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Biogas: Pathways to 2030



If we do not address methane emissions from organic wastes all our efforts to tackle the climate crisis will fail. Anaerobic digestion is one of the ready to go, ready to scale technologies that can do this. The path we must take is clear.

**David Newman, President
World Biogas Association**



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Biogas: Pathways to 2030 Report launch

Dr Nick Primmer, Policy analyst

Biogas: Pathways to 2030

Over **105 billion tonnes** of organic wastes produced from human activity each year

Food waste *1.3 billion tonnes*
One third of all food produced is wasted

Sewage *69.1 billion tonnes*
80% of wastewater is returned to the environment untreated

Livestock manures/slurry *33.3 billion tonnes*
Almost all is spread back to land untreated

Crop residues *2.0 billion tonnes*
Typically either ploughed back into soil or burnt

Mismanagement directly results in:



Methane emissions
5% of global GHG emissions



Contaminating freshwater
Spreading disease and reducing biodiversity



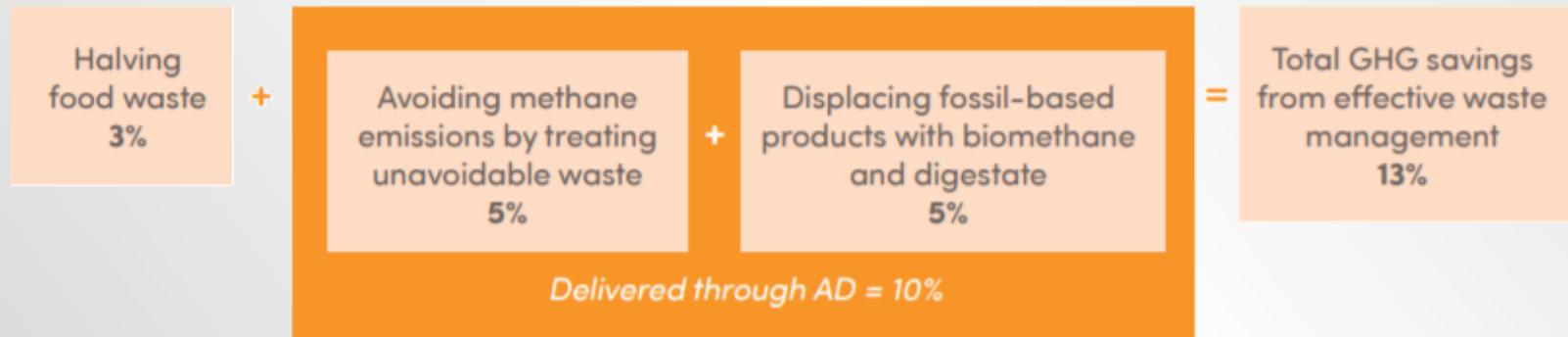
Reducing air quality
Harming public health

Biogas: Pathways to 2030

- 1) **Reduce** organic waste production
- 2) **Recycle** the remaining unavoidable and unpreventable organic wastes. We are unlocking just **2%** of these bioresources full potential.

Anaerobic digestion (AD) unlocks the greatest value from organic wastes

Total global GHG savings (%):



Contribution to 9 Sustainable Development Goals:

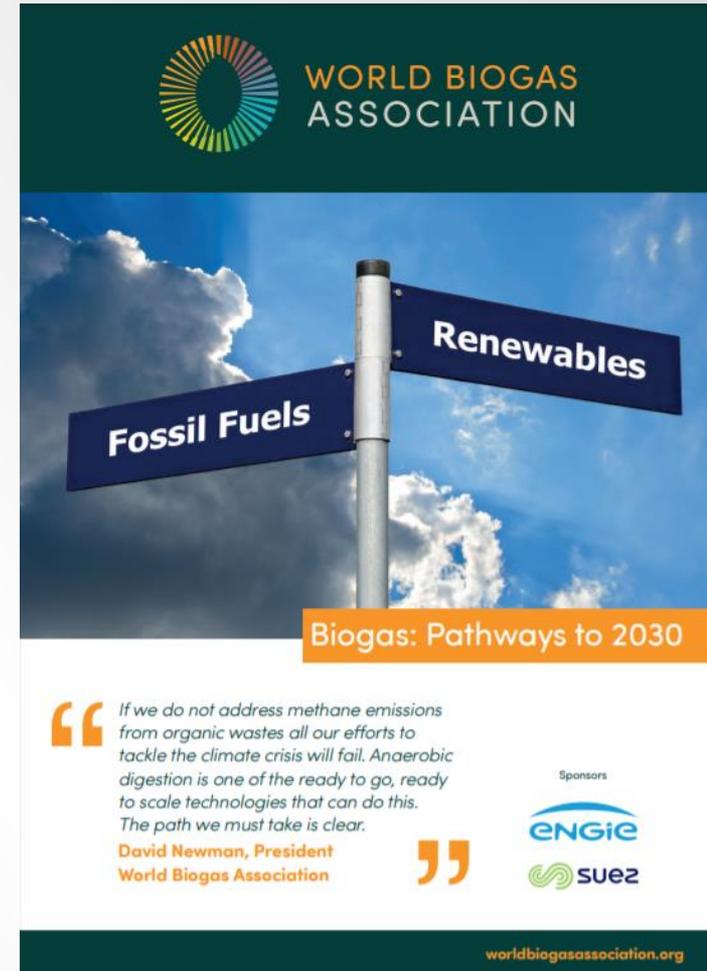


Biogas: Pathways to 2030



This report:

1. Highlights the problems caused by organic wastes and the need to manage them
2. Identifies the key barriers inhibiting the treatment and recycling of organic wastes
3. Presents a toolkit for policymakers to improve organic waste management worldwide
 - Present the intrinsic value of their organic wastes
 - Identify policies and regulation to promote their recycling
4. Details how to unlock organic wastes' **full potential**



Building on past work



GLOBAL FOOD WASTE MANAGEMENT: AN IMPLEMENTATION GUIDE FOR CITIES

Full Report



Global Potential of Biogas

“By coming together as an industry, we can drive the change needed to make anaerobic digestion and biogas thrive. Our mission is clear: to raise global awareness of biogas technologies and encourage their uptake as solutions to the challenges of our times.”

David Newman, President World Biogas Association



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WBA
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ANAEROBIC DIGESTION MARKET REPORT POLAND

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WBA
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ANAEROBIC DIGESTION MARKET REPORT UNITED STATES OF AMERICA

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ANAEROBIC DIGESTION MARKET REPORT AUSTRALIA

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ANAEROBIC DIGESTION MARKET REPORT ITALY

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ANAEROBIC DIGESTION MARKET REPORT THE NETHERLANDS

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Canada Market Report

Lead Author: Dr Sarika Jain

Foreword

Canada is a leader in the use of biogas for electricity and heating. The country has a long history of biogas production, and the industry is growing rapidly. This report provides an overview of the biogas market in Canada, including the current status and future prospects.

Current Status

The biogas market in Canada is growing rapidly, driven by the increasing use of biogas for electricity and heating. The market is expected to continue to grow in the coming years, as more biogas production facilities are built.

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Market Report

Malaysia

Lead Author: Dr Sarika Jain

Overview

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Market Report

Germany

Lead Author: Dr Sarika Jain

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Market Report

China

Lead Author: Dr Sarika Jain

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Market Report

Sweden

Lead Author: Dr Sarika Jain

Foreword

Sweden is a leader in the use of biogas for electricity and heating. The country has a long history of biogas production, and the industry is growing rapidly. This report provides an overview of the biogas market in Sweden, including the current status and future prospects.

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Market Report

Spain

Lead Author: Dr Sarika Jain

Foreword

Spain is a leader in the use of biogas for electricity and heating. The country has a long history of biogas production, and the industry is growing rapidly. This report provides an overview of the biogas market in Spain, including the current status and future prospects.

