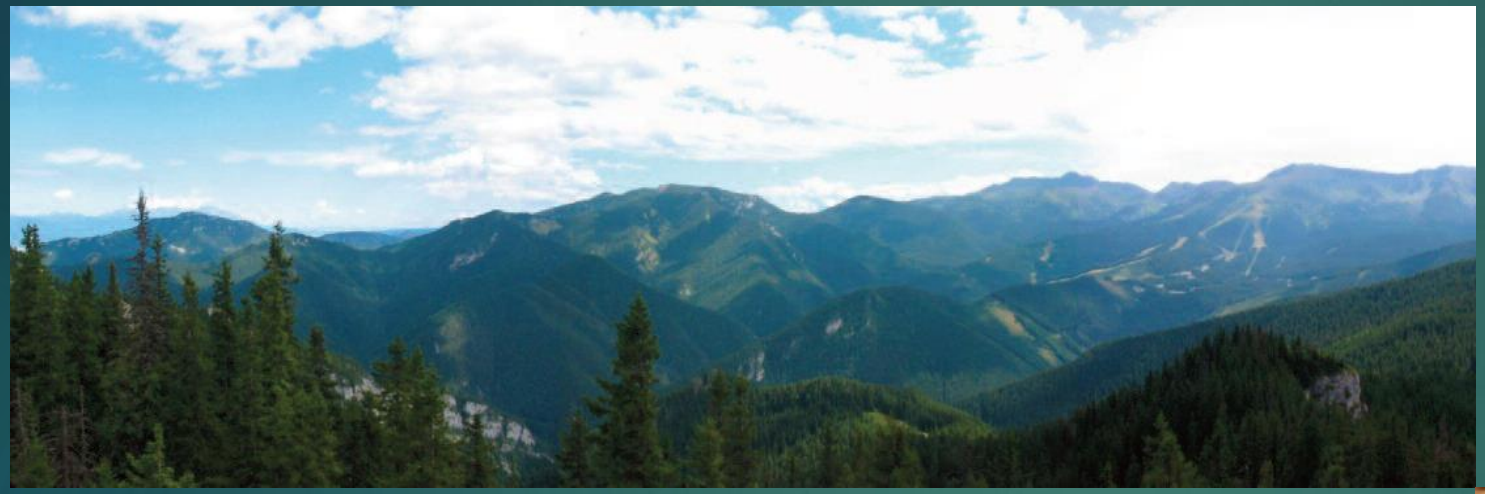
WOOD PELLET

GLOBAL MARKET DEVELOPMENT



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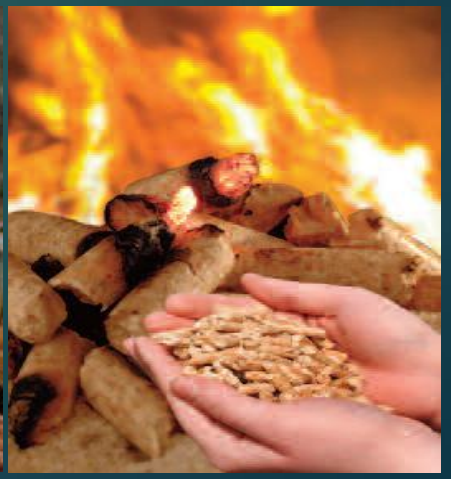

1 INTRODUCTION

- Rapid deployment of renewable energies plays an important role in efforts against global warming and strengthens the security of energy supply.
- The global use of renewable energy has almost doubled in absolute terms between 1973 and 2008, but it is still only about 13% of the global energy consumption.
- Among the renewable energy sources biomass plays a specific role. It covers about two thirds of all renewables and is the fastest growing sector in absolute terms.

1 INTRODUCTION

- A variety of different biomass raw materials can be used for energy purposes.
- Many different conversion technologies are available to transform primary energy from biomass to heat, electricity or transportation fuels.
- The use of biomass and the potential for further development is closely related to forestry and agriculture and to the energy sector.
- Currently, biomass, mainly wood and wood energy products is the main from renewable sources for heat production.
- Forestry and wood-based industries produce wood, which is the largest resource of solid biomass. Biomass procurement logistics from forest to bioenergy plants are the subject to major improvements. The sector covers a wide range of different resources with different characteristics - wood logs, bark, wood chips, sawdust and more recently pellets.

