WORLD BIOGAS ASSOCIATION

Global Food Waste Management: an implementation guide for cities

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Many Thanks!

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The report in synthesis

There is no new research in this report

- wants to be a practical guide, not an academic study
- brings together lots of previously dispersed information
- wants to give examples and experiences to help cities find their way
- understands the constraints cities are under, politically and financially
- provides advice on various technologies and not just AD
- offers help and to bring cities together to support each other

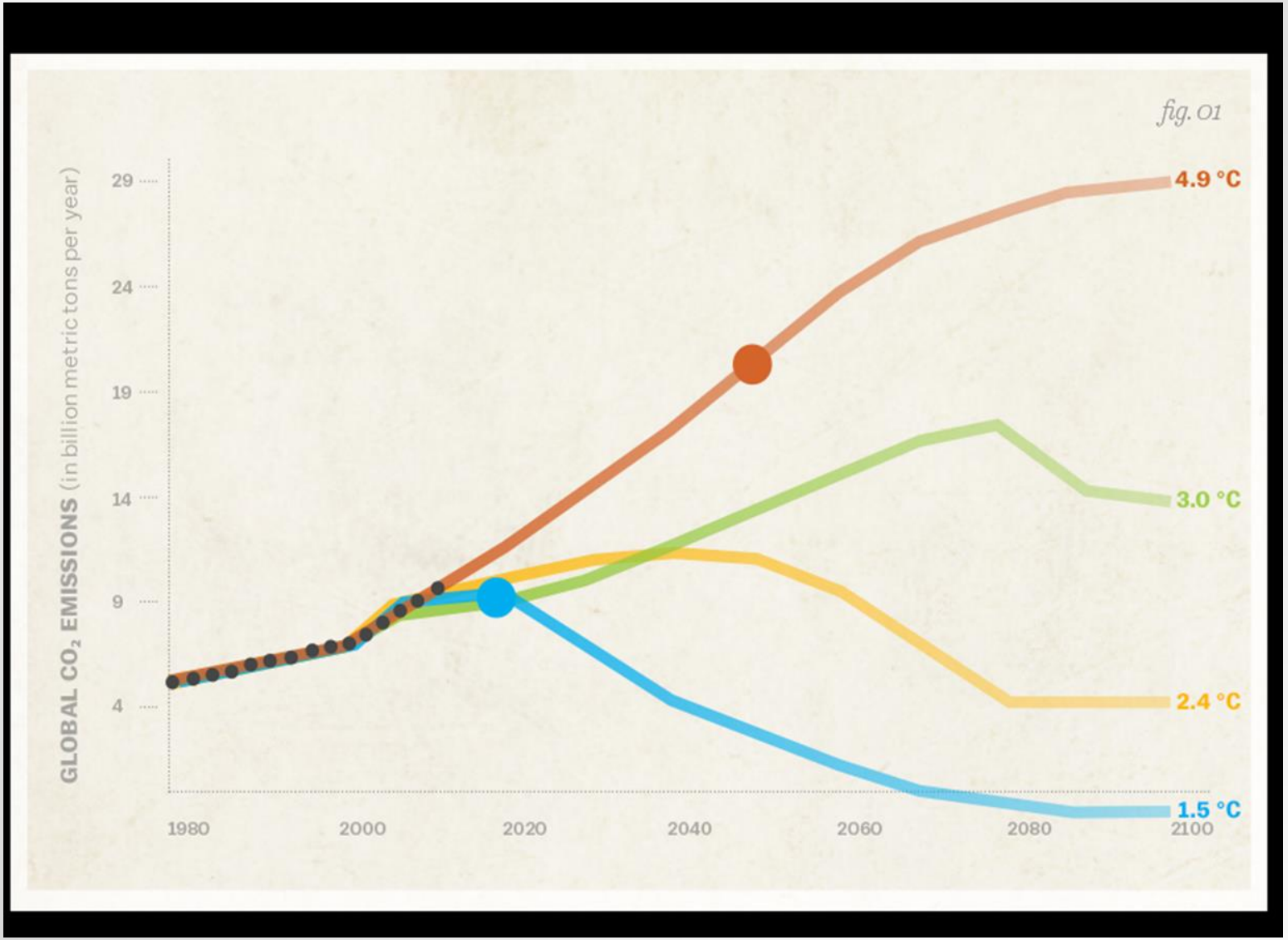
Table of Contents

Chapter 1:
Sources and Impact of Food Waste

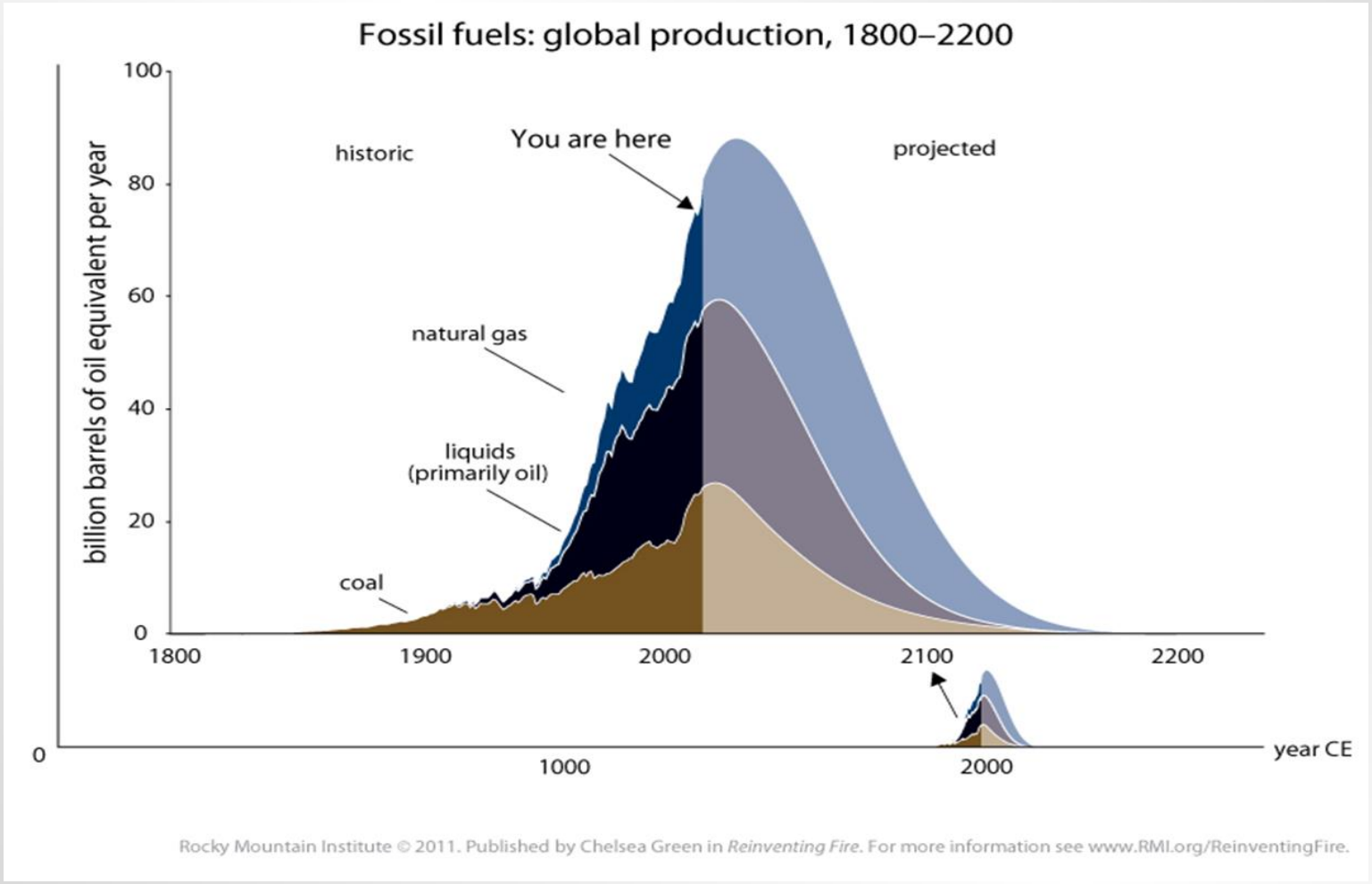
Why is food waste a problem?

