



Principles & backgrounds of agrarian solid biofuels certification.

Technical peculiarities of agrobiomass refining

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Workshop

Use of agricultural residues for bioenergy

Certification body has the scope of accreditation "Solid biofuels", accredited according to European Cooperation for Accreditation (EA), listed standards include EN 14961, planned to list also ISO EN 17225



Key definition: BIOMASS

Biomass - a mixture of organic polymers with a renewable recycling

1. Macrostructure of biomass is multilevel, capillary-porous.
2. Biomass - a complex set of biological polymers and water.

Researches has led us to the understanding the essence of the problems encountered in its processing



Standartisation & certification

Standards are regulatory documents that establish rules, guidelines and specifications relating to the activities and results. They may contain requirements for terminology, symbols, packaging, marking and / or labels that apply to a specific product, process or service.

Certification (English. Certification) - procedure by which a particular body in the established order, documentally certifies the conformity of products, quality systems, quality management systems, environmental management systems, personnel to the established by legislation or market requirements.



Tasks of ENplus certification

1. Defining classes of quality and performance properties of the pellets.
2. Specifications of the internal quality control (equipment and processes, skills, documented responsibilities, internal quality control).
3. Verification and validation of compliance of wood pellets, their manufacture, logistics (warehouses to final consumers) and quality management to the European standards and requirements.
4. The certification and external monitoring, issuance and cancellation of licenses, complaints.
5. Labeling and the use of an ENplus identification number (ID).



TCI

ENplus is based on EN-14961-2

European Pellet Council



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graph TD; EPC[European Pellet Council] --> SB[Certification bodies]; EPC --> IB[Inspectional bodies]; EPC --> TL[Testing labs]; SB --> ENplusA1[EN plus-A1]; SB --> ENplusA2[EN plus-A2]; SB --> ENB[EN-B]; ENplusA1 --> HQP[Highest quality for private use]; ENplusA2 --> SC[Second class for municipal boilers]; ENB --> IP[Industrial pellets];
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Certification bodies

