Why would an SME engage with the emerging bioeconomy in Hungary?

BENEFITS and DISADVANTAGES in SHORT- and LONG-TERM.

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We are at a crossroads

The transition to a sustainable and circular bioeconomy is inevitable. For some 200 years fossil fuels accelerated industrial production and global economic growth. Now it’s time to end the fossil fuel era because it has caused major problems for the climate, the environment and for mankind as a whole. We are at crossroads. Of course it is possible to wait until the world runs out of fossil resources like coal and oil, or to wait until oil prices will rise again. But then we’ll be too late.

If we look at the global development goals, a bioeconomy is at the heart of the solution. It would have an impact on climate change, food security, jobs, ecological balance and regional development.
MUSHROOM-BIOGAS COMPLEX AGRISYSTEM
Mushroom-biogas complex agrisystem at Pilze-Nagy Ltd.

- The Pilze-Nagy Ltd. is in the business of oyster mushroom substrate production, growing and trade. It is a family run enterprise, which started its operation in the vicinity of Kecskemét in the beginning of the 1990s.

- The company is the country largest oyster mushroom producer and exporter. The company is also considered as one of Europe’s largest oyster mushroom grower based on plant size and annual revenues.
Electric energy

Grid

Substrate production

Waste Heat

Oyster mushroom growing

Mushroom drying

Straw

Agricultural fields

Digestate (fertilizer)

10%

biogas

Heat

Electric energy
Multilevel utilization of energy stored in the straw: value generation in 5 levels

<table>
<thead>
<tr>
<th>Bioconversion rate</th>
<th>Technology</th>
<th>Product</th>
<th>Product type</th>
<th>Time dim.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomass with 100% energy</td>
<td>Cereal growing</td>
<td>Straw</td>
<td>Agr. By-product</td>
<td>&lt; 1 year</td>
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<tr>
<td>20%</td>
<td>Mushroom growing</td>
<td>Mushroom substrate</td>
<td>Food</td>
<td>~ 50-60 days</td>
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<tr>
<td>20%</td>
<td>Biogas production</td>
<td>Electricity</td>
<td>Renewable energy</td>
<td>~ 40-50 days</td>
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<tr>
<td></td>
<td></td>
<td>Heat – dried mushrooms</td>
<td>Food</td>
<td>~ 2-3 years</td>
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<tr>
<td>36% 24%</td>
<td>Soil preparation</td>
<td>Digestate</td>
<td>Fertilizer</td>
<td>&lt; 1 year</td>
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</table>
Circular bio-economy

In this complex mushroom growing agrisystem, biogas production and agricultural crop production work in close cooperation. All organic wastes from mushroom production (spent mushroom substrate) are utilized in a biogas plant in order to decrease the environmental footprint of the production and serve the sustainable economy.

It is a good example of circular economy:

- The initial feedstock (straw) is cycled,
- renewable energy production is involved,
- while fresh mushrooms are part of the healthy human diet,
- and finally value generation happens in all parts of the value chain.
SHORT OVERVIEW ON SITUATION OF HUNGARY’S SME SECTOR
Economical Potential

While Hungary’s SME sector provides 99.9% of number of all businesses, accounts only for more than half of value added in the business economy and around 70% of employment.

Source: SBA Fact Sheet – Hungary, 2015
### SMEs – basic figures

<table>
<thead>
<tr>
<th></th>
<th>Number of enterprises</th>
<th>Number of persons employed</th>
<th>Value added</th>
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<tr>
<td></td>
<td>Number</td>
<td>Share</td>
<td>Number</td>
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<tr>
<td>Micro</td>
<td>613241</td>
<td>95.3%</td>
<td>1041777</td>
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<tr>
<td>Small</td>
<td>26002</td>
<td>4.0%</td>
<td>495454</td>
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<tr>
<td>Medium-sized</td>
<td>4578</td>
<td>0.7%</td>
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<tr>
<td>TOTAL</td>
<td>643821</td>
<td>100%</td>
<td>1981107</td>
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</tbody>
</table>

Source: A kis és középvállalkozások jellemzői, KSH 2014. november
Weakness of the SME sector

- Average number of persons employed by SMEs is 3.
- Dominance of micro enterprises within the sector.
- Lack of highly qualified human resources.
- Innovative capacities of SMEs: the proportion of SMEs which introduced product or process innovation dropped from 18% in 2004 to less than 13% in 2012.
- Percentage of SMEs that offer green products or services is much lower than the EU average.
Hungary possesses excellent agro-ecological conditions for competitive production of agricultural products and biomass.
Benefits in long-term

Acquisition of new knowledges, competences:

- Development of new primary production systems.
- Development of new dedicated crops, or exploration of alternative uses.
- Making the most efficient sustainable use of available agricultural land.
- New biomass production: algae, energy crops, etc.
- Increased circularity.
- Harmonised cooperation among research, agriculture and biotechnology.
Risks

Creating demand in the number-one trigger for a thriving bioeconomy in the EU. At the current low oil price, the bioeconomy has little chance to emerge.

Bioeconomy requires flexibility: qualified labours, sources of capital, increased innovations, ongoing development, new management strategies, new product range, etc.

The today’s SME sector does not have all the competences to easily survive during the transition from our existing economy to a low-carbon economy.
Bioeconomy is the next wave of the global economy, producing growth and prosperity.

It is crucial to create an inspirational business environment in which SME sector can be mobilized to lead up to new challenges.
Thank you for your kind attention.