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Market Report

Japan

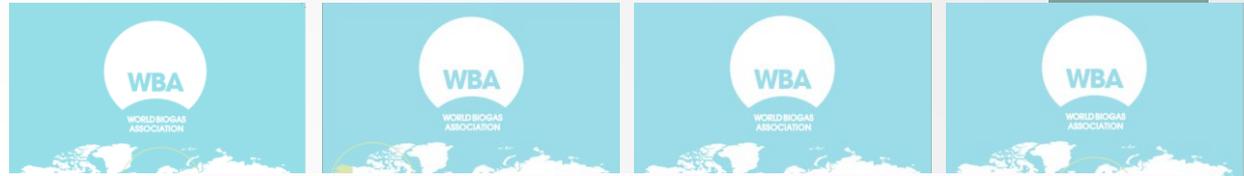
Lead Author: Dr Sarika Jain

Foreword

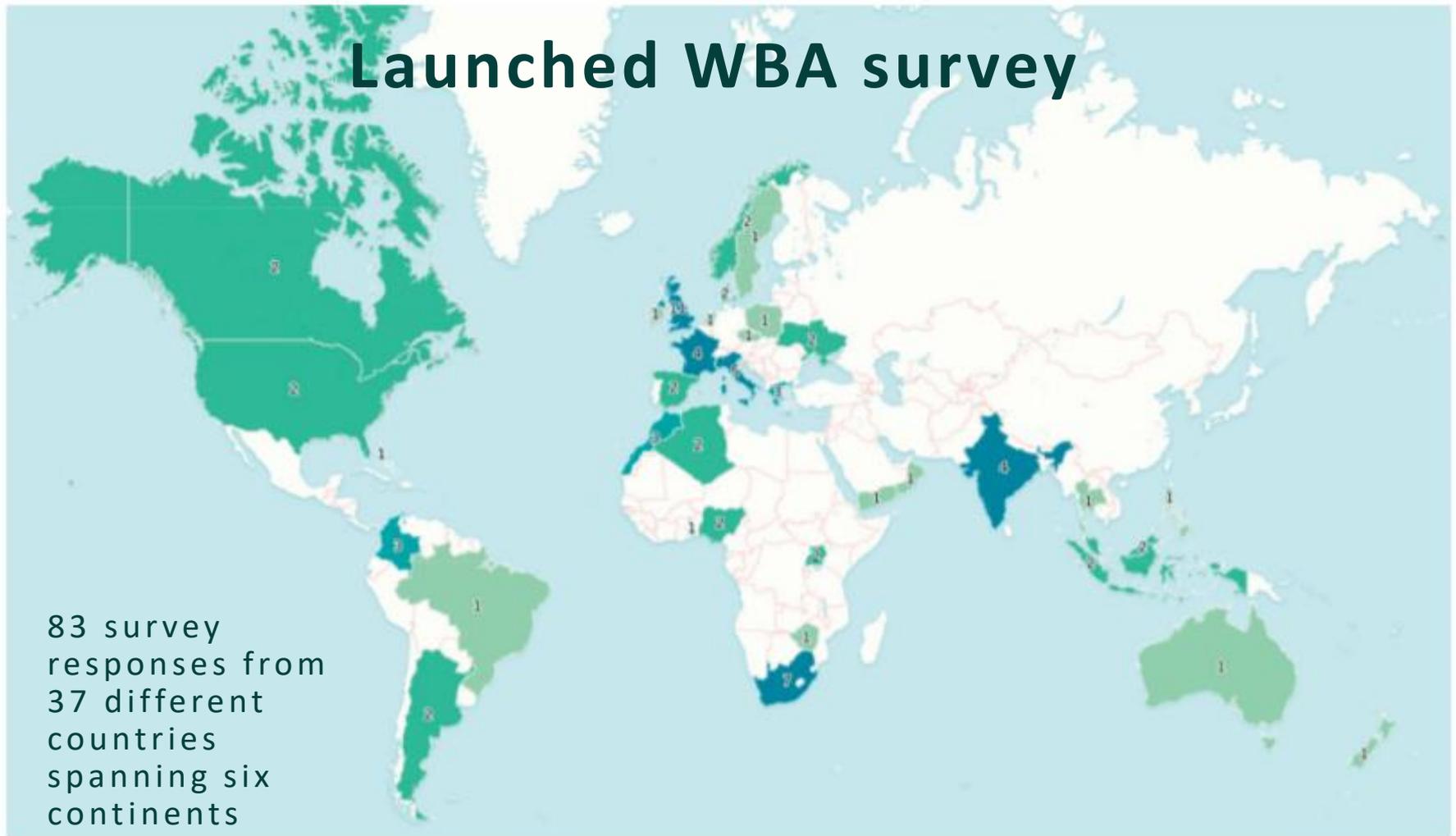
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Building on past work



Launched WBA survey



83 survey responses from 37 different countries spanning six continents

Authors



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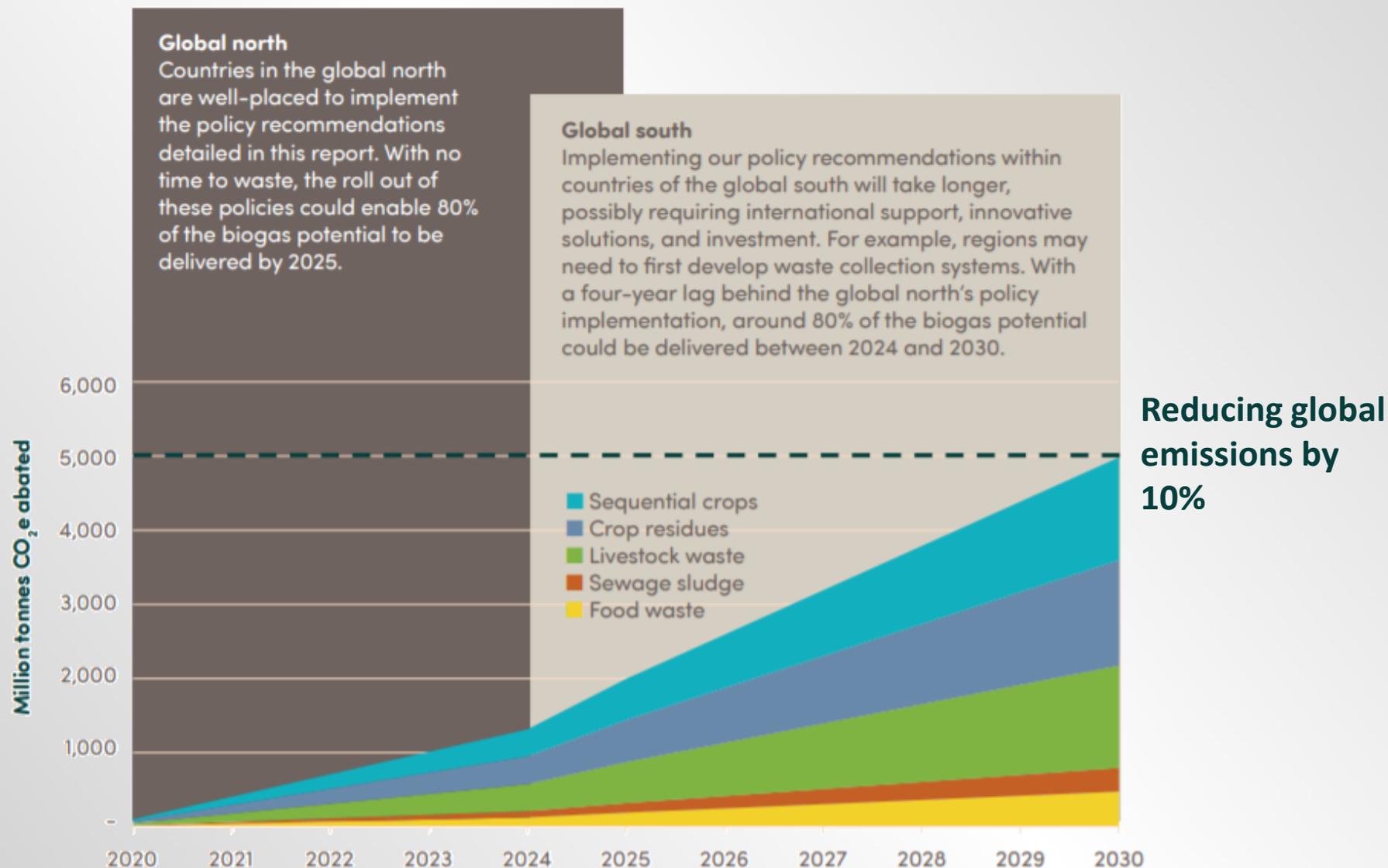