Inspectional bodies

Testing labs

EN plus-A1

EN plus-A2

EN-B

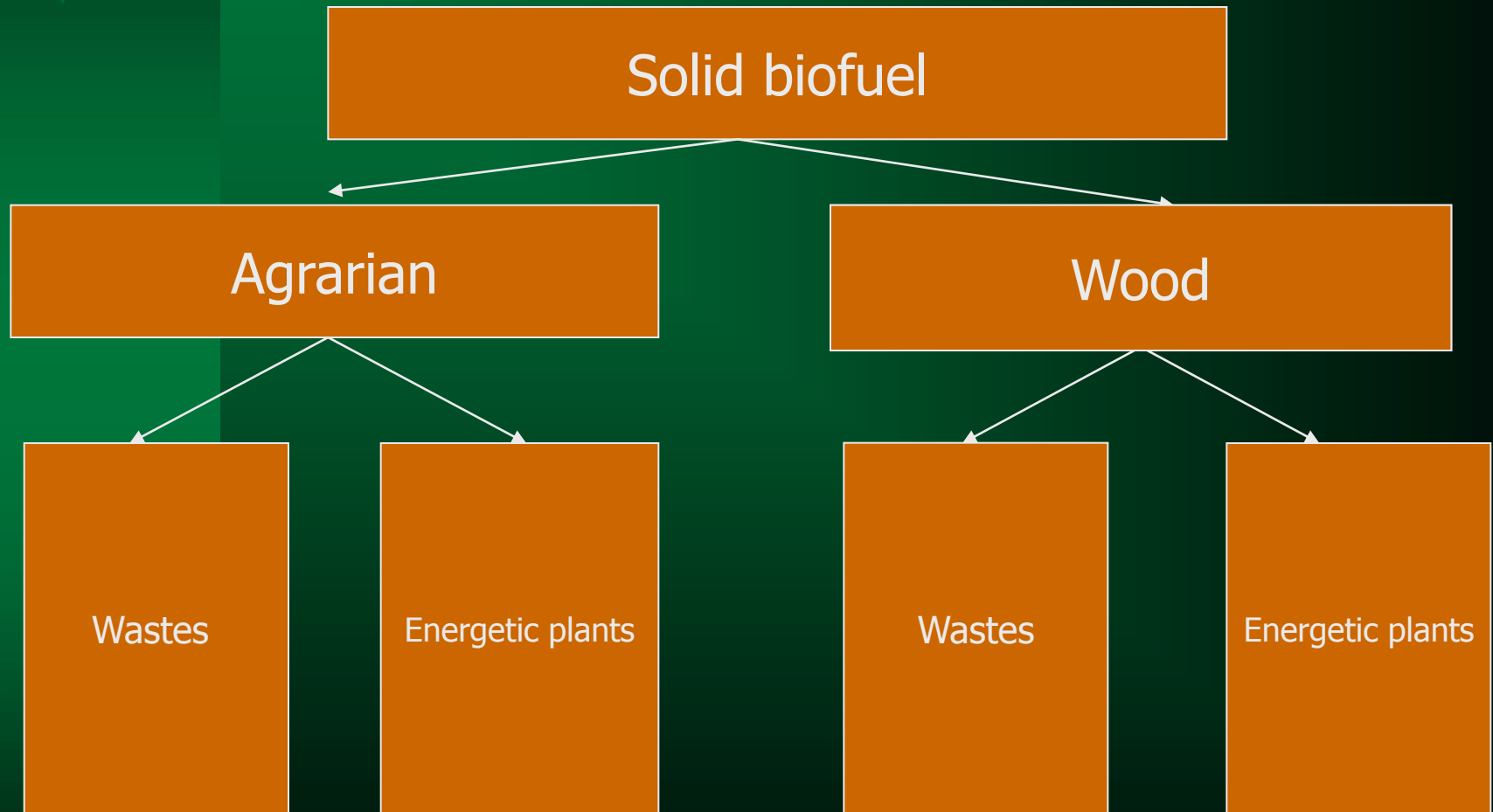
Highest quality
for private use

Second class
for municipal boilers

Industrial pellets

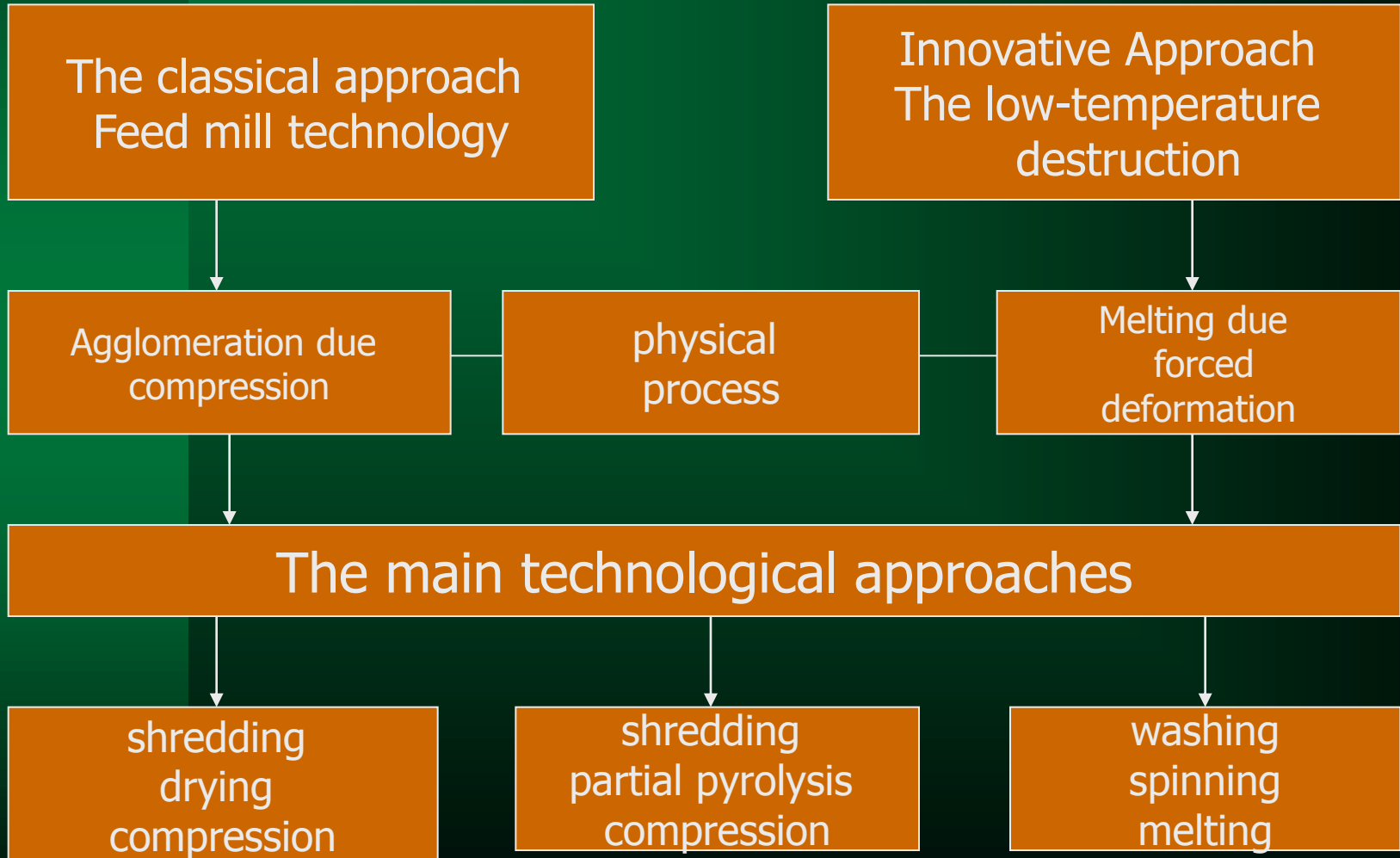


Classification of raw materials for solid biofuels





Processing of biomass into solid fuel





Successful projects

Currently in Ukraine can be realized only those projects in which the following conditions hold:

1. Customer is the owner of the raw material;
2. Biomass is produced as a waste product from the primary production;
3. The resulting fuel is needed to solve own energy and technological problems;
4. Customer himself able to finance the project.



Bioenergy - Bio Refining

With the high added value on the basis of complex deep-processing of biomass resources

directly in the region grow.

Bioenergy - the problems of development

- **Kinetics of reproduction (increase) and the specific productivity per unit of land area (plantations) or water (microalgae);**
- **The complexity of the use of biomass;**
- **Integrated use of agro- resources;**
- **Depletion of soils under intensive agrarian works and plantational afforestation;**
- **Energy efficiency**



Advantages of bioenergy

- **Energy Efficiency**
- **transportability**
- **Safety and stability**
- **Transformation into electricity**
- **The transformation of wood into motor fuel**
- **Compatible with fossil fuels**
- **Compatibility with existing energy systems and infrastructure**
- **Ability to use automated autonomous heating systems of small and average size**



Product redistribution of biomass in the energy direction



