



The Potential of **BIOMETHANE** Production in Poland



Biomethane potential

The report on biomethane production potential is based on the availability of biodegradable waste from:

- Municipal waste landfills;
- Municipal and industrial sewage sludge;
- Waste from the agri-food sector.

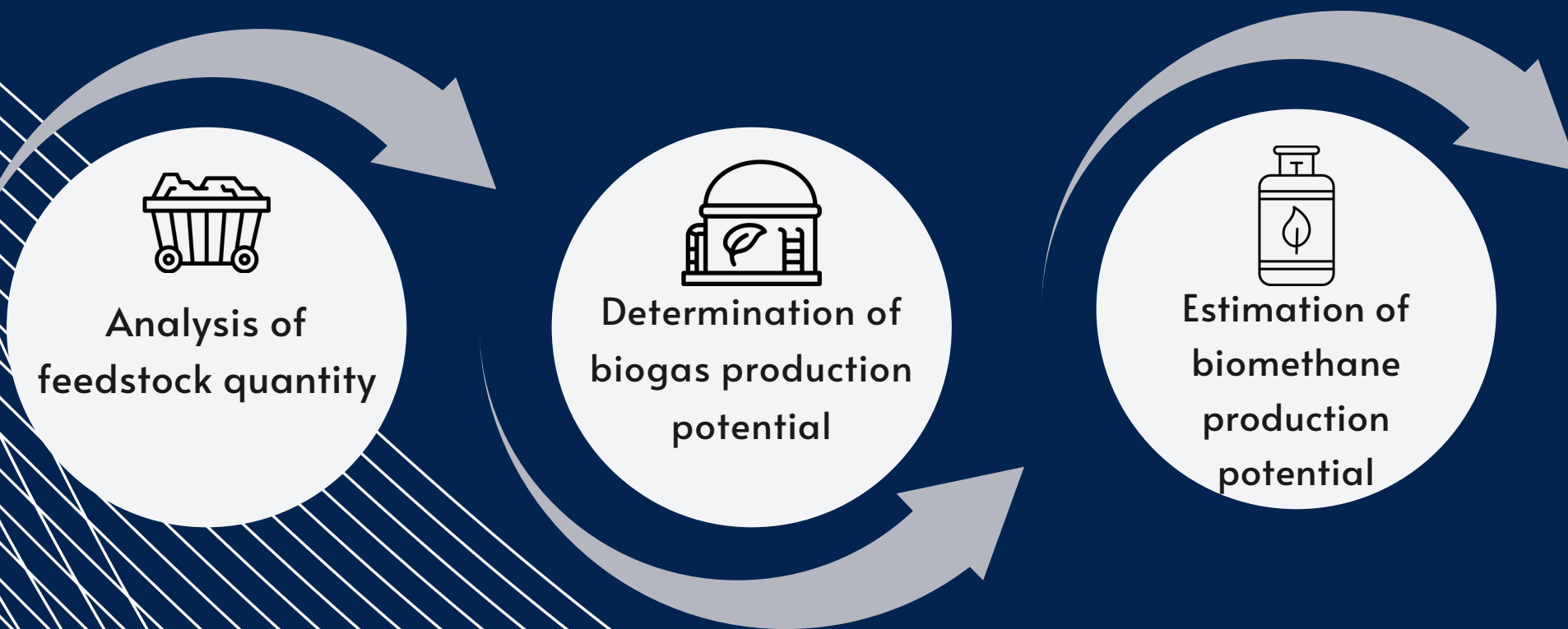
The calculated potential includes the total substrate available for biogas production. The presented potential does not take into account dedicated energy crops.

