

# The benefits of compost and digestate from biowaste when applied to soil

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# Introduction ECN

# European Compost Network - ECN

 **Vision** Living well within the limited resources of the planet and respecting the organic cycle

 **Mission** Leading the organic recycling industry through our focus on separate collection of biowaste, quality assurance for compost and digestate and to keep our soils healthy

**Values**  Care  Internet & Networking  Simplicity

**Pillars**  Quality Assurance  Advocacy  Market  Innovation

  
**Circularity & Sustainability is at the heart of everything we do**

67 Members from 27 European countries

> 4.500 Composting & Anaerobic Digestion Plants

≈ 48 M tpa Treatment Capacity

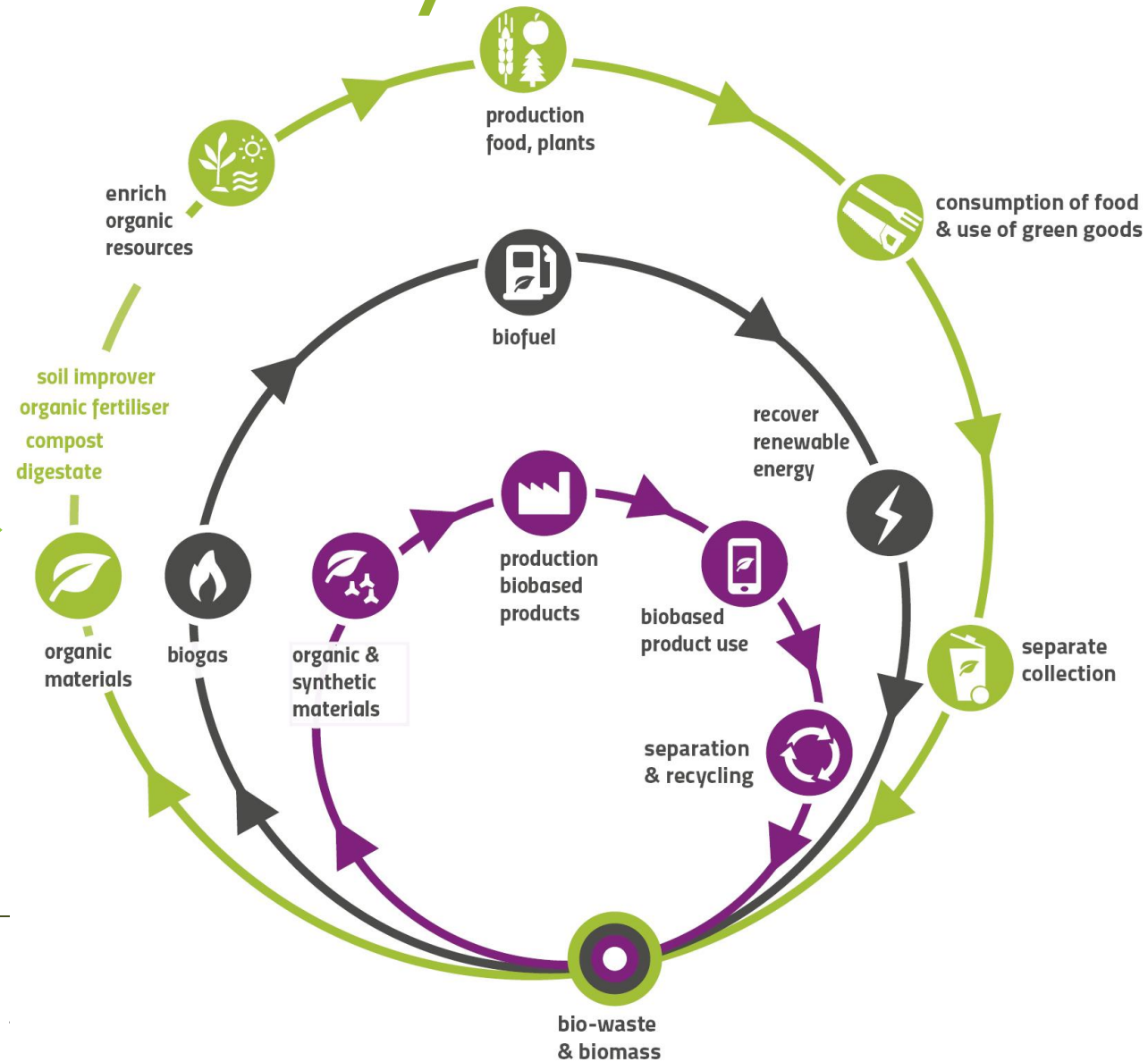
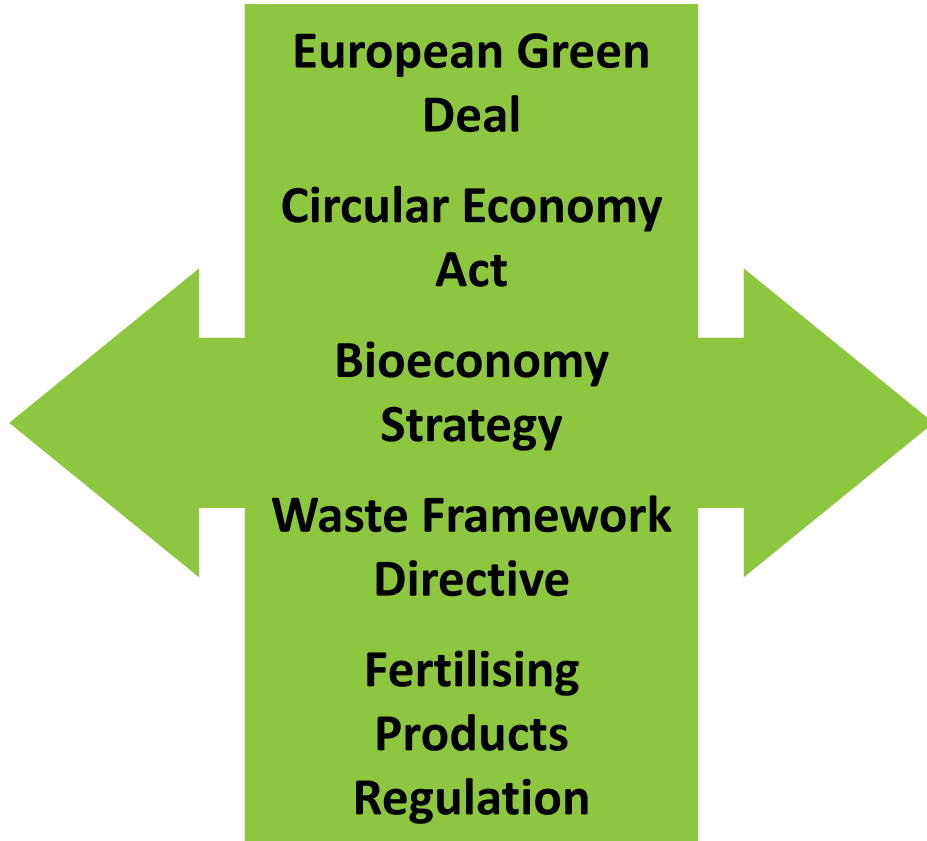
# Biowaste and the Circular Bioeconomy

