BBioNets

Boosting the adoption of Bio-Based Technologies

Cross-Fertilisation Meetings

Bio-Based Practices on Farms & Forests

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Two examples from ProPelety experience in the effective using of wood and agricultural biomass in the Czech Republic

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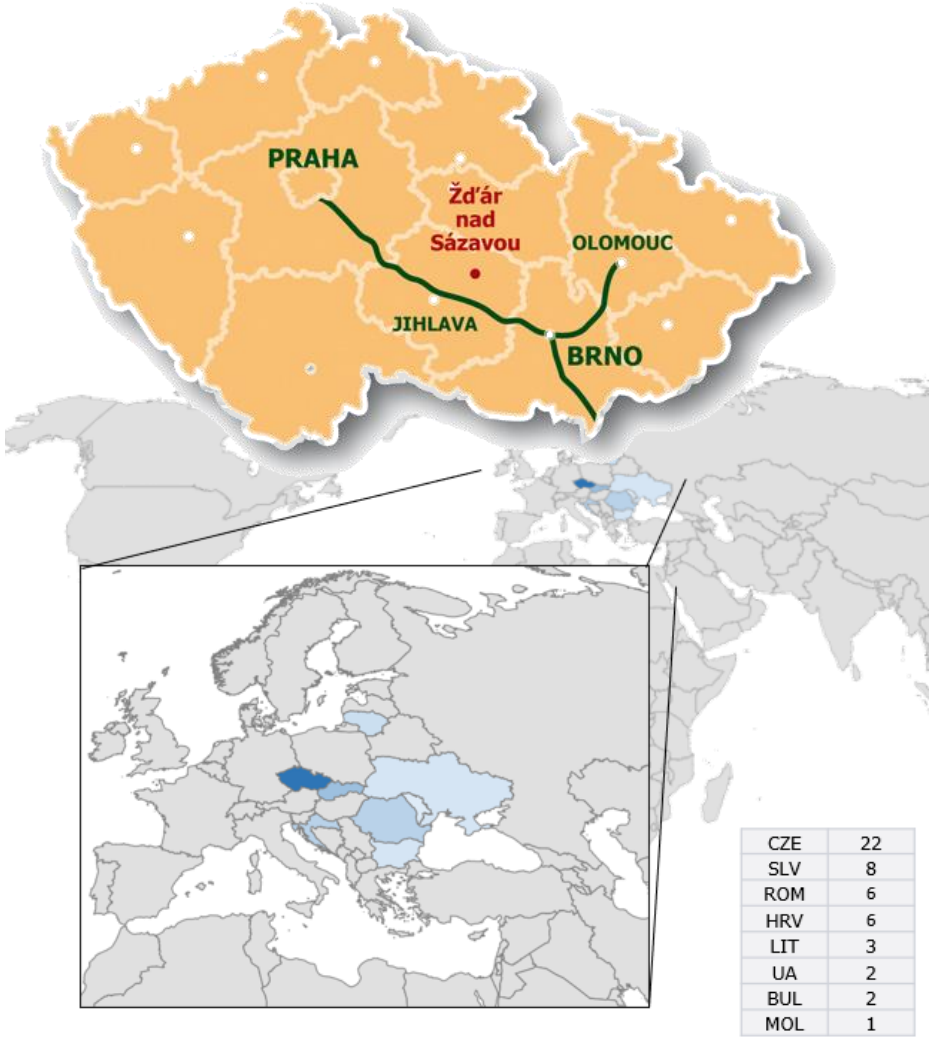
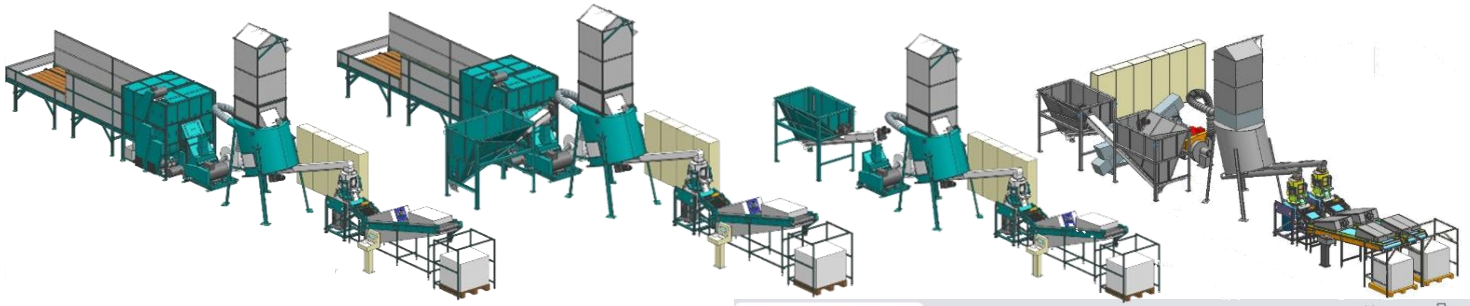
About ProPelety Ltd. company
Basic information