1 INTRODUCTION

- This paper deals with the analysis of the global wood pellet market.
- What are wood pellets?
- Wood pellets are generally made from compressed sawdust or other residuals from sawmilling and manufacturing other wood products, though an increasing proportion of raw material for pellets now comes from round wood thinnings and harvest residues.
- Wood pellets are a clean, CO2 neutral and convenient fuel, mostly produced from sawdust and wood shavings compressed under high pressure using no glue or other additives. They are cylindrical in shape and usually 6-10 mm in diameter. The average length is about 10-30 mm.

1 INTRODUCTION

- Pellets, due to their high energy density and standardised characteristics, offer great opportunities for developing the bioenergy market worldwide.
- As demand for wood increases from both wood processing industries and the energy sector, the question of whether there is enough wood is of great concern nowadays.
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1 INTRODUCTION

- In order to understand how much wood is available, it is essential to know how much wood is as a growing stock in the forests and how much is removed.
- Wood for use as an energy source comes not only from tree felling, but also from selective thinning of managed forests and other forestry practices (direct sources).
- Wood for energy use may also be derived as a by-product from downstream processing in wood-based manufacturing, for example, as off-cuts, trimmings, sawdust, shavings, wood chips or black liquor (indirect sources).
- End-of-life wood and paper products may also be used as a source of energy (recovered wood).

2 WOOD PELLETS PRODUCTION AND CONSUMPTION

- Wood pellets are made mostly of dried and densified sawdust, shavings or wood powder.
- Pelletization is currently the most economic and energy saving ways to convert biomass into a fuel with high energy density and consistent quality.
- Due to their high energy content the convenient delivery and storage features, pellets are the ideal fuel for fully automatic small scale heating systems. With a rapidly growing share in the market, they are a key technology for increasing biomass utilisation in Europe.
- For this reason it is one of the fastest growing forms of upgraded biomass mainly in Europe but also worldwide.

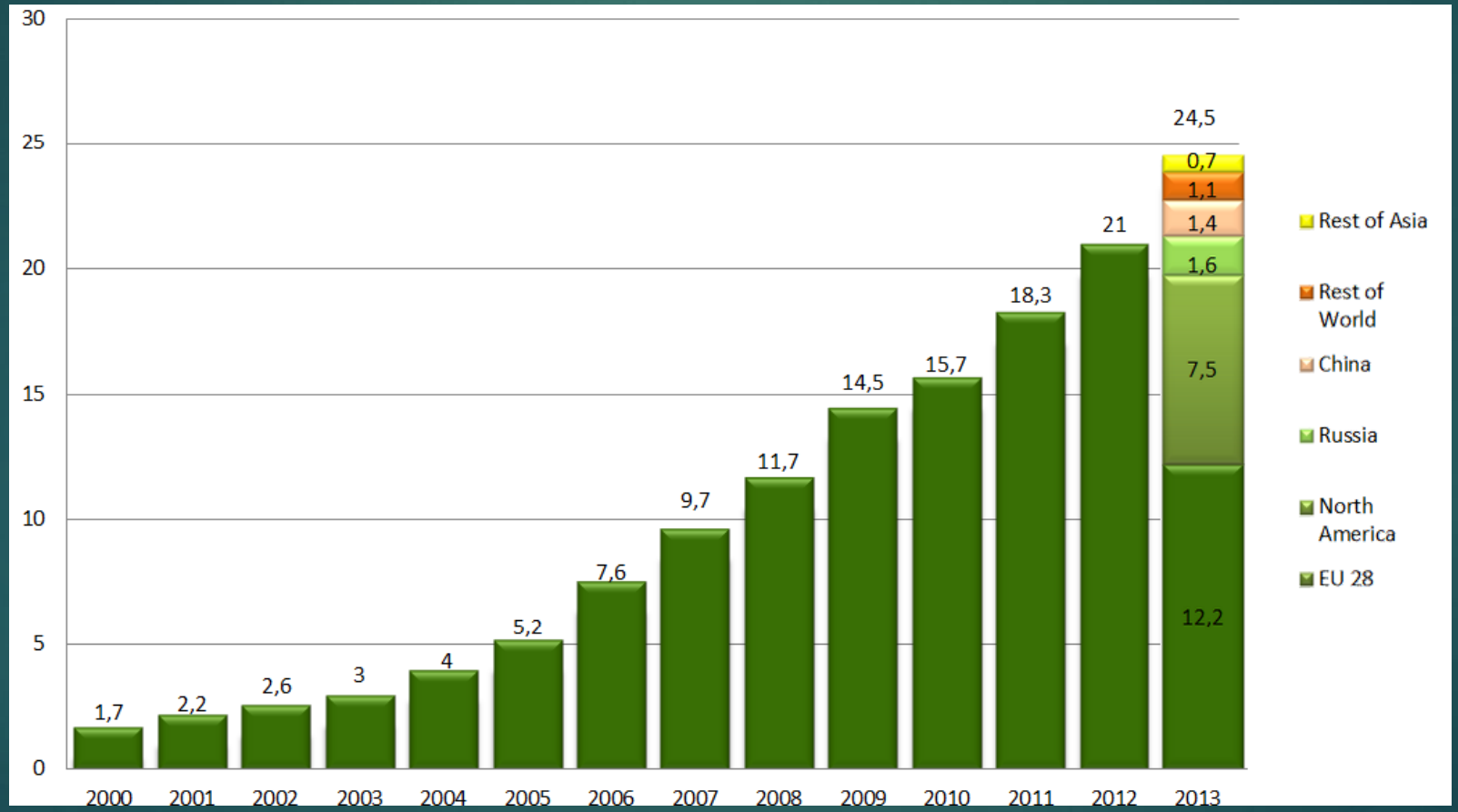
2 WOOD PELLETS PRODUCTION AND CONSUMPTION