• Greenhouse gas emissions	…8% of global emissions
• Nutrient loss	…52% of agricultural land
• Sanitation	…13-33% openly dumped
• Water footprint	…3 times volume of Lake Geneva
• Ecological impacts	…Intangible
• Economic impacts	…2.6 trillion dollars

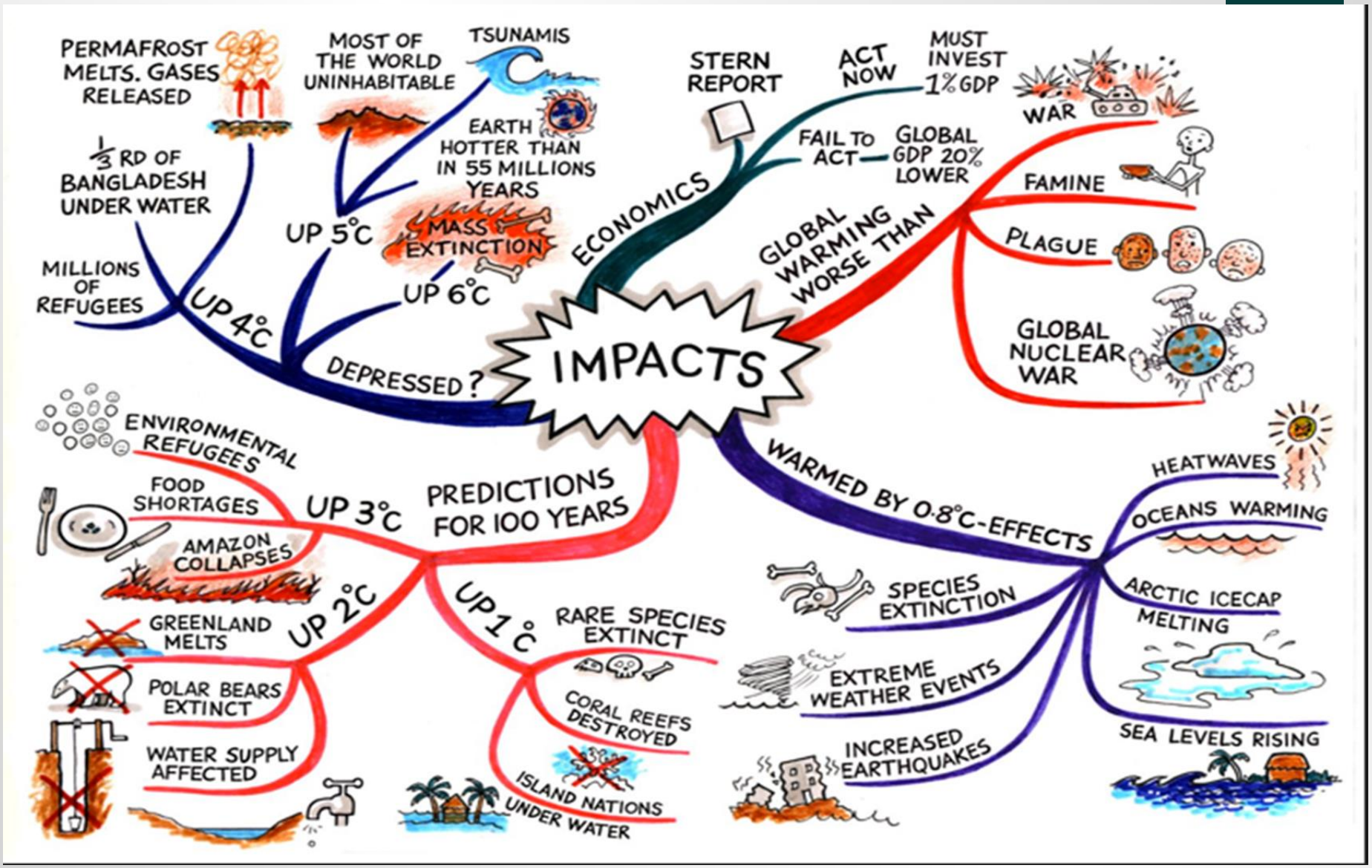