# Biowaste in the circular bioeconomy

## Biowaste



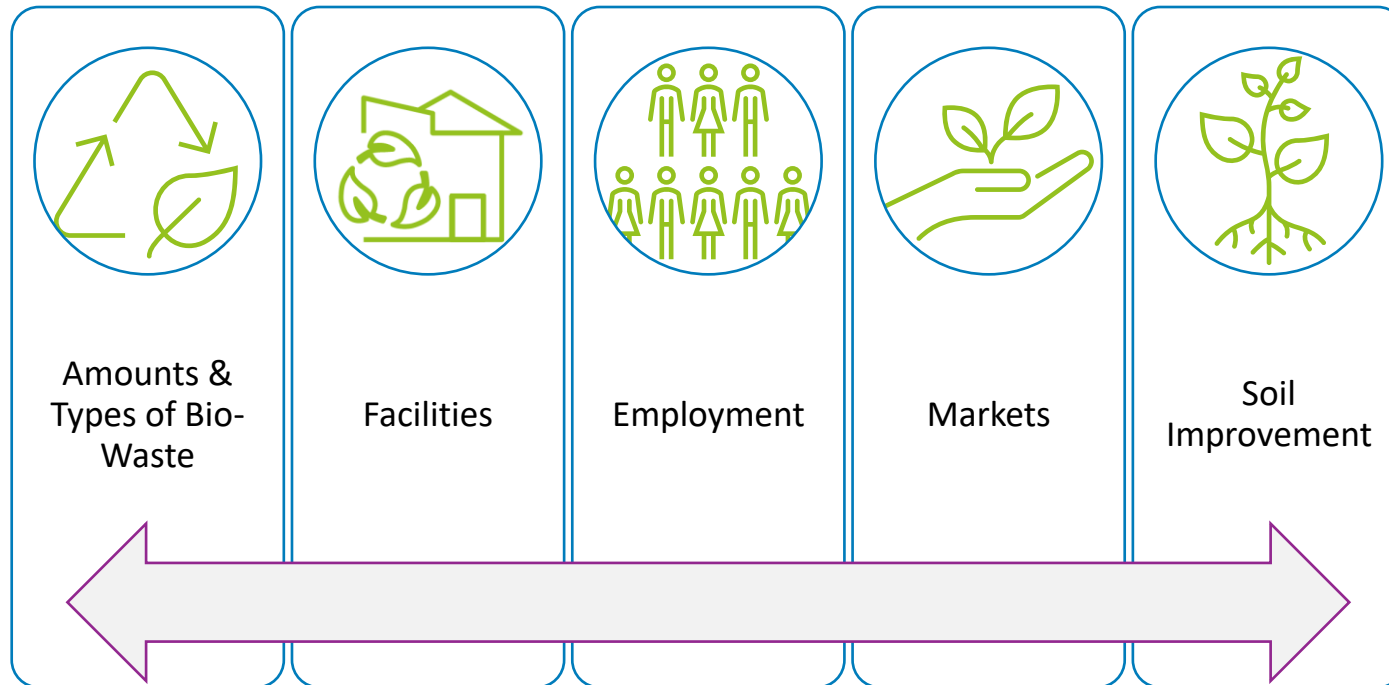
## A Cross-Cutting Resource



# Biowaste management

# Overview on Biowaste Management in Europe

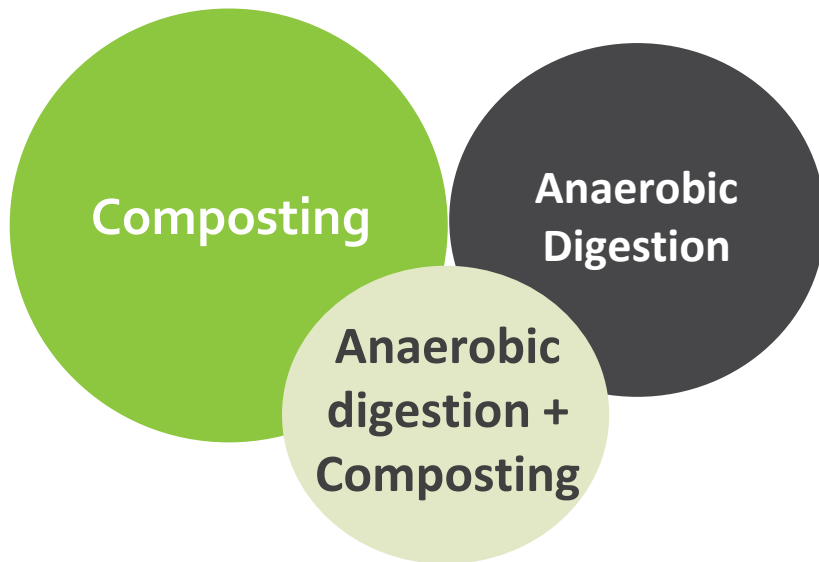
Comprehensive survey in 2021



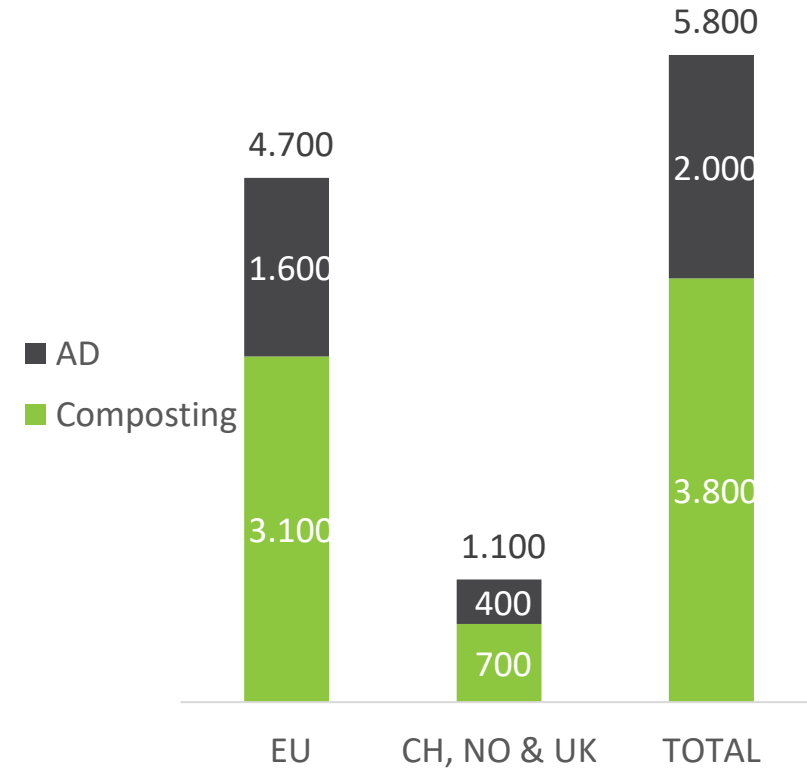
<https://cutt.ly/D1ceQ2u>

# Biowaste treatment

## Recycling Processes for Biowaste



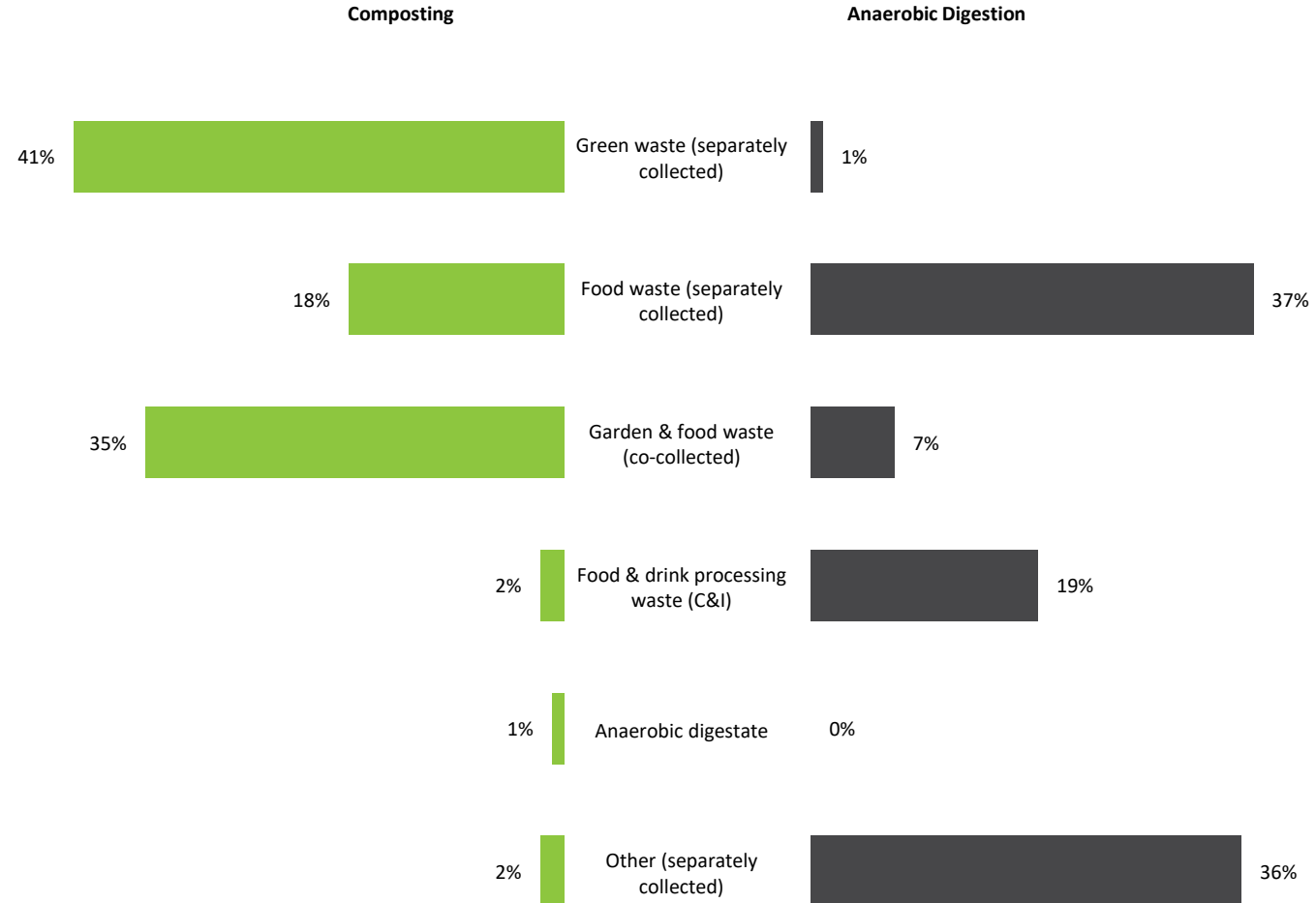
## Number of facilities





# Input for compost & digestate production

**76 % Composting**  
Green waste  
Garden & food waste



**73 % Anaerobic Digestion**  
Food waste  
Other