- Wood pellets can be used both for residential and commercial heating and for power production.
- Wood pellets can be used in large pulverized fuel or circulating fluidized bed power plants. These plants can be operated in co-firing mode with coal, be retrofitted from coal up to 100 % wood pellets or be newly built.

Tab. 1 World Wood Pellet Production Development 2000 – 2013 (in millions of tons)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Production in MT	1,75	2,21	2,67	3,12	4,23	5,23	7,61	9,72	11,73	14,52	15,71	18,3	21,2	24,6

World wood Pellet production [in millions of tons]



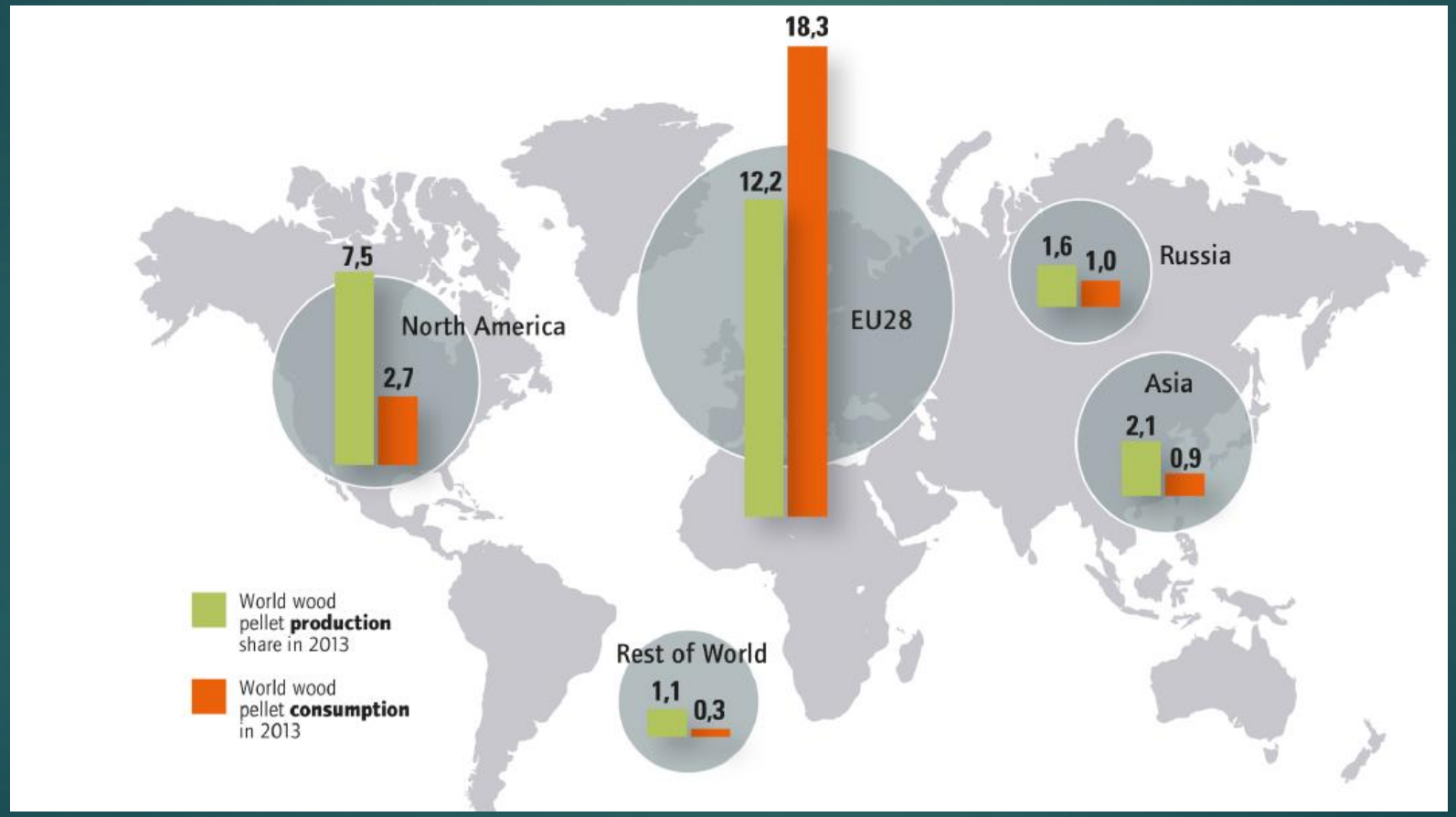
2 WOOD PELLETS PRODUCTION AND CONSUMPTION