Methodology and Data Sources

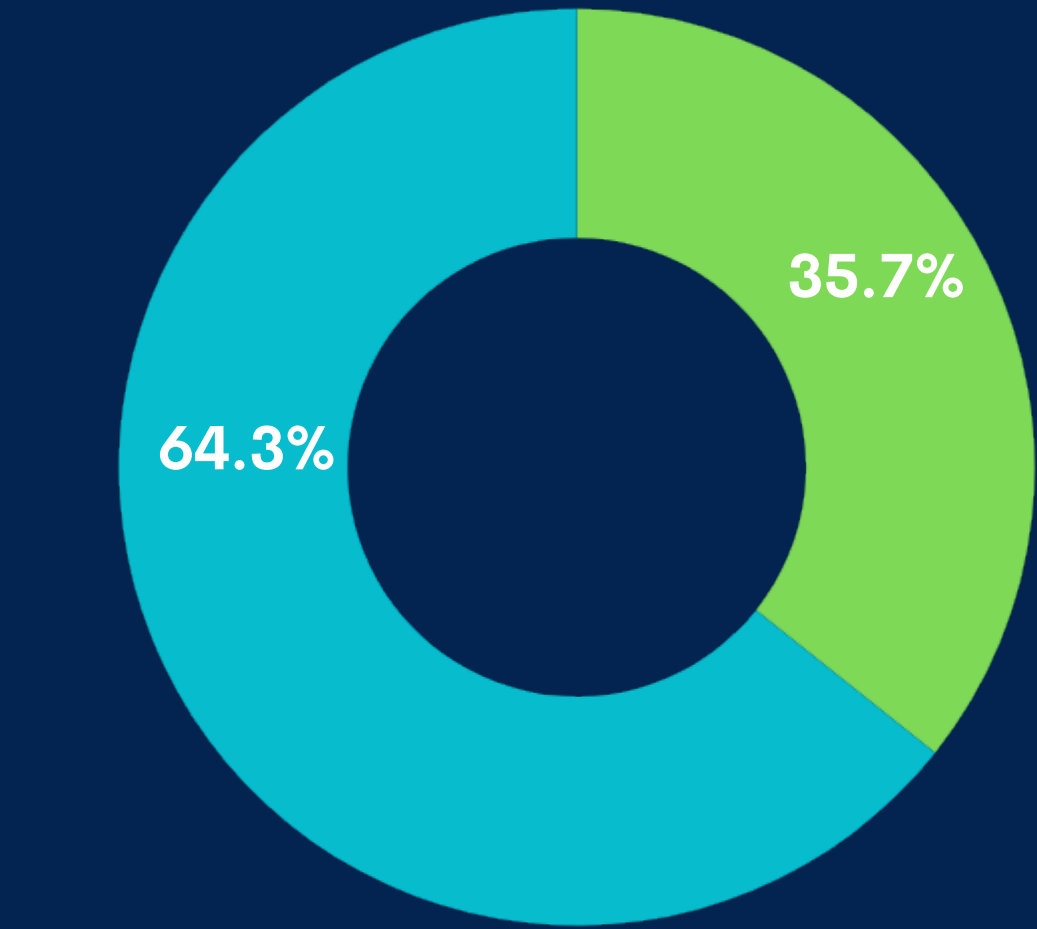
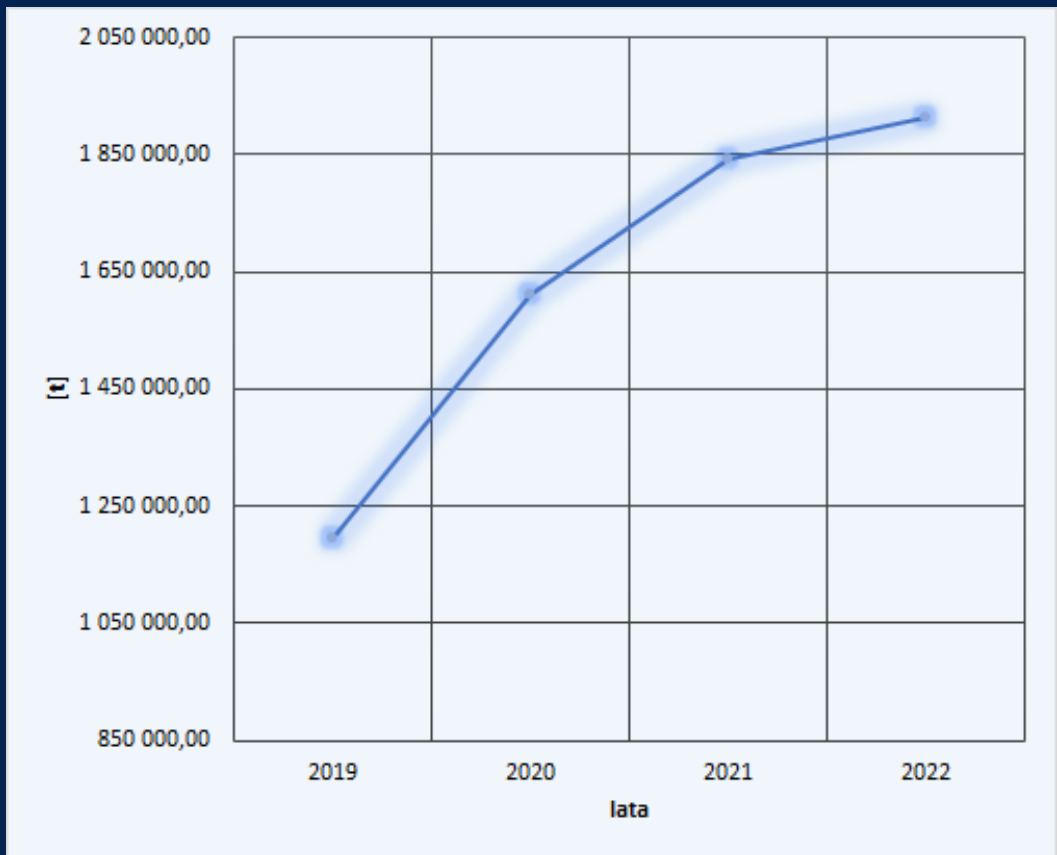
Three main steps were applied in analyzing the potential for biogas and biomethane production:

A wide range of literature sources was utilized in the preparation of this document:

- Reports and data from the Energy Regulatory Office (URE)
- Publications from the National Support Centre for Agriculture (KOWR)
- Statistics from the Central Statistical Office (GUS)
- Scientific research
 - Industry articles



Separately collected biodegradable waste



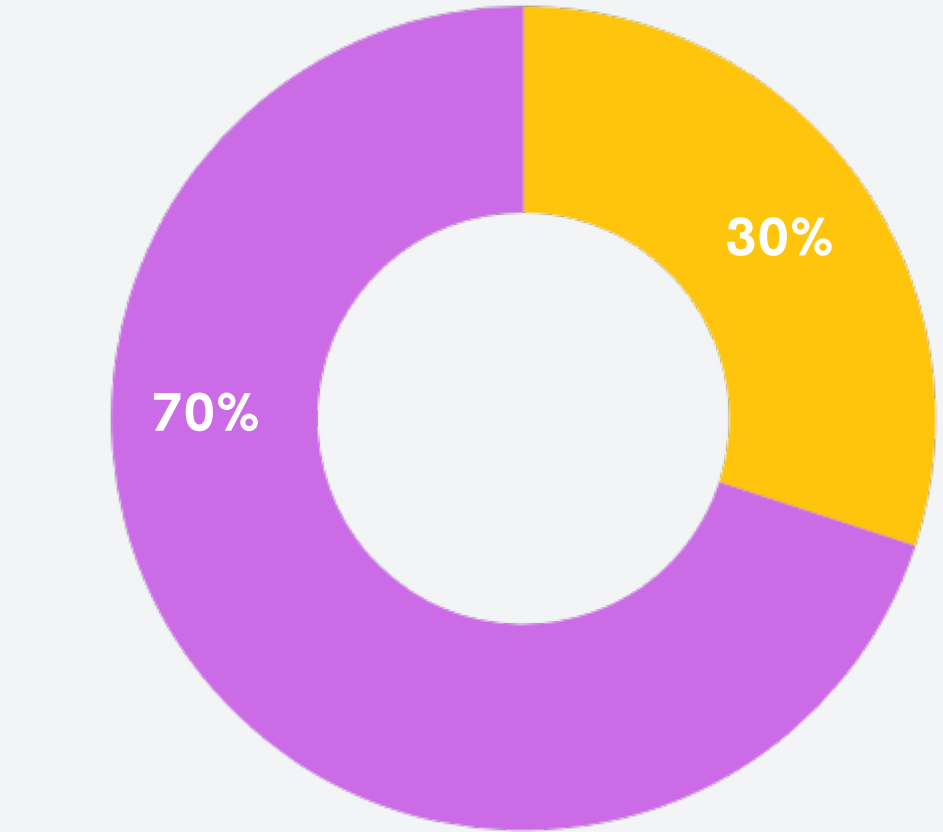
● Other separately collected waste ● Separately collected biodegradable waste