# Compost & digestate production

**71 M tpa**

BIO-WASTE RECYCLED

**21 M tpa**

COMPOST PRODUCED

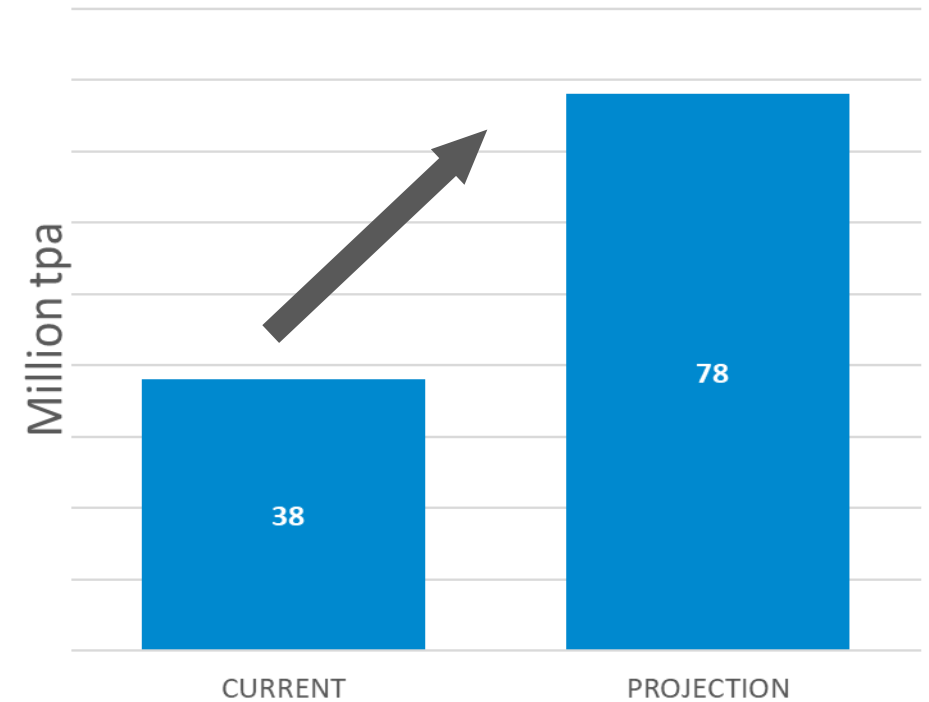
Surface area (million ha)	Fraction of Arable Land	Fraction of Mod./ Severely Eroded Land
2.1	2%	16%

ESTIMATION FOR 2035

**46 M tpa**

COMPOST PRODUCED

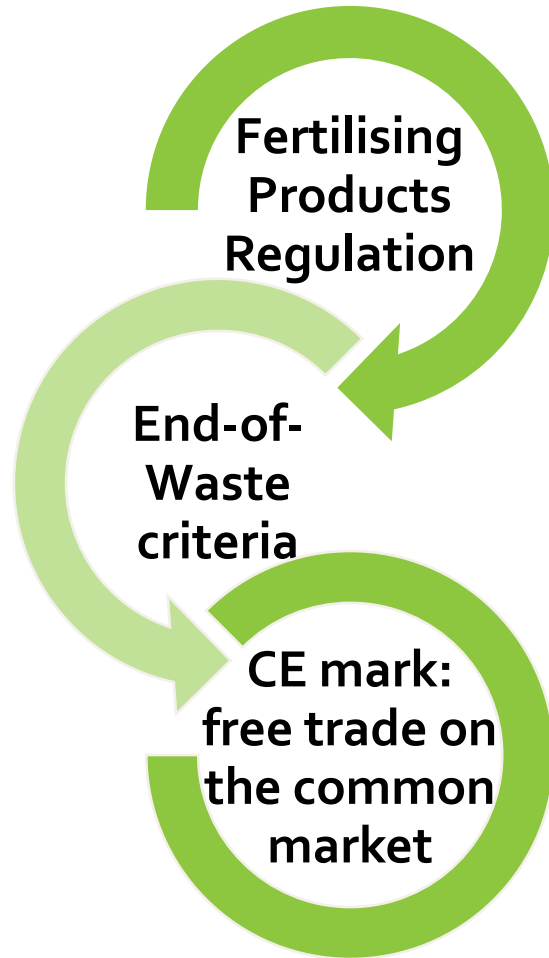
# Biowaste recycling potential



Quantities of municipal biowaste collected and treated in EU 27

# Compost and Digestate

# From waste to product – Quality Assurance



**Quality assurance  
to ensure the quality of  
compost and digestate  
products**

Voluntary Quality Assurance Schemes  
are vital for enhancing consumer trust, ensuring product  
quality at every production stage, and promoting broader  
ethical standards in business operations.

Source: Fer-Play Guideline

# From waste to product – ECN Quality Assurance Scheme

Separate collection of biowaste & Quality Assurance are pre-conditions for placing compost- or digestate-based fertilising products on the European market



**25 % of the compost**  
produced in the EU 27, CH, NO and UK  
**is certified by the ECN-QAS**

# Compost & Digestate – Environmental benefits

Soil organic matter decreases  
in most European arable soils.