Žďár nad Sázavou, Czech Republic
www.propelety.cz

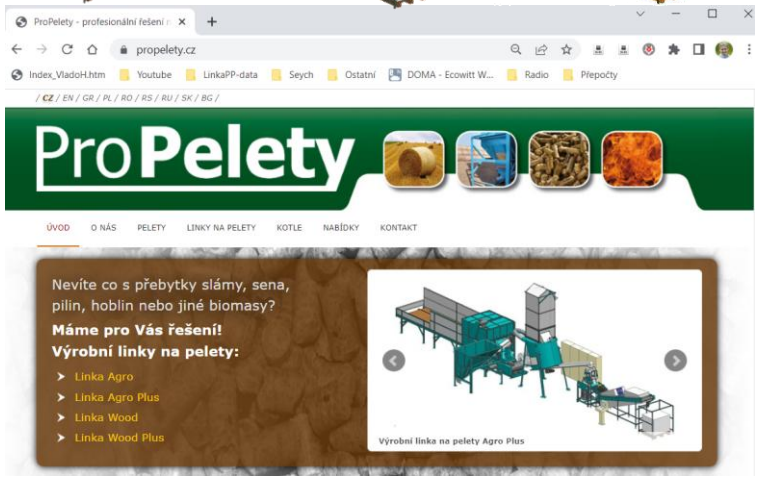


CZE	22
SLV	8
ROM	6
HRV	6
LIT	3
UA	2
BUL	2
MOL	1

- **ProPelety Ltd. develops, manufactures, supplies and services of midle-size capacity modular production lines for the processing of agromass, dendromass and waste to form of pellet for their using on the trade as FEEDING, BEDDING, FERTILAZER and FUEL**
- **ProPelety Ltd. have supplied almost 50 lines since 2010 with a total value of more than 10 million EUR**



- **ProPelety Competence**
  - Marketing + pre-sales consulting
  - Comprehensive supply of pellet production lines by the own production documentation
  - Warranty and post-warranty service
  - Pelletizing services on production line at the own demo center



ProPelety Experiences and Background
Development demo center at Žďář nad Sázavou, Czech Rep.

- ProPelety demo center is an operational base for the development of pelletizing machines
- It includes a unique test operation of ProPelety prototype pelletizing line
- The output is a proprietary database of results from more than 300 pelletization tests for different types of materials



ProPelety Experiences
Pellet production from different material types

- **Pellets from dry plant agro-materials**
  - wheat straw
  - rapeseed straw
  - hay
  - alfalfa straw
  - miscanthus
  - rice straw
  - etc.
- **Pellets from dry sawdust, wood shavings or micro wood chips**
- **Pellets from dried compost with additives**
- **Pellets from dried slurry or manure**