The annual quantity of biodegradable waste collected

1 196 373 [t]
2019
1 842 994 [t]
2021

1 610 035 [t]
2020
1 913 664 [t]
2022

Biodegradable waste constituting fractions of mixed waste

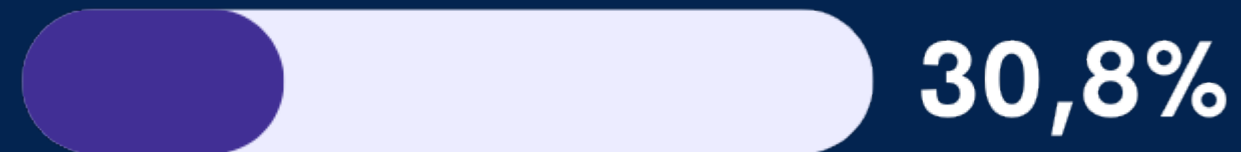


● Other fractions of mixed waste ● Biodegradable waste as fractions of mixed waste

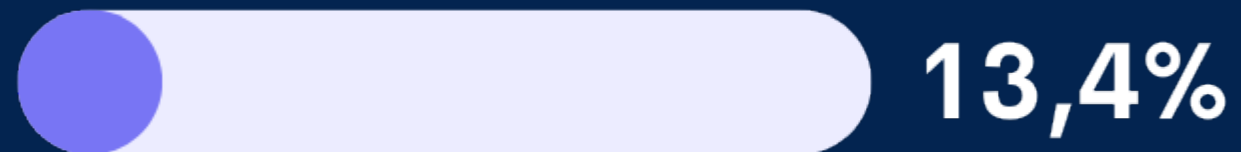
Out of the total mass of mixed waste (8,059,310.35 tons), it is estimated that **2,415,106.67 tons** are biodegradable waste.

The biomethane production potential from biodegradable waste

Separately collected biodegradable waste



From existing biogas installations at waste landfills



Biodegradable waste constituting a fraction of mixed waste



The efficient utilization of biodegradable waste is hindered by challenges with source separation and contamination, such as plastic bags. The solution lies in the development and implementation of advanced waste sorting systems and intensified educational efforts on waste segregation.



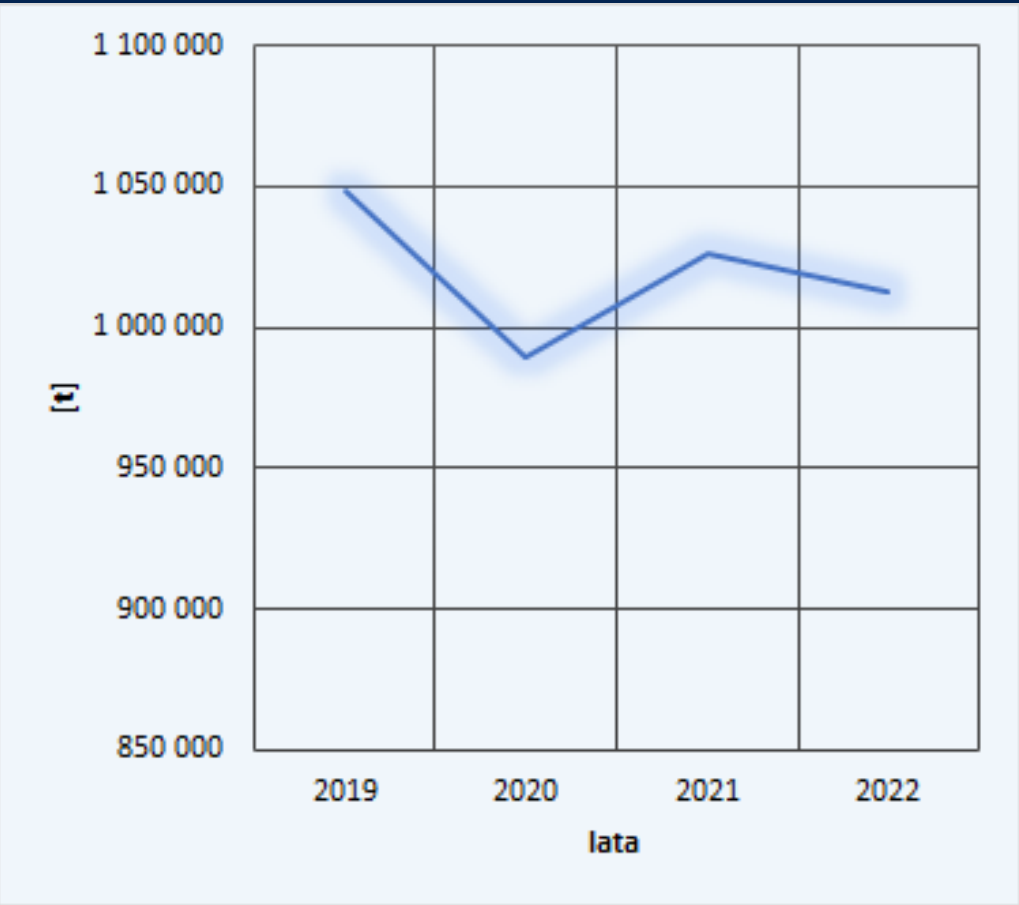
Separately collected biodegradable waste

