Zero Waste:
Theory & Practice Around the World

Paul Connett, PhD
Executive Director
American Environmental Health
Studies Project (AEHSP)
www.AmericanHealthStudies.org
pconnett@gmail.com

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OUTLINE

- A. A quick word about sustainability
- B. Zero Waste the Springboard to Sustainability
- C. The critical step forward
- D. From ZW to sustainability
- E. ZW around the world
- E. Back to the Big Picture

A. A quick word 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

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

Mahatma Gandhi

Our real task is to fight over-consumption

Please note that while waste incineration is aggressively promoted by many companies and countries, it is NOT sustainable

Kg Greenhouse gas/tonne Municipal Waste

A combination of recycling and composting is 46 times better	-461
at reducing greenhouse gases than	X 46
Incineration generating electricty	-10

Waste Management Options and Climate Change. AEA 2001

B. Zero Waste is the Springboard to SUSTAINABILITY

ZERO WASTE IS A NEW DIRECTION

THE BACK END OF WASTE MANAGEMENT

THE
BACK END
OF
WASTE
MANAGEMENT

THE
FRONT END
OF
INDUSTRIAL
DESIGN

THE KEY

is to find a way to use

COMMUNITY RESPONSIBILITY

At the back end to drive

INDUSTRIAL RESPONSIBILITY

At the front end

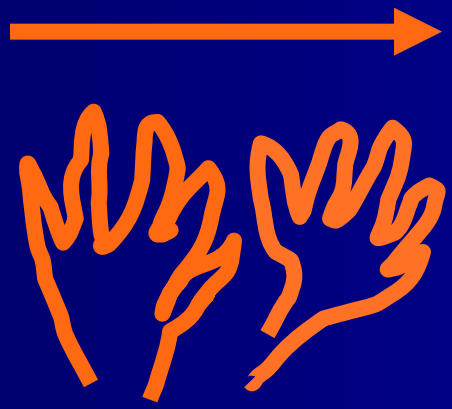
FOUR STEPS FROM ZERO WASTE TO SUSTAINABILITY

1) THE FIRST STEP.
2) THE OTHER PRACTICAL STEPS.
3) THE KEY STEP TO GET TO ZW.
4) USING ZW TO GET TO SUSTAINABILITY.

1. Zero Waste starts with something everyone has

- The ten things on the end of our hands!
- These are the “magic machines” which can make sure that we do not convert discarded resources into waste

waste



Resources

Source Separation

2. Zero Waste continues with a series of simple steps

- which are
- Practical
- Cost effective and
- Politically acceptable

Source Separation

Door to Door Collection

Source Separation

Door to Door Collection

Composting

Source Separation

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

3. The critical step forward to achieve Zero waste

- This is where
- Community Responsibility
- Must be used to drive
- Industrial Responsibility

Residual Separation & Research Facility

Source Separation

Door to Door Collection

Composting

Recycling

Waste Reduction Initiatives

Reuse, Repair & Deconstruction

Economic Incentives

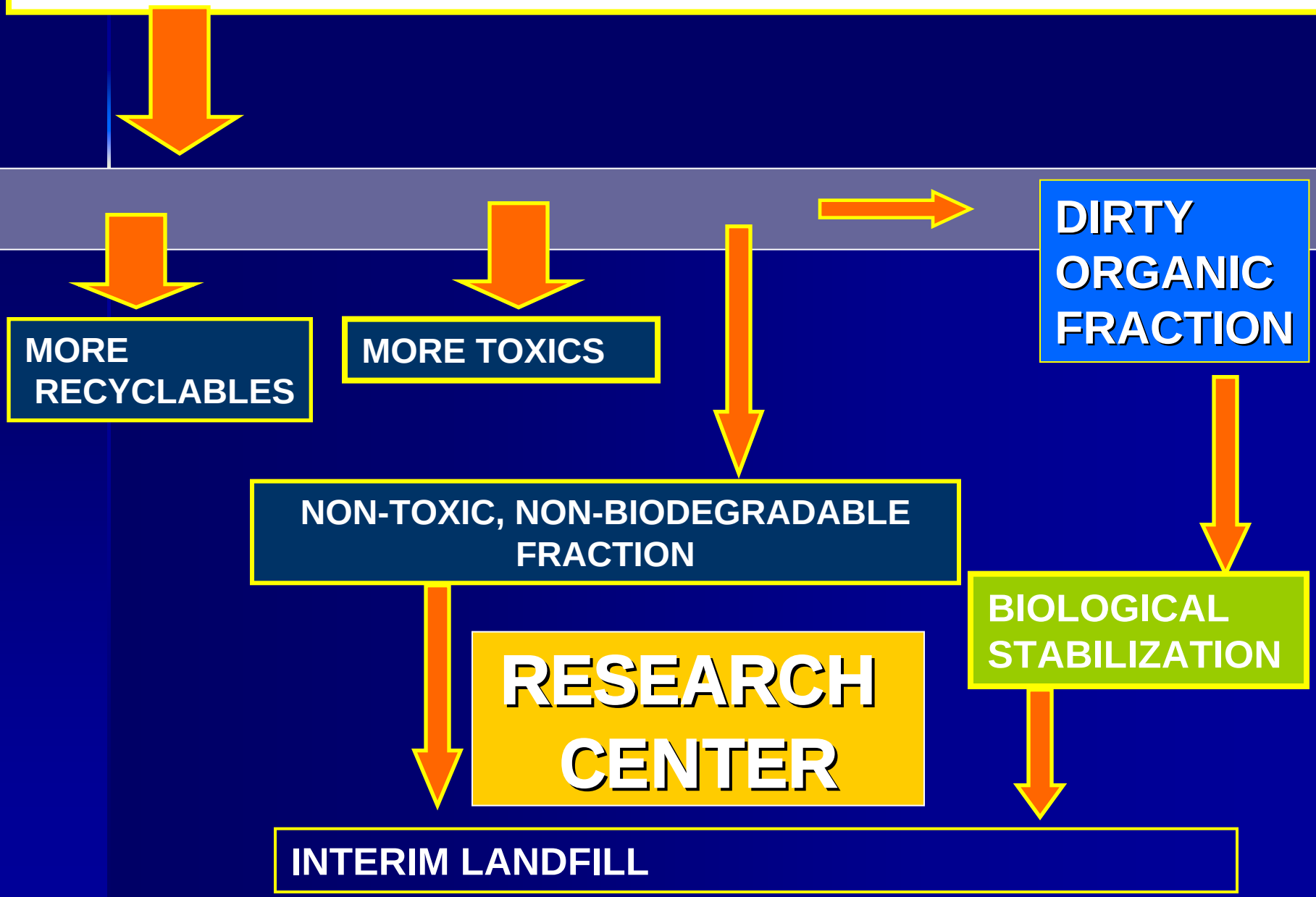
Residual Separation & Research Center

Residual Separation & Research Facility

RESIDUAL SEPARATION & RESEARCH FACILITY

- 1. Built at entrance to landfill
- 2. No material can enter landfill without it being separated and screened
- 3. Toxics removed and identified
- 4. Dirty organics biologically stabilized
- 5. Non-recyclable materials STUDIED

RESIDUAL SCREENING & RESEARCH FACILITY



RESIDUAL SEPARATION & RESEARCH FACILITY

NON-RECYCABLE MATERIALS

Local University

Or Technical College

RESEARCH CENTER

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
- Research for CLEAN Production

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

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 for SUSTAINABILITY!

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

Waste Reduction Initiatives

Reuse, Repair & Deconstruction

Economic Incentives

Residual Separation & Research Center

Better Industrial Design

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

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
- GOAL:75% waste diverted by 2010
- GOAL:100% by 2020 (or very close!)

70 - 80%

COMMUNITY RESPONSIBILITY

Residual Separation & Research Facility

Better Industrial Design

2020

INTERIM LANDFILL

70-80%

COMUNITY RESPONSIBILITY

20-30%

INDUSTRIAL
RESPONSIBILITY

INTERIM LANDFILL

2020

Industrial Responsibility

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

Extended Producer Responsibilty - 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 Responsibilty - 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

4. To move from Zero Waste to Sustainability we must use the wisest and brightest minds in our society

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


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


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


Composting
Better Industrial Design
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Composting
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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
Sustainable Agriculture
Education For Sustainability
Deconstruction
Sustainable Architecture
Sustainable industries & Jobs
Zero Waste 2020
Anaerobic Digestion
Sustainable Energy
Sustainable Community development
Sustainable Economic development
100's of "green boxes"


Composting
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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"

D. Progress towards Zero Waste around the world

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

Envision a world without waste

Solid Waste Integrated Resources Plan

All of us together can make Zero!