A pause to reflect on climate change



Burning fossil fuels will still be predominant way to produce energy



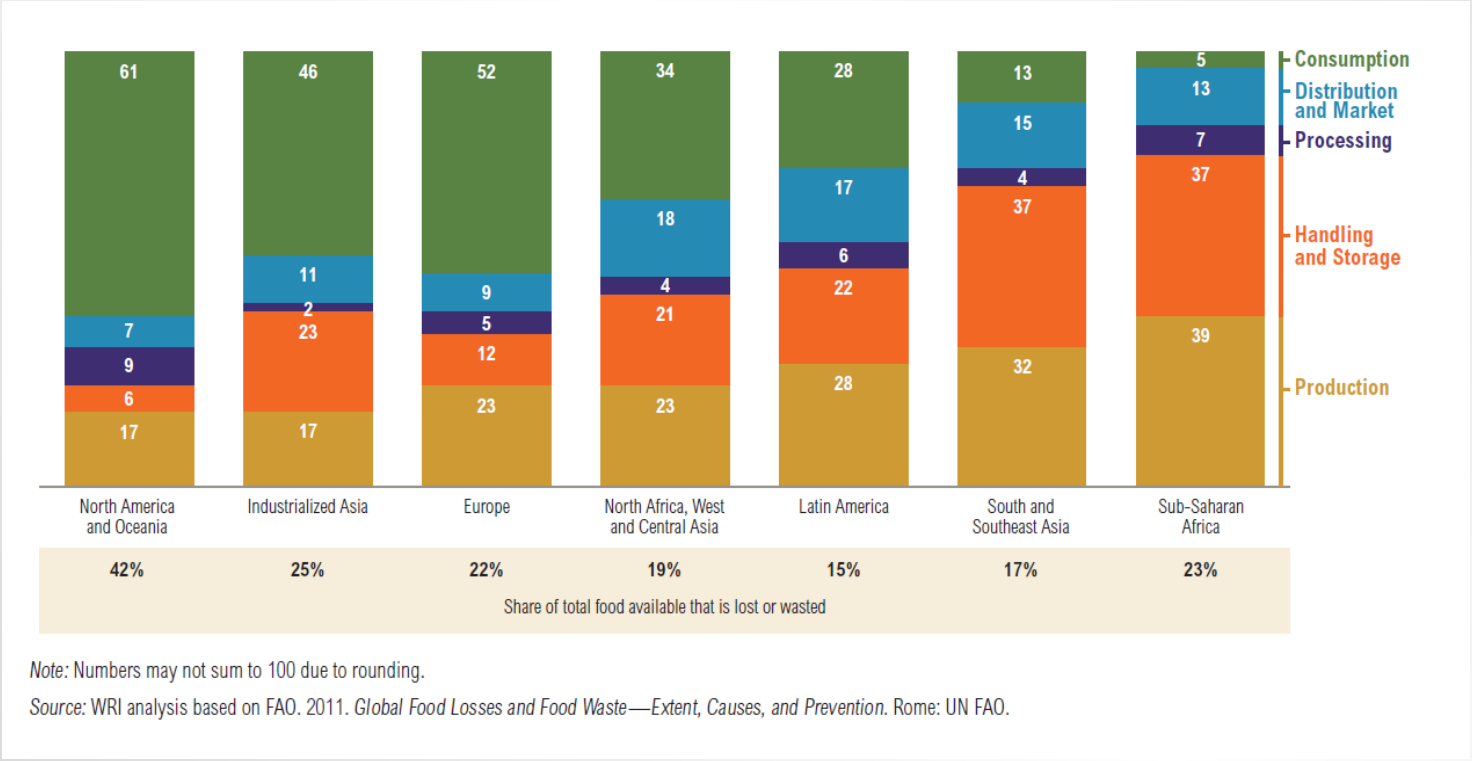
So if we cannot reduce fossil fuels quickly we have to implement other strategies to reduce GHG emissions.