Granulation tasks

1. Change in transportation logistics;
2. Change storage logistics;
3. Standardization of solid fuel parameters.

Types of solid biofuels

Firewood wet

Firewood dry

Firewood torrefied

Charcoal

Wood chips

Wood pellets/ briquettes



Biomass refining market

Production of pellets and briquettes in Ukraine increases in small pace.

The main problem - development of the domestic pellet consumption market for municipal and individual boilers.

Continuously increasing use of pellets (granules) due to their high energy content (3-5 times higher than that of wood chips).

To produce 1 GWh of energy must be 385 cubic meters of pellets or 1200-1800 of biomass crushed

Production and use of pellets is based on a number of scientific principles to ensure high efficiency (up to 95-97%).

Biomass is a very promising sector that will increase the profitability of the agricultural and forestry sector several times. Development of this industry depends on the creation of **INTERNAL MARKET** of biomass consumption with deep level of processing.



The main problem of untreated biomass

Porosity and humidity

In contrast to the original biomass, having natural due to capillary-porous structure humidity of 30-50%, the pellets have a moisture of 6-8%.

The decision to obtain thermal energy is the area of the two-stage combustion

Burning of pellets is carried out in two stages - gasification under controlled oxygen deficiency (λ sensors) and vortex combustion of gaseous products in mixture with secondary air.



Thank you for your
attention!

Questions are welcomed!

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