Media Breakfast Briefing

January 23, 2007

Reina Pereira, Project Manger, SWIRP and
Senior Environmental Engineer,
Los Angeles Bureau of Sanitation

CITY OF LOS ANGELES
SANITATION
DEPARTMENT OF PUBLIC WORKS

ZERO WASTE PLAN
Solid Waste Integrated Resources Plan

California

- As a result of a state law passed in the early 1990's hundreds of California cities exceeded over 50% diversion from landfills and incinerators by 2000
- Some communities said why stop at 50%, why not 60%, 70%...
- Why not aim for Zero Waste?

NEW ZEALAND

Over 70% 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.

Italy

- Over 2000 communities in Italy are achieving over 50% diversion using “door to door” collection systems
- Over 200 communities achieving over 70% diversion

Italy

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

Italy

- The Treviso region - 22 communities averaging 76% diversion (Priula consortium)

Italy

- Villafranco d'Asti (Piedmont) has reached 85% diversion

Some other developments

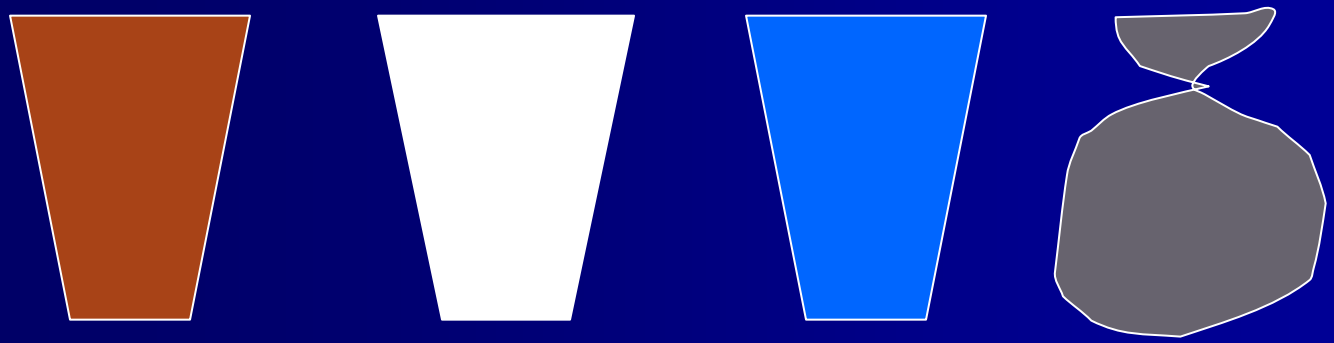
- Canberra, Australia
- Kovalam, India
- The Philippines and
- The UK

E. Some practicalities

“The Fantastic 3”

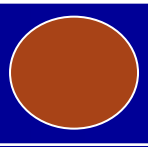
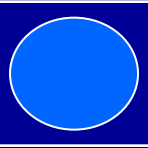
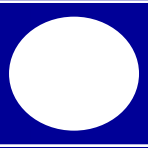
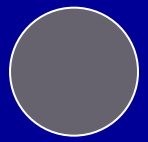
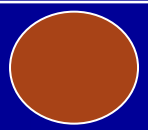
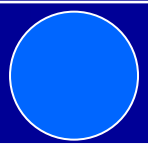
The San Francisco system

I “Fantastici 4”