- Global pellet production reached 24.62 million tons in 2013, an increase of nearly 14 % over 2012 volumes.
- The EU accounted 50 % of global production, followed by North America (31 %).
- Companies in Canada and the United States were busy building new pellet production facilities to keep up with European demand.
- The 2013 shipments were up 50 % over 2012 and almost double those of 2011, reaching a value of more than USD 650 million.
- During 2013, a large number of companies were actively engaged in supplying equipment and bioenergy plants that convert solid biomass - mainly wood chips and pellets - to heat and electricity. Businesses in the United States, Europe, Asia and elsewhere were busy constructing new biomass heat and power plants.

Tab. 2 World Pellet Production/Consumption in 2013 (in millions of tons)

Region	EU 28	North America	Asia	Russia	Rest of World
Production MT	12,21	7,52	2,14	1,62	1,13
Consumption MT	18,32	2,73	0,91	1,04	0,31

World pellet production/consumption in 2013 [in millions of tons]



3 WOOD PELLETS TRADE

- In 2000, trade in wood pellets was almost non-existent. The wood pellet market has experienced a large growth in the last years.
- However, in volume terms, world trade of wood pellets has now grown to surpass that of ethanol and other bio-based fuels.
- Europe is currently the leading worldwide market for trade in wood pellets. The EU is the main consumer of wood pellets as well as a major producer. There is a high volume of wood pellet trade among EU member countries.
- The international market increased more than 200 percent between 2002 and 2006, shooting global production from 8 million tons in 2007 to more than 13 million tons in 2009 and 24.6 million tons in 2013.

3 WOOD PELLETS TRADE

- The production and trade of wood pellets as a renewable energy source have increased significantly since 2008.
- The USA has become a significant producer and biggest exporter of wood pellets, primarily to the European Union.
- Wood pellet demand is also increasing in Korea and Japan. Those countries also seek to increase use of renewable energy.

3 WOOD PELLETS TRADE

- Most wood pellets that are traded globally are used for electricity generation.
- In the EU, residential heating accounts for the largest share of pellet demand, but there is a large and growing demand for imported wood pellets to produce electricity.
- World wood pellet demand were in power (power plant, CHP) 7.6 million tons and in heating (residential, commercial, district heating) 17 million tons in 2013. To meet this growing demand, the EU imported around 6.2 million tons in 2013. About 77 % of total imports were from North America (an increase of 50 % over 2012), and much of the remainder came from Russia and Eastern Europe.

3 WOOD PELLETS TRADE

- Currently, bioenergy markets (including wood pellets market) are largely influenced by national policies, mainly in the EU.
- Apart from the impacts of energy policy and existing import duties and taxes.
- The trade dynamics for the bioenergy industry are influenced by three general factors: **feedstock prices**, **sustainability governance (and legislation), and local economic reality.**
- These issues are intertwined with each other and hence it is important to look into each aspect not only separately, but also collectively to see the opportunities and challenges that may determine the trade dynamics.

