9 INTERNATIONAL CONFERENCE Bioenergy

Towards a sustainable biomass market

Hacia un mercado de la biomasa sostenible

Valladolid, October 21st, 2014

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Session I

"Advances in baling, storage, pelletization and torrefaction to increase the competitiveness of bioenergy"

Sesión I

"Avances en el empacado, almacenado, peletizado y torrefacción para aumentar la competitividad de la bioenergía"

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euro pruning

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Session I

International standards for wood chip and hog fuel – EN ISO 17225-1

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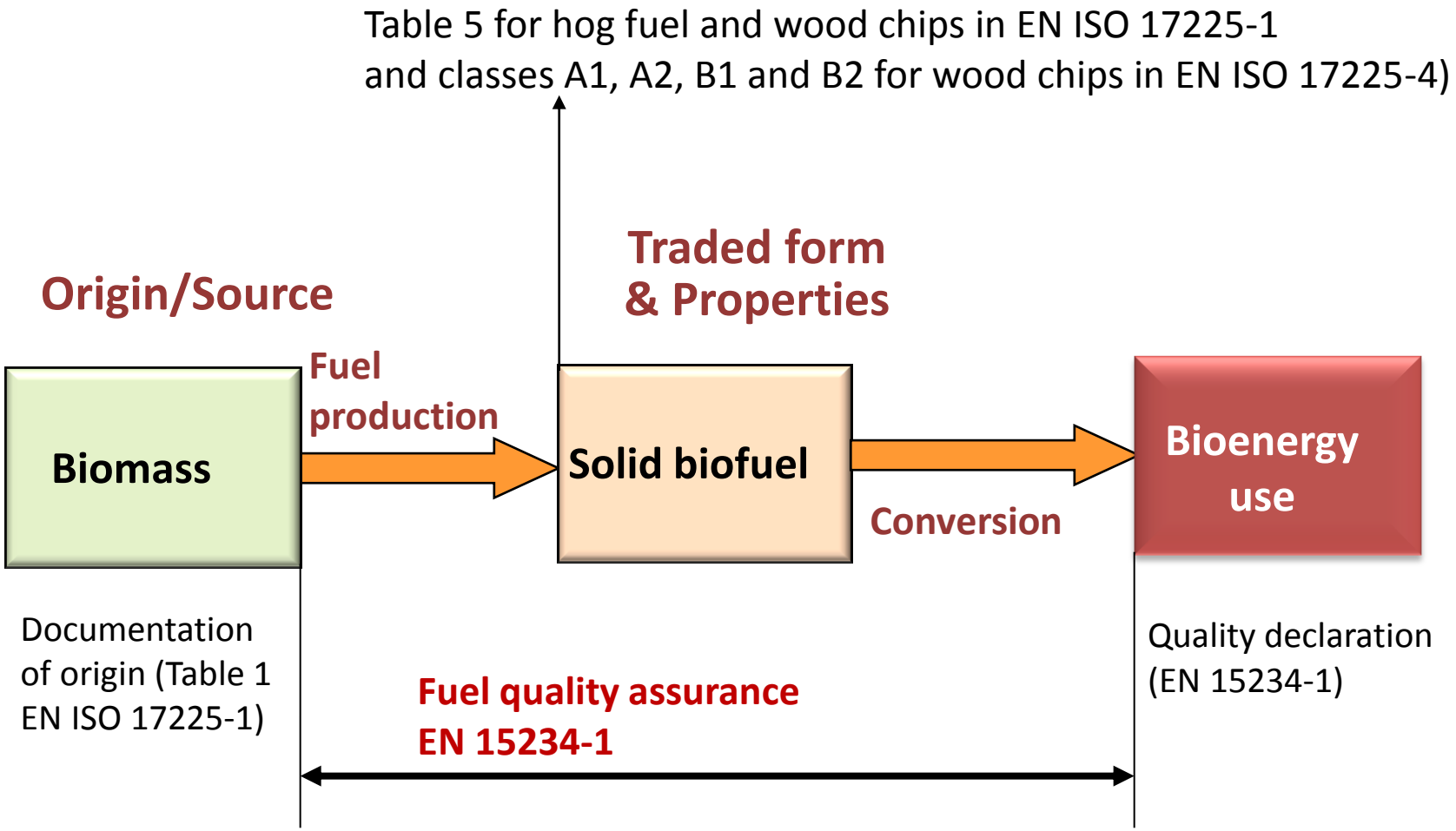
VTT

Specification and classes (EN ISO 17225-1)

- Hierarchical classification system in table format:
  1. **Woody biomass**
  2. **Herbaceous biomass**
  3. **Fruit biomass**
  4. **Aquatic biomass**
  5. **Biomass blends and mixtures**
     - blends = intentional
     - mixtures = unintentional
- Special requirements for chemically treated biomass
- **Chemical treatment** defined as any treatment with chemicals other than air, heat or water (e.g. glue and paint)
- Biomass, if chemically treated material **may not include halogenated organic compounds or heavy metals at levels higher than those in typical virgin material**.