Biodegradable waste forming a fraction of mixed waste

The total production potential from biodegradable waste

311 671 495 m³

Sewage sludge generated annually



The amount of sludge generated annually

1 048 687 [t]

2019

989 491 [t]

2020

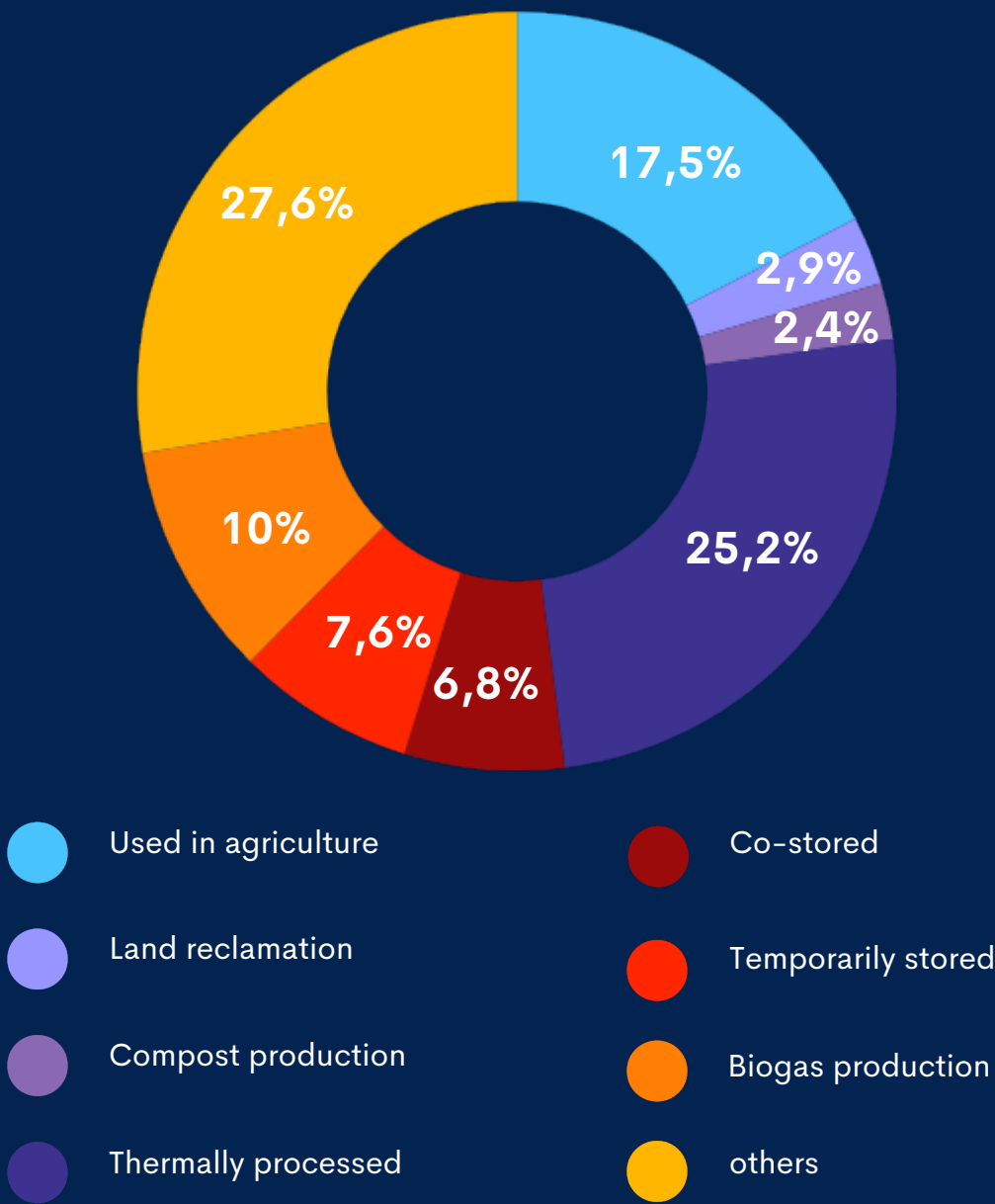
1 025 788 [t]