3 WOOD PELLETS TRADE

- The trade dynamics of liquid and solid biofuels are significantly different.
- The liquid biofuels markets are reasonably developed markets. The market is less complex.
- The solid biofuels markets are closely related to agriculture commodities, therefore the markets are highly complex. The trade dynamics are more straightforward for solid biofuels. The main market is the EU. Main driver of development, mainly in the EU, are national support policies mostly for the promotion of renewable electricity production and residential heating. It is still too early to discuss the impacts of new sustainability requirements within as using are still reacting to the policies.

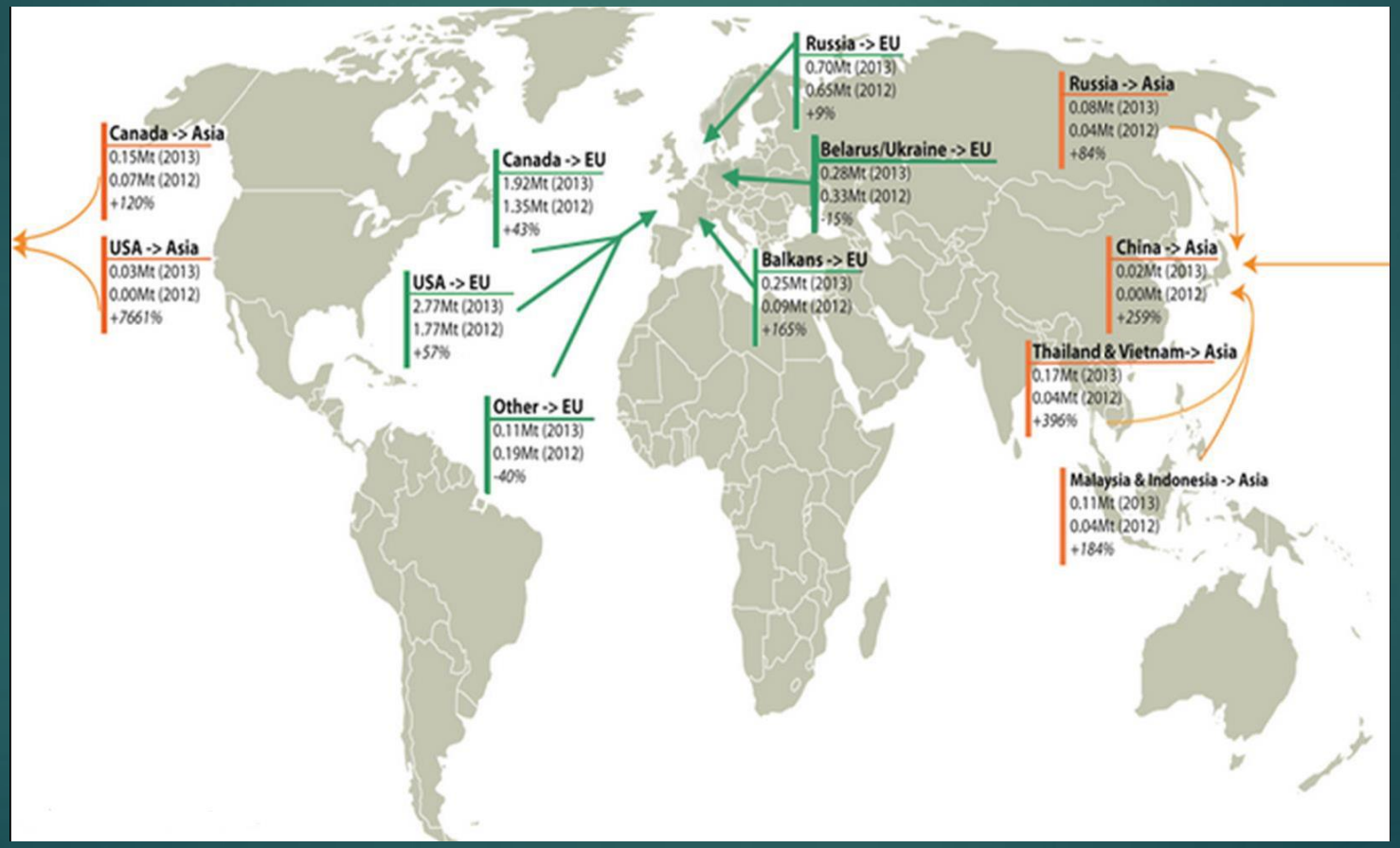
Tab. 3 World Wood Pellets Trade Follows to EU in 2012 and 2013 (in millions of tons)

