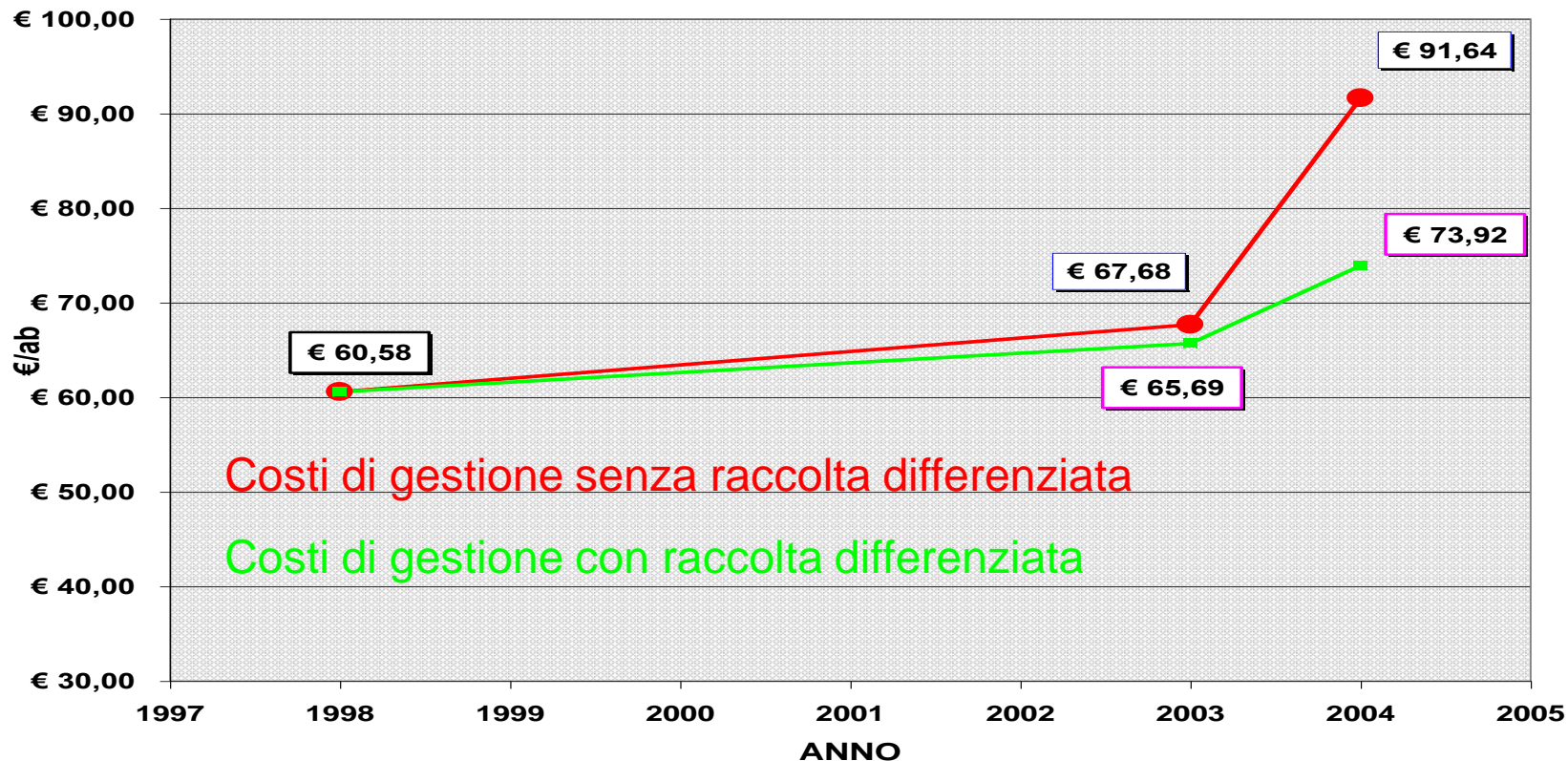
AUMENTO % RACCOLTA DIFFERENZIATA

4 communities over 80% diversion



DIFFERENZIATA COSTA DI PIU?