Content



- 1) Introduction and background
- 2) The world in 2030 and the pathways to get there
- 3) International and national climate policy
- 4) Feedstock management policy
- 5) Digestate policy
- 6) Biogas utilisation policy
- 7) Conclusion

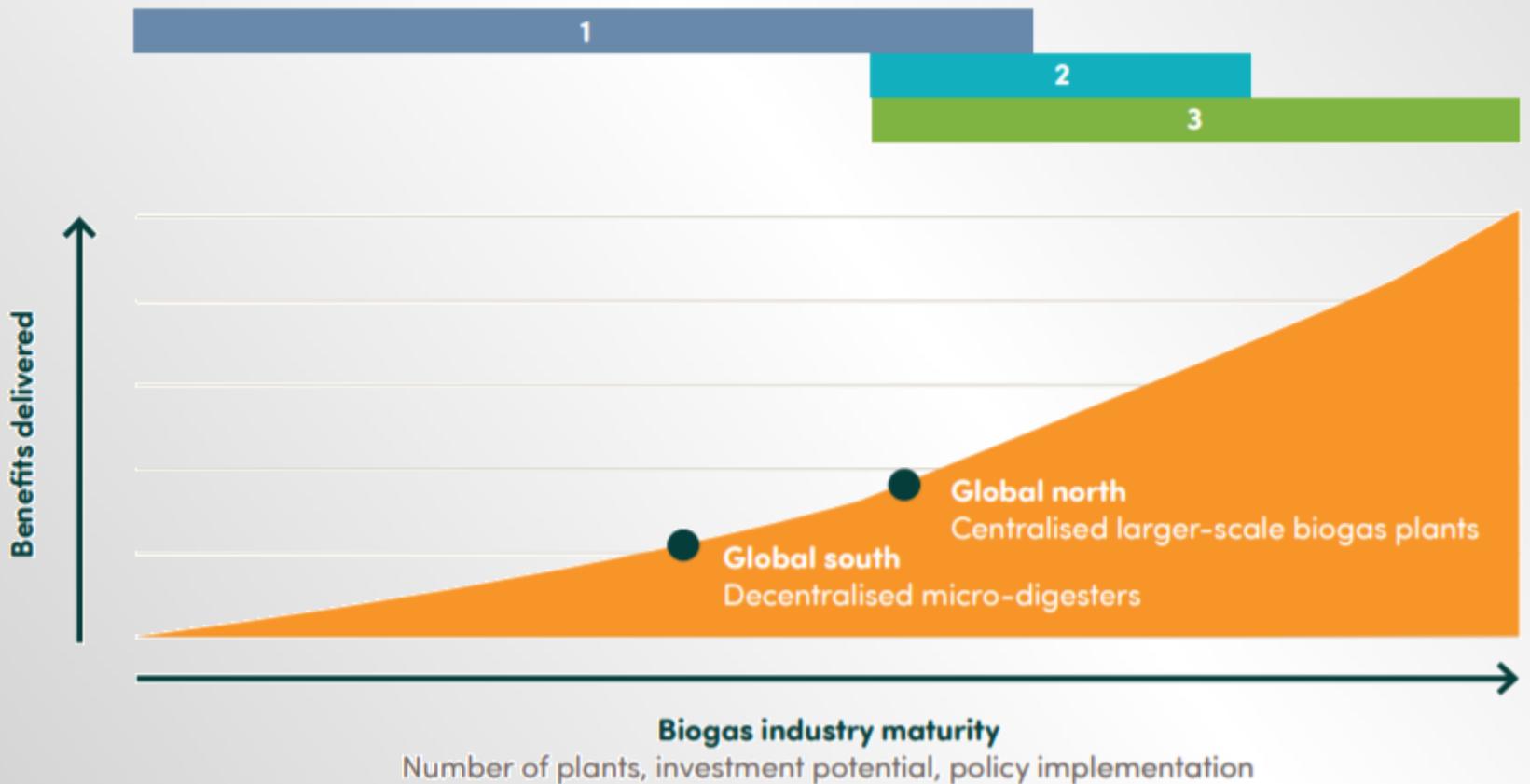
Pathways to 2030



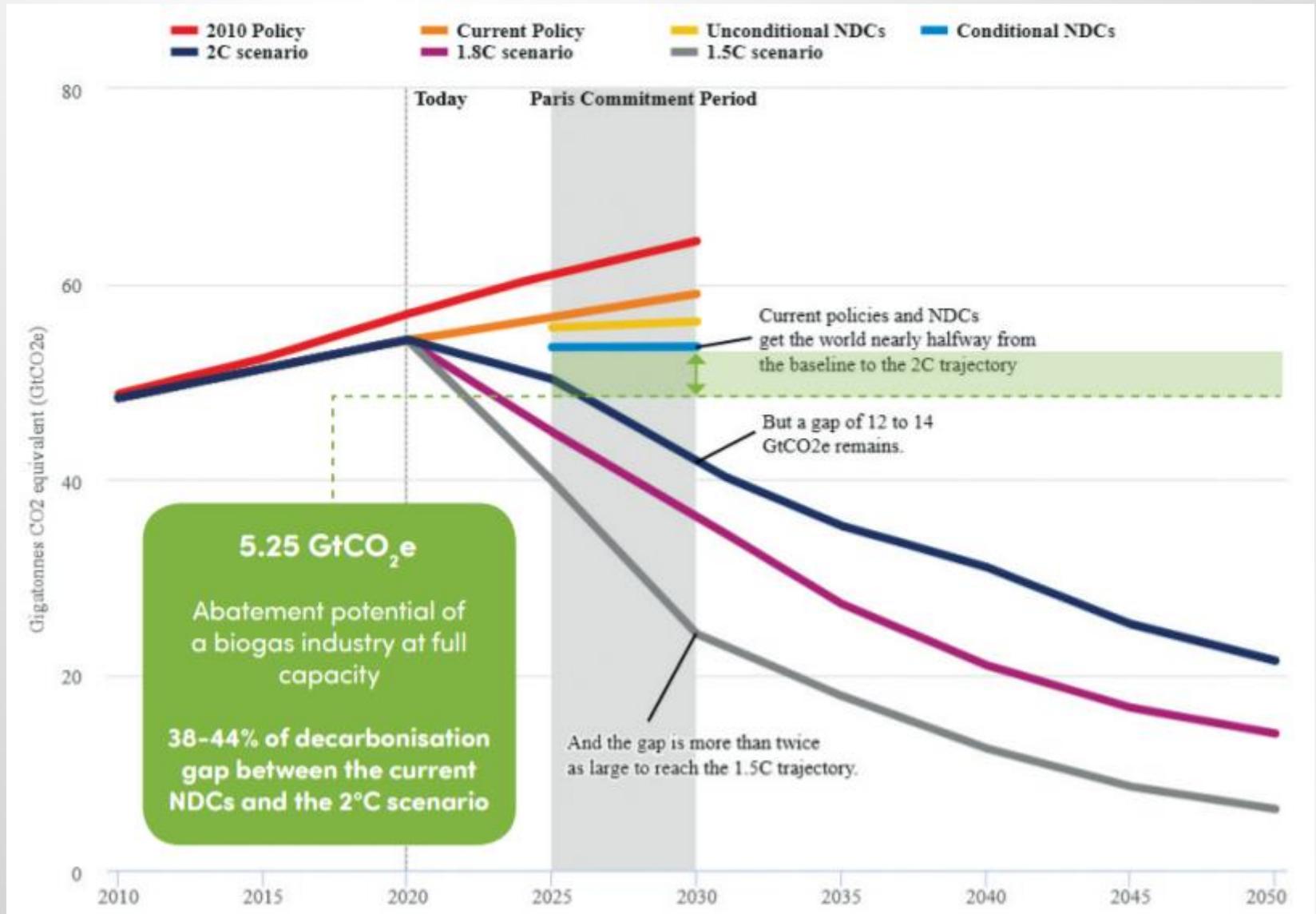
Overarching Policy Timeline



- 1) Commitment to biogas in NDCs, backed by tariff
- 2) Transition to more market-based policy support
- 3) Carbon Pricing policies



Urgent need for decarbonisation



Turkey
 "Recovering energy from waste by using processes such as material recycling of wastes, bio-drying, bio-methanisation, and composting"

Uzbekistan
 "Development and broad use of alternative energy sources... creation of biogas plants"

Nepal
 "Additional 220 MW of electricity from bio-energy by 2030, including 130,000 household systems, 1,000 institutional and 200 community biogas plants"

Vietnam
 "Widely replicate technologies that treat and reuse by-products and waste from agricultural production, to produce animal feed, mushrooms, materials for industries, biogas, and organic fertiliser"

Burkina Faso
 Unconditional investment of US\$19.7m for bio-digesters, rising to US\$189m based on international support. & Plan to equip 75,000 homes with biodigesters, with digestate used to fertilise 750,000 ha of cultivable land.