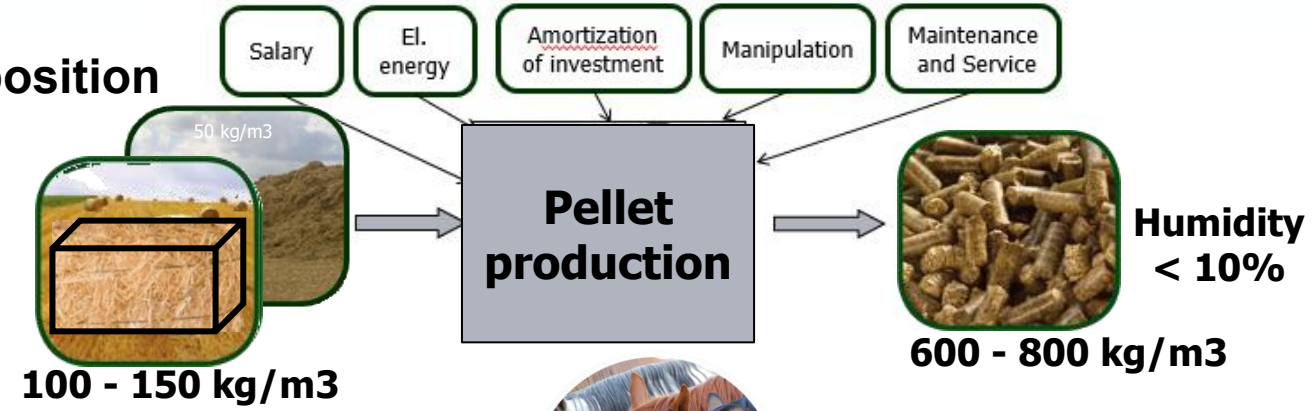


- **Pellets from sewage sludge**
- **Pellets from shreded electro waste**
- **Pellets from paper and polyethylene waste**
- **Pellets from TAP/RDF and sorted municipal or industrial waste**



