Processing agricultural waste to ensure energy independence Rikipal company

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"Supporting the development of bio-based economy partnerships in the Danube Region through a triple-helix approach"

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Our Company started its activity in 2009. We are part of a holding company which has been carrying out its activity for more than 15 years. Manufacturing and selling wooden packages in such countries as Russia, Latvia, Ukraine and Belarus. We work in accordance with the highest standards in the field, established and improved during many years. The range of packaging materials offered by RIKIPAL fully complies with the market trends and requirements.

Besides the core business, the company has business in agriculture - walnuts and almonds in the system BIO.

Manager General: Cernouțan Alexandru
General description of the project

- Moldova is dependent on energy imports;
- Over 95% of energy needs from imports is assured;
- Dependence on external energy sources has led to the steady increase in their prices and accumulating large debts to external supplier;
- The energy sector is vital for economic development of the country.
- Moldova has a great potential for producing energy from renewable sources that is yet untapped.
- The most abundant alternative energy source is biomass in Moldova.
- This will lead to partial ensure energy independence of enterprise, energy sustainability project over a long period and the following fact decreasing energy costs for the company.
## EQUIPOS PARA LA PREPARACIÓN DE LA BIOMASA

- **Fabricación de astillas**
  - Trituradora

- **Fabricación de pellets**
  - Molino de martillos
  - Peletizadora

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### Materiales de Biomasa

- Bagasse
- Bamboo Waste
- Bark
- Coco Husk
- Coconut shell
- Corn Cob
- Corn Stalk
- Cotton Straw
- Empty Fruit Bunch (EFB)
- Energy Crops
- Forest residue
- Manure
- Palm Fiber
- Palm Kernel Shell
- Paper Mill Waste
- Peat
- RDF pellets
- Rice Husk
- Rice Straw
- Saw Dust
- Wheat Straw
- Willow
- Wood Chips
- Wood Waste
Flail Mower Collector KOALA PROFESSIONAL

Rear mounted Flail Collection Mower with catcher lift for 25 tractor HP.

The new flail mower KOALA PROFESSIONAL is a small machine to be fitted to 25HP compact tractors with no lower weight than 900 kg. This flail mower uses the patented flails for high grass cutting performance with verticut operation. Now with this high collector system contractors, greenkeepers and end users.
Small Pellet Mill

- **Biomass small pellet mill** is a kind of special equipment which takes sawdust, palm, peanut shell and other crops as raw materials and compressed them into pellets. The pellets produced by this kind of equipment have big density, high heat value, combustion resistance. Due to its small volume, simple operation, it can be used for making pellets at home.

**Characters of biomass small pellet mill**
1. Scientific and reasonable structure and design, high production and low energy consumption.
2. It can adapt to different raw materials and the finished pellets have high hardness and smooth surface.
3. Simple operation and maintaining, safety and reliable performance.
4. The machine was founded integrally with beautiful surface, solid structure and long service life.
What are the advantages for consumers if used as briquettes and pellets instead of wood or coal?

- Can be purchased - weekly, without the need for warehouse and storage facilities occupy very small;
- Ignite very quickly and very easily;
- Simple handling, easy and clean;
- Using briquettes and pellets avoid forest destruction;
- Very little ash in a ratio of 1.5%;
- Burning appliances;
- Their low cost compared to using natural gas, wood, coal, etc;
- They calorific much higher than wood (but less than coal);
- They are cheaper than coal;
- Small storage volume;
- Ecological - 100%.
The advantages of biomass

- reducing energy dependence on oil and gas;
- agricultural by-products and organic waste recovered;
- stimulate industries in the social sector;
- It gives farmers access to the energy market.
Coverage of the heat the company Rikipal

- At the moment, the main task in the Company 'Rikipal "is providing the necessary heating from biomass During the heating season, namely from existing agricultural waste.

- Subjected to heating buildings in the cold season are:
  - Office with an area of 280 m²;
  - Warehouse with an area of 400 m².

- In accordance with current standards for thermal comfort inside normally during the heating season of 183 days for the surface buildings shall correspond total value of consumption of thermal energy required about 440 kWh / year.
The return on investment from this project

When determining the payback on investment in technical equipment necessary for the whole technological process of pelletizing agricultural waste which includes collecting, chopping and pressing this waste, resulting in the final product pellet biomass, account was taken of the investment cost and expenses operating.

**Duration payback**

<table>
<thead>
<tr>
<th>Descriptions</th>
<th>Unit of measurement</th>
<th>The value</th>
</tr>
</thead>
<tbody>
<tr>
<td>The total amount of biomass pellet</td>
<td>t/year</td>
<td>39,5</td>
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<tr>
<td>Annual gross profits from the sale of pellets</td>
<td>lei / year</td>
<td>94 500</td>
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<tr>
<td>Annual operating expenses</td>
<td>lei / year</td>
<td>74 824</td>
</tr>
<tr>
<td>Net profit from the sale of pellets annually</td>
<td>lei/year</td>
<td>40 136</td>
</tr>
<tr>
<td>The total investment</td>
<td>lei</td>
<td>99 060</td>
</tr>
<tr>
<td>Duration payback</td>
<td>years</td>
<td>2,47</td>
</tr>
</tbody>
</table>
Conclusion

To ensure energy independence of the company «Rikipal» was examined proposal to use agricultural waste such as straw, nut shells, almond shells and branches in orchards. These agricultural wastes to be passed through the pelletization. This process consists of the following steps; collection of agricultural waste shredding and granulating then pressed-pellet biomass final product.

The project analyzed the appropriateness of the procurement of equipment for the production of pellets both technically and economically. So according to the survey results of the analysis and calculations are as follows:
- The potential annual available biomass pellets from agricultural waste is about 39.5 tons, which is growing;
- Total investment in the feasibility study and the technical equipment is 99 060 lei;
- During the payback is 2.47 years;
- The total annual quantity of pellet biomass needed to heat buildings undertaking is 9.7 tonnes;
- Ensuring the independence of primary fuel pellet biomass is 100%.
- Reduce greenhouse gas greenhouse warming in the transition from natural gas to biomass heating pellets own 100%. 
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Thank you for your attention!