Capannori, Italia

Capannori

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


1
2
3


1
2
3
Composting Facility

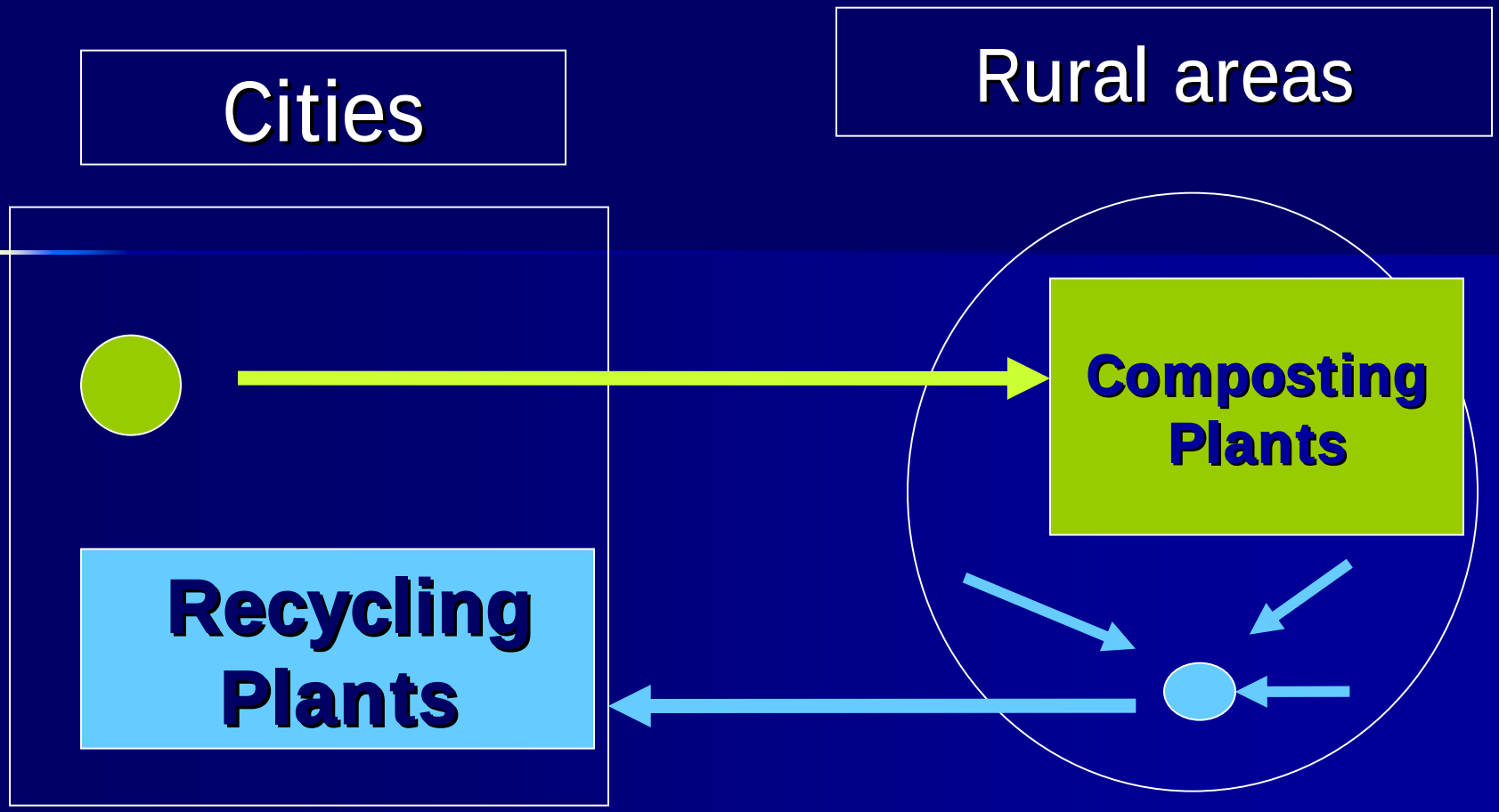
Composting plant for San Francisco

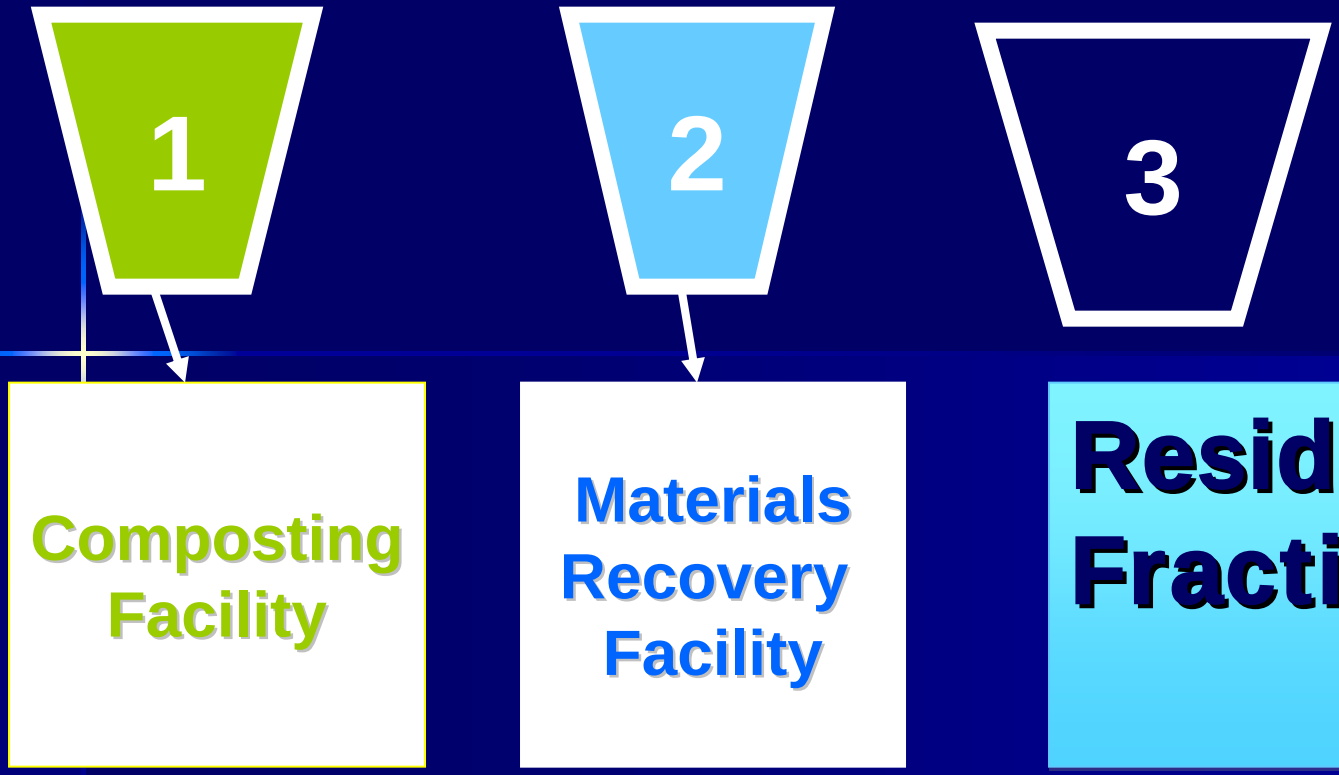

1
2
3
Composting Facility


1
2
3
Composting Facility
Materials Recovery Facility

MATERIALS RECOVERY FACILITY

at Pier 96


Cities
Rural areas
Composting Plants
Recycling Plants


1
2
3
Composting Facility
Materials Recovery Facility
Residual Fraction

We have to minimize the residual fraction with…

- 1) Waste reduction initiatives
- 2) Reuse, repair and deconstruction
- 3) Economic incentives

Waste Reduction Initiatives

Undesirable packaging

- Four options:
- Ban it
- Tax it
- Put a returnable deposit on it
- Avoid it

Ireland

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

Italy

- Several supermarket chains are providing dispensers which allow customers to refill shampoo and detergent bottles...
- As well as 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

Reuse, Repair and Deconstruction

VALUE OF L.A. DISCARDS

Market Categories	%	Tons/Year	$/ton	$
1.Reuse	2.0	72,000	550	39,600,000
2.Paper	[illegible]	792,000	20	15,840,000
3.Plant Debris	5.5	198,000	7	1,386,000
4.Putrescibles	17.0	612,000	7	4,284,000
5.Wood	4.0	144,000	8	1,152,000
6.Ceramics	13.0	468,000	4	1,872,000
7.Soils	10.0	360,000	7	2,520,000
8.Metals	4.0	144,000	40	5,760,000
9.Glass	2.0	72,000	10	720,000
