

Incineration versus the Alternatives

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OUTLINE

- 1. Waste and the Big Picture
- 2. The arguments against incineration
- 3. The Zero Waste 2020 strategy
- 4. The Key Step Forward
- 5. Zero Waste Initiatives Around the World
- 6. Back to the Big Picture

4. The key step forward

**Landfills & Incinerators
attempt to make the residuals
disappear**

**To move towards
zero waste & sustainability
we need to make the
remaining residuals
very visible**

Residuals must not go directly to a landfill

- but to a residual separation facility built
- in front of the landfill

Residual Separation Facility

RESIDUAL SCREENING FACILITY



**MORE
RECYCLABLES**

MORE TOXICS

**DIRTY
ORGANIC
FRACTION**

**BIOLOGICAL
STABILIZATION**

INTERIM LANDFILL

RESIDUAL SCREENING FACILITY

Built in front of landfill

Operating in
Nova Scotia

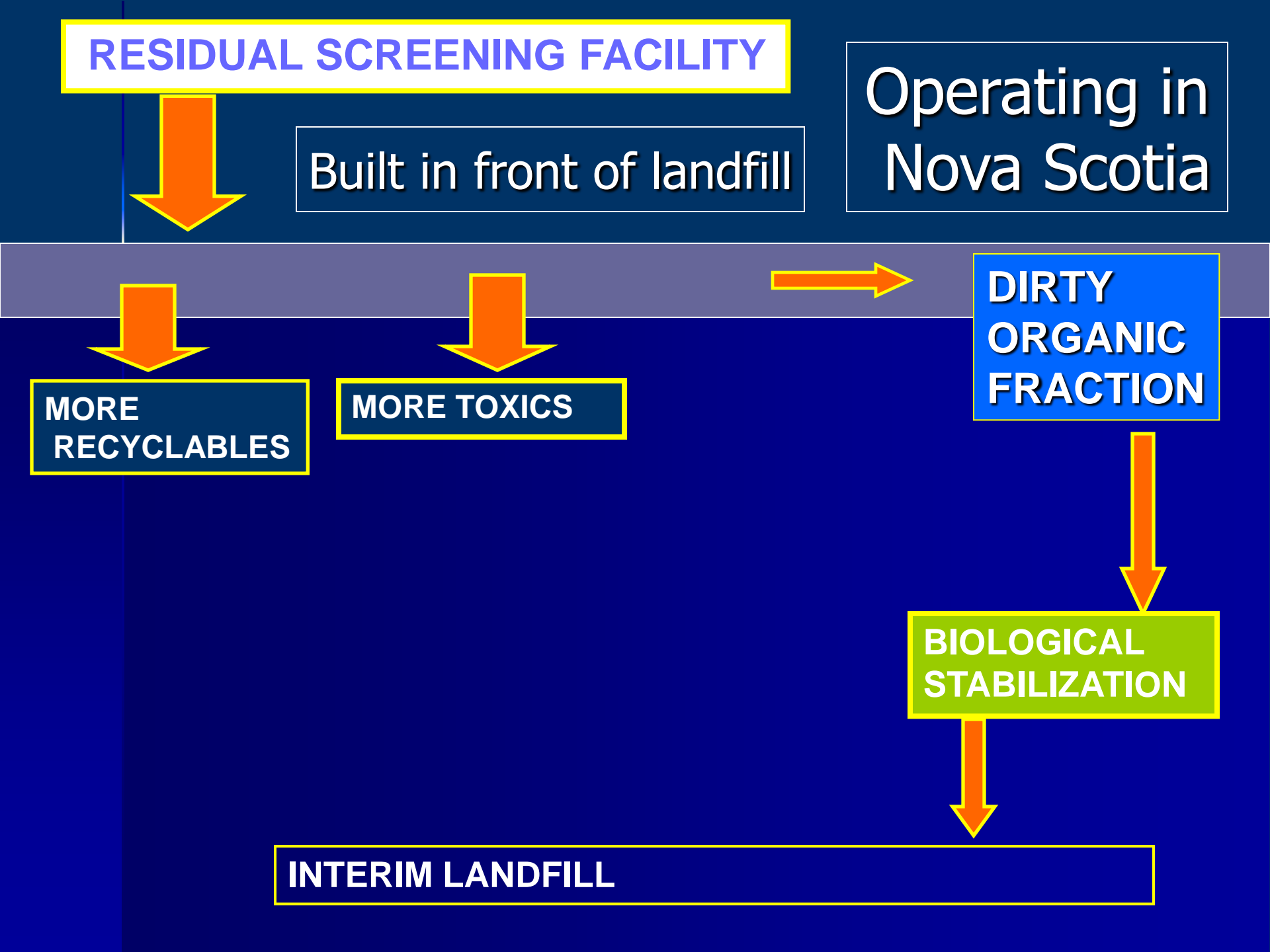
MORE
RECYCLABLES

MORE TOXICS

DIRTY
ORGANIC
FRACTION

BIOLOGICAL
STABILIZATION

INTERIM LANDFILL



A critical improvement on Nova Scotia

Insertion of a **Research** center

RESIDUAL SCREENING & RESEARCH FACILITY

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graph TD; A[RESIDUAL SCREENING & RESEARCH FACILITY] --> B[DIRTY ORGANIC FRACTION]; A --> C[MORE RECYCLABLES]; A --> D[MORE TOXICS]; A --> E[NON-TOXIC, NON-BIODEGRADABLE FRACTION]; B --> F[BIOLOGICAL STABILIZATION]; C --> G[INTERIM LANDFILL]; D --> G; E --> H[RESEARCH CENTER]; F --> G;
```

The diagram illustrates a waste management process starting from a 'RESIDUAL SCREENING & RESEARCH FACILITY'. This facility leads to four distinct paths: 1) 'MORE RECYCLABLES' which leads to 'INTERIM LANDFILL'; 2) 'MORE TOXICS' which leads to 'INTERIM LANDFILL'; 3) 'NON-TOXIC, NON-BIODEGRADABLE FRACTION' which leads to a 'RESEARCH CENTER' and then to 'INTERIM LANDFILL'; and 4) 'DIRTY ORGANIC FRACTION' which leads to 'BIOLOGICAL STABILIZATION' and then to 'INTERIM LANDFILL'.

**MORE
RECYCLABLES**

MORE TOXICS

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

**RESEARCH
CENTER**

INTERIM LANDFILL

**DIRTY
ORGANIC
FRACTION**

**BIOLOGICAL
STABILIZATION**

RESIDUAL SEPARATION & RESEARCH FACILITY

NON-RECYCABLE MATERIALS

Local
University

Or
Technical College

RESEARCH
CENTER

Residual Separation & Research Facility

RESEARCH CENTER

- Improve **capture rate** of reusables, recyclables and clean compostables
- Recommend improved **waste avoidance strategies** by local businesses
- Develop some **local uses** for some materials
- **Recommend better industrial designs to industry on packaging and products**

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
- We cannot become sustainable without it

Nature makes no waste

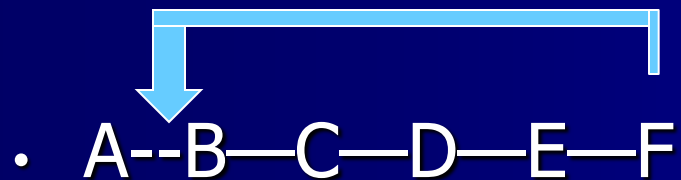
- Because she uses FEEDBACK mechanisms

A--B—C—D—E—F

- If F builds up because not being used then F will switch off the first enzyme controlling the first step of this process

Nature makes no waste

- Because she uses FEEDBACK mechanisms



**Nel Feb 24, 2007
Capannori (vicino Lucca)
e` diventata la prima
citta` a dichiarare una
strategia rifiuti zero 2020**

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 poliaccoppiati	8.05 %
6.	Imballaggi poliaccoppiati 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 %

FRAZIONE RESIDUA — Capannori

1.	Tessili e cuoio	16.52 %
2.	Pannolini	13.95 %
3.	Materiale organico da cucina	10.56 %
4.	Questa e' l'analisi del 17% che rimane dopo la separazione dell' 83% del materiale raccolto porta a porta	
5.		
6.		
7.		
8.		
9.		
10		



The waste problem