I wonder if we are sometimes in denial ?

Sources of Food Waste

- Manufacturing
- Wholesale and retail
- Food services
- Households

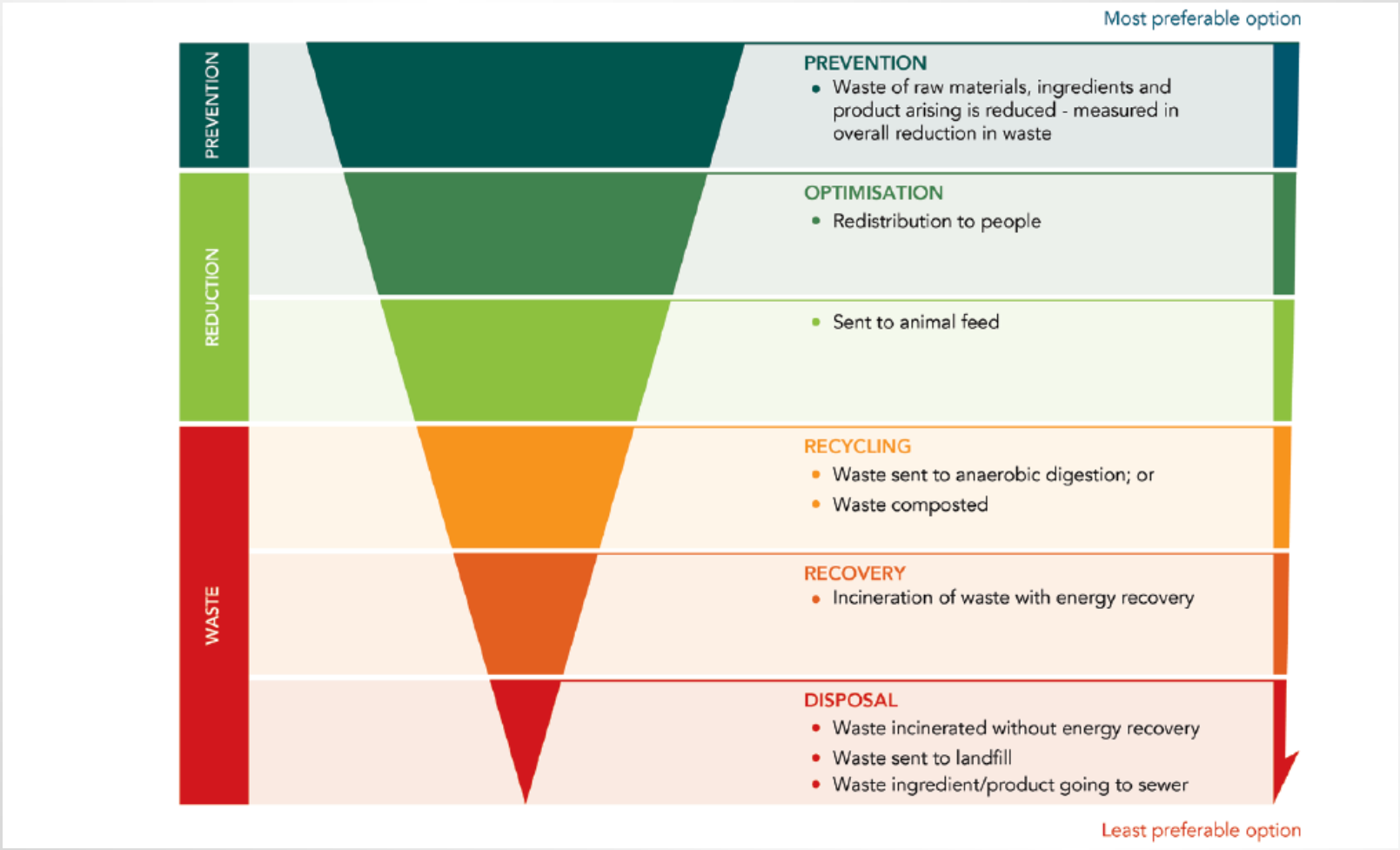


Note: Numbers may not sum to 100 due to rounding.

Source: WRI analysis based on FAO. 2011. *Global Food Losses and Food Waste—Extent, Causes, and Prevention.* Rome: UN FAO.

Chapter 2:
Food Waste Prevention

Food and Materials Hierarchy



What can cities do?

- Quantification and characterisation of food waste
- Engagement and reporting
- Organisation - level initiatives
- Regulatory initiatives
- Raising awareness and communication policies

Chapter 3:
Food Waste Collection

Unique collection case studies

- Auckland, New Zealand
- Cajica, Colombia
- Copenhagen, Denmark
- Hartberg, Austria
- Milan, Italy
- Minneapolis, USA
- New York, USA
- Oslo, Norway
- Seoul, South Korea

Chapter 4:
Food Waste Treatment

Comparison Table

TABLE 8: COMPARISON OF TECHNOLOGIES TABLE

TECHNOLOGY	SUPPORTS FOOD WASTE REDUCTION	COST SCALE 1-5 (LOW-TO HIGH)	ENERGY PRODUCTION	NUTRIENT RECOVERY	CAN BUILD SOIL ORGANIC MATTER
FOOD WASTE SEPARATELY COLLECTED					
Anaerobic digestion	✓	4	✓	✓	✓
In-vessel composting	✓	3	x	✓	✓
Windrow composting	✓	2	x	✓	✓
Liquefaction	✓		Dependent on context		✓
Rendering	✓		Dependent on context		✓
FOOD WASTE COLLECTED IN RESIDUAL WASTE					
Gasification	x	5	✓	x	x
Incineration and energy recovery	x	4	✓	x	x
Landfill without gas extraction	x	1	x	x	x
LFG extraction	x	2	✓	x	x
MBT	x	2	✓(with AD)	x	x
Pyrolysis	x	5	✓	x	x

Chapter 5:
Anaerobic Digestion

What AD can do for your City

Renewable energy
Climate change
Circular economy
Air quality
Food security
Health and sanitation
Economic development

One tonne of food waste from a supermarket/restaurant can drive your car 852 km!