10.Polymers	8.0	288,000	100	28,800,000
11.Textiles	2.0	72,000	20	1,440,000
12.Chemicals	0.5	18,000	15	270,000
No market (diapers, treated wood, mistakes)	10.0	360,000		0
TOTAL PER YEAR	100	3,600,000		$103,644,000

reuse

Reuse, Repair & Deconstruction

Urban Ore, Berkeley, California

- “Economically, incineration represents ONE BIG BLACK BOX
- The Zero Waste strategy represents 100’s of LITTLE GREEN BOXES”
- (Ted Ward, Zero Waste, Del Norte County, California)

Deconstruction

Deconstruction

Reuse &
Repair Center

Deconstruction

Reuse & Repair Center

Furniture, Flooring, etc

VIDEOS

- "On the Road to Zero Waste"
- Part 1: Nova Scotia
- Part 2: Burlington, Vermont
- Part 3: Canberra, Australia
- Part 4: San Francisco
- Zero Waste: Idealistic Dream or Realistic Goal?
- Pieces of Zero: Creativity versus Waste
- www.AmericanHealthStudies.org

Economic Incentives

The “ Pay by bag” system

The “ Pay by bag” system

free

The “ Pay by bag” system

free

free

The “ Pay by bag” system

free

free

The more you make, the more you pay!

The “ Pay by bag” system

No surcharge	No surcharge	Surcharge!

The “ Pay by bag” system

No surcharge	No surcharge	Surcharge!

Total cost of program comes out of local taxes

1

2

$

Community Initiatives to Reduce waste

Composting Facility

Materials Recovery Facility

Residuals ?

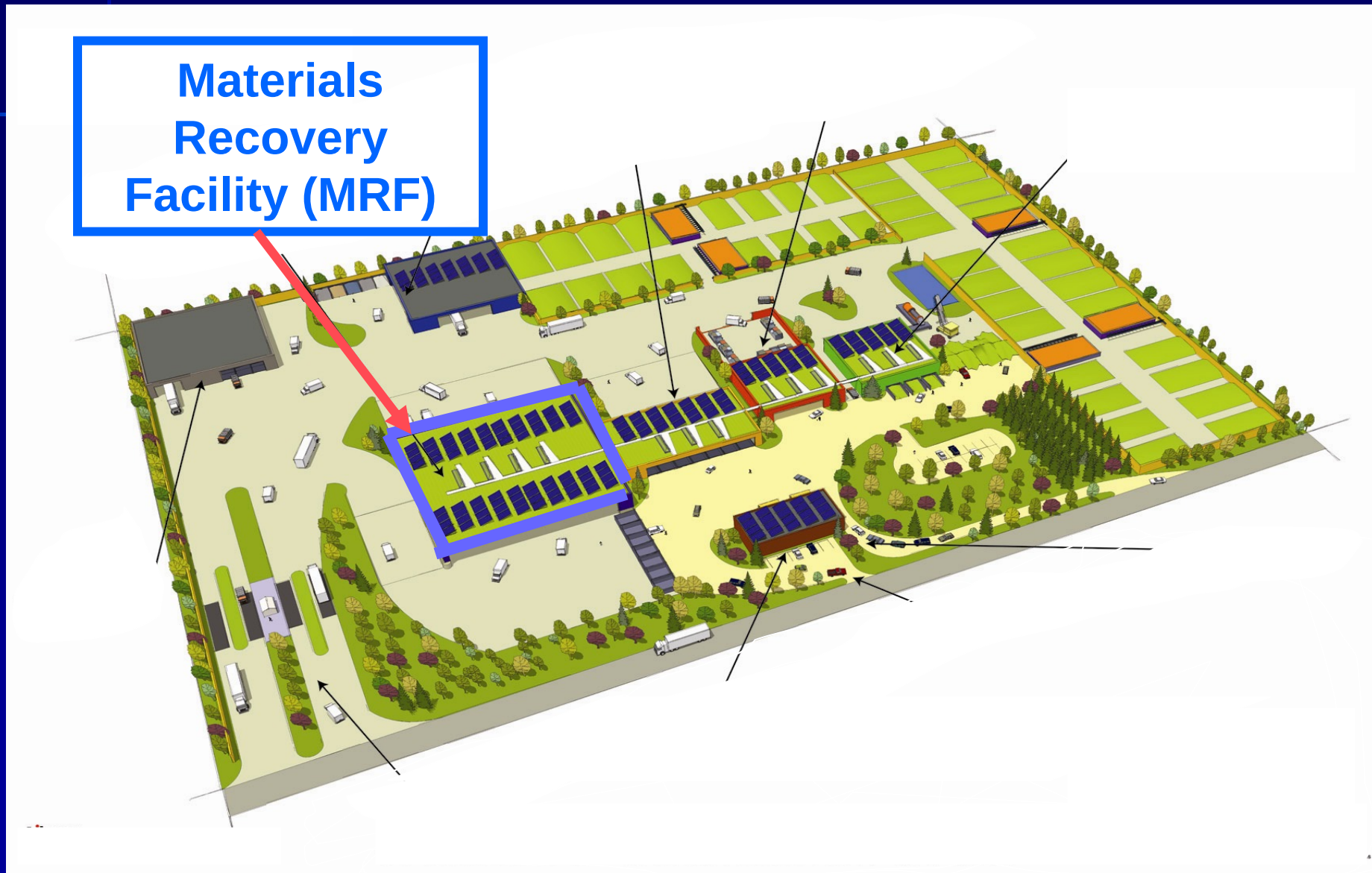
Reuse & Repair & Deconstruction

Residual Separation & Research Facility

One stop shopping!