- Is too important to be left to “waste experts” (which are usually engineers)
- We need all sectors involved if we are to move towards a **sustainable** society

Sustainability

- As far as sustainability is concerned the waste problem is a fabulous place to start
- Because everyone makes waste!

Research Institute for Zero Waste and Sustainability

Research Institute for Zero Waste and Sustainability

1) Research for better industrial design

Research Institute for Zero Waste and Sustainability

- 1) Research for better industrial design**
- 2) Linking zero waste with other key developments needed for sustainability**



Better
Industrial
Design

**Sustainable
Agriculture**

**Education
For
Sustainability**

**Sustainable
Architecture**

**Sustainable
industries
& Jobs**

Zero Waste 2020

**Sustainable
Energy**

**Sustainable
Economic
development**

**Sustainable
Community
development**



Composting

Better
Industrial
Design

**Sustainable
Agriculture**

**Education
For
Sustainability**

**Sustainable
Architecture**

**Sustainable
industries
& Jobs**

Zero Waste 2020

**Sustainable
Community
development**

**Sustainable
Economic
development**

**Sustainable
Energy**



Research Center

Composting

**Better
Industrial
Design**

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Zero Waste 2020

**Sustainable
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**Sustainable
Community
development**



Composting

Research Center

**Better
Industrial
Design**

**Sustainable
Agriculture**

**Education
For
Sustainability**

Deconstruction

**Sustainable
Architecture**

**Sustainable
industries
& Jobs**

Zero Waste 2020

**Sustainable
Community
development**

**Sustainable
Economic
development**

**Sustainable
Energy**



Composting

Research Center

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Industrial
Design**

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Agriculture**

**Education
For
Sustainability**

Deconstruction

**Sustainable
Architecture**

**Sustainable
industries
& Jobs**

Zero Waste 2020

**Anaerobic
Digestion**

**Sustainable
Energy**

**Sustainable
Community
development**

**Sustainable
Economic
development**



Composting

Research Center

Better
Industrial
Design

**Sustainable
Agriculture**

**Education
For
Sustainability**

Deconstruction

**Sustainable
Architecture**

**Sustainable
industries
& Jobs**

Zero Waste 2020

Anaerobic
Digestion

**Sustainable
Energy**

**Sustainable
Community
development**

**Sustainable
Economic
development**

Incineration is
not sustainable
energy!

Composting

Research Center

**Better
Industrial
Design**

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For
Sustainability**

Deconstruction

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**Sustainable
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& Jobs**

Zero Waste 2020

**Anaerobic
Digestion**

**Sustainable
Energy**

**Sustainable
Community
development**

**Sustainable
Economic
development**

100's of "green boxes"



Composting

Research Center

**Better
Industrial
Design**

**Sustainable
Agriculture**

**Education
For
Sustainability**

Deconstruction

**Sustainable
Architecture**

**Sustainable
industries
& Jobs**

Zero Waste 2020

**Anaerobic
Digestion**

**Sustainable
Energy**

**Sustainable
Community
development**

**Sustainable
Economic
development**

**Reuse &
Repair
Centers**

100's of "green boxes"

A summary of the steps towards zero waste

Source Separation

**Source
Separation**

**Door to Door
Collection**

**Source
Separation**

**Door to Door
Collection**

Composting

**Source
Separation**