ANDAMENTO DEI COSTI DI GESTIONE OPERATIVA
CON E SENZA RACCOLTA DIFFERENZIATA



**La gestione dei rifiuti
nei Comuni del Consorzio Priula**

Paolo Contò

Consorzio Intercomunale Priula - Villorba (TV)

consorzio@priula.it

**On Feb 24, 2007
Capannori (near Lucca)
became the first town in
Italy to declare a Zero
Waste 2020 strategy**

Rossano Ercolini

Ambientefuturo@interfree.it

338-28-66-215

The waste problem

- Is too important to be left to “waste experts”
- We need all sectors involved if we are to move towards a sustainable society
- As far as sustainability is concerned the waste problem is a fabulous place to start



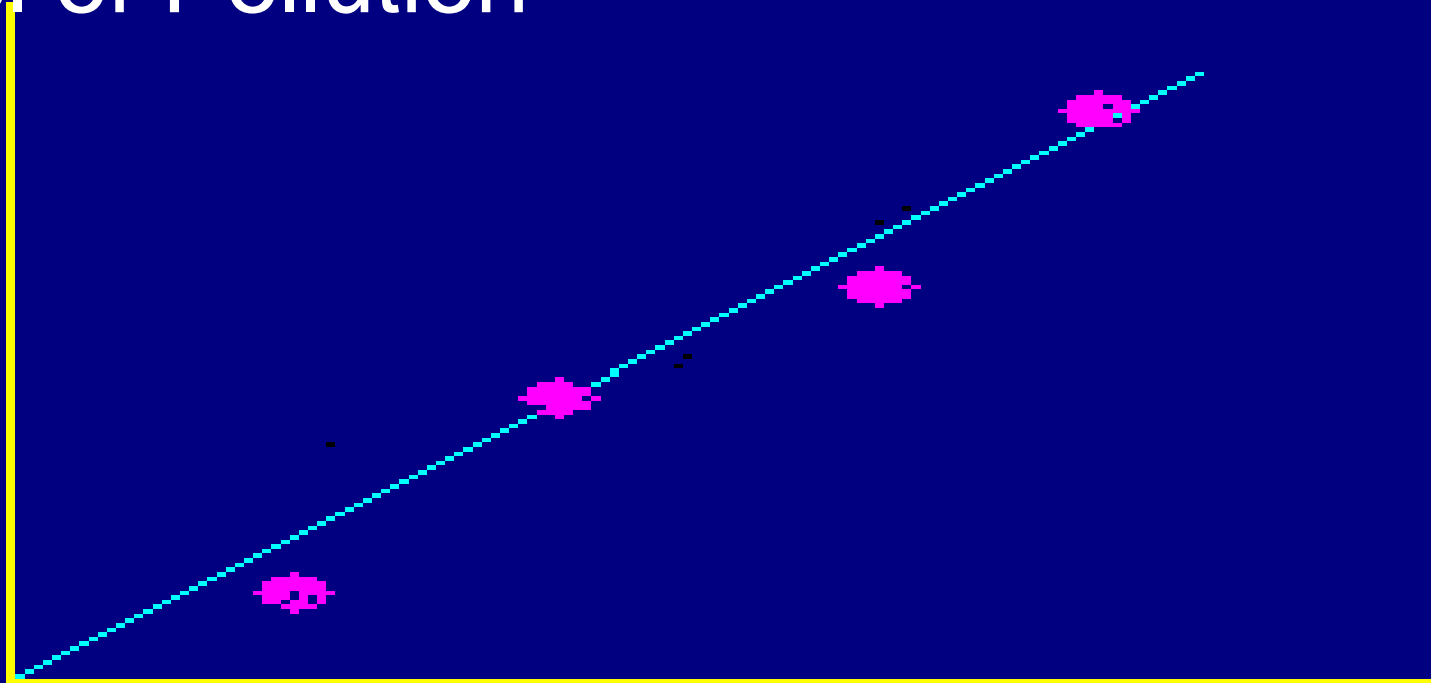
Conclusions

- We do not need mega-landfills or incinerators!
- There is a better alternative which is
- Better for our health,
- Better for the economy,
- Better for our children, and
- Better for the planet!