The Resource Recovery Park

The Resource Recovery Park



The Resource Recovery Park

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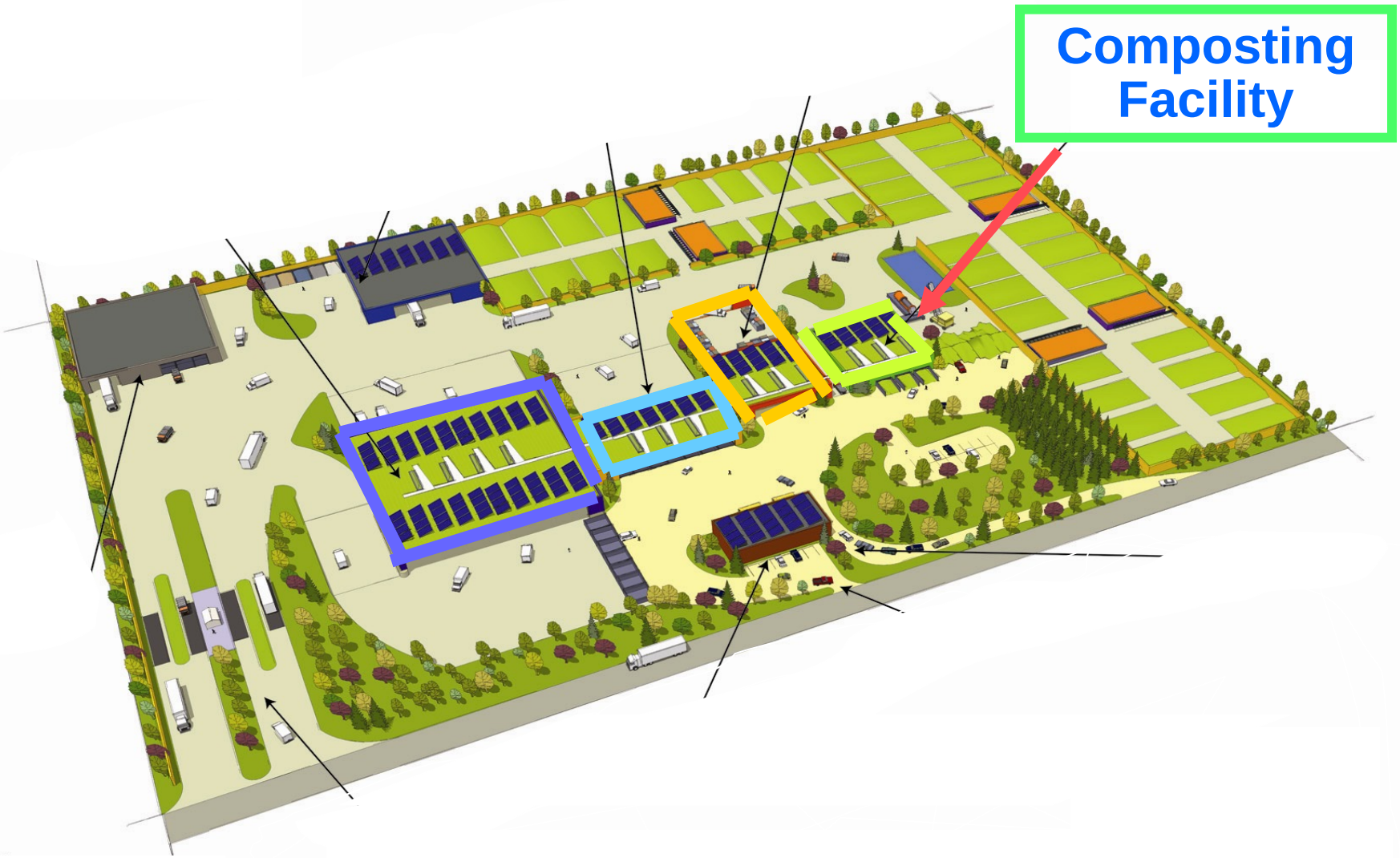
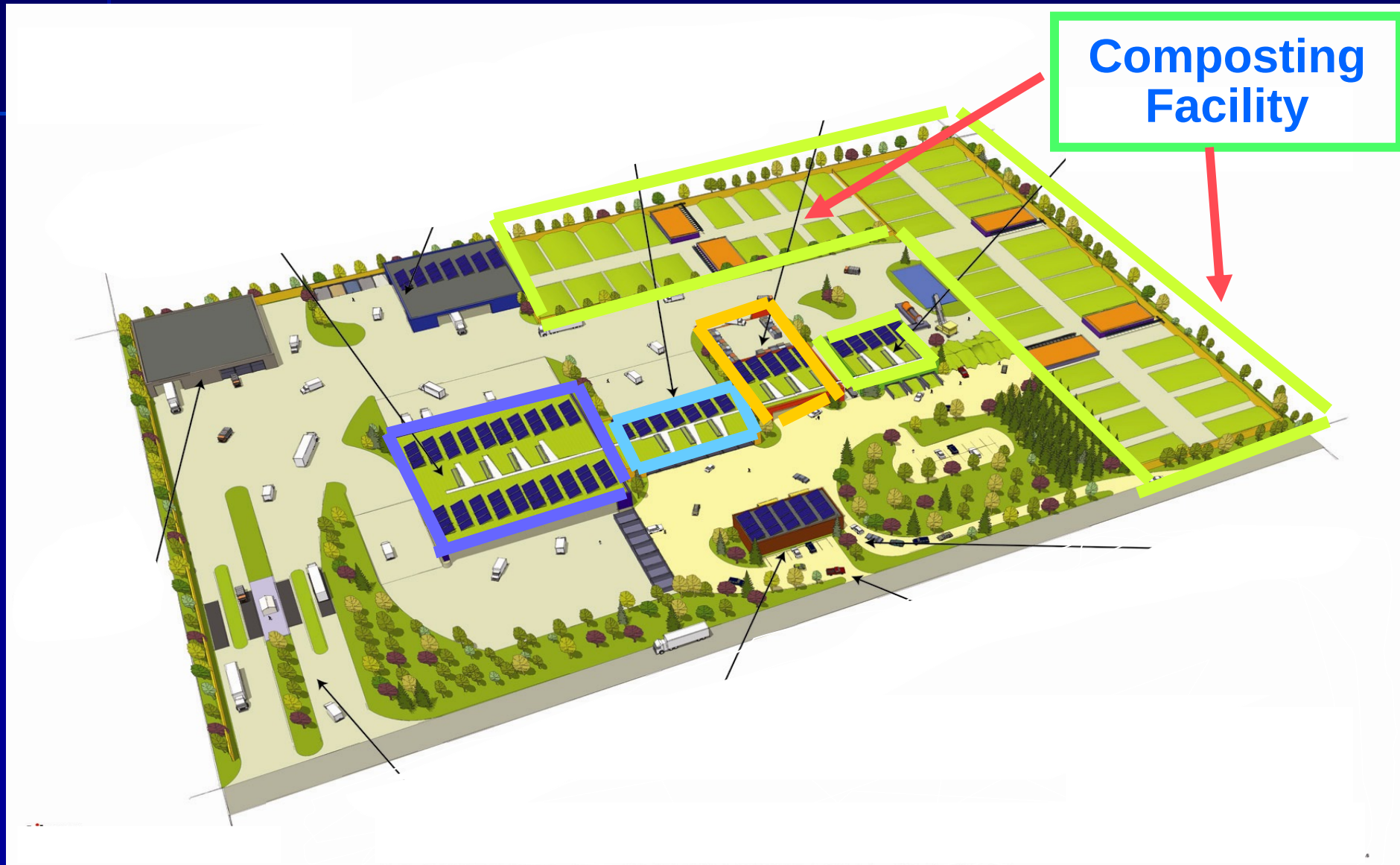
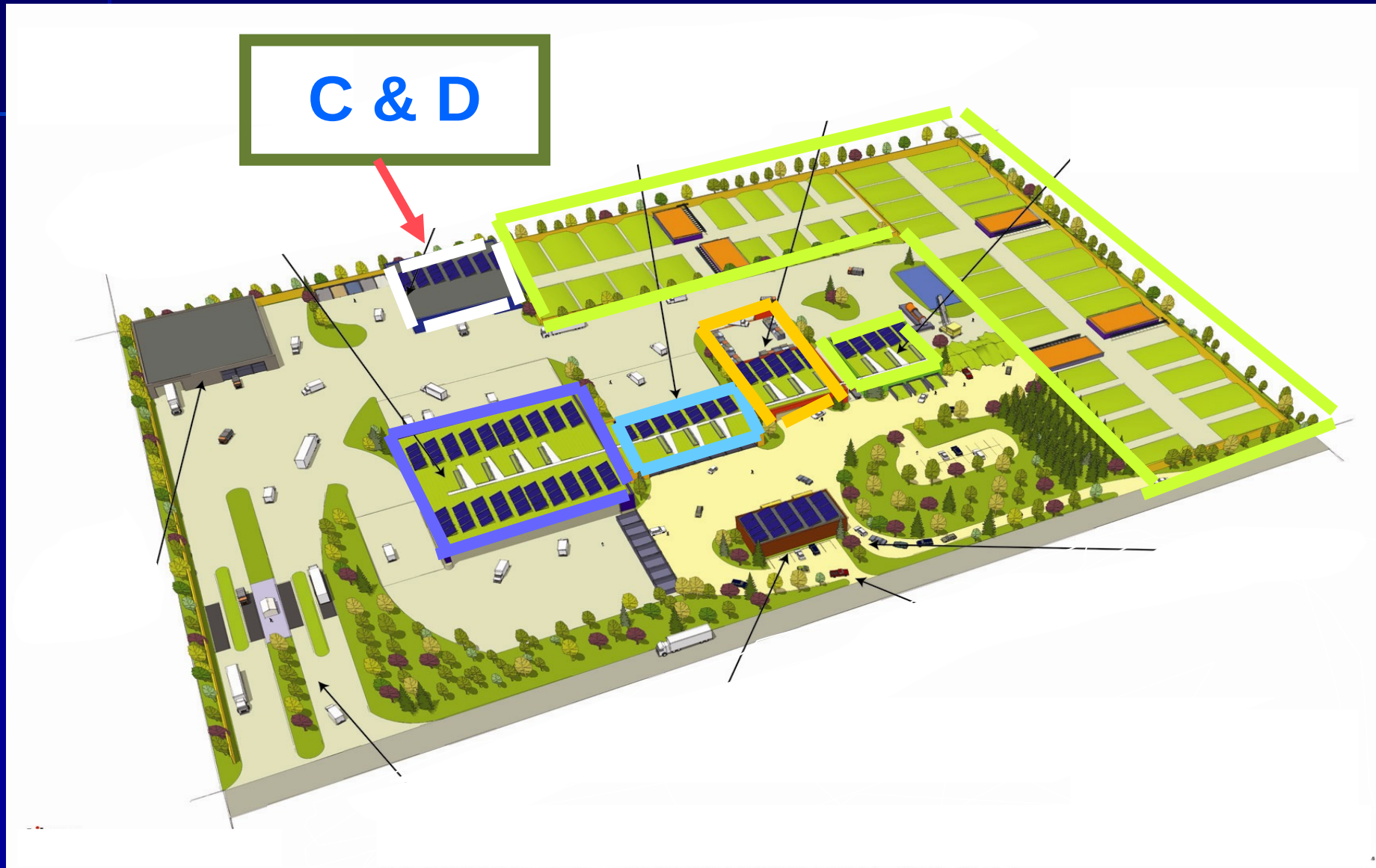


