
Two Key Trends in the Global Forest Sector: The Growth of China and Bio-Energy

Don G. Roberts,
CEO, Nawitka Capital Advisors Ltd.
Don.roberts@nawitka.com



Buea, Cameroon
Forests in 300 Years and Actions Now to Secure Them
MEGAforestais Working Group

May 5-9, 2014

ROLE OF CHINA