Ghana
 US\$5m for 200 large-scale bio-digesters.

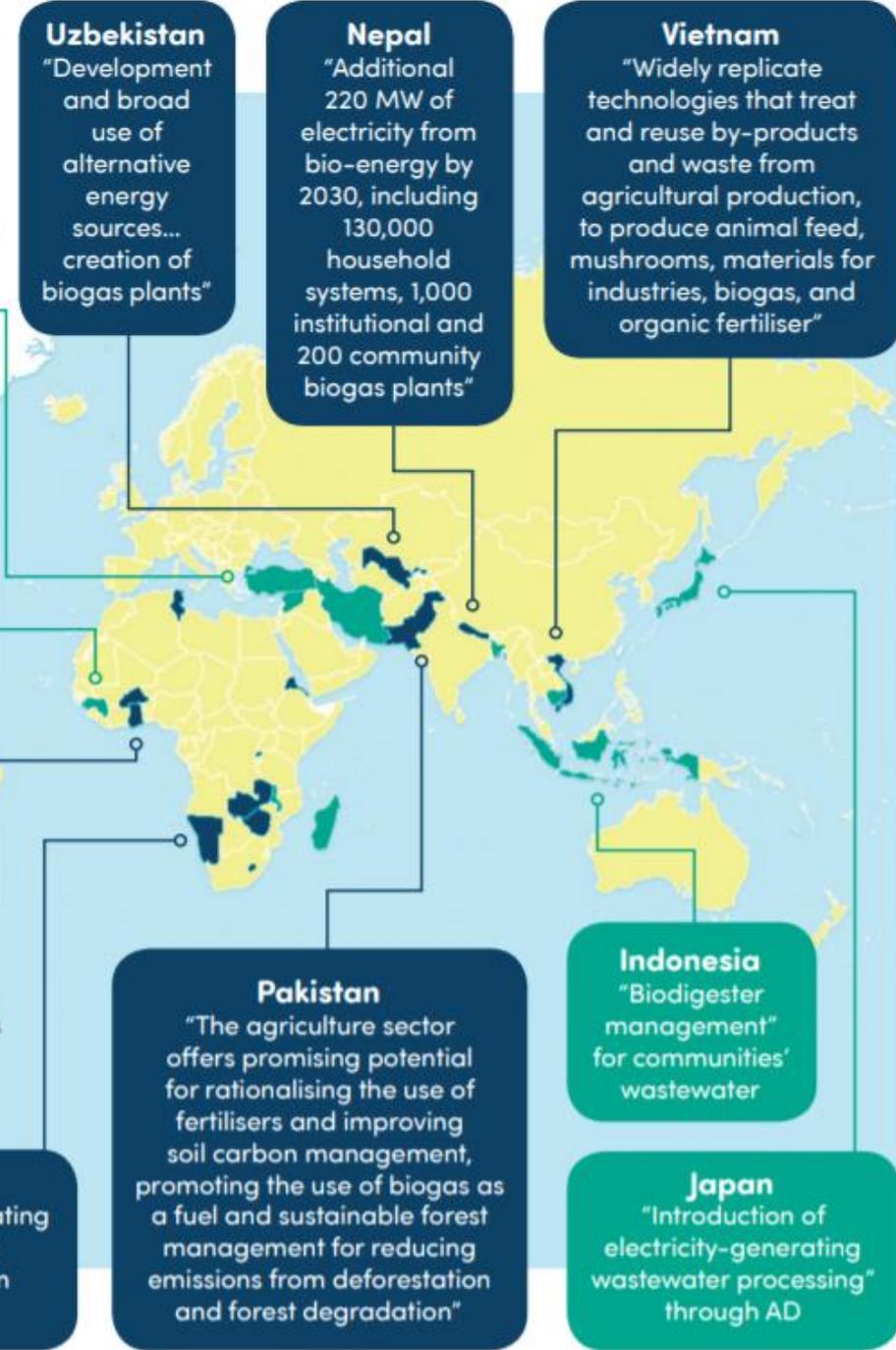
Pakistan
 "The agriculture sector offers promising potential for rationalising the use of fertilisers and improving soil carbon management, promoting the use of biogas as a fuel and sustainable forest management for reducing emissions from deforestation and forest degradation"

Indonesia
 "Biodigester management" for communities' wastewater

Japan
 "Introduction of electricity-generating wastewater processing" through AD

Key
 ■ Stronger inclusion of biogas
 ■ Weaker inclusion of biogas
 ■ No inclusion of biogas

Zambia
 "Sustainable agriculture integrating rural biogas plants" for the generation of electricity from agriculture waste.



NDCs

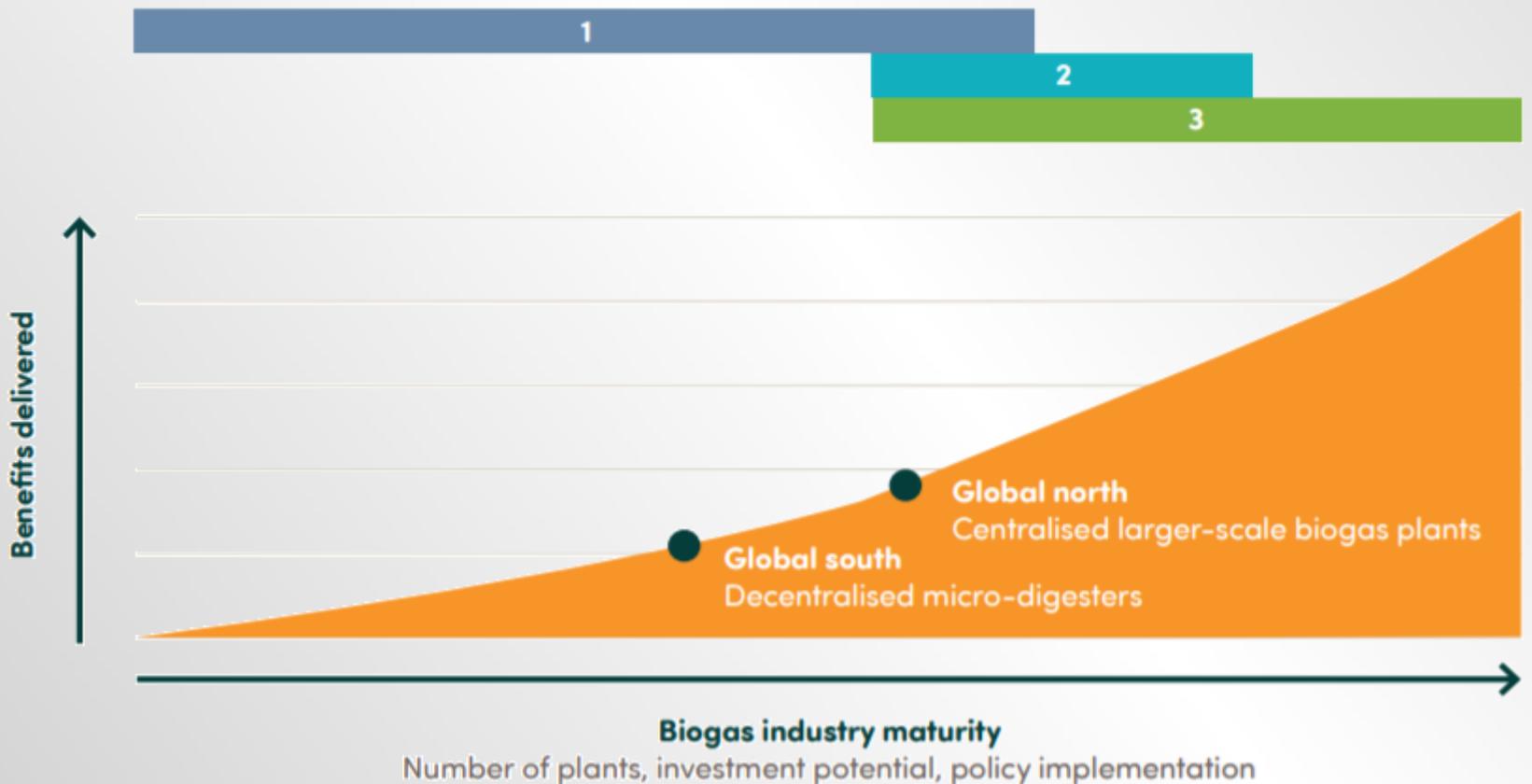
Out of 195 countries' NDCs:

- 24 NDCs acknowledged AD or biogas. The combined emissions of these countries account for just 10% of global emissions.
- 52 NDCs discuss biogas, biofuels or biomass

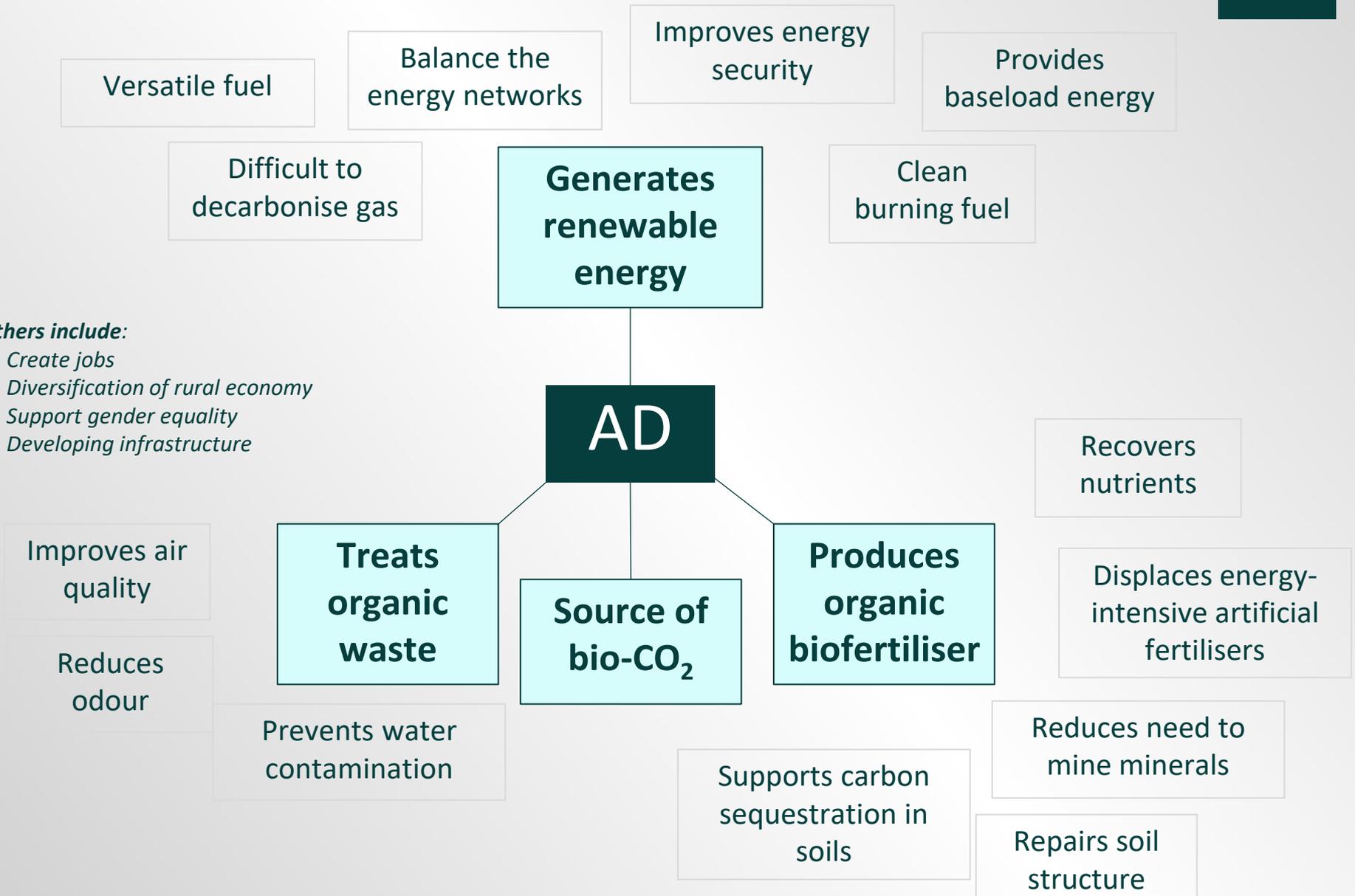