**But there remains a
major obstacle:**

THE BAD LAW

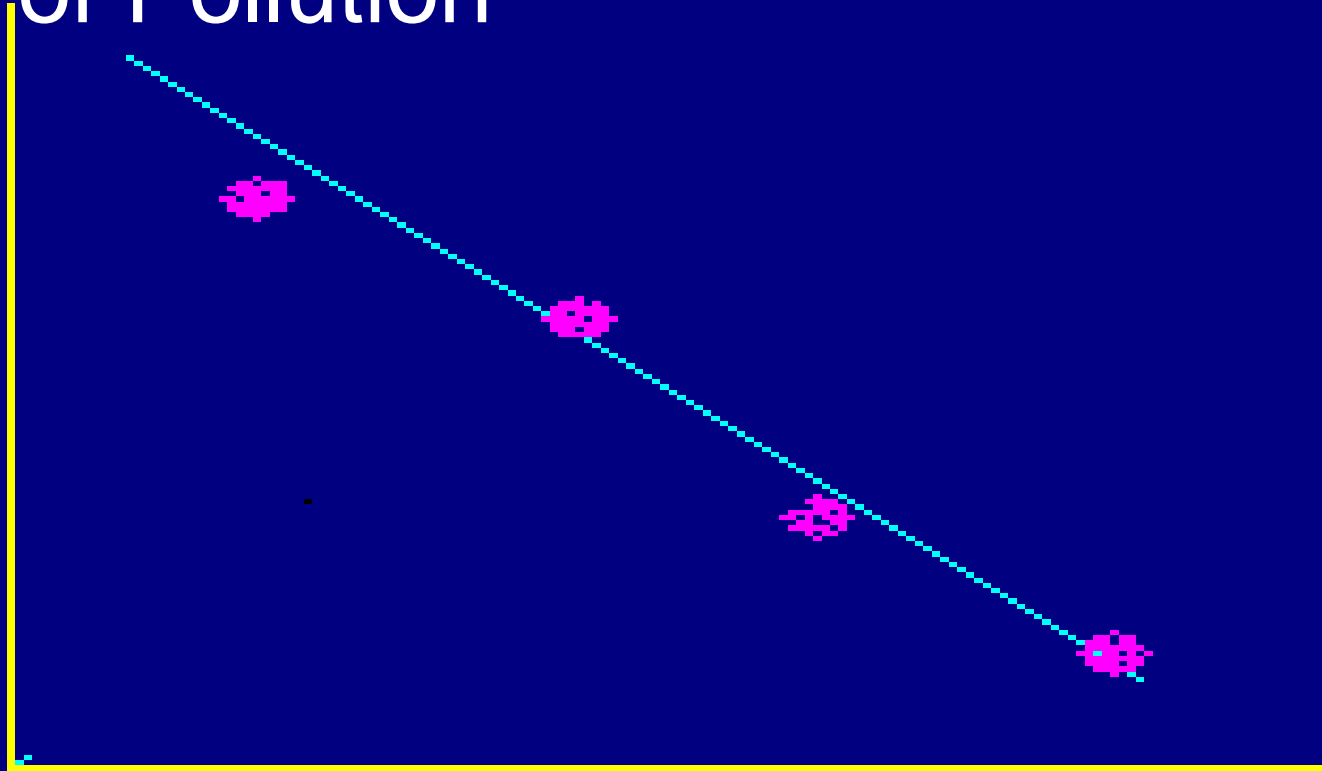
Level of Pollution



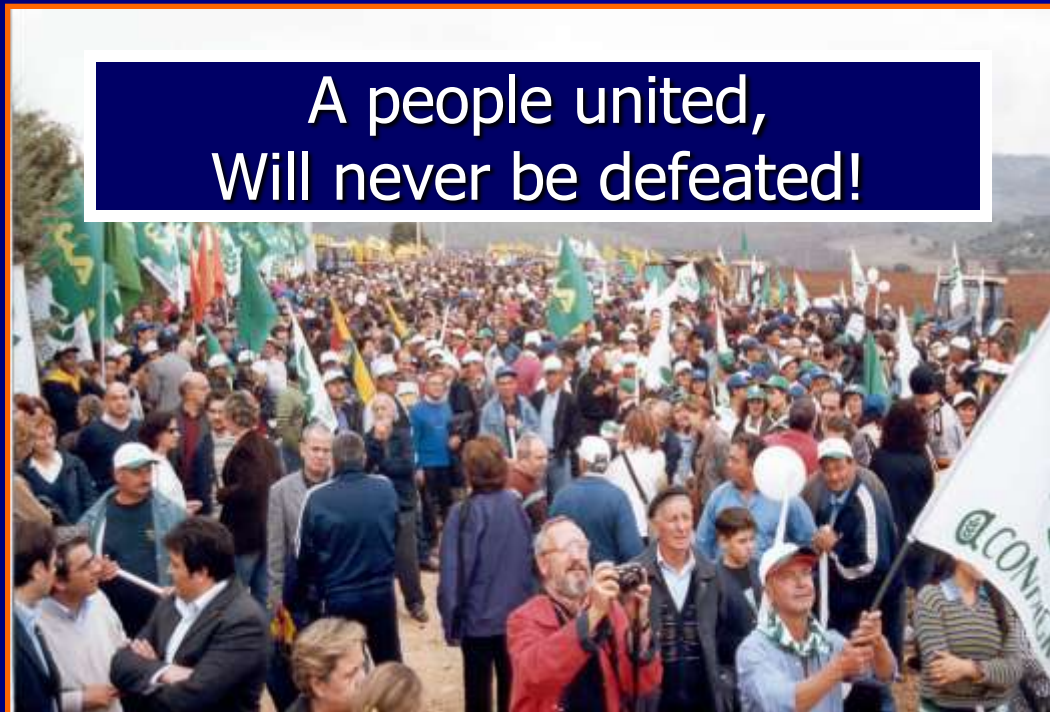
Level of corruption

THE GOOD LAW

Level of Pollution



Level of Public participation



A people united,
Will never be defeated!

THREE FINAL MESSAGES

- **TO CITIZENS:** don't let high paid consultants take either your common sense or your democracy away from you
- **TO POLITICIANS:** put your faith back in people - we will not let you down!
- **TO ACTIVISTS:** be gentle with yourselves. To avoid burn out you need to
- **HAVE FUN!**

My **Rainbow** Colored Race

Pete Seeger

- One blue sky above us
- One ocean lapping on our shore
- One earth so green and round
- Who could ask for more
- And because I love you
- I'll give it one more try
- My **Rainbow** colored race
- It's too soon to die

The Battle Hymn of Garbage

(Chorus)

We don't want incineration

We don't want incineration

We don't want incineration

We know there's a better way!

The Battle Hymn of Garbage

While we recognize our landfills
All are swelling with the waste
This doesn't justify
A bad decision made in haste!
Let us put our heads together
So the problem may be faced
And we must do it now!

The Battle Hymn of Garbage

(Chorus)

We don't want incineration

We don't want incineration

We don't want incineration

We know there's a better way!

The Battle Hymn of Garbage

Mine eyes have seen the garbage
That's a smoldering on the grate
We must stop incineration
Before it is too late
Unless we wish the dangers
We had better separate
And we must do it now!

The Battle Hymn of Garbage

(Chorus)

We don't want incineration

We don't want incineration

We don't want incineration

We know there's a better way!



God

**recycles,
The devil
burns**