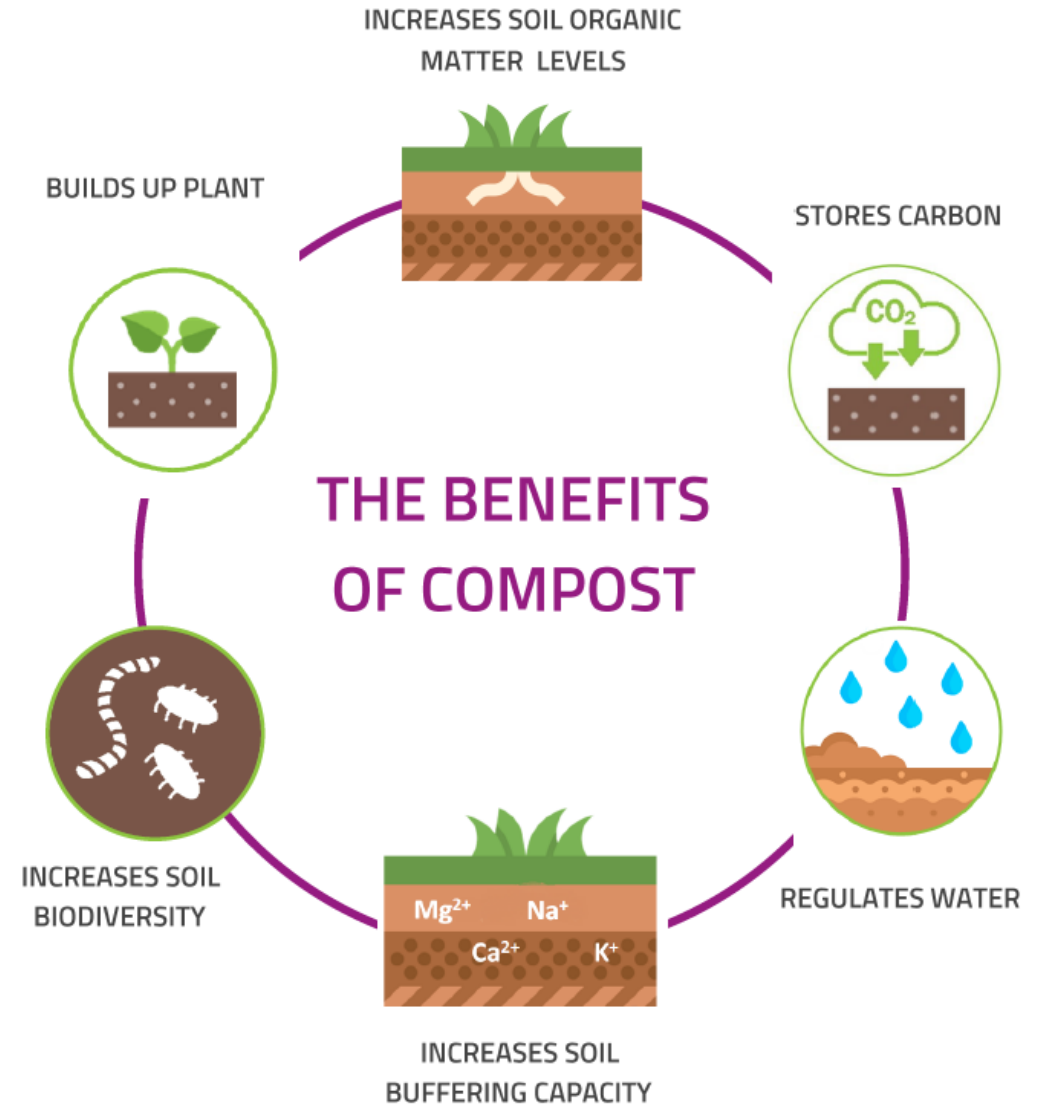
 Soils are less productive.

 Soils hold onto less water.

 Soils store less carbon and nutrients.



Applying high-quality compost and digestate on  
agricultural soils **helps keeping soils healthy and  
productive, and contributes to carbon sequestration.**



# Compost – Carbon storage in soil



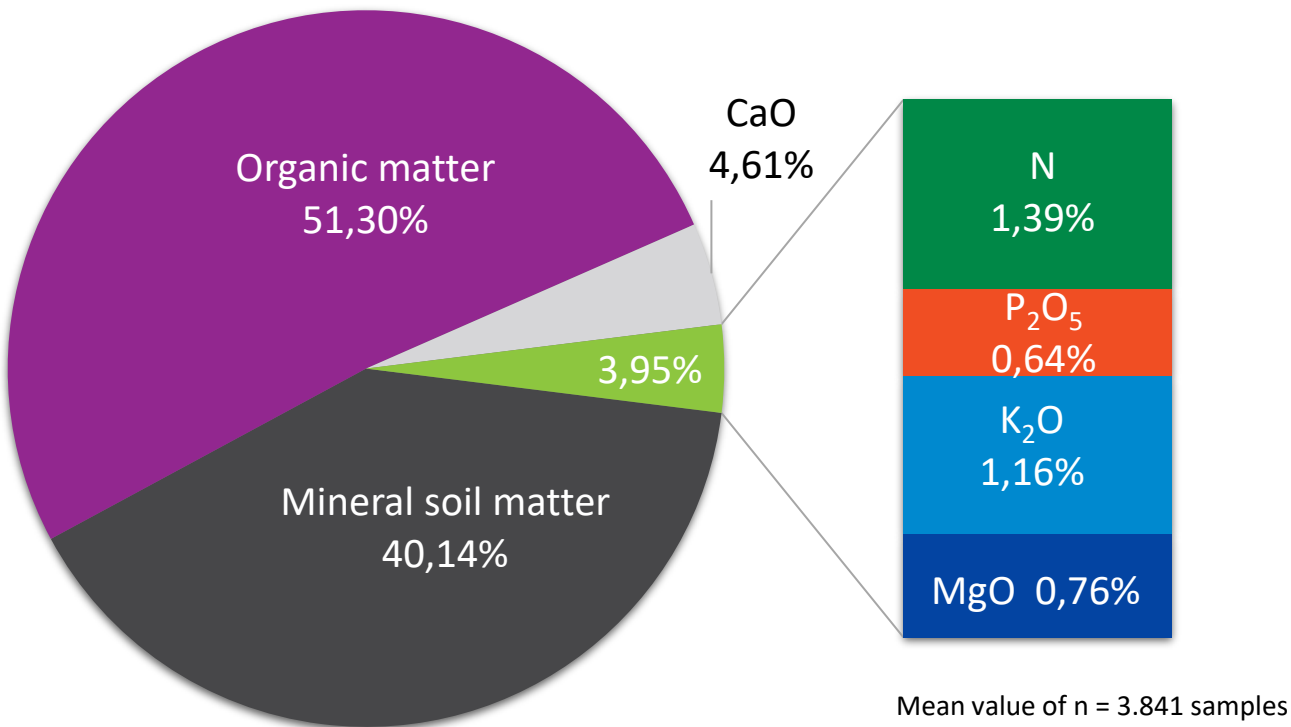
A fraction of the organic matter contained in biowaste is converted into a stable form called ‘humus’.  
This humus can remain in soil for many years.