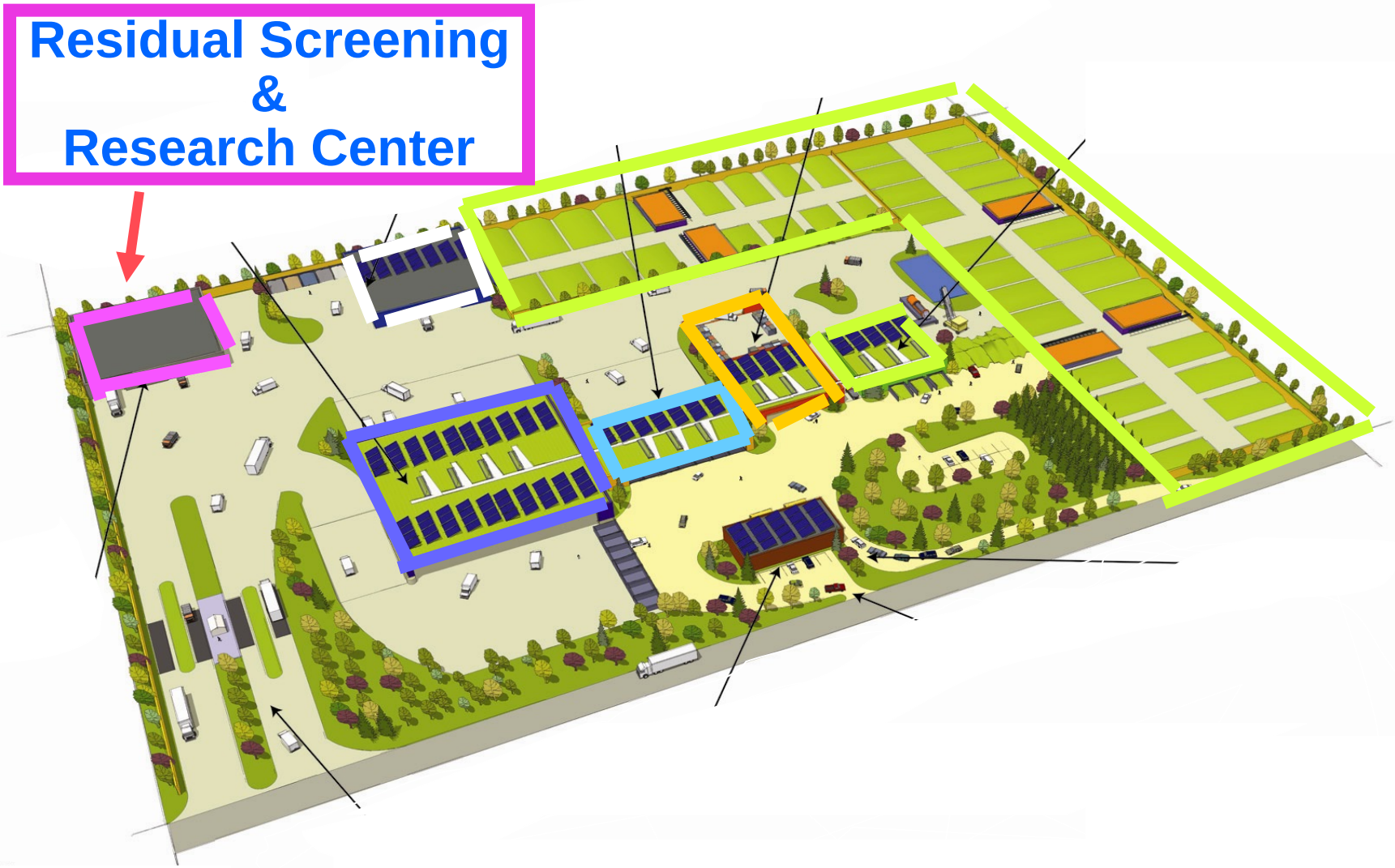
The Resource Recovery Park



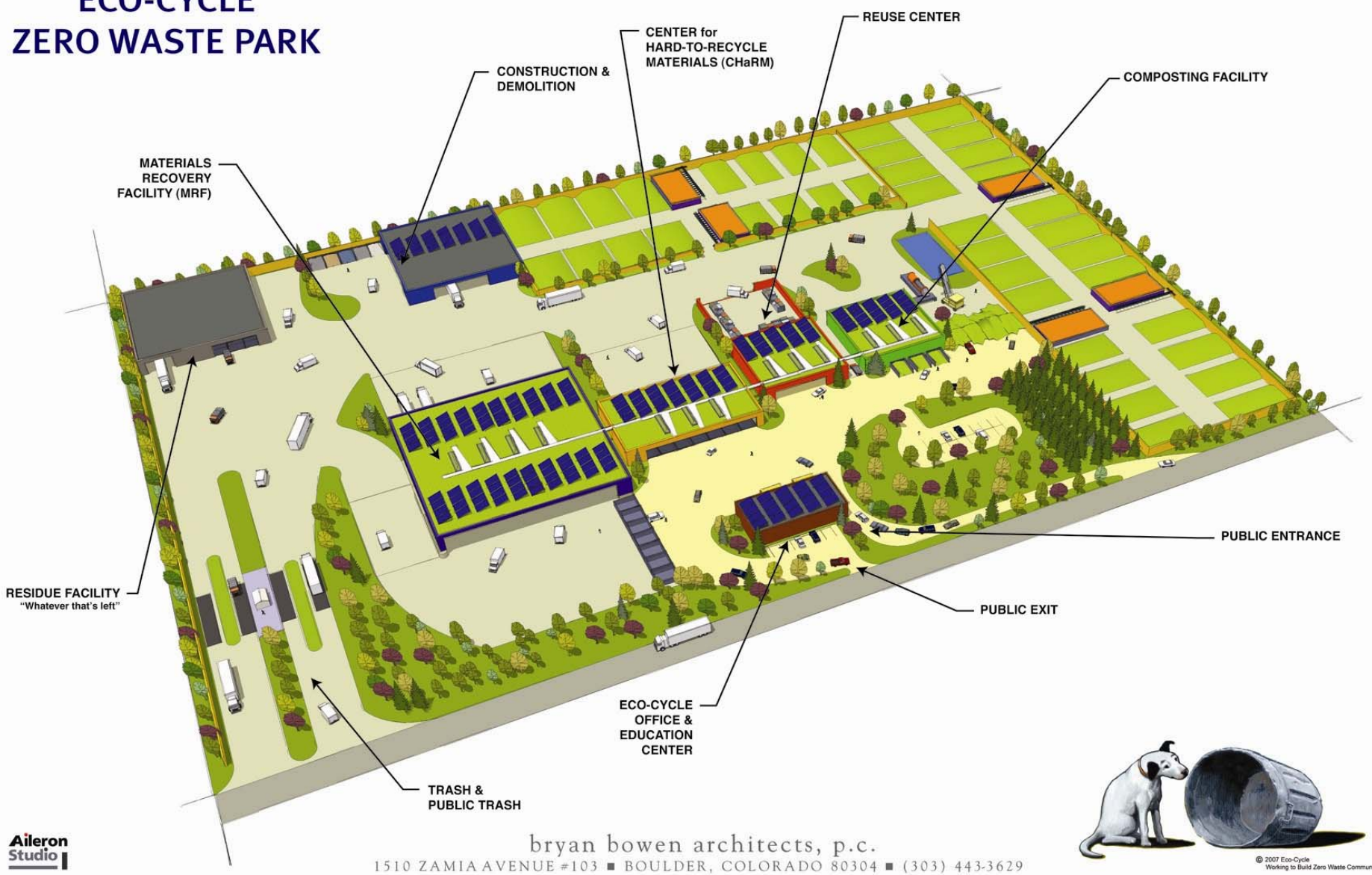
The Resource Recovery Park



The Resource Recovery Park



ECO-CYCLE
ZERO WASTE PARK

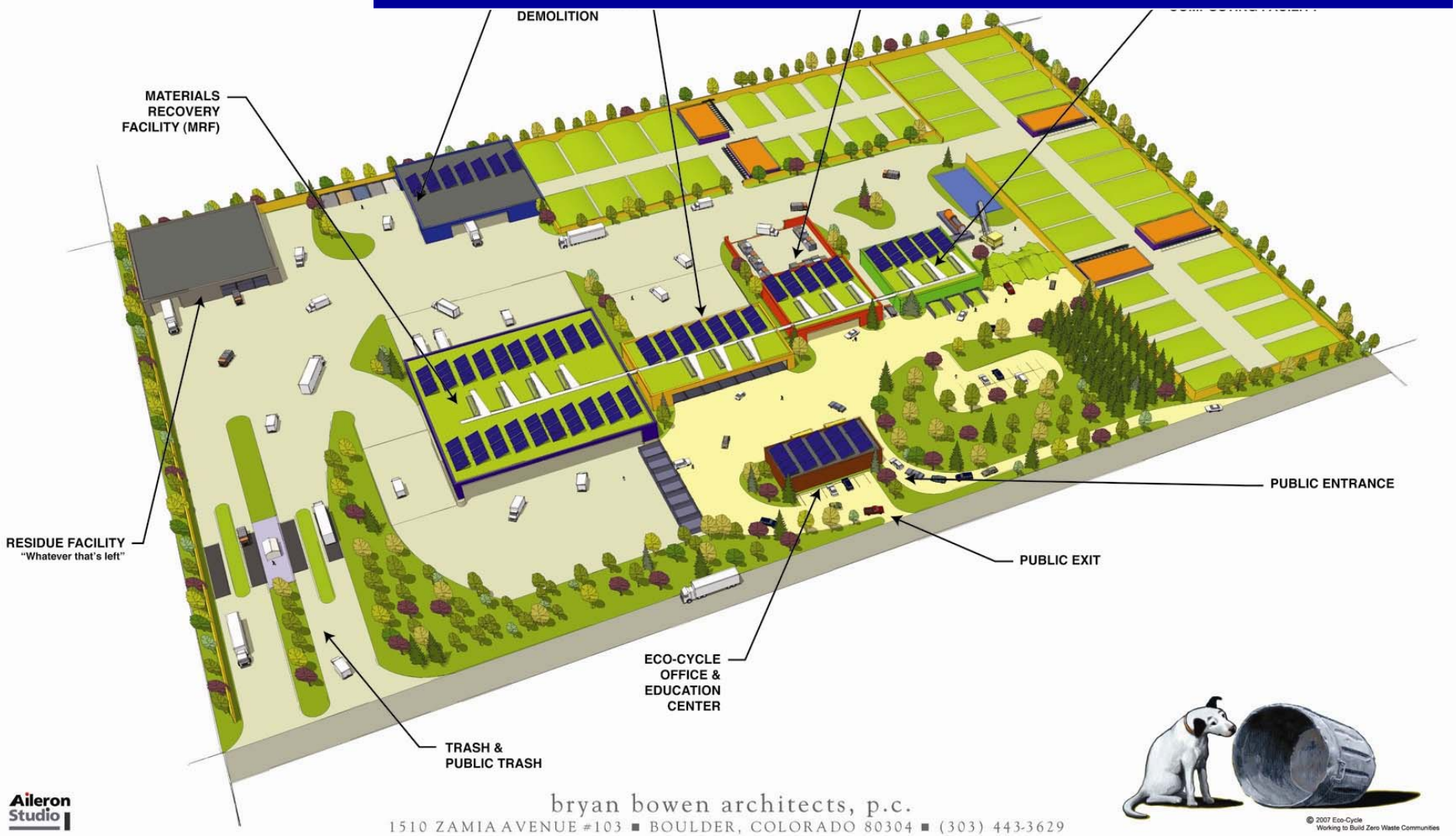


Aileron Studio

bryan bowen architects, p.c.
1510 ZAMIA AVENUE #103 ■ BOULDER, COLORADO 80304 ■ (303) 443-3629