2021

1 012 436 [t]

2022

Applications of Sewage Sludge

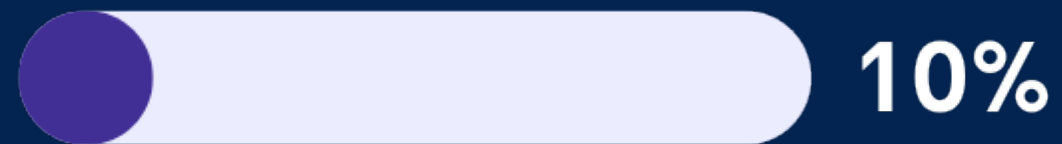


Unused potential of accumulated sewage sludge

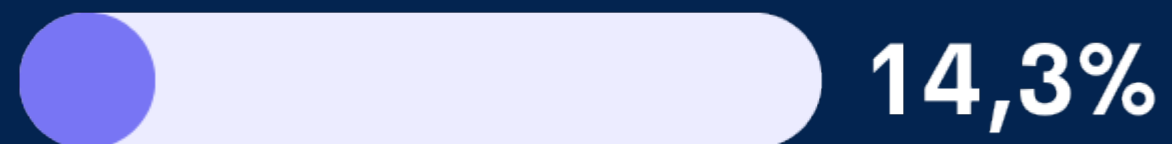
By the end of 2022, Poland had accumulated **6 096 546 tons** of sewage sludge, which initially had significant potential for biogas and biomethane production. However, over time, the energy potential of this sludge diminishes due to prolonged storage. Long-term storage leads to natural fermentation and the gradual release of methane into the atmosphere, reducing its energy value while simultaneously increasing greenhouse gas emissions.