**1 tonne of compost (fresh mass)**  
sequesters  
**110 kg CO<sub>2</sub> equivalents**  
(equivalent to 11% of its mass)



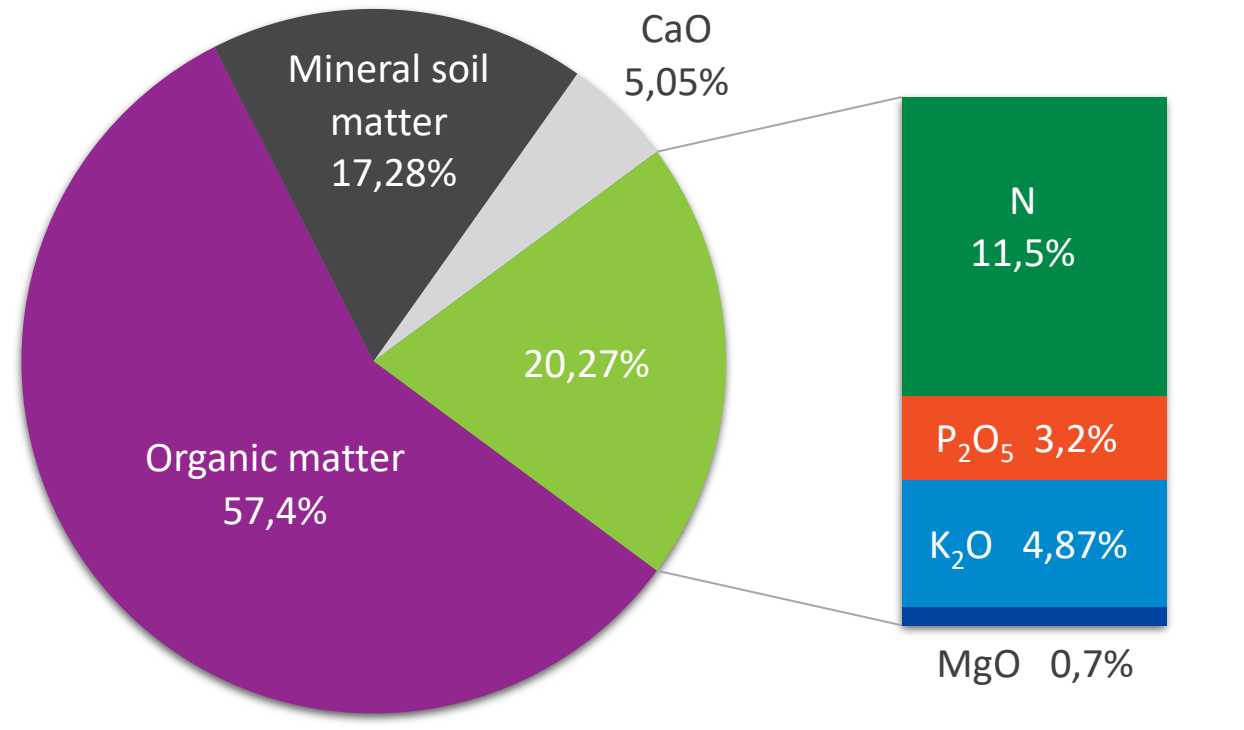
# Compost & digestate – Nutrient composition

