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Pellet Market News Worldwide

Hungary: raw material quality as a crucial factor

World Sustainable Energy Days
28 February – 2 March 2018, Wels/Austria

MTA SZTAKI
Hungarian Academy of Sciences
Computer and Automation Research Institute

Dr. Zsolt János Viharos
Senior research fellow
Institute for Computer Science and Control (SZTAKI) Hungarian Academy of Sciences (MTA), Budapest, Hungary;
John von Neumann University, Faculty of Economics and Business, Kecskemét, Hungary

Krisztina Konrád
Ph.D. student
University of Sopron, Simonyi Károly Faculty of Engineering, Wood Sciences and Applied Arts, Sopron, Hungary;
University of Pannonia, Faculty of Engineering, Institute of Mechatronics Instruction and Research, Zalaegerszeg, Hungary

Member of the IEEE (Institute of Electrical and Electronics Engineers), No.: 93787359

Member of the International Society of Applied Intelligence /ISAI/

President of the Hungarian National IMEKO Committee of the International Measurement Confederation (IMEKO).

Scientific secretary of the TC10 on Technical Diagnostics of the International Measurement Confederation (IMEKO).

Member of the board for the Production Systems section of the Scientific Society for Mechanical Engineering (GTE).

Member of the Computer and Automation Committee of the public body of the Hungarian Academy of Sciences (MTA).

Marc 1, 2018

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Emberi Erőforrások Minisztériuma
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Supported by the ÚNKP-17-3-III New National Excellence Program Of The Ministry Of Human Capacities and by the European Commission through the H2020 project EPIC under grant No. 739592

MTA SZTAKI – Introduction

- Established in 1964
- EU Centre of Excellence in IT, Computer Science and Control
- Basic and applied research
- Contract-based R&Đ&I activity mainly on complex systems, turnkey realizations
- Transferring up-to-date results to industry and universities



- **Basic research**
  - Computer science
  - Systems- and control theory
  - Engineering and business intelligence
  - Machine perception and human-computer interaction
- **Applied research and innovation**
  - Vehicles and transportation systems
  - Production informatics and logistics
  - Energy and sustainable development
  - Security and surveillance
  - Networking systems and services, distributed computing

Key figures

- Budget
  - 11 MEuros/year
  - ~30% basic funding
- Staff
  - ~220 (FTE)
  - ~100 with scientific degree
  - 7 members of the Hungarian Academy of Sciences
  - 15 with DSc degree
  - 70+ with PhD degree
  - ~15 members in Hungarian Academy of Engineering

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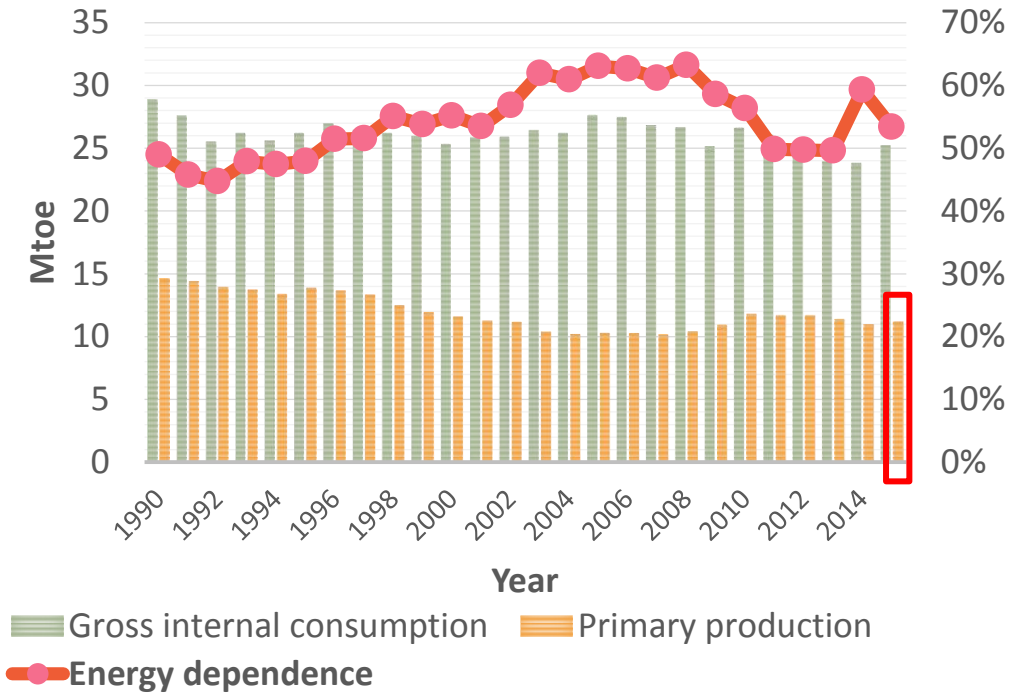
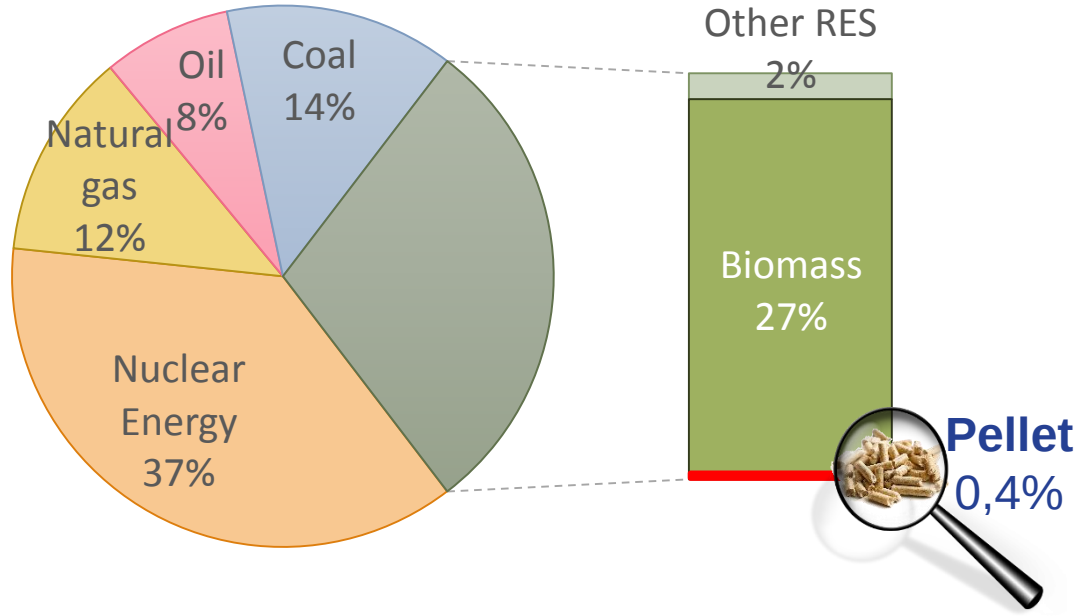
Energy situation and trends in Hungary



- **Significant deficit** between production and consumption
- **Strong energy dependence**
- Hungary energy consumption is **~1.3% of Europe consumption**
- Hungary energy production is **~1.0% of Europe production**



- **RES are increasing large-scale** in total energy production
- **Biomass pivotal in RES**
- Number of small and medium capacity **plants are growing steadily**
- Total pellet production is **0,7% of Europe production**
- **Wood pellets** for **export, agripellets** for **local use**

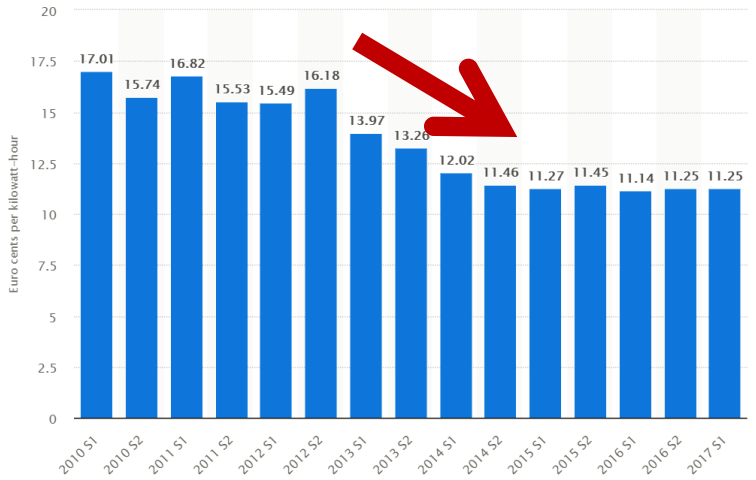
Influencing factors of the Hungarian pellet market

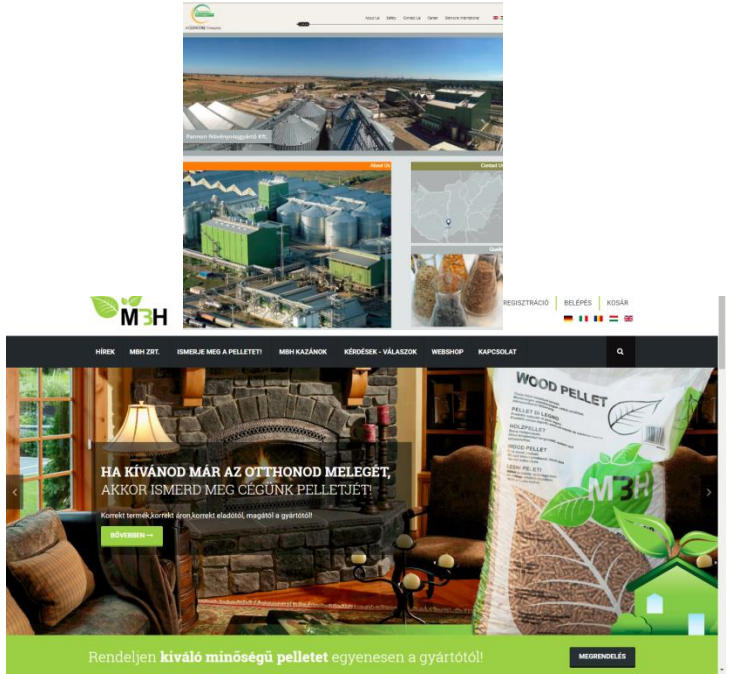
- From 2013 the Hungarian government introduced **financial support for the utility rate**
  - In 2013, regulated prices for household consumers in the *gas and electricity* sector were cut by *20%*
  - and further decreases were announced for 2014 (electricity by 5.7% and gas by 6.5%).

  →The relative cost advantage of pellet was eliminated

  + Pellet based heating requires higher investment than others, e.g. gas

  →Resulted decreasing pellet production and usage

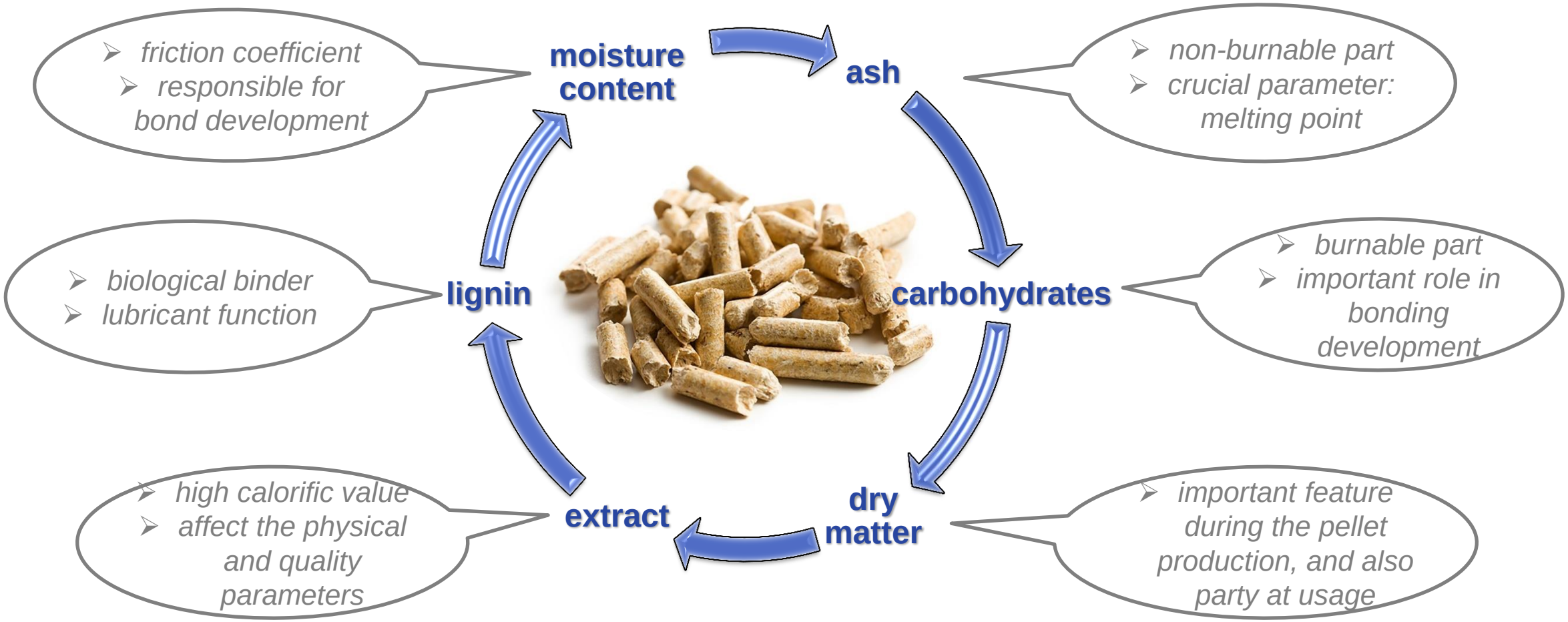




- **The production of agripellets is slightly increasing**
  - **To get raw material is becoming more and more difficult**
    - Recycling inside agriculture
  - Typically, companies active in agriculture establish pellet production as a side-activity near their main business
    - Mainly for the own use
  - The control of such pellet production is much more difficult

Key raw material parameters of pellets

The pelletability and combustion properties are influenced by the raw material features, too.
Knowledge on these parameters is crucial for the regulation of the entire production process, furthermore, it may define also the quality of finished product.



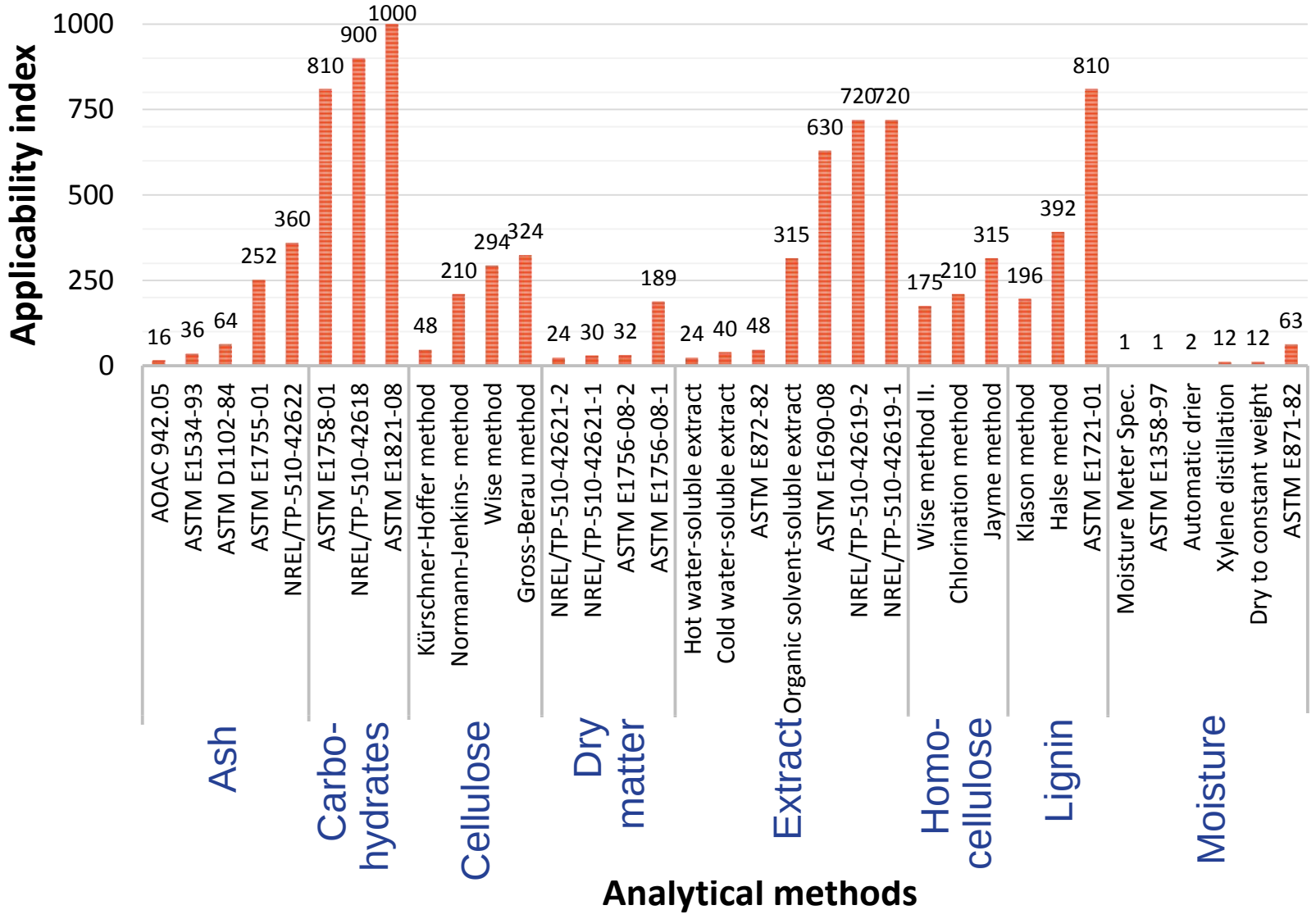
Evaluation and ranking of the measurement methods of pellet's raw material

Evaluation and ranking with a new measurement applicability index.

- Three evaluation coefficients for evaluation
  - *The device requirement;*
  - *The time requirement;*
  - *The degree of complexity.*

- The multiplication of these three values result the final score of the individual solutions.

- Applicability index can be between 1 and 1000.
  - **The best index is 1**,
  - and the least favourable is 1000.



Proposal for ISO 17225 standard extension

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Part 1: General requirements

Foreword
Introduction
1 Scope
2 Normative references
3 Terms and definitions
4 Symbols and abbreviated terms
5 Principle
6 Classification of origin and sources of biofuels
6.1 General
6.2 Woody biomass
6.3 Herbaceous biomass
6.4 Fruit biomass
6.5 Aquatic biomass
6.6 Biomass blends and mixtures
7 Specification of solid biofuels based on traded form and properties
7.1 Traded form of solid biofuels
7.2 Specification of properties of solid biofuels
Annexes
Bibliography

Instead of raw material classification based on origin and source, classification based on elementary and chemistry composition

Pellet qualification based just properties

Part 2: Graded wood pellets
Part 3: Graded wood briquettes
Part 4: Graded wood chips
Part 5: Graded firewood
Part 6: Graded non-woody pellets
Part 7: Graded non-woody briquettes

Selected publications

- **Konrád, K.; Viharos, Zs. J.; Németh, G.**: Evaluation, ranking and positioning of measurement methods for pellet production, *Measurement*, Vol.X . No. X., 2018, pp. X-X. (https://doi.org/10.1016/j.measurement.2017.12.036), in print
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- **Konrád, K.; Németh, G.; Viharos, Zs. J.**: Extension of the quality control systems to the raw materials of pellets (In Hungarian, Minőségszabályozási rendszerek kiterjesztése pellet alapanyagokra), *17th International Conference on Energetics-Electrical Engineering - 26th International Conference on Computers and Educations* (XVII. Nemzetközi Energetika-Elektrotechnika Konferencia - XXVI. Nemzetközi Számítástechnika és Oktatás Konferencia (XVII. ENELKO - XXVI. SzámOkt, ENELKO 2016)), Hungarian Technical Scientific Society of Transylvania (Erdélyi Magyar Műszaki Tudományos Társaság); Sapientia EMTE;Magyar Energetikai Társaság, Kolozsvár, Romania, 6-9 October, 2016, pp. 72-77.
- **Konrád, K.; Viharos, Zs. J.**: The system and challenges of control and measurement for pellet product cycle (In Hungarian, Pellet termékciklus szabályozásának, mérésének rendszere és kihívásai), *XXII. Ifjúsági Tudományos Fórum*, Pannon Egyetem, Georgikon Kar, Keszthely, Hungary, május 26., 2016, ISBN: 978-963-9639-83-6, Paper nr. 6/2.
- **Viharos, Zs. J.; Sidló, Cs. I.; Benczúr, A. A.; Csempesz, J.; Kis, K. B.; Petrás, I.; Garzó, A.**: "Big Data" Initiative as an IT Solution for Improved Operation and Maintenance of Wind Turbines, *European Wind Energy Association (EWEA) Conference, "Make your vision reality"*, 4-7. February, 2013, Vienna, Austria, S9.3, pp. 184-188.
- **Kovács, A.; Erdős, G.; Viharos, Zs. J.; Monostori, L.**: A system for the detailed scheduling of wind farm maintenance**,** *CIRP Annals – Manufacturing Technology*, Vol. 60, No. 1, 2011, (DOI: 10.1016/j.cirp.2011.03.049), pp. 497-501.

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Thank you for your attention!

Contact

Dr. Zsolt János Viharos

viharos.zsolt@sztaki.mta.hu
www.sztaki.hu/~viharos

+36 1 279 6 195

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