Overarching Policy Timeline



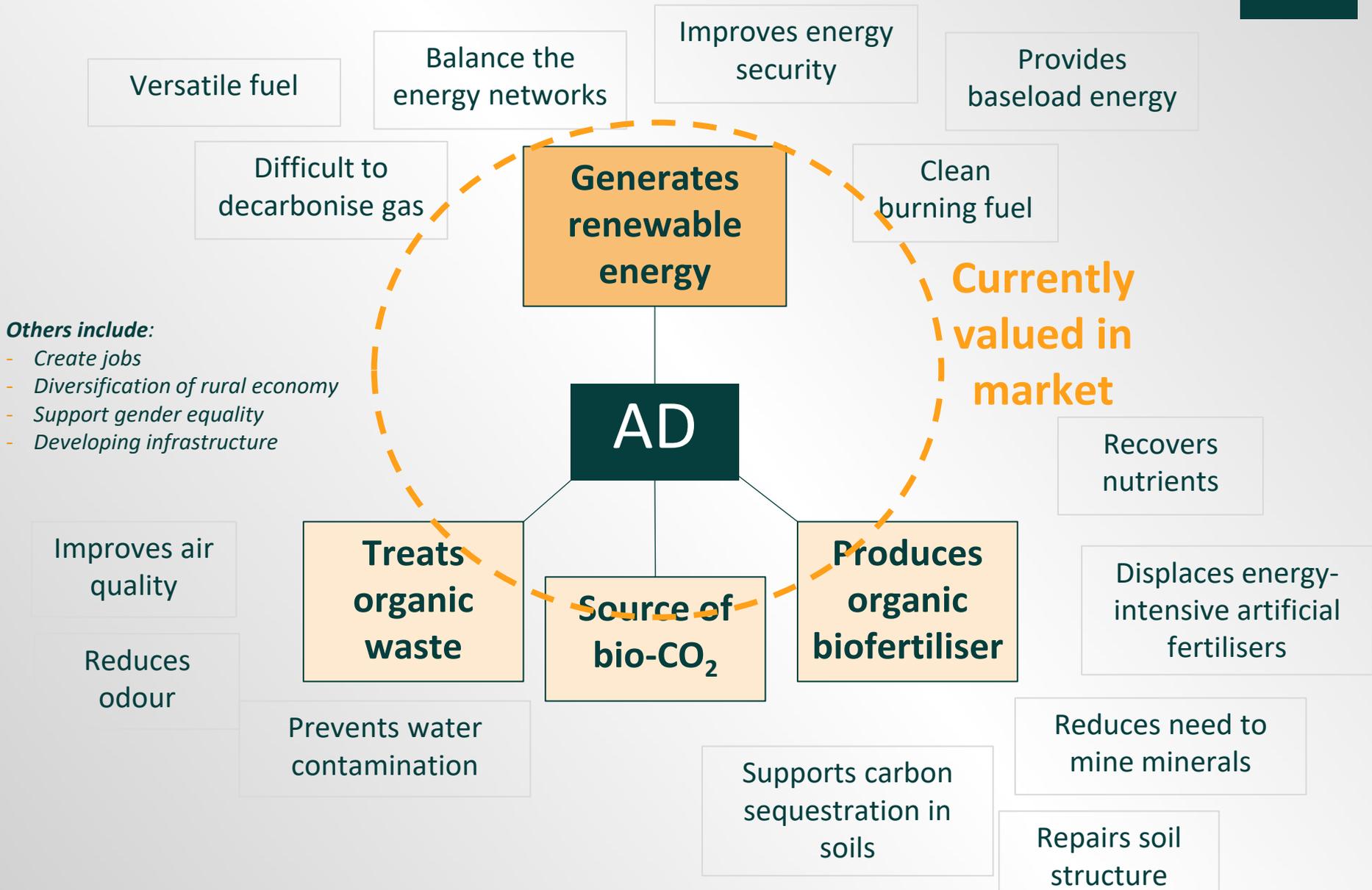
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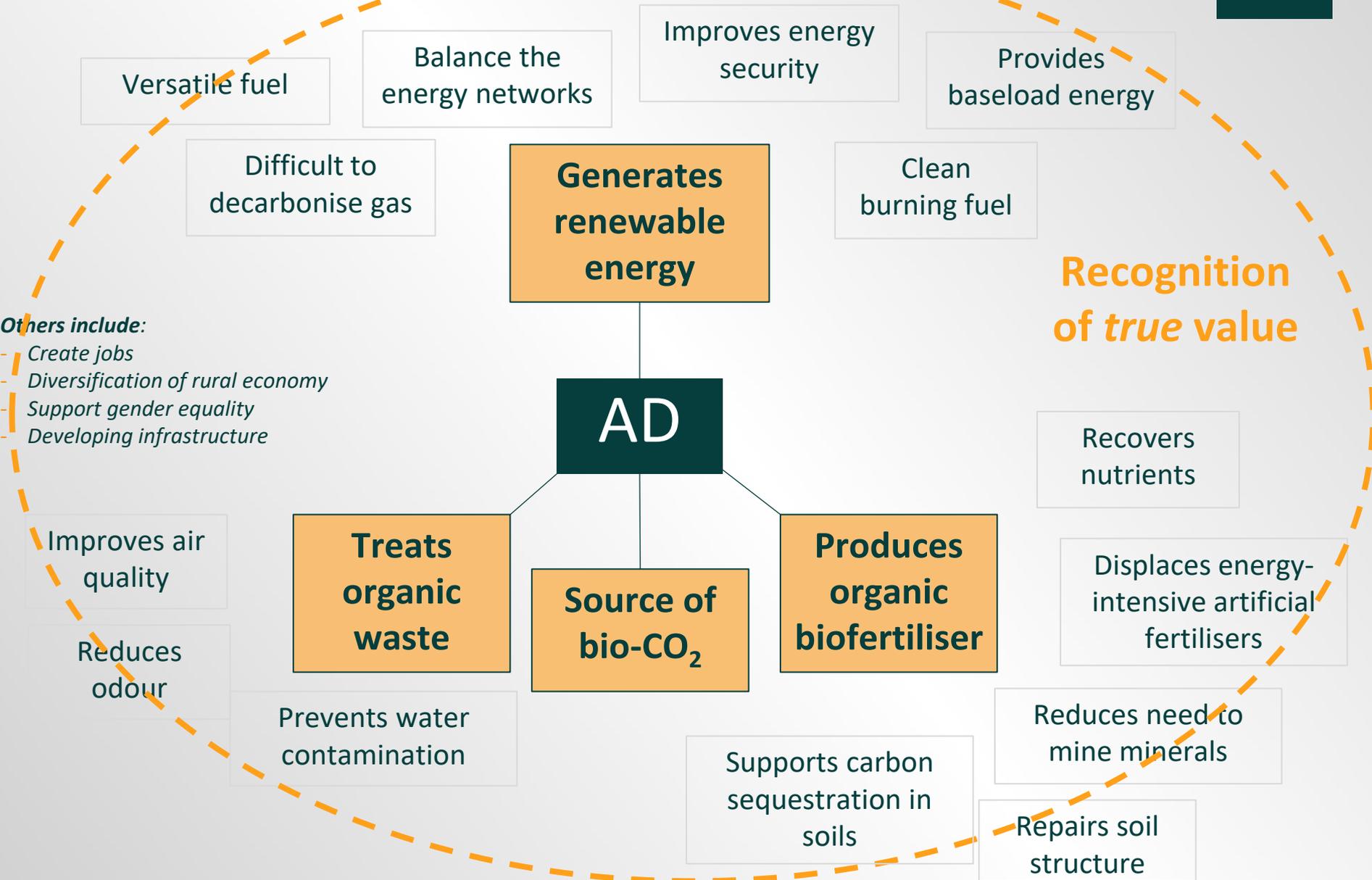
AD's services