## Compost



DM 70,9 %; pH 8,6; Salt content 4,4 g/l

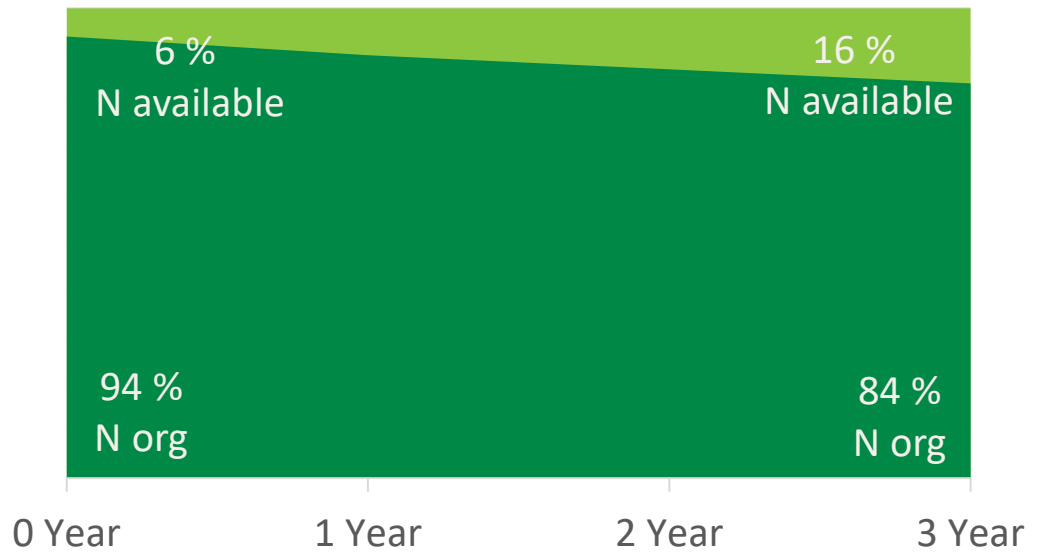
## Liquid digestate



DM 4,6 %; C/N 2,9; Nmineral/Ntotal 64%; pH 8,5; Salt content 16,1 g/l

# Compost & Digestate – Nitrogen availability

Compost

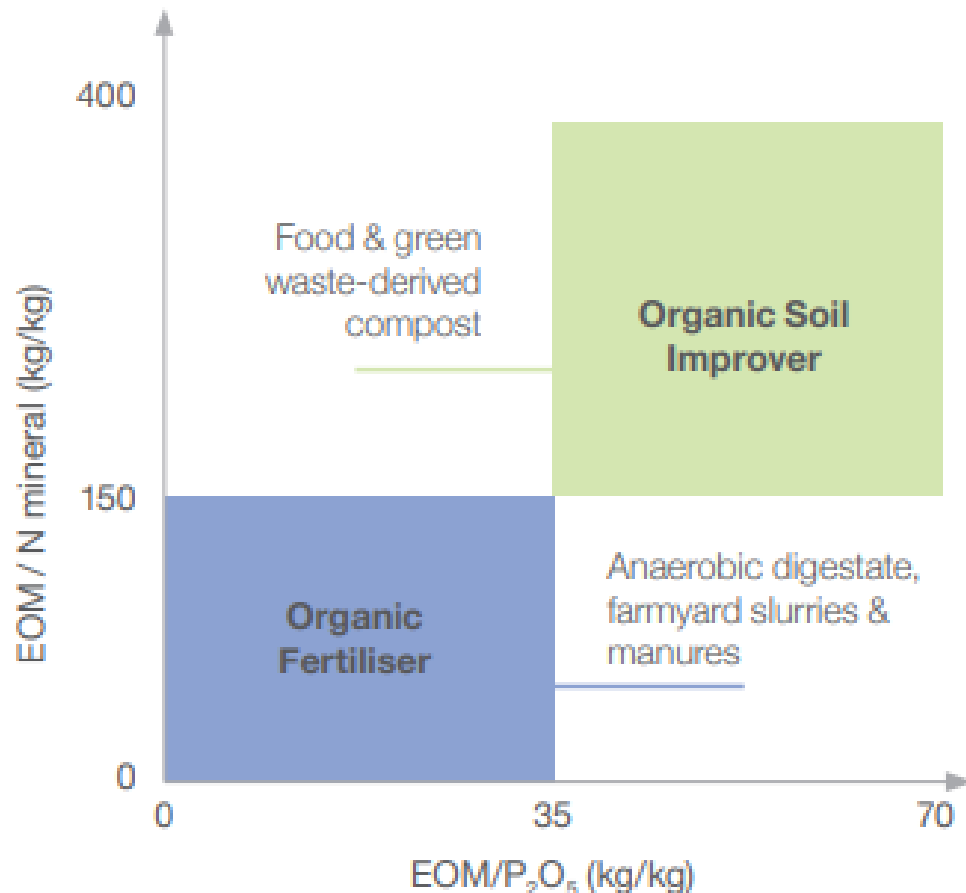


Digestate



# Compost & Digestate – Soil improver / organic fertiliser

**Figure 9** – Classification of organic amendments as either an organic soil improver or organic fertiliser based on the ratio of EOM to nutrients (N & P) (re-drawn from Veeken *et al.* 2017).



- **Compost** is a solution for:
  - Increasing soil organic matter, soil fertility.
  - Increasing nutrient availability.
  - Replacing mineral phosphorus and potassium
- **Digestate** is a solution to:
  - Provide nutrients.
  - Replace mineral fertilisers

Source: ISWA 2020: Benefits of applying compost and anaerobic digestate when applied to soils