Overview of AD

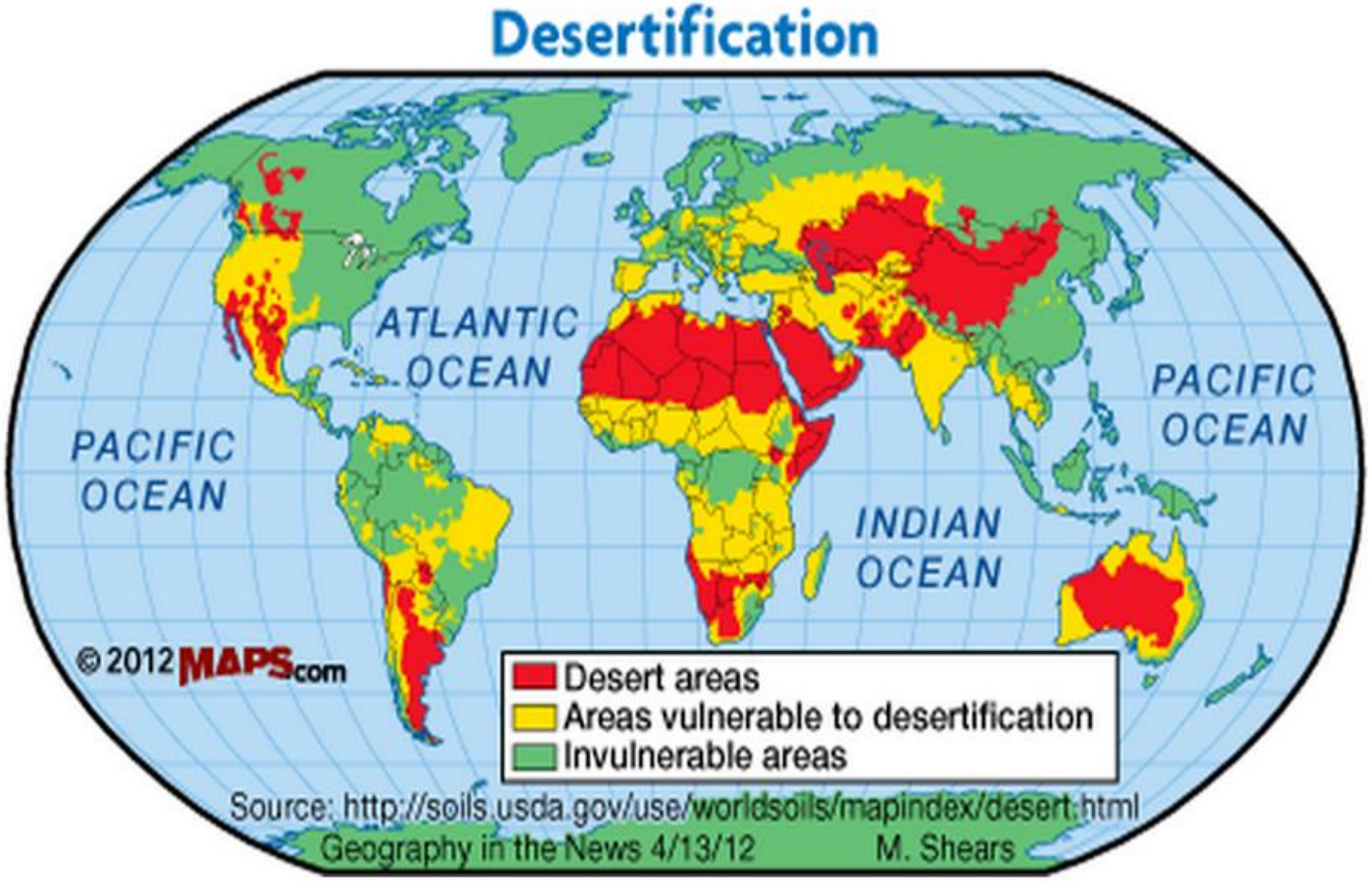
- What happens inside a digester and an AD plant
- Examples from all around the globe
- Financial considerations
  - Capital cost
  - Operating cost
  - Income streams
- Health and safety
- Establishing good practice

Chapter 6:
Products of AD

Products

- Biogas cooking and lighting
- Biogas boilers
- Electricity
- Heat
- Biomethane
  - To grid
  - For use as vehicle fuel
- Digestate/compost
- Carbon dioxide
- Cooling

A pause to reflect upon desertification and topsoil loss



So we must get all the organic carbon and humus back to soil that is possible

Chapter 7:
Policy recommendations, barriers and implementation

Policies to support

- Targets
- Policies to meet targets
  - Pricing GHG emissions
  - Renewable Energy Incentives
- Waste Management Policies
  - Pay As You Throw
  - Organics to landfill ban
  - Recycling requirements
- Capital Grants

5 Actions cities can take today

- Undertake large scale food waste awareness and prevention campaigns
- Require businesses to separately collect food waste
- Monitor and measure
- Provide separate collection of food waste to households
- Require use of food in line with the food and drink material hierarchy

There is no need to reinvent the wheel, there are great experiences available shown in the report.

Thank You!

The report is now available for download at:

http://www.worldbiogasassociation.org/food-waste-management-report/

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www.worldbiogasassociation.org