Biomass supply chain



Principle of the fuel specification and classification

- Origin and source of raw material (EN ISO 17225-1, Table 1)
  - 4 level hierarcial classification
- Properties according to traded form
  - (e.g. wood chips or hog fuel
- EN ISO 17225-1 each property is selected separately (suitable for individual contracts)

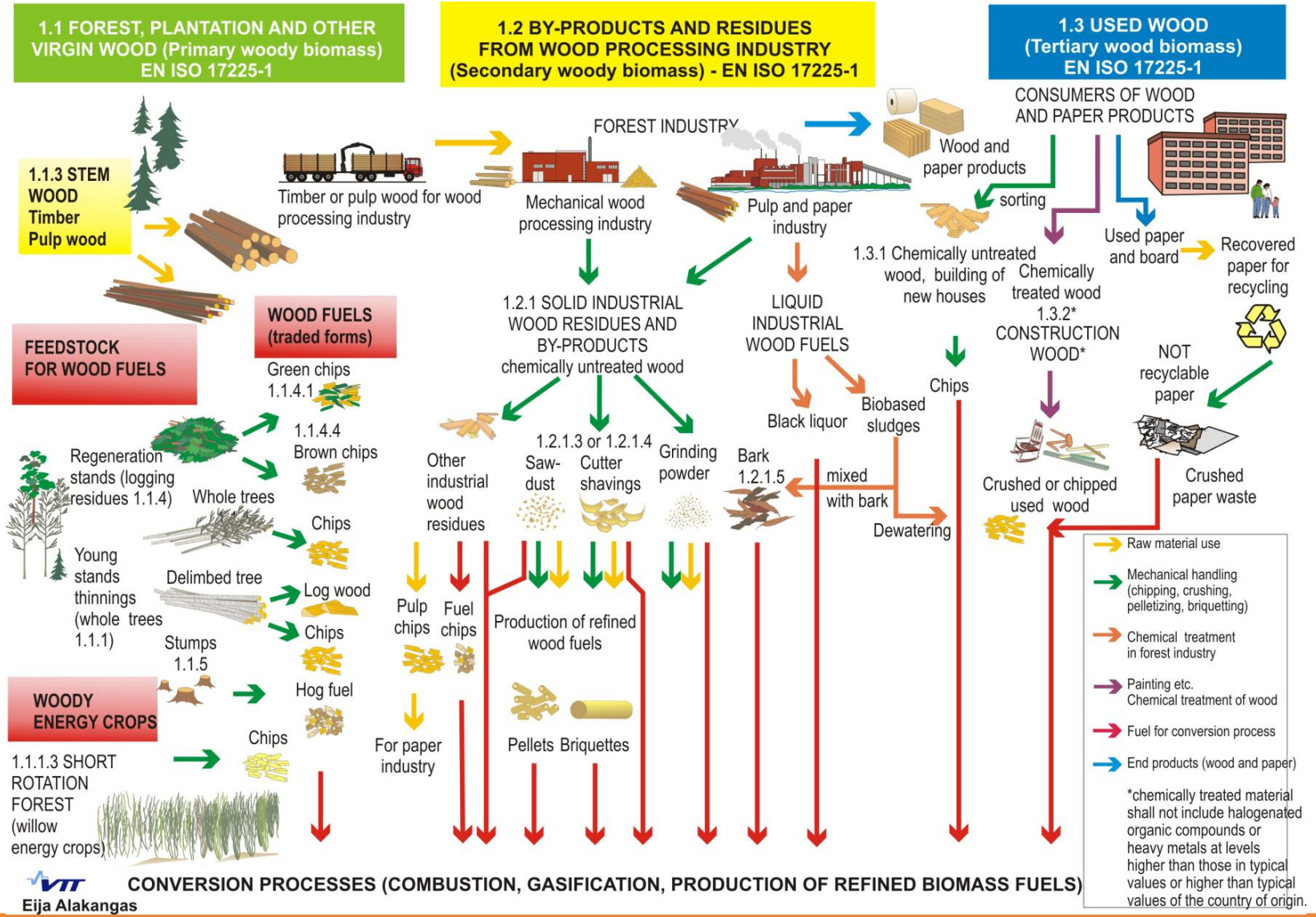
- EN ISO 17225-4 properties are bound together to form a class:
  - Classes A1, A2, B1 and B2
  - Recommended for smaller plants less 1 MW

Classification of 1 Woody biomass

- **1.1 Forest, plantation and other virgin wood**
  - Detailed classification next slides
- **1.2 By-products and residues from wood prosessing industry**
  - 1.2.1 Chemically untreated (bark, sawdust …)
  - 1.2.2 Chemically treated (plywood, particle board…)
- **1.3 Used wood**
  - Pallets, wood packages, construction wood
- **1.4 Blends and mixtures**
  - Inside 1 Woody biomass

Used wood 1.3

Classification of 1 Woody biomass



Eija Alakangas

Fuel specification for wood chips and hog fuel – EN ISO 17225-1

Normative (mandatory)

- Origin and source
- Moisture, M (in formulas M_{ar})
- Ash, A (dry basis)
- Particle size distribution (P)

Stumps 1.1.5

Informative (voluntary)

- Bulk density (BD) if trade is carried out in volume basis
- Net calorific value as received (Q, in formulas $q_{p,net,a}$) or Energy density (E, in formulas E_{ar})
- For chemically treated wood nitrogen (N), sulphur (S) and chlorine (Cl)

Wood chips and hog fuel moisture (M) and ash (A)

Class, M	w-%	Class, A	w-% dry basis
M10	≤ 10	A0.5	≤ 0.5
M15	≤ 15	A0.7	≤ 0.1
M20	≤ 20	A1.0	≤ 1.0
M25	≤ 25	A1.5	≤ 1.5
M30	≤ 30	A2.0	≤ 2.0
M35	≤ 35	A3.0	≤ 3.0
M40	≤ 40	A5.0	≤ 5.0
M45	≤ 45	A7.0	≤ 7.0
M50	≤ 50	A10.0	≤ 10.0
M55	≤ 55	A10+	> 10.0*
M55+	> 55*		

* Maximum value to be stated.

Particle size distribution, P

Class	Main fraction (at least 60%) mm	Course fraction (mm)	Maximum length for oversized particle, mm	Cross sectional ared of cource fraction m^2 Only for EN ISO 17225-4 standard
P16S	3.15 <P ≤ 16	≤6% >31,5 mm	≤45 mm	≤2
P16	3,15 <P ≤ 16	≤6% >31,5 mm	≤150 mm	
P31S	3,15 <P≤ 31,5	≤6% >45 mm	≤150 mm	≤4
P31	3,15 <P≤ 31,5	≤6% > 45 mm	≤200 mm	
P45S	3,15 <P ≤ 45	≤10% >63 mm	≤200 mm	≤6
P45	3,15 < P ≤ 45	≤10% >63 mm	≤350 mm	
P63	3,15 <P ≤ 63	≤10% >100 mm	≤350 mm	
P100	3,15 <P ≤ 100	≤10% >150 mm	≤350 mm	
P200	3,15 <P ≤ 200	≤10%>200 mm	≤400 mm	
P300	3,15 <P ≤ 300	To be stated		

Analysis according to EN ISO 17827-1/EN ISO 17827-1
Classes marked by S are for EN ISO 17225-4 standard (for small plants)

Fine fraction (<3,15 mm)

Fine fraction (< 3,15 mm), EN ISO 17225-1		EN ISO 17225-4
F05	≤ 5 %	-
F10	≤ 10 %	P31S and P45S classes
F15	≤ 15 %	P16S class
F20	≤ 20 %	-
F25	≤ 25 %	-
F30	≤ 30 %	-
F30+	> 30 (maximum value to be stated)	-

Example– Logging residue P31, F25

Screen size	amount, w-%	Measured (requirement in standard)	Class[1]	Cumulative amount
< 3,15 mm	24,2	24,2 % (F25)	F25	24,2
3,15 – 8 mm	34,2	64 % (≥ 60 %)		58,4
8 – 16 mm	29,8		P16	88,2
16 – 31,5 mm	8,3			96,5
31,5 – 45 mm	0,7	8,3% (≤ 6% more 31,5 mm)	P31	97,2
45 – 63 mm	2,8			100
63 – 100 mm	0	All < 150 mm	P16	100
< 100 mm	0			100

[1] Smallest class to be selected, which fullfill the requirements.
P31 and fine fraction F25 according to EN ISO 17225-1.

Product declaration- olive pruning

	Product declaration according to EN ISO 17225-1		
Normative	Property	Unit	Property class
	Origin	-	1.1.7 Olive tree pruning
	Location	-	Zaragoza, Spain
	Particle size, P	mm	P 63
	Moisture, M	w-%	M 30
	Ash, A	w-% dry	A 10
Informative	Bulk density, BD	kg/m^3	BD 260
	Net calorific value as received, Q	MJ/kg	11.40

Thank you :: Gracias

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