```
graph TD; A[Source Separation] --- B[Recycling]; A --- C[Door to Door Collection]; A --- D[Composting];
```

The diagram consists of four colored boxes with white borders on a dark blue background. A teal box at the top left is connected by a thin white line to a light blue box below it. To the right of the teal box is a dark blue box, and to the right of that is a lime green box. All boxes contain bold white text.

**Door to Door
Collection**

Composting

Recycling

**Source
Separation**

**Door to Door
Collection**

Composting

Recycling

**Waste
Reduction
Initiatives**

**Source
Separation**

**Door to Door
Collection**

Composting

Recycling

**Waste
Reduction
Initiatives**

**Reuse,
Repair &
Deconstruction**

**Source
Separation**

**Door to Door
Collection**

Composting

Recycling

**Waste
Reduction
Initiatives**

**Reuse,
Repair &
Deconstruction**

**Economic
Incentives**

**Source
Separation**

**Door to Door
Collection**

Composting

Recycling

**Waste
Reduction
Initiatives**

**Reuse,
Repair &
Deconstruction**

**Economic
Incentives**

**Residual
Separation &
Research
Center**

**Source
Separation**

**Door to Door
Collection**

Composting

Recycling

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**Better
Industrial
Design**

**Source
Separation**

**Door to Door
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Composting

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Deconstruction**

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Incentives**

**Residual
Separation &
Research
Center**

**Better
Industrial
Design**

Temporary Landfill

**Source
Separation**

**Door to Door
Collection**

Composting