Eric Lombardi, Eco-Cycle
www.ecocycle.org

ECO-CYCLE ZERO WASTE PARK



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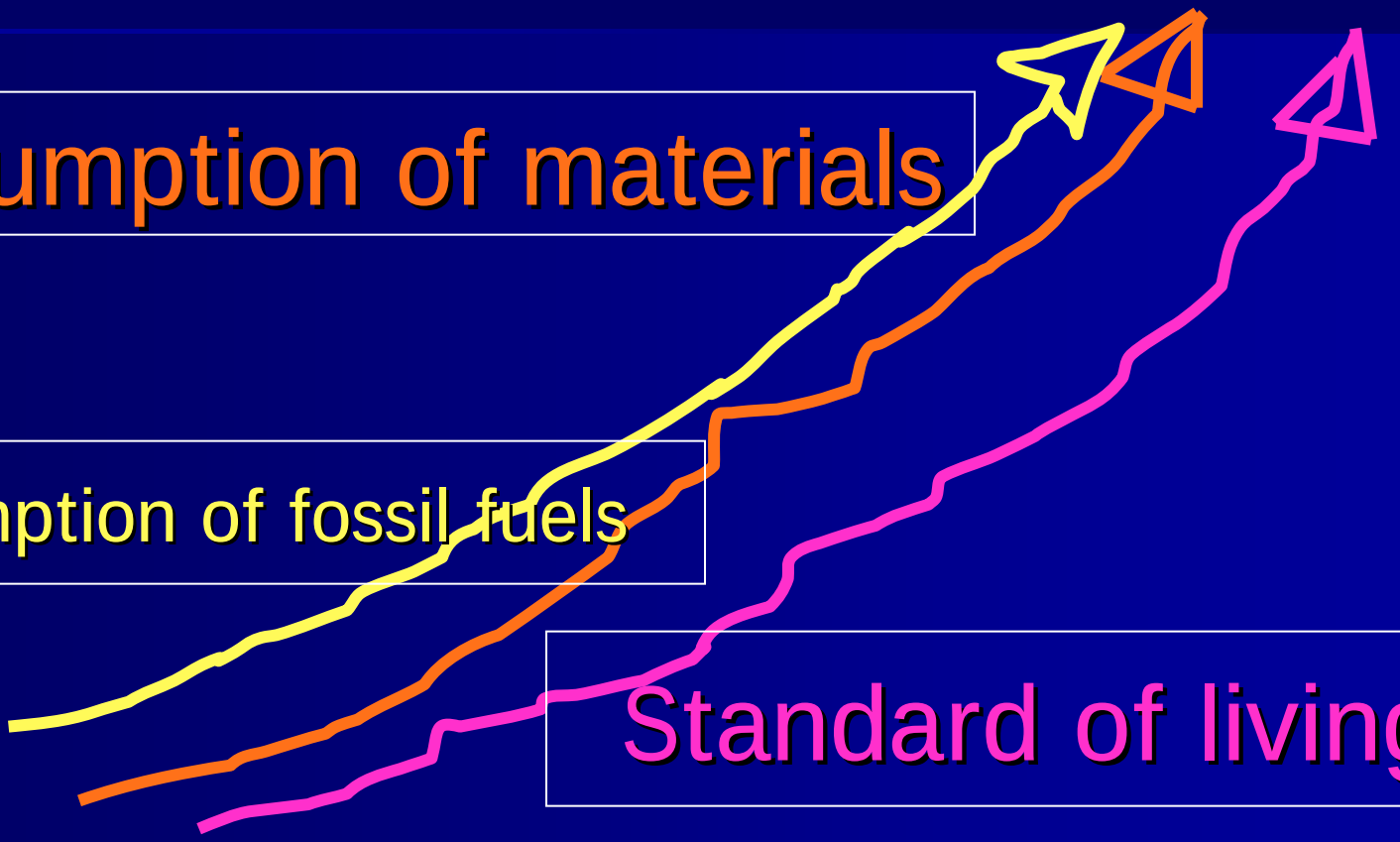
F. Back to the Big Picture