AD's services



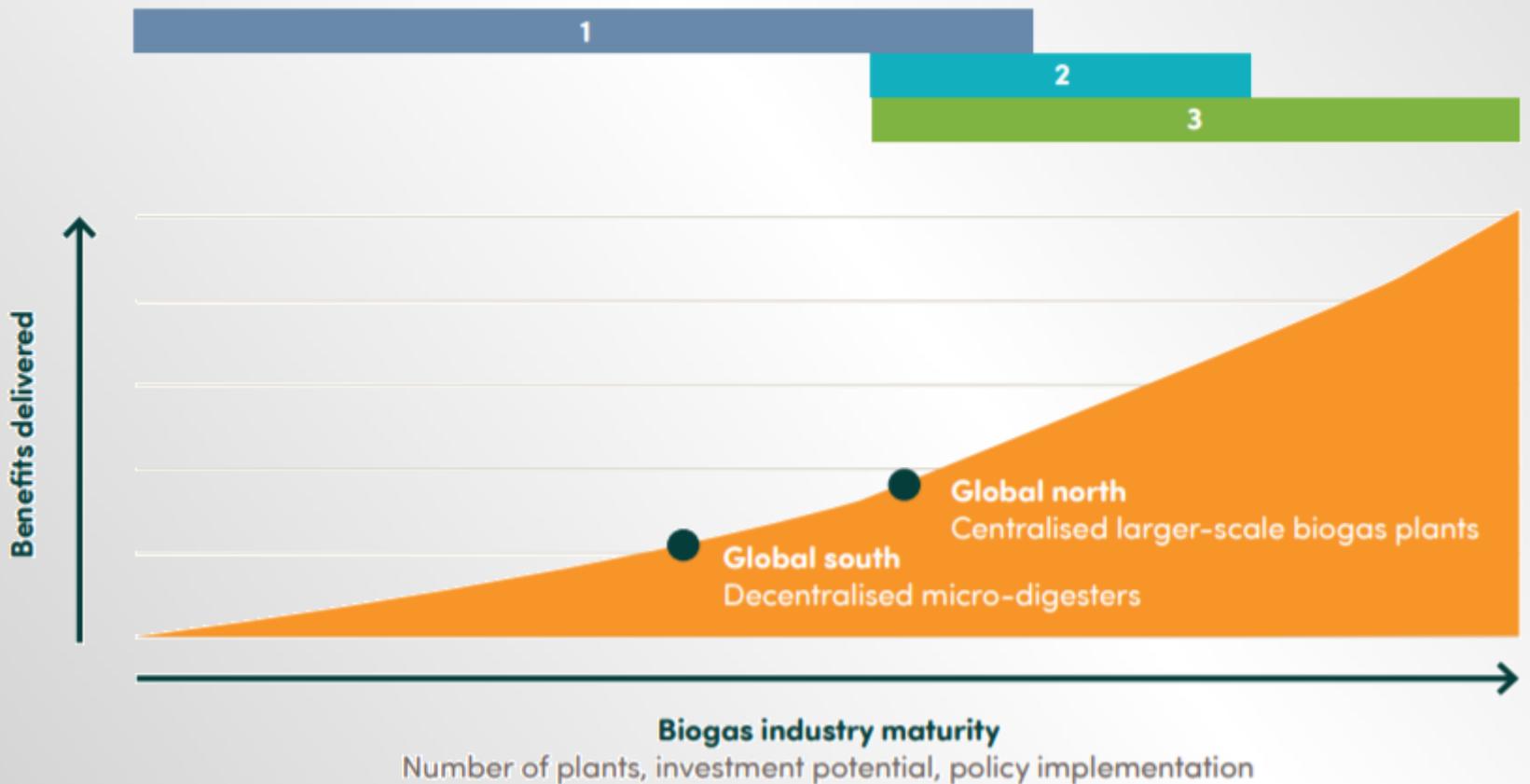
AD's services



Overarching Policy Timeline



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Quantifying these services



AD is the **only** technology capable of delivering all these services.

Delivering a **low carbon** waste management technology which generates **low carbon** energy *and* a **low carbon** organic fertiliser (*and more!*).

Carbon is one of the best measures of all AD's environmental services

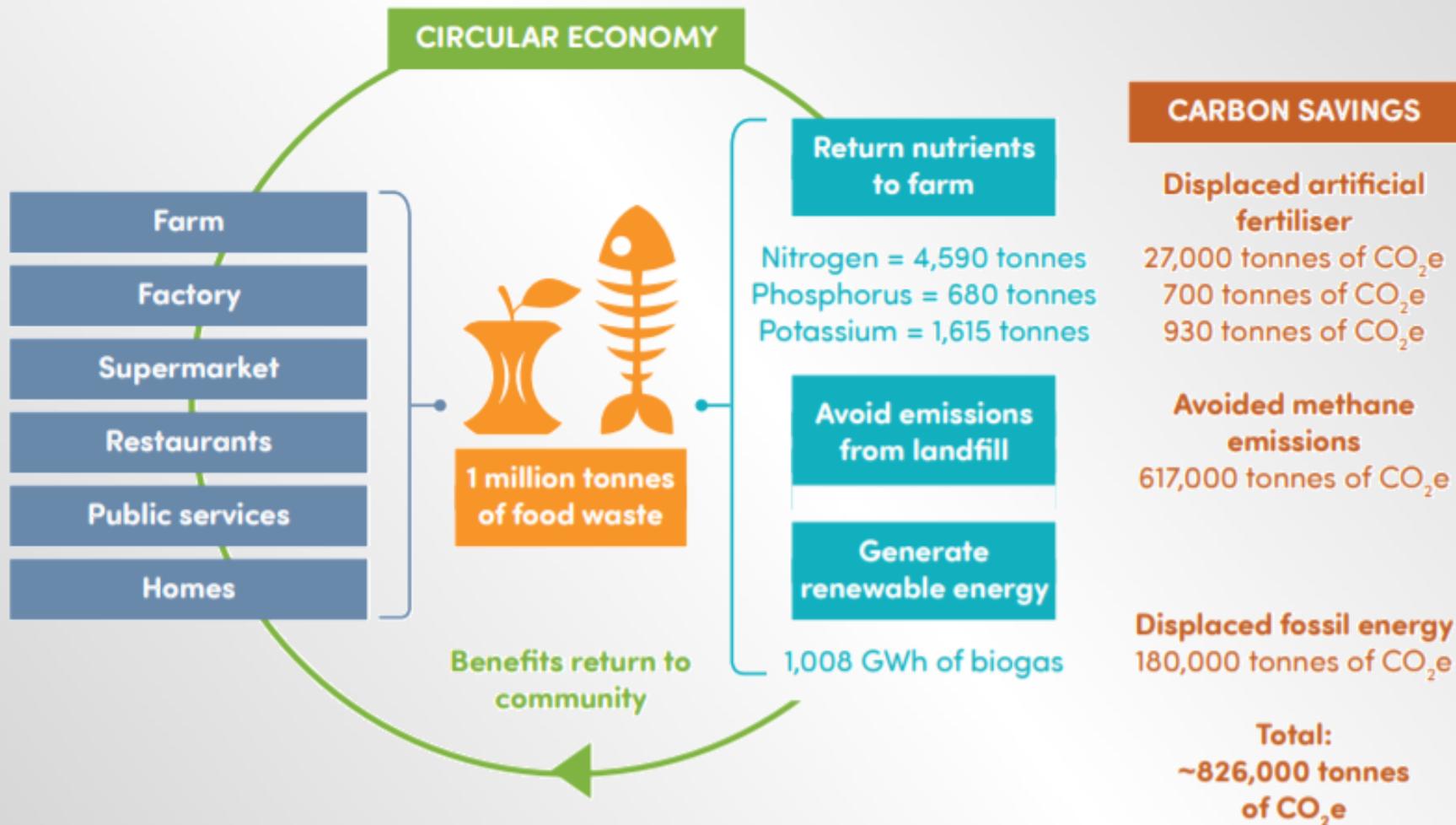
Offering value for money

AD ≈ US\$ **1,500** per tonne of CO₂ saved

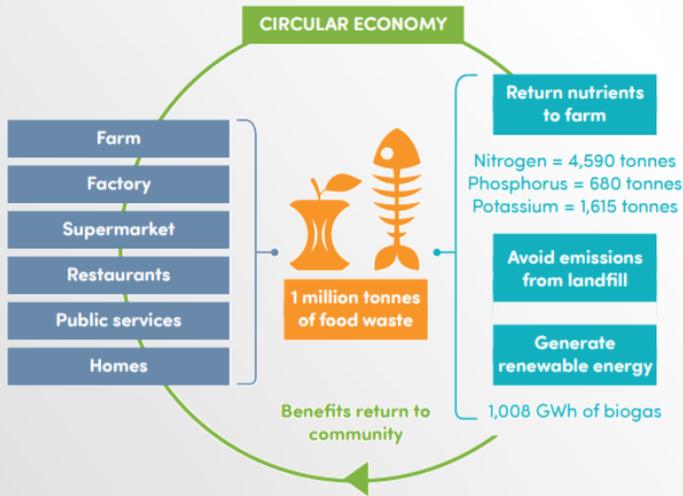
Offshore wind ≈ US\$ **1,150** per tonne of CO₂ saved

Solar PV ≈ US\$ **3,200** per tonne of CO₂ saved

Useful tool to estimate potential



Useful tool to estimate potential



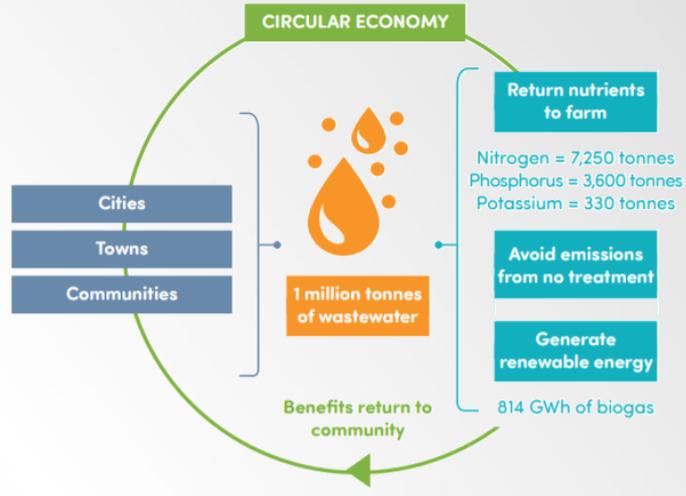
CARBON SAVINGS

Displaced artificial fertiliser
27,000 tonnes of CO₂e
700 tonnes of CO₂e
930 tonnes of CO₂e