Wide range of pellet using from vegetable or organic materials

Using depends on the composition and quality of input material



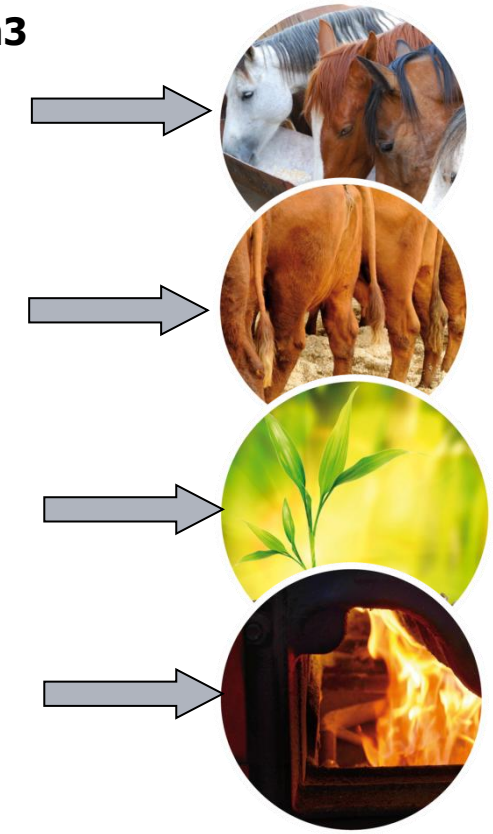
Humidity cca 14%

100 - 150 kg/m3

Humidity < 10%

600 - 800 kg/m3

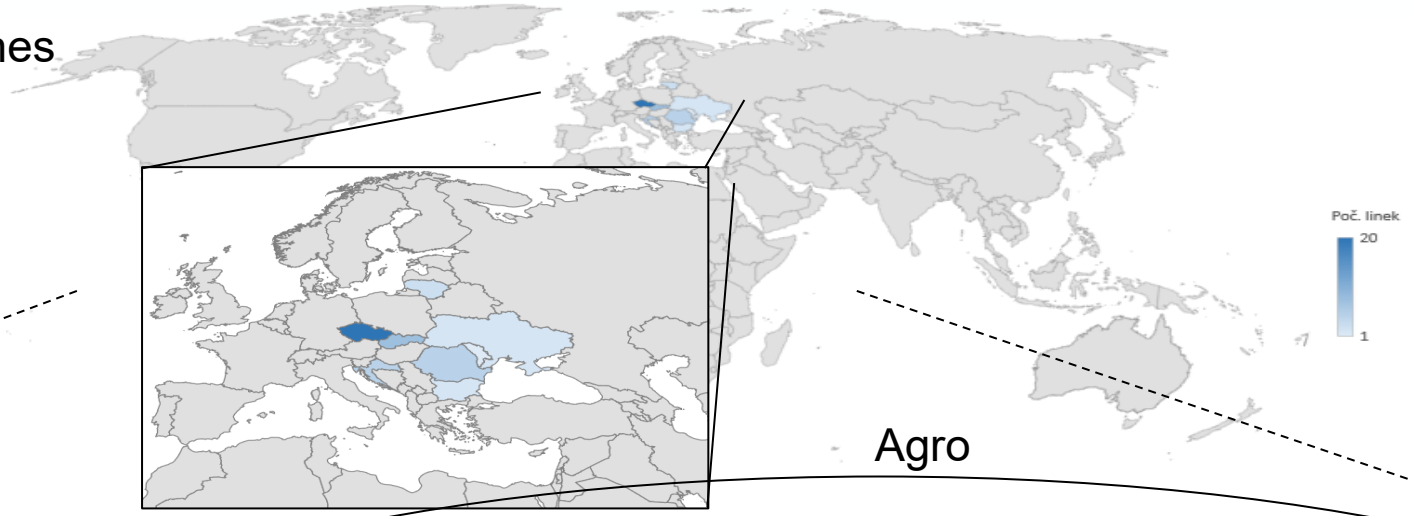
- **Nutritional value**
  - depending on the composition of the feedstock
- **Absorption value**
  - Dryness
- **Composition of nutrients**
  - The quality depending on the feed composition
- **Calorific value**
  - Dryness of residual biomass



- **Feeding**
  - Dispensability
  - Simple storage and handling
- **Bedding**
  - High moisture absorption (4-5× compared to straw)
  - Sterile - no germs
- **Fertilizer**
  - natural nutrients
  - gradual supplying into the soil
- **Fuel**
  - The calorific value comparable with coal (14-17 MJ / kg)
  - High efficiency of combustion in boilers used for pellets

ProPelety customer experiences
Efficient Woody and Agro Biomass Utilisation

50 ProPelety pellet production lines
delivered to 8 countries
see www.propelety.com



Woody

Agro

Customers who produce
Wood pellets
from surpluses and residues
(wood or MDF sawdust,
wood shavings and short
length wood chips, ect.)

Customers who produce
Agro pellets
from surpluses and residues
(straw, hay, husks, residues from cleaning
of agricultural materials, ect.)

Experience No.1

Experience No.2

Experience No.1 - Efficient Woody Biomass Utilisation ISOTRA Ltd., Opava, Czech Republic





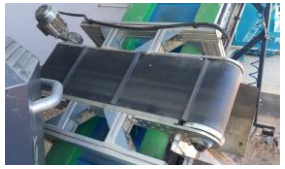


- **Supplier of shading technology** (blinds, roller blinds, sunshades, marquees, pergolas, insect screen nets) to more than 45 countries worldwide
- 600 employees, 13 buildings in Opava and Bruntál
- central gas heating of buildings was replaced by 5 local pellet heating room in 2005-2007 with a total consumption of 600 tons/year
- **Pellet production from dry wood processing residues was installed in 2024. The total capacity is 200 tons/year, covering 33% of the company's total wood pellet consumption.**

Pellet production process::

- Input materials: **damaged or unusable wooden pallets, wood residues and other damaged wooden packages with a moisture content up to 14% and dimensions from 10 to 100 cm.**
- 1st level of crushing into G30 micro-chips (**ROBUST 90 crusher**) incl. magnetic metal separation
- 2dn level of crushing into sawdust, homogenization, pellet pressing, dust removal, cooling and storage of pellets in big bags (by line **ProPelety Wood Basic pellet line with upgrade ready to Duo**)
- **pellet diameter 6 mm**, calorific value 16.72 MJ/kg (approx. 4644 Wt/kg)
- storage and distribution to local heating rooms at ISOTRA company
- **2 operators per shift** – responsible for preparing input material for the 1st level of crushing, operating and servicing production line technologies, handling Big Bags











