**Demonstration plants**

SYSTEMIC will demonstrate circular solutions for biowaste at five large-scale demonstration plants in the EU.

<table>
<thead>
<tr>
<th>Demonstration plant</th>
<th>Products</th>
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</thead>
<tbody>
<tr>
<td>Groot Zevert, The Netherlands</td>
<td>Biogas&lt;br&gt;NK concentrate&lt;br&gt;Calcium phosphate struvite&lt;br&gt;Organic soil amendments</td>
</tr>
<tr>
<td>AM-Power, Belgium</td>
<td>Biogas&lt;br&gt;NK concentrate&lt;br&gt;Ammonia water&lt;br&gt;Organic fertiliser</td>
</tr>
<tr>
<td>Acqua &amp; Sole, Italy</td>
<td>Biogas&lt;br&gt;Ammonium sulphate&lt;br&gt;Organic fertilisers</td>
</tr>
<tr>
<td>RIKA - Friday’s, United Kingdom</td>
<td>Biogas&lt;br&gt;Ammonium sulphate&lt;br&gt;Organic fertiliser</td>
</tr>
<tr>
<td>GNS-Benas, Germany</td>
<td>Biogas&lt;br&gt;Ammonium sulphate&lt;br&gt;Calcium carbonate&lt;br&gt;Organic fertiliser</td>
</tr>
</tbody>
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Urgency to close nutrient cycles

In the present economy, natural resources are becoming scarce and valuable nutrients are being lost, leading to significant environmental damage.

Biowaste – animal manure, sewage sludge and food waste – can offer opportunities to reduce harmful impacts to soil, water and air through the recovery and re-use of nutrients, therefore closing the nutrient cycle.

The SYSTEMIC project works to facilitate the transition to a circular economy in Europe by demonstrating new approaches to nutrient recovery from biowaste.

Recovery of nutrients from biowaste is essential to sustaining our future food production while decreasing environmental impacts.

Treatment of biowaste

Within a circular economy, biowaste can be a source of energy, organic matter and nutrients, including: nitrogen, phosphorus and potassium. These can be used either as a direct substitute of fertilisers or as a resource for the production of mineral fertilisers. The remaining organic matter can be used to improve soils in the local region.

Such an approach to biowaste will:
- reduce the energy consumption and CO\(_2\) emissions associated with synthetic nitrogen production;
- reduce Europe’s dependency on external and finite phosphate reserves;
- reduce CO\(_2\) emissions of biowaste transport; and
- reduce the nutrient losses to water and air due to the increased nutrient use.

Towards a circular economy

SYSTEMIC demonstrates new approaches for the valorisation of biowaste into green energy, mineral resources, fertilisers and organic soil improvers at five large-scale biogas plants throughout Europe. These pioneering plants will be enhanced with novel nutrient-recovery technologies and play an important role in the testing of our new circular solutions.

The composition and quality of the recovered products will be tuned to meet the requirements of regional markets. This market-driven approach is needed to develop a viable and sustainable industry.

The wider uptake of our approaches and transition towards a circular economy will be stimulated through:
- creation of business opportunities for ten additional plants (outreach locations);
- dissemination of economic and environmental benefits;
- policy recommendations.

SYSTEMIC will boost the implementation of circular solutions for biowaste in Europe.