The biomethane production potential from sewage sludge generated annually

From existing biogas installations at wastewater treatment plants



From stored and temporarily stockpiled sludge



From the remaining sludge generated annually

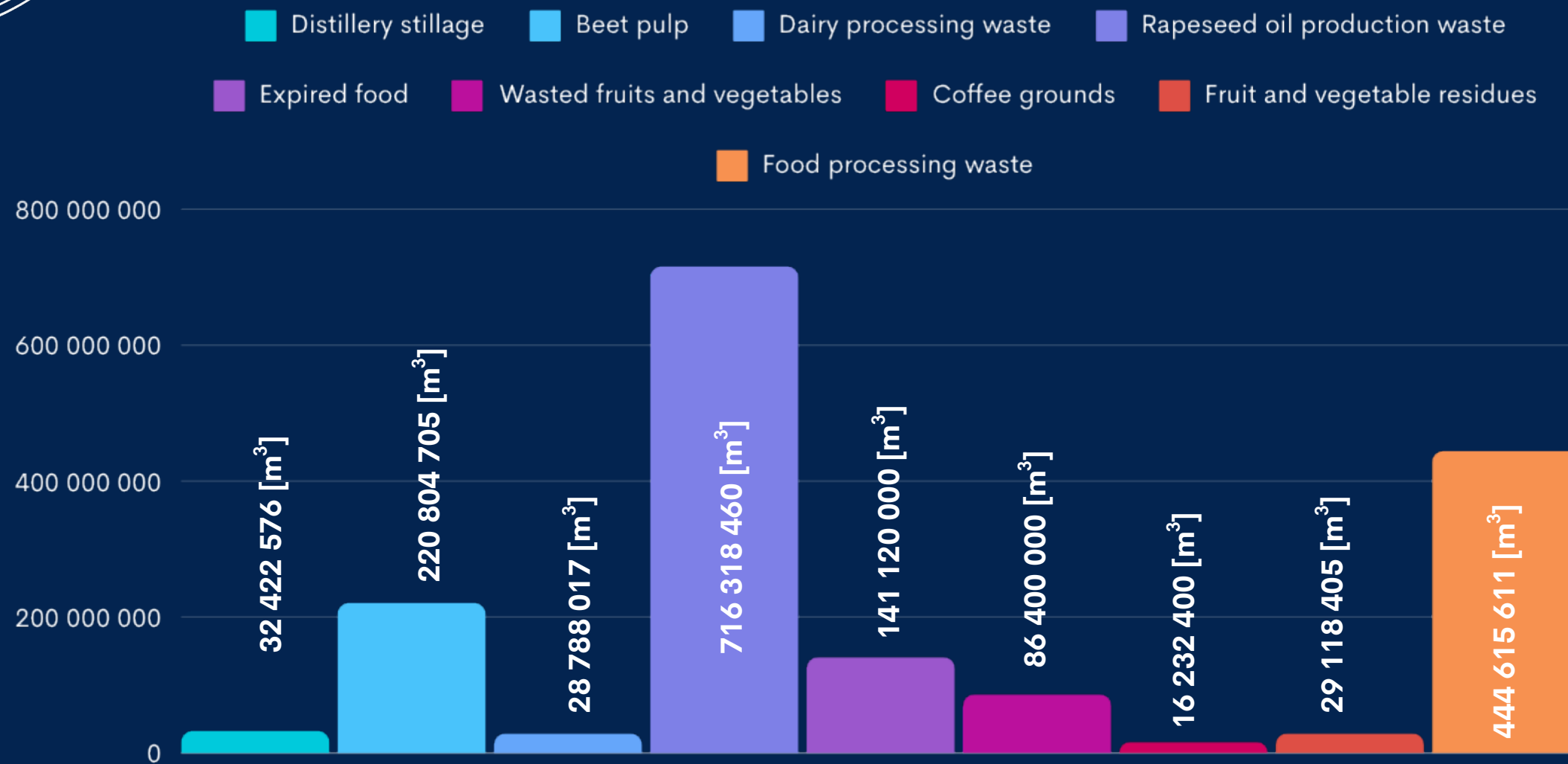


The total production potential from sewage sludge

227 798 100 m³

The biomethane production potential from agri-food sector waste

The biomethane production potential from food processing waste



The total biomethane production potential from livestock waste



The total biomethane production potential from straw



Biomethane production potential from agri-food sector waste*

6 627 059 171 m³

Straw



7 372 316 024 m³

livestock waste



1 686 820 174 m³

Food processing
waste



15 686 195 369 m³

Biomethane production
potential in the agri-food
sector

The final biomethane production potential from the agri-food sector was calculated by summing the potential from agri-food processing, livestock waste, and straw. The straw potential value was adjusted to account for the amount of straw already included in the manure, to avoid double counting.

*The biomethane production potential from dedicated energy crops was not considered.



ESTIMATED BIOMETHANE PRODUCTION POTENTIAL
IN POLAND

16 billion m³

REALISTIC BIOMETHANE PRODUCTION POTENTIAL
IN POLAND

9 billion m³