Recycling

**Waste
Reduction
Initiatives**

**Reuse,
Repair &
Deconstruction**

**Economic
Incentives**

**Residual
Separation &
Research
Center**

**Better
Industrial
Design**

Temporary Landfill

2020

San Francisco

- Population = 850,000
- Very little space
- 50% waste diverted by 2000
- 63% waste diverted by 2004
- 70% waste diverted by 2008
- 72% waste diverted by 2009
- 75% waste diverted by 2010 (goal)
- 100% by 2020 – Zero Waste (or very close!)

70 - 80%

COMMUNITY RESPONSIBILITY

**Residual
Separation &
Research
Facility**

**Better
Industrial
Design**

2020

INTERIM LANDFILL

70-80%

COMMUNITY RESPONSIBILITY

20-30%

INDUSTRIAL
RESPONSIBILITY

INTERIM LANDFILL

2020

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

70-80%

COMMUNITY RESPONSIBILITY

20-30%

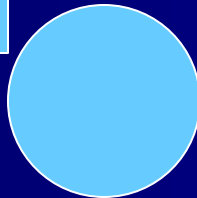
**INDUSTRIAL
RESPONSIBILITY**

INTERIM LANDFILL

2020

Community
Responsibility

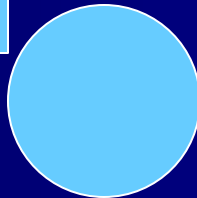
70%



Community
Responsibility

70%

Residual Separation &
Research Facility

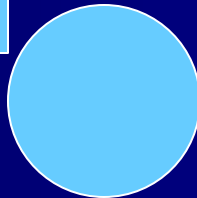


Community
Responsibility

Industrial
Responsibility

70%

Residual Separation &
Research Facility



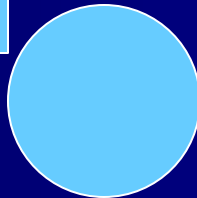
Community
Responsibility

Industrial
Responsibility

70%

80%

Residual Separation &
Research Facility



Community
Responsibility

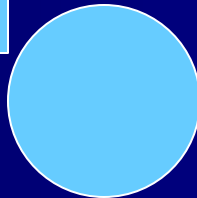
Industrial
Responsibility

70%

90%

80%

Residual Separation &
Research Facility



The other model

60-70%

COMMUNITY RESPONSIBILITY

30-40%

INCINERATION

Compare



Compost
Recycle
Reuse
Repair
Reduce

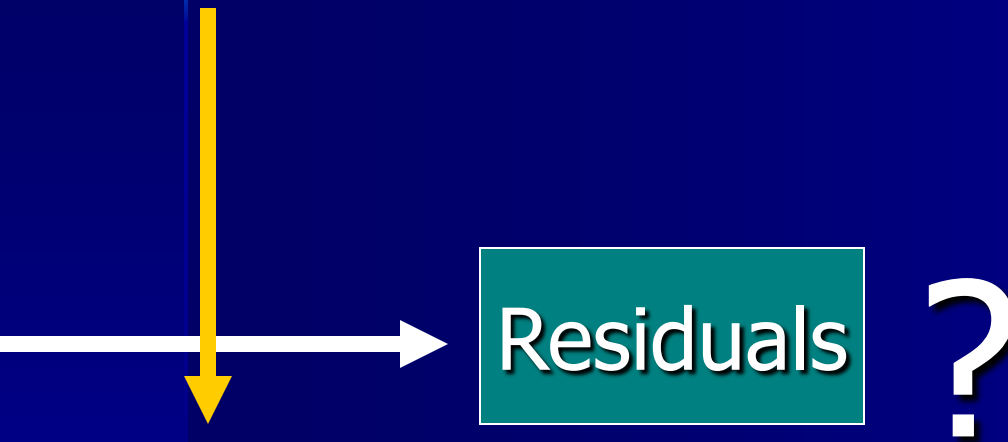
Compare