Experience No.1 - Efficient Woody Biomass Utilisation ISOTRA Ltd., Opava, Czech Republic





Project Advantages:

- **Cost reduction for waste elimination** from high value-added wooden product processing = approx. 23.000, EUR/year
- **Cost reduction for fuel pellet purchasing** = approx. 33.000,- EUR/year = production of pellets is 57% cheaper than purchasing them
- **Local production, local consumption** = minimal transport costs, environmentally friendly
- **Local employment**

Project Disadvantages:

- **Investment into production technology** = approx. 285.0000 (crusher + pellet line + building modifications)
- **Electrics energy for pellet production** = approx. 115 watts of electricity (We) per 1 kg of produced pellets
- **Legislation** – it is necessary to meet the legal regulations and requirements of local authorities

General benefits of this solution:

- **Increasing independence from gas suppliers**
- **Utilization of waste from wood production with added value** for internal heating use
- **Heating cost savings** are approx. 56.000 EUR/year = ROI 5 years







watch https://www.propelety.cz/index.php?str=galerie&folder=woodbase&album=02_OPAV_ProPelety_Wood_Basic

Experience No.2 - Efficient Woody and Agro Biomass Utilisation
AZPELLETS – Zdeněk Pěč, Bohostice, Czech Republic











- Since 2002, Mr. Zdeněk Pěč has been operating a municipal gas **heating plant (7,000 GJ/year)** for neighbourhood heating in the Prague-Háje
- In 2022, a decision was made to switch from gas to alternative biomass due to gas price instability, the energy crisis, and the war in Ukraine
- In 2023, a boiler for heating production from alternative pellets and wood chips was installed (**Multi-bio 800 kW**)
- In 2024, production of alternative pellets began (ProPelety line) at the production and storage facility in Bohostice (70 km south of Prague)
- In 2025, the capacity for **producing alternative pellets as FUEL during the heating season** was increased. **During the rest of the year**, **the line produces agro pellets as FEEDING or BEDDING for animal farmers** (horses, goats, sheep, rabbits, etc.) under the brand „AZ Pellets - Bohostické pelety"

Pellet production process:

- Input material for alternative pellets: **local agricultural surpluses and residues (bales of hay, straw) and waste wood from forestry (logs, branches, wood chips)** which can be stored in dry and ventilated storage halls in Bohostice (capacity 15.000 m²) = i.e. a 2-year stock for pellet production
- **Mobile wood chipper** (**GREENMECH**) for the production of **wood microchips of size G30**
- **Line for the production of mixed alternative pellets (ProPelety Agro Plus Power Dou) in a ratio of 50% agro + 50% wood**
- **Pellet diameter 8 mm**, calorific value 15.95 MJ/kg (approx. 4430 Wt/kg) for heating plants or boiler rooms that have the appropriate technology for burning alternative pellets
- **All technologies are operated by 3 operators** who handle input raw materials, do control, service and maintenance of machines, do weighing and storage of pellets in shipping packages (Big Bags, 5 and 15 kg bags).