# Compost – Fertiliser resource and value



## Nutrient value of compost

**41 €** per tonne of compost  
(fresh mass)



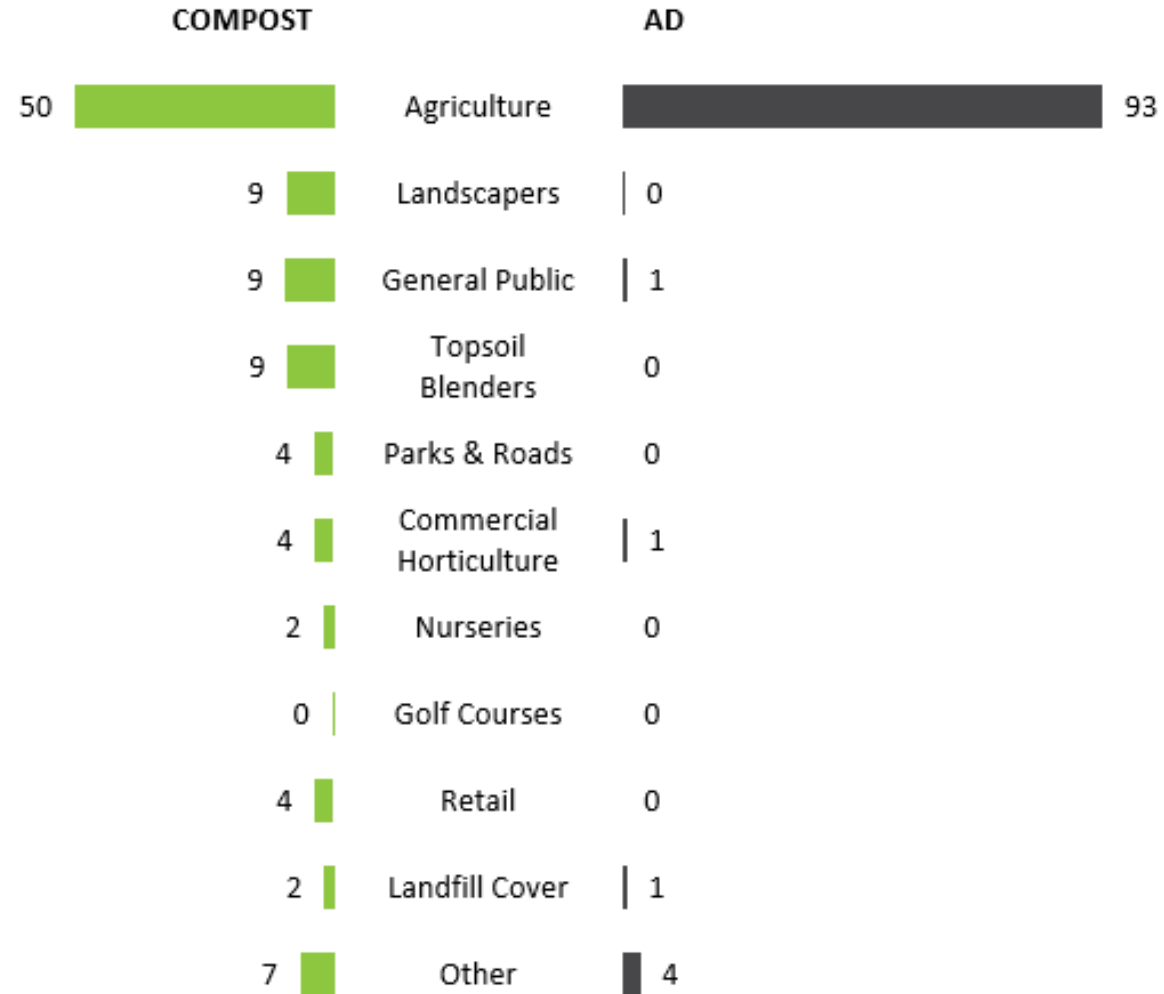
## Mineral fertiliser replacement

**21 million tonnes** of compost  
can replace

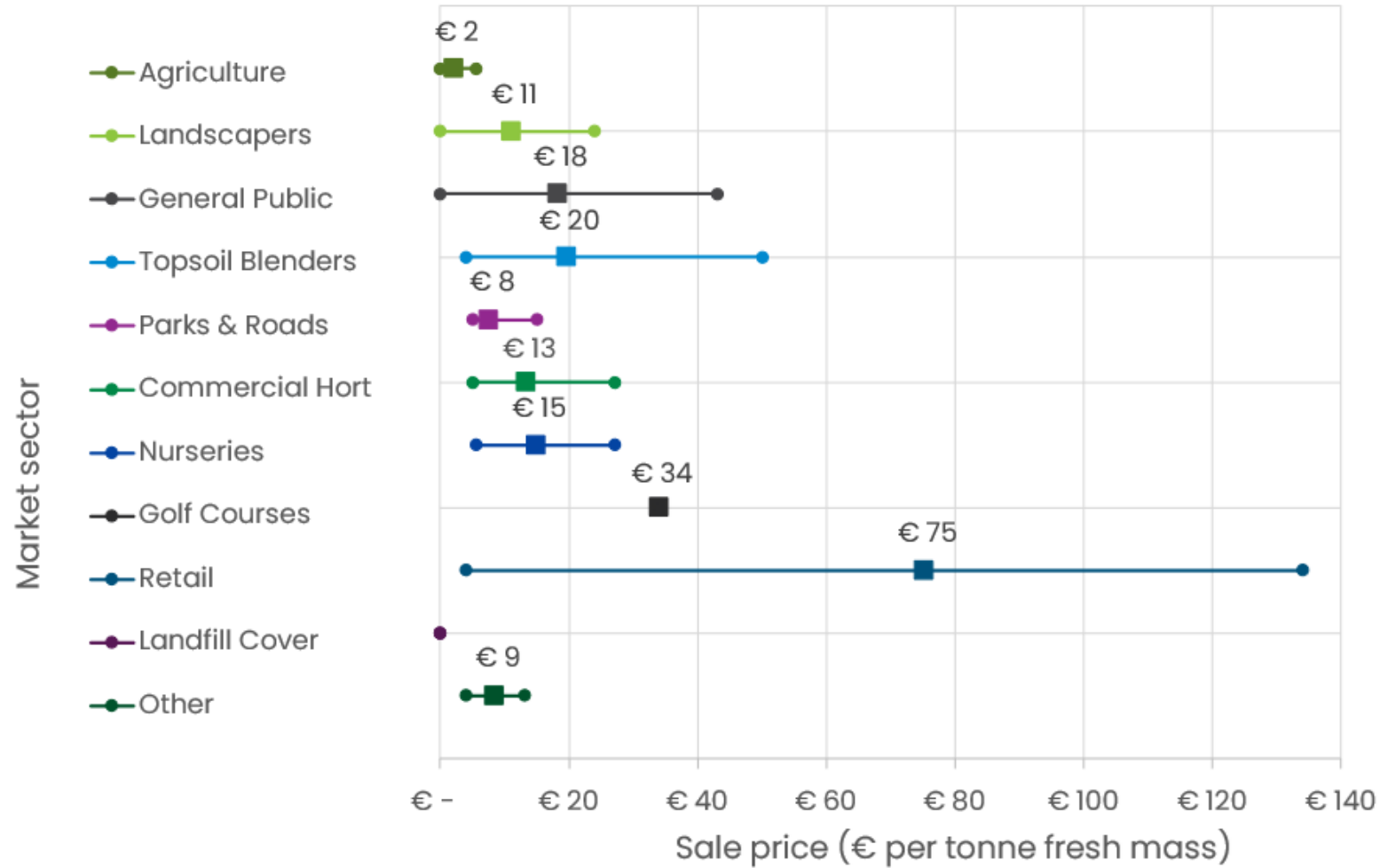
**2 %** of mineral nitrogen

**5,8 %** of mineral phosphorus

# Compost & Digestate – Markets



# Compost – Market prices in Europe



Source: ECN Data Report 2022

# Market perspective

- **Implementation of EU policy is needed** for the promotion of recycling of biowaste resources and for the sustainable use of compost and digestate.
- **Good quality compost and digestate** is needed!
- **Quality Assurance and Certification** is essential to **support the markets** for compost and digestate.



# Thank you for your attention

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**If you want to become actively involved in  
our work, please join our network!**



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