Avoided methane emissions
617,000 tonnes of CO₂e

Displaced fossil energy
180,000 tonnes of CO₂e

Total:
~826,000 tonnes of CO₂e



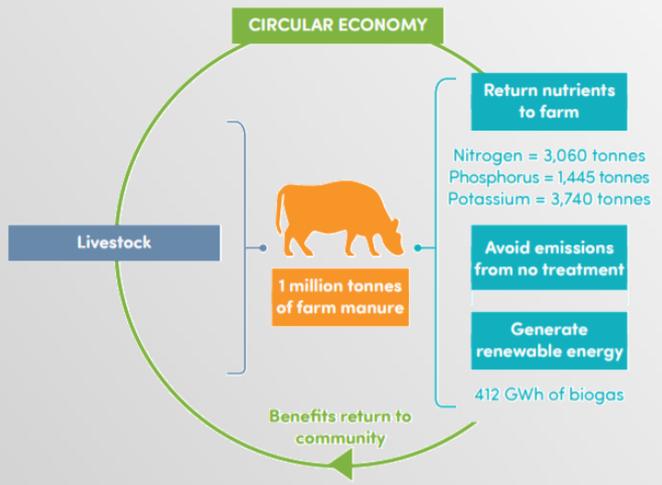
CARBON SAVINGS

Displaced artificial fertiliser
42,600 tonnes of CO₂e
3,700 tonnes of CO₂e
200 tonnes of CO₂e

Avoided methane emissions
500,000 tonnes of CO₂e

Displaced fossil energy
157,000 tonnes of CO₂e

Total:
~704,000 tonnes of CO₂e



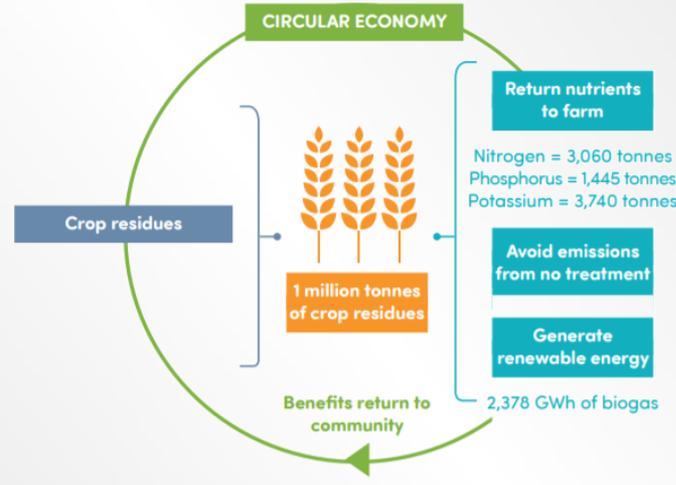
CARBON SAVINGS

Displaced artificial fertiliser
18,000 tonnes of CO₂e
1,500 tonnes of CO₂e
2,200 tonnes of CO₂e

Avoided methane emissions
66,000 tonnes of CO₂e

Displaced fossil energy
74,000 tonnes of CO₂e

Total:
~161,000 tonnes of CO₂e



CARBON SAVINGS

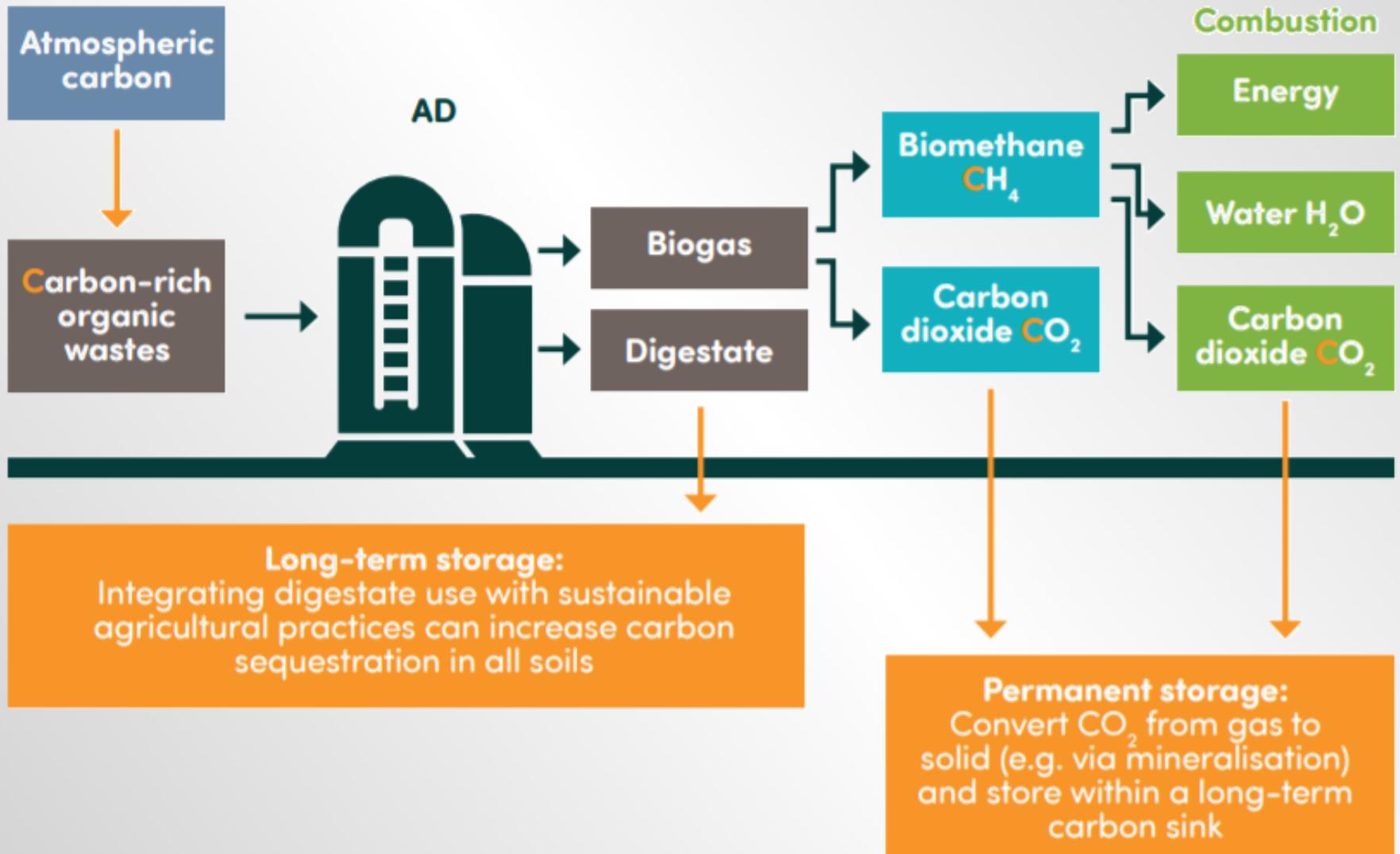
Displaced artificial fertiliser
18,000 tonnes of CO₂e
1,500 tonnes of CO₂e
2,200 tonnes of CO₂e

Avoided methane emissions
>0 tonnes of CO₂e

Displaced fossil energy
425,000 tonnes of CO₂e

Total:
~450,000 tonnes of CO₂e

A carbon *negative* technology



Now is the time to act!

- Mismatched organic wastes are global problem.
- Need to reduce organic waste production and recycle the unavoidable wastes (cutting GHG emissions by 3% and 10% respectively)
- AD unlocks the greatest value from organic wastes. Wastes are converted to **bioresources**:
 - *Cut global emissions by 10%*
 - *Provide 33% of the global gas demand*
 - *Restore soil and enhance productivity*
 - *Create 10-15 million jobs*
 - *Stimulate investment of \$100 trillion*
 - *Improve food and energy security*
 - *And more...*
- AD is a ready to use, future proof technology

... it's a win-win-win-win-win.

Thank you



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Biogas: Pathways to 2030



If we do not address methane emissions from organic wastes all our efforts to tackle the climate crisis will fail. Anaerobic digestion is one of the ready to go, ready to scale technologies that can do this. The path we must take is clear.

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