The diagram features a dark blue background. At the top, a light blue rectangular box contains the word 'Compare'. Below this box, a vertical yellow arrow points downwards. To the left of the 'Residuals' box, a horizontal white arrow points to the right. The intersection of these two arrows is positioned over a light blue box containing a list of five items: 'Compost', 'Recycle', 'Reuse', 'Repair', and 'Reduce'. To the right of the intersection, a teal box contains the word 'Residuals'.

Residuals

Compost
Recycle
Reuse
Repair
Reduce

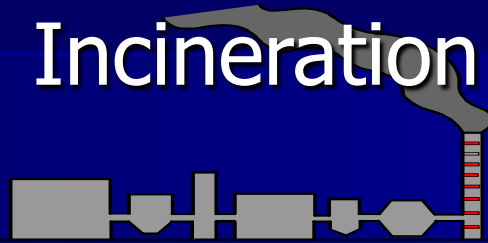
Compare



Compost
Recycle
Reuse
Repair
Reduce

Compare

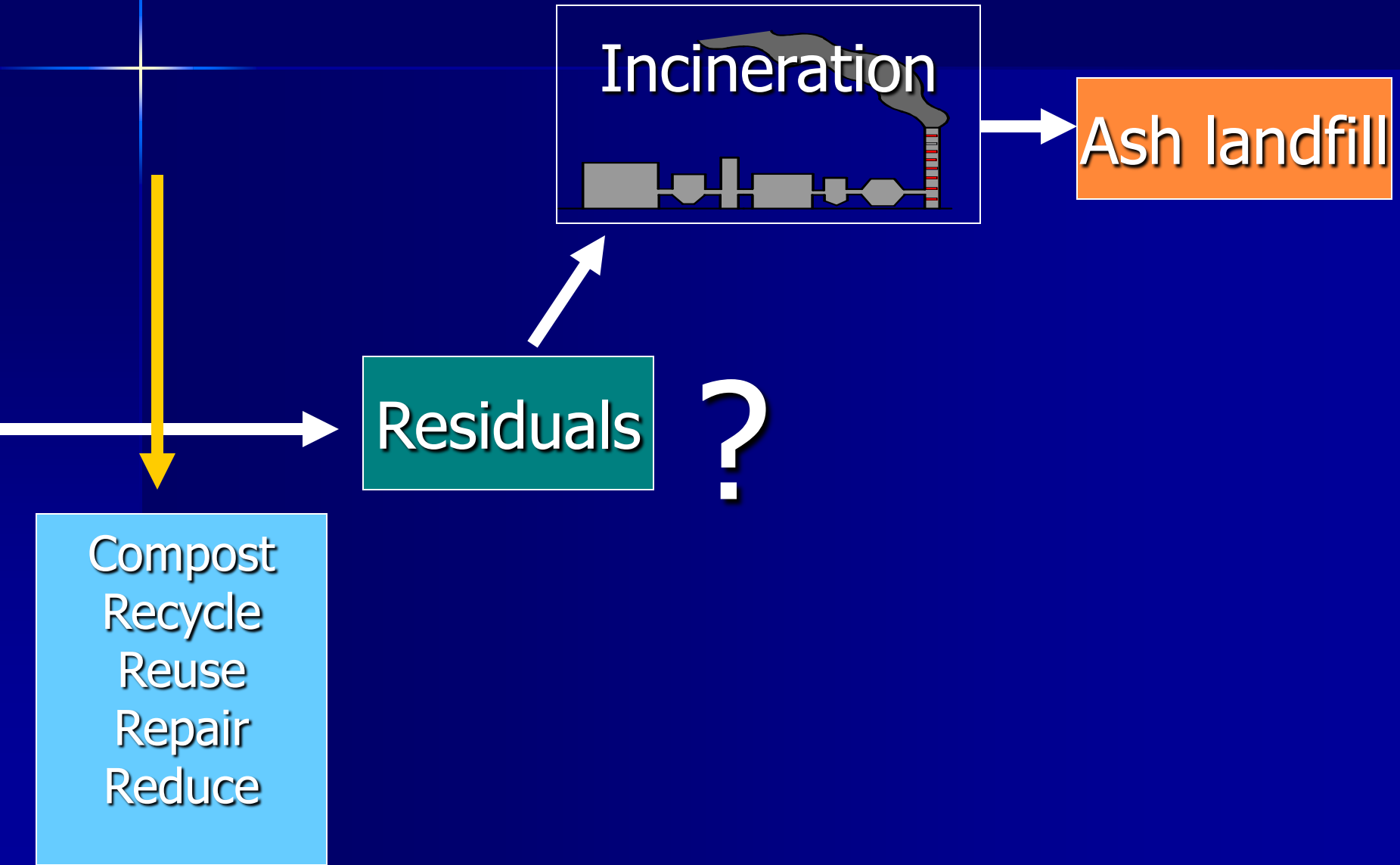
Incineration



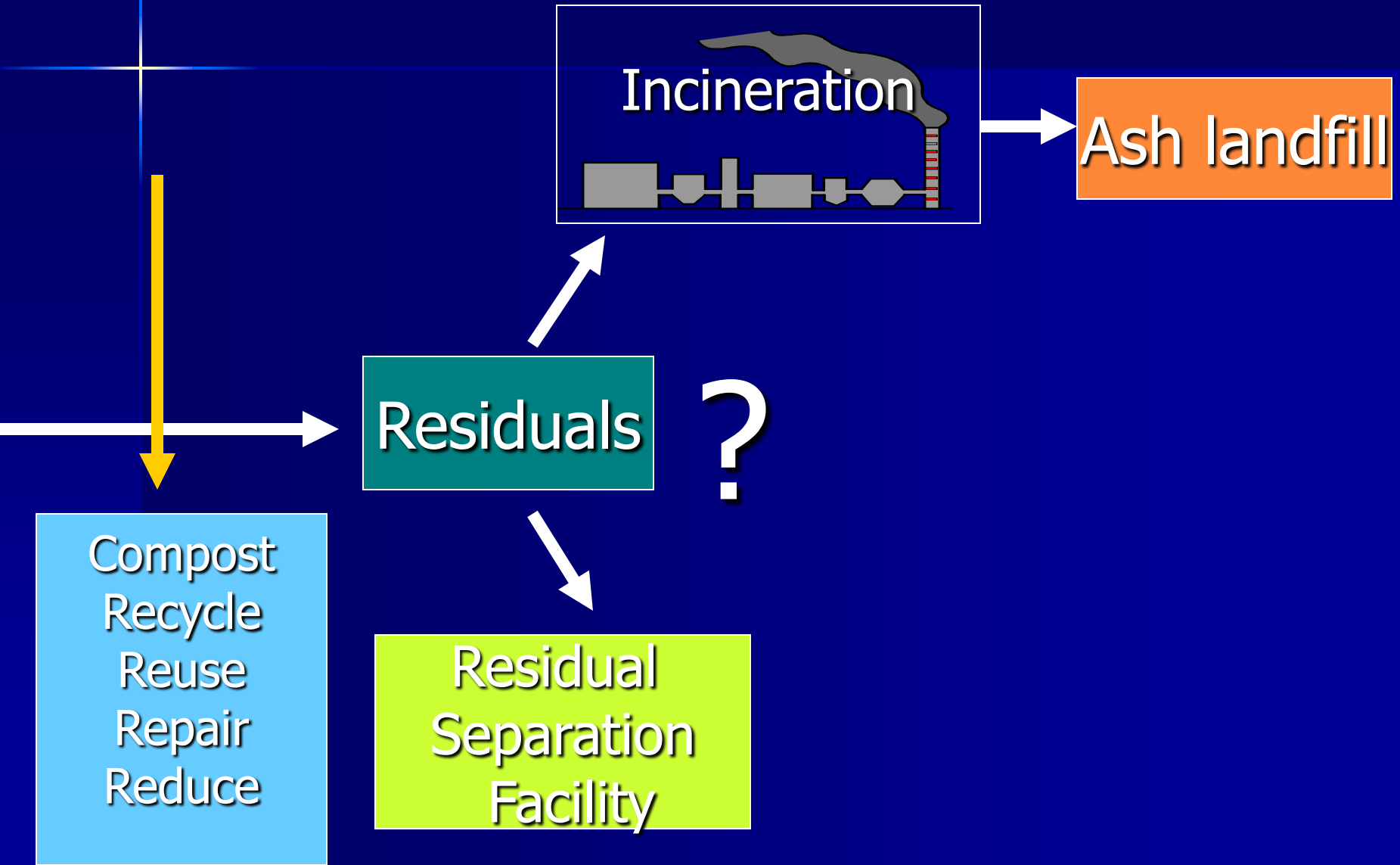
Residuals ?

Compost
Recycle
Reuse
Repair
Reduce

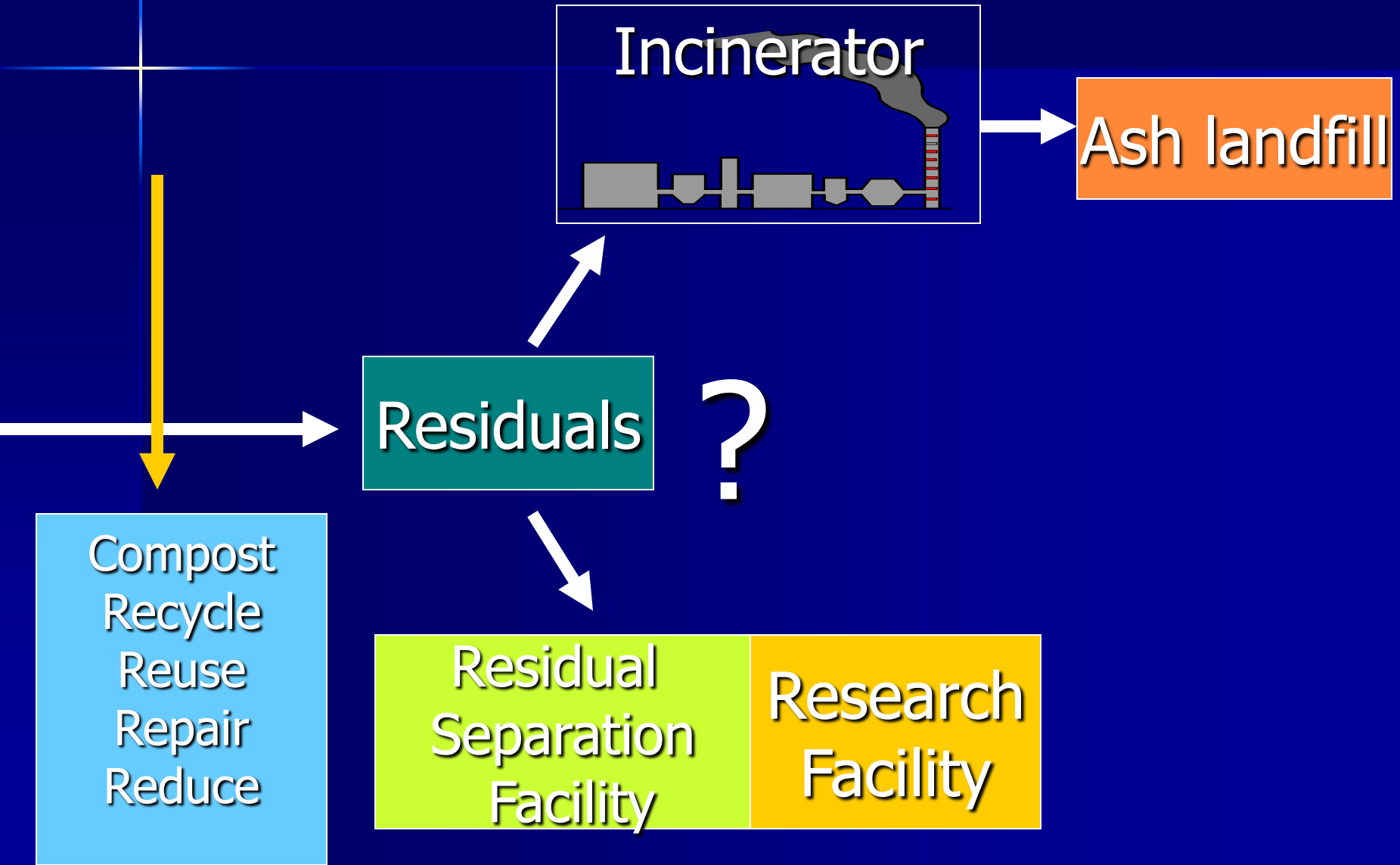
Compare