Current situation

Consumption of materials

Consumption of fossil fuels

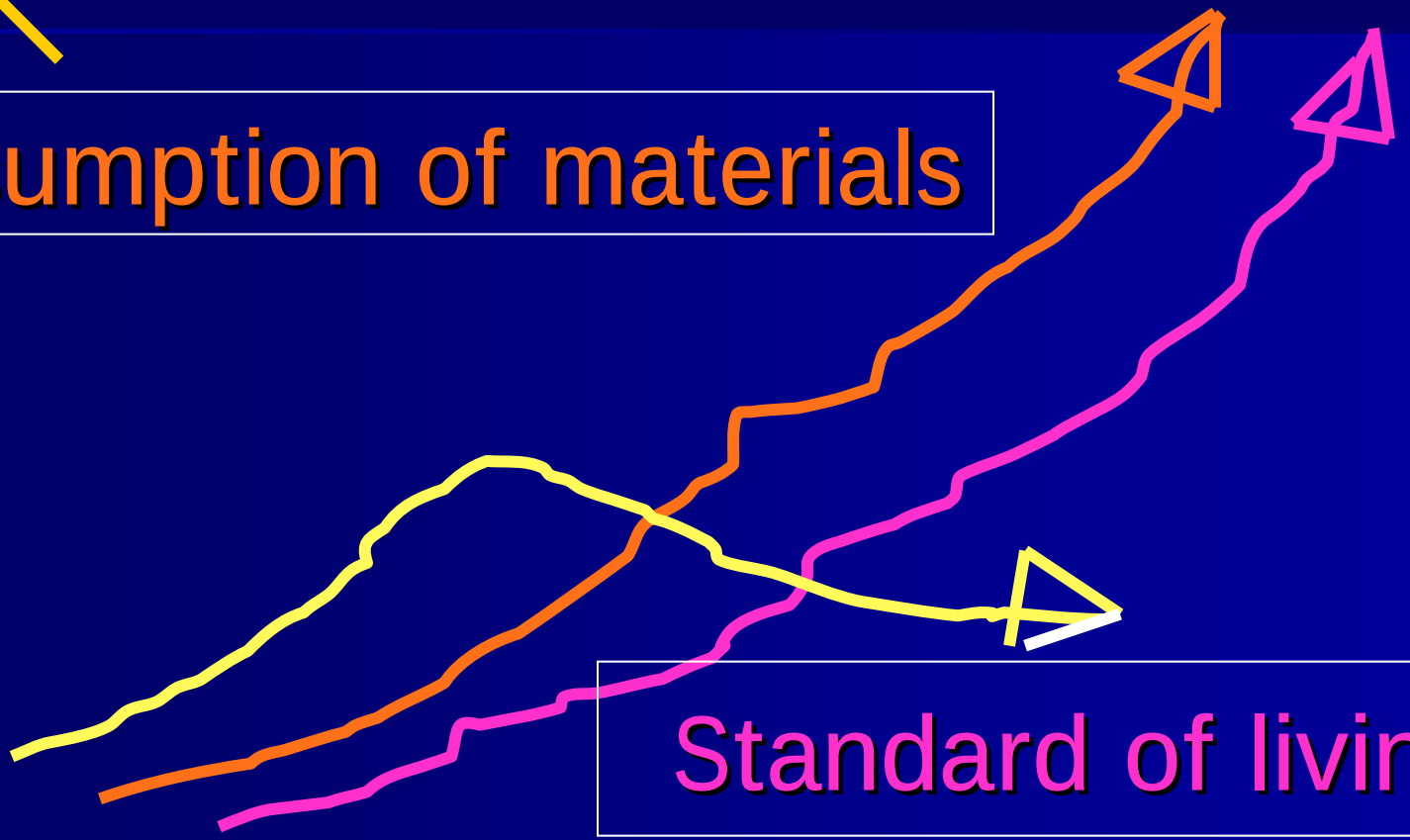


Standard of living

Change 1

Solar Energy

Consumption of materials

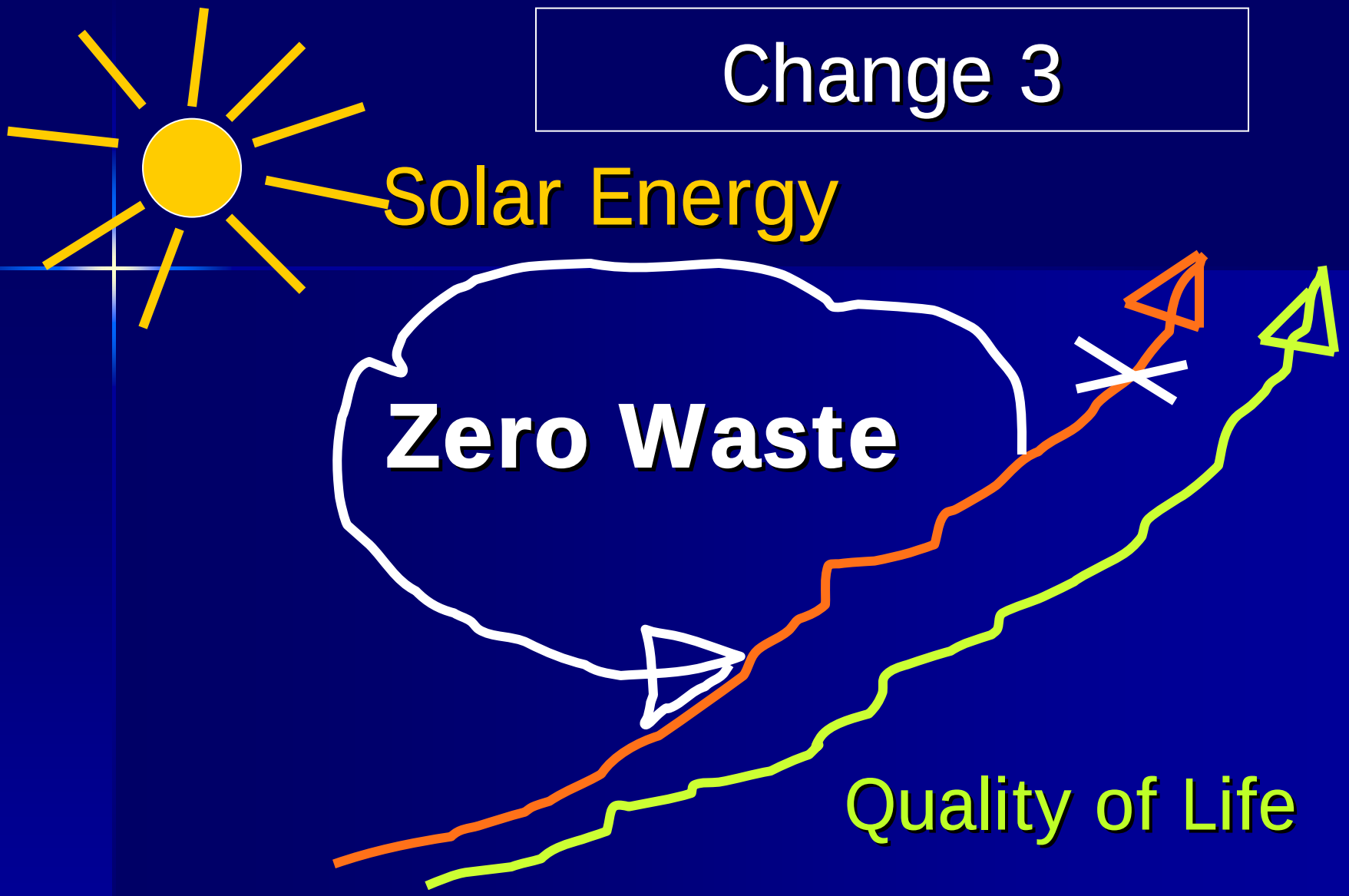


Standard of living

Change 2

Solar Energy

Change 3



We have to separate the Quality of life from the material consumption

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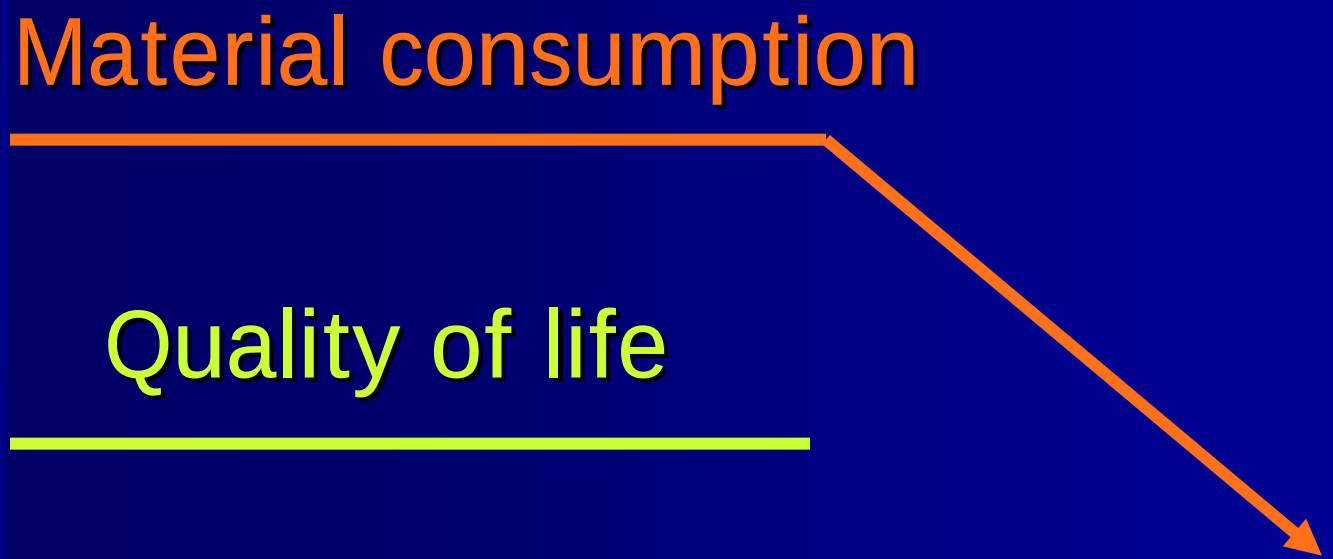

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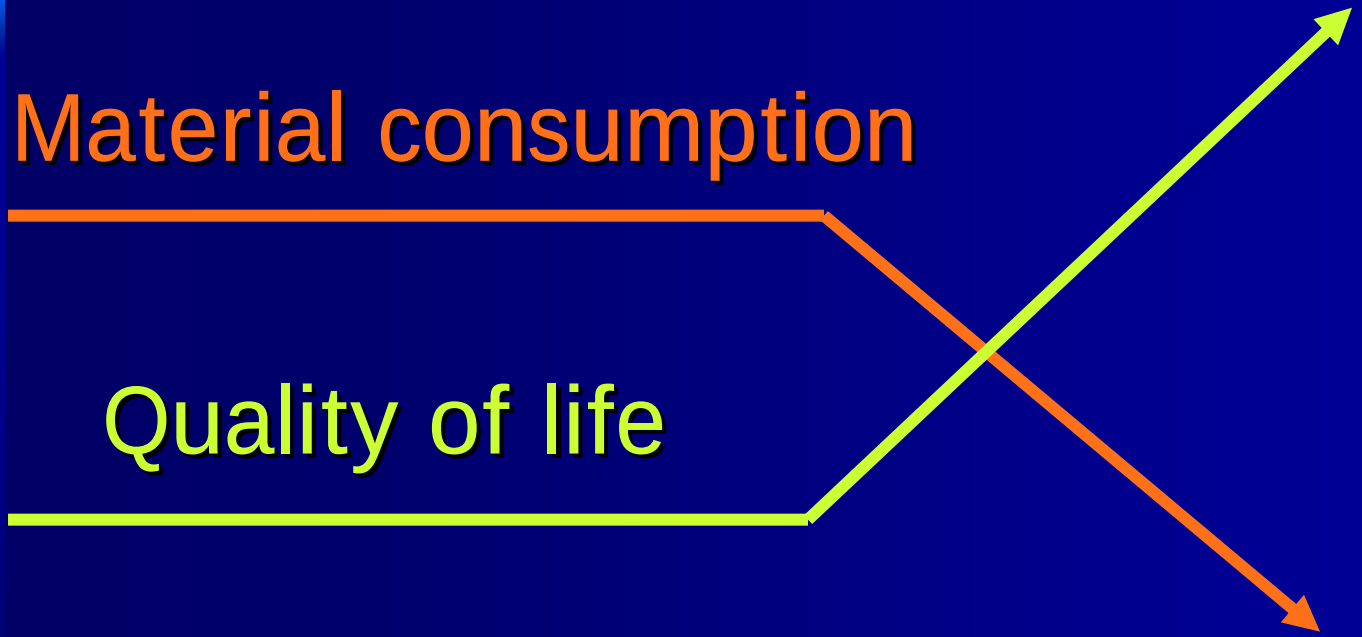

To fight over-consumption

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"

In the 2000's

"Make Friends, Not Waste"

Conclusions

- We do not need mega-landfills or incinerators!
- There is a better alternative
- The ZERO WASTE strategy is
- Better for our health (LESS TOXICS)
- Better for the economy,
- Better for our children, and
- Better for the planet (MORE SUSTAINABLE)!