Region	Canada	USA	Russia	Belarus Ukraine	Other
	To EU				
2012 MT	1,35	1,77	0,65	0,33	0,19
2013 MT	1,92	2,77	0,70	0,28	0,45
Change in %	+ 43	+ 57	+ 8	- 15	+ 237

Tab. 4 World Wood Pellets Trade Follows to Asia in 2012 and 2013 (in millions of tons)

Region	Canada	USA	Russia	China	Malaysia Indonesia	Thailand Vietnam
	To Asia					
2012 MT	0,07	0,00	0,04	0,00	0,04	0,04
2013 MT	0,15	0,03	0,08	0,02	0,11	0,17
Change in %	+ 114		+ 99		+ 175	+ 325

World wood Pellets trade map in 2013 [in millions of tons]



3 WOOD PELLETS TRADE

- It is also important to consider that most wood pellets procurement strategies involve long term contracts. Therefore trade flows are unlikely to change on short notice. There is also a tendency for utilities to carry out vertical integration for solid biomass operations.
- Due to the nature of the market, solid biofuels consumers, in particular wood pellets buyers have been working on harmonizing the existing certification schemes and systems. Beyond sustainability considerations, harmonization of technical aspects and quality specifications is also one important consideration, which requires coordination and harmonization. By putting effort in integrating diverse existing systems and regulations requirements, the industry players aim to create a commodity market for solid biofuels. Due to the vertical integration and harmonization effort, sustainability certification is less likely to become a trade barrier in the future.

4 CONCLUSIONS

- The international trade with wood and wood products may expand and can have a significant impact in some markets or market segments including wood pellet market.
- In recent years the bioenergy market has increased in importance, and international trading of biomass feedstocks and biofuels has expanded.
- The use of renewable energy sources for heat production has increased significantly during the past years, and according to the rising energy demand and the prospective climate targets a further increase in this field can be expected.
- Wood pellets and wood chips, as well as biodiesel and ethanol, all are now commonly traded internationally in large volumes.

4 CONCLUSIONS

- During the past decade, the global trade of wood pellets has been growing - great world expansion.
- Wood pellet market is becoming a world market. Rapid increases in the production and consumption of wood pellets and predictions on its increased demand in the near future have formed a competitive global market.
- The EU is still the main market for wood pellets and will remain as such for the next several years. The production of wood pellets in EU increased, reaching 12.21 million tons in 2013, near 50 % of the global production. In the same period EU wood pellet consumption increased to reach over 18.32 million tons in 2013, 79 % of the global wood pellet demand.

4 CONCLUSIONS

- The main exporters are and will be the USA, Canada, the Russian Federation and the some Eastern Europeans countries by 2020.

- In coming years Australia, Mozambique, South Africa, and several countries of Latin America are expected to become exporters of pellets.

- Belgium, Denmark, the Netherlands, Sweden and the UK are and will be the main importers of industrial pellets. The Netherlands serves as an import hub for northern Europe.

- The EU has mandated 20 percent of energy consumption must come from renewable resources by 2020. The EU demand could range between 25-50 million tons by 2020, depending to a large extent on

a) the energy policies on cofiring in the UK, Netherlands, Germany and Poland, and

b) on the price of heating oil and the related attractiveness to switch to wood pellets for small-scale users (households and medium-sized residential buildings).