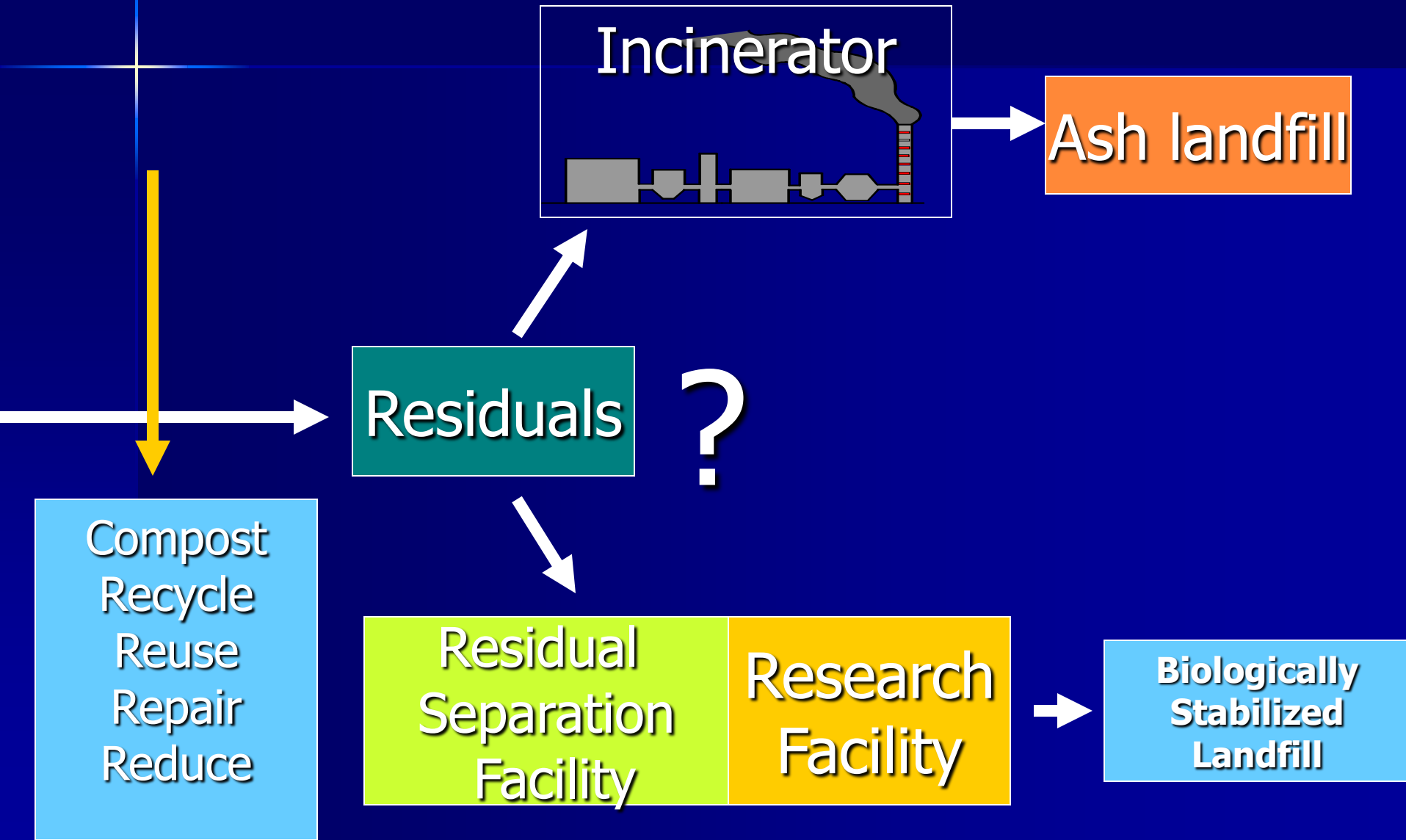
Compare



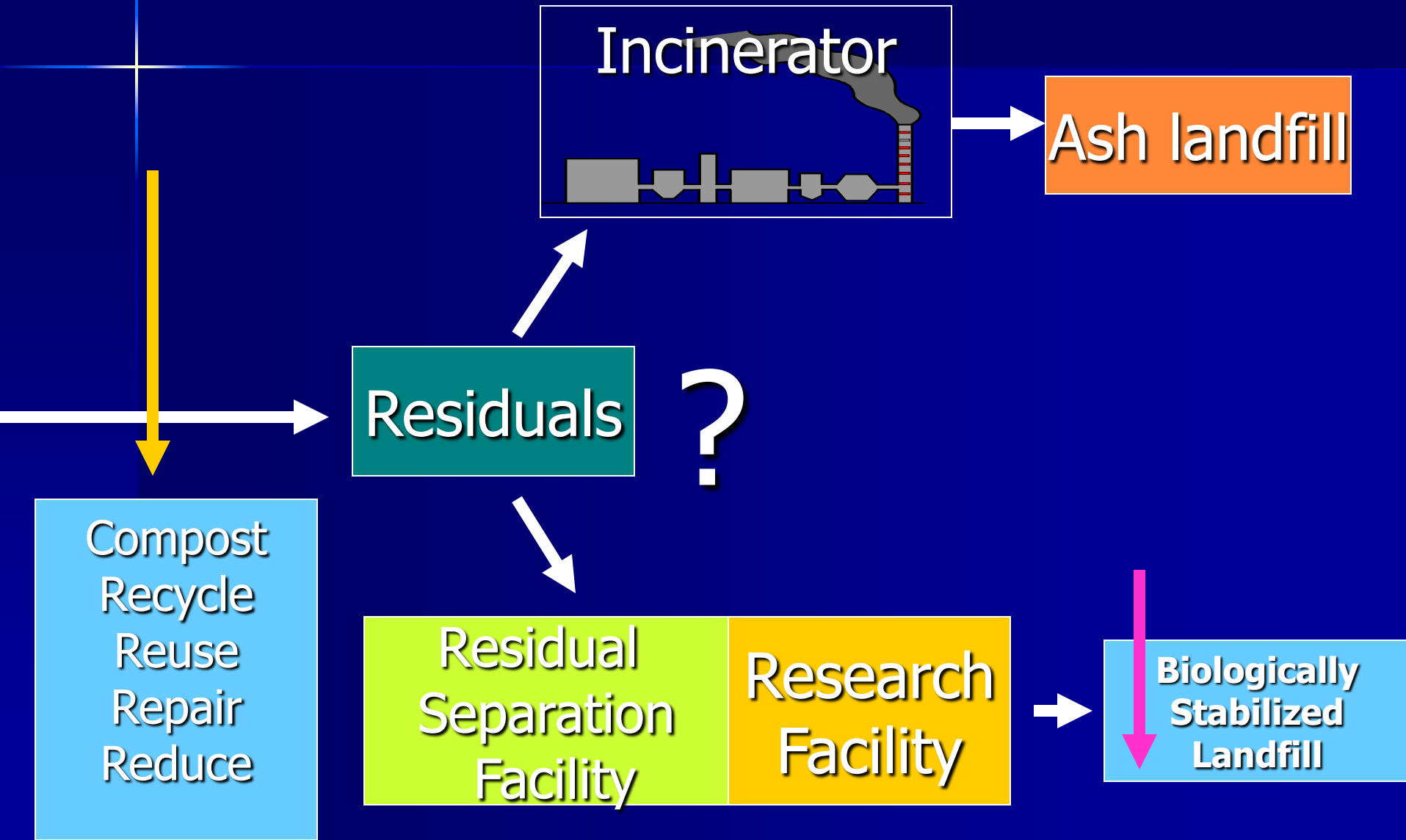
Compare



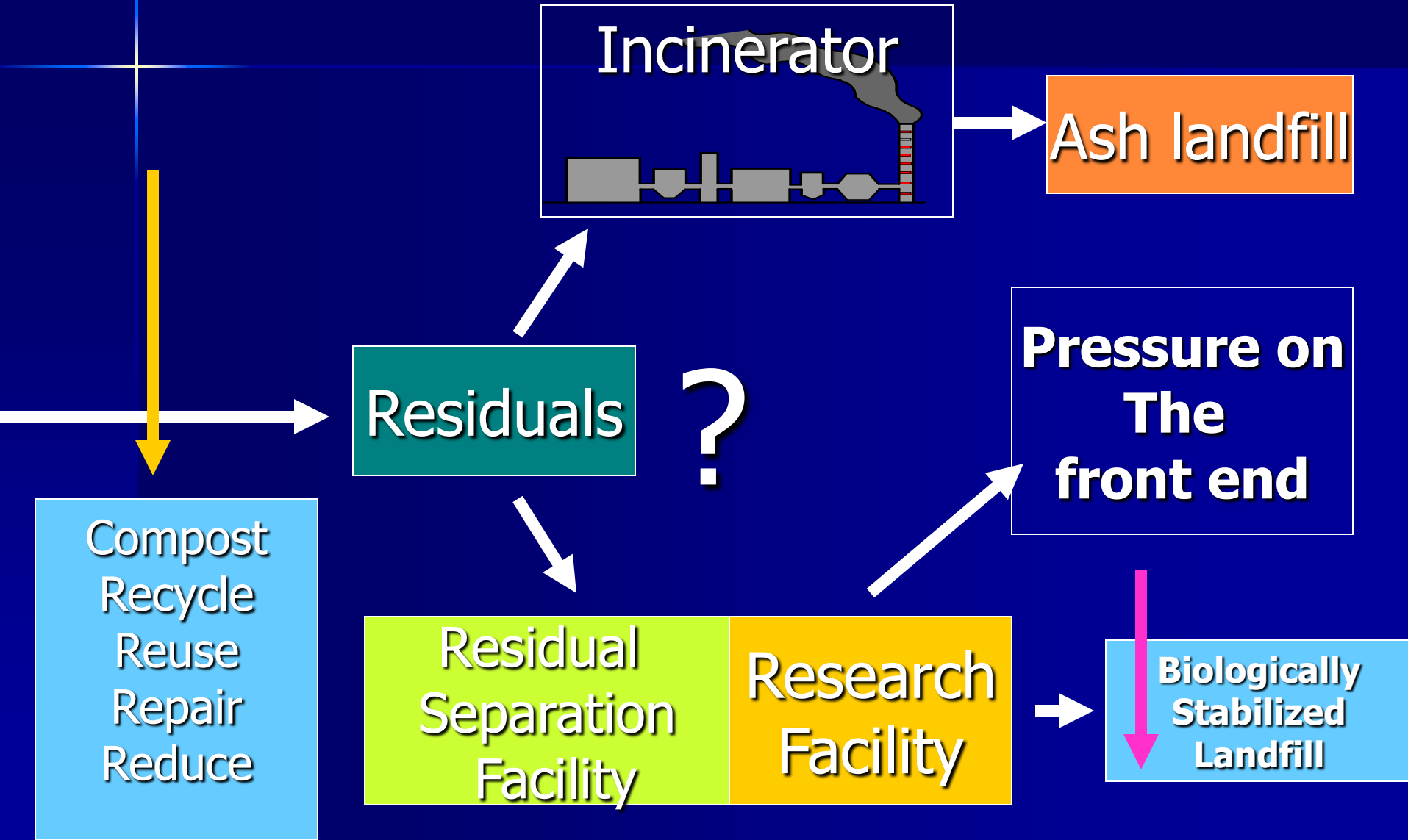
Compare



Compare



Compare



GOOD LEADERSHIP

- We need leaders who have
 - A big vision
 - Imagination
 - Creativity
 - Perseverance
 - and
- WHO ARE NOT BORING!

BORING EXPERTS

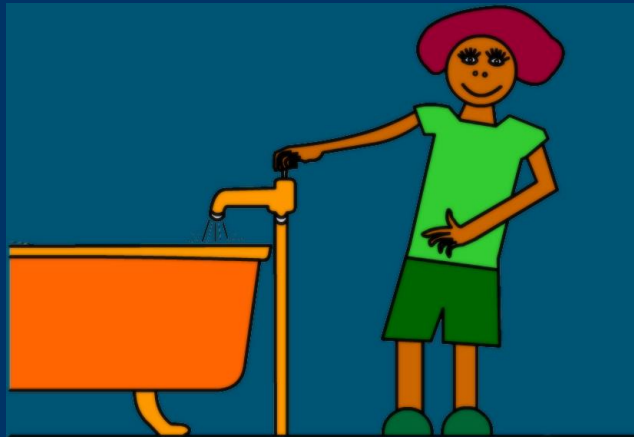
- Think with the wrong end of their bodies

A BACK END THINKER...



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

A FRONT END THINKER...



**Our only hope to move
towards sustainability in
time, is to move to the
front end of the problem**

THE BACK END OF WASTE MANAGEMENT

**THE
BACK END
OF
WASTE
MANAGEMENT**



**THE
FRONT END
OF
BETTER
INDUSTRIAL
DESIGN**

5. Progress towards Zero Waste around the world

- www.zwia.org
- www.GRRN.org
- www.no-burn.org (GAIA)