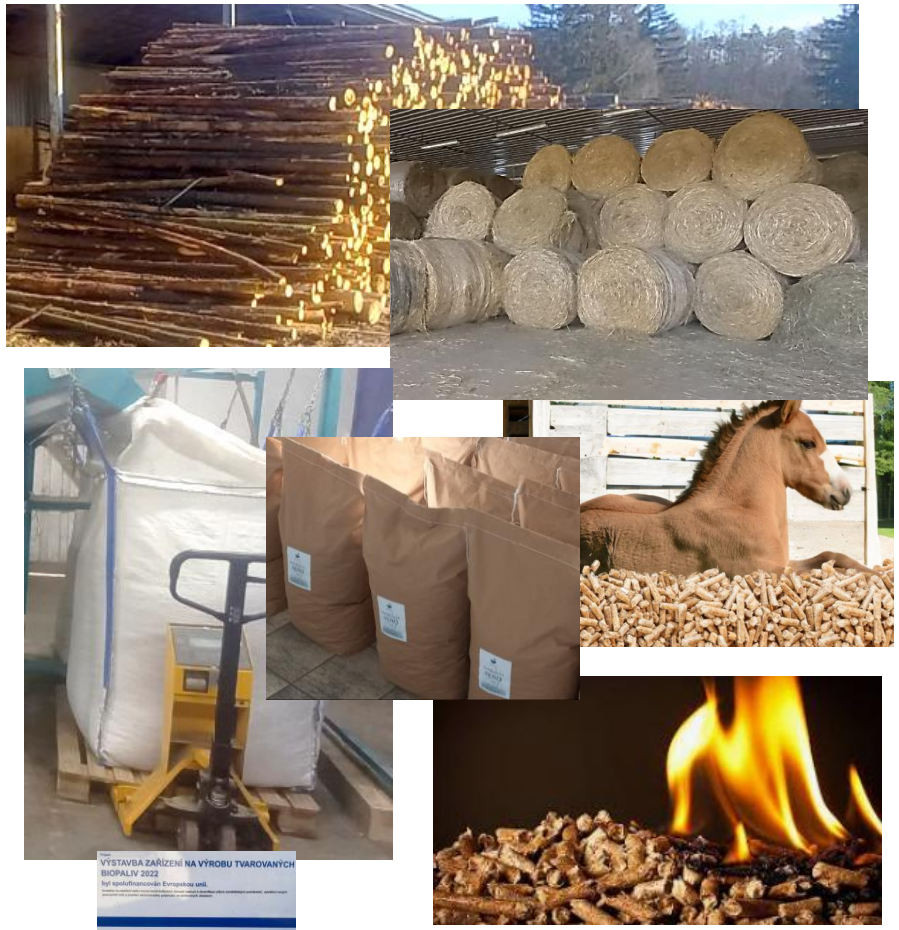




Experience No.2 - Efficient Woody and Agro Biomass Utilisation
AZPELLETS – Zdeněk Pěč, Bohostice, Czech Republic



- If FUEL is not produced, then 8 mm agro pellets are produced as FEEDING and BEDDING for animal farmers. Pellets are packaged in paper bags (3 and 15 kg) or Big Bags (up to 600 kg) – see www.azpellets.cz
- The owner, Mr. Zdeněk Pěč, plans to use the roof space of the halls in his production and storage facility to install a photovoltaic power plant that would cover the electricity consumption of the overall facility (total peak consumption is approximately 270 kW/h)



Project Advantages:

- **Diversification** – fuel base for the operation of the heating plant in Prague-Háje = alternative pellets to be burned at similar operating costs as gas
- **Independence** – from fluctuations in imported gas prices
- **Low production costs** – the production cost of alternative pellets is 0,225 EUR/kg (i.e., at the level of gas).
- **Low energy consumption** - in the production of alternative mixed pellets = approx. 150 W/kg
- **Efficiency** – i.e. the ratio of energy used to produce alternative pellets vs. energy obtained by burning them is 1:30
- **Energy accumulation** – storing of residual and surplus vegetable biomass for the winter period is a natural way how to accumulate energy and use it when needed
- **Sustainability – environmentally friendly**, CO2-neutral solution, utilization of local cheap surplus and residual agricultural and forest biomass for the production of high-quality fuel
- **Local employment**

Project Disadvantages:

- **Investment in production technology** – 620.000,- EUR (wood chipper + pellet line + handling equipment + building modifications) with a EU grant 187.000,- EUR (Programme for Rural Development by Ministry of Agriculture)
- **Emissions from biomass combustion** - are at the level which is specified in the protocol of the fuel certification
- **Legislation** – authorities have no experience with actively supporting the combustion of alternative biomass (we face clientelism and preference for other renewable energy sources that do not have storage capabilities)

General benefits of this solution:

- **Independence** from gas suppliers
- **Cost comparable to gas-based heat production**
- **Stability of natural material availability with the advantage of energy accumulation** by using cheap local residual and surplus from agricultural and wood biomass

watch https://www.propelety.cz/index.php?str=galerie&folder=agroplus&album=13_BOHO_ProPelety_Agro_Plus_Dou_Power

Thank you!

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www.bbionets.eu