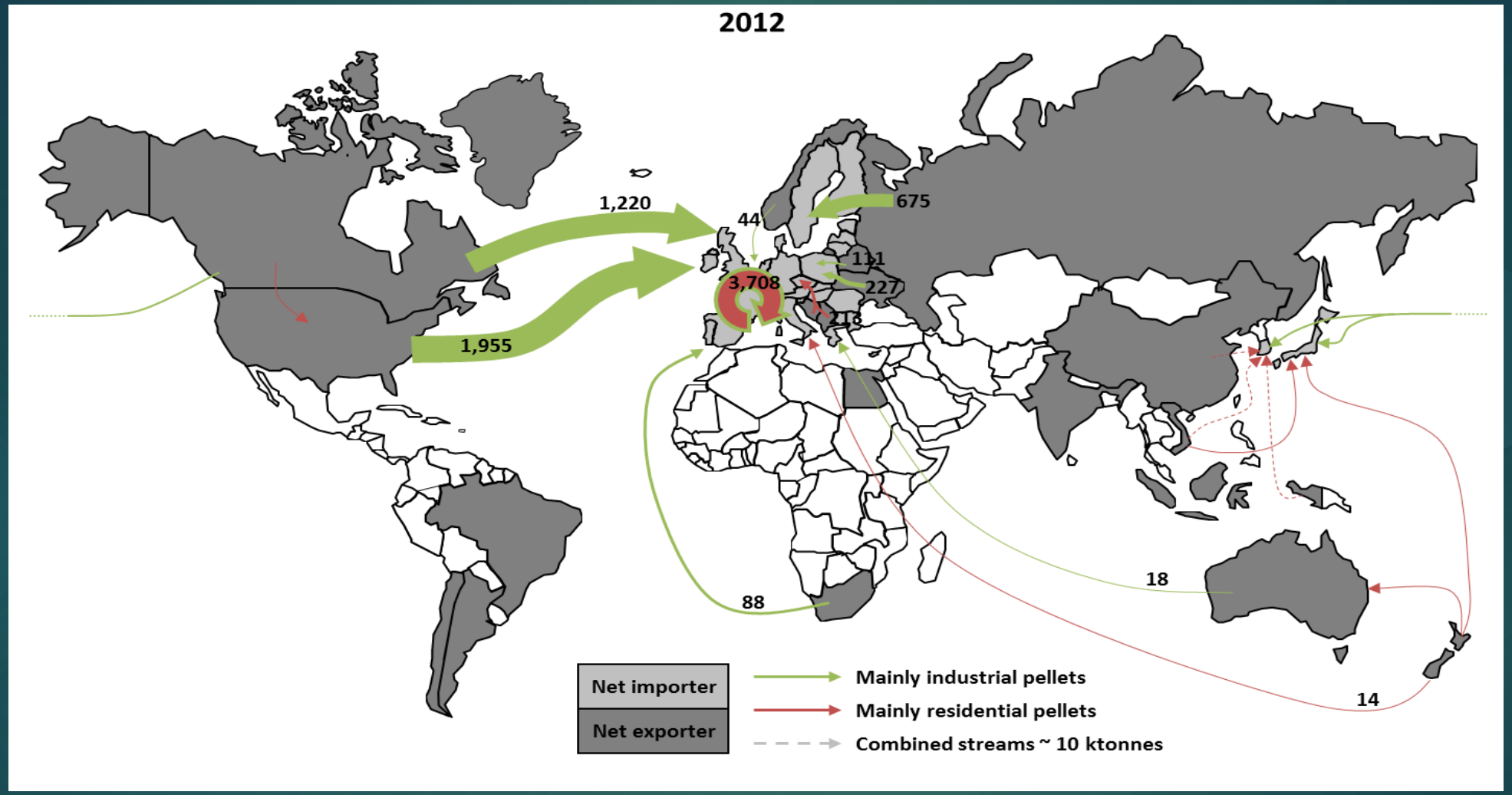
4 CONCLUSIONS

- The EU is very likely to remain the largest wood pellets consumer in the world, but
- The East Asia is going to show a very strong growth and may be a close second position in 2020. The East Asian demand strongly depends on policy developments in Japan and South Korea.
- Demand in the USA will probably remain limited to small scale use in households, and will not use pellets on a large scale for industrial purposes. One crucial factor will be the price of heating oil and gas.

4 CONCLUSIONS

- Dry residues from sawnwood production have historically been the main feedstock for wood pellet production due to low prices, no need for thermal drying of the feedstock and a relatively homogenous composition. Such feedstock also gives low ash contents. Declining activity in the sawnwood industry has reduced the availability of feedstock for many wood pellet plants. The transition from smaller pellet plants using dry feedstock to larger plants using **wet** feedstock in future, pellet production can be expected to follow comparative advantages, especially regarding feedstock and energy costs, but also with respect to economies of scale. Increased production in the medium term will probably take place in larger mills based on pulpwood which offers more secure biomass supply compared to dry residues. Long term development of production, consumption and demand wood pellets also depends on the development biofuels, bio-refineries and other technologies for renewable power production as well as the development in the forestry and wood processing industry.

Wood pellet market is becoming a world market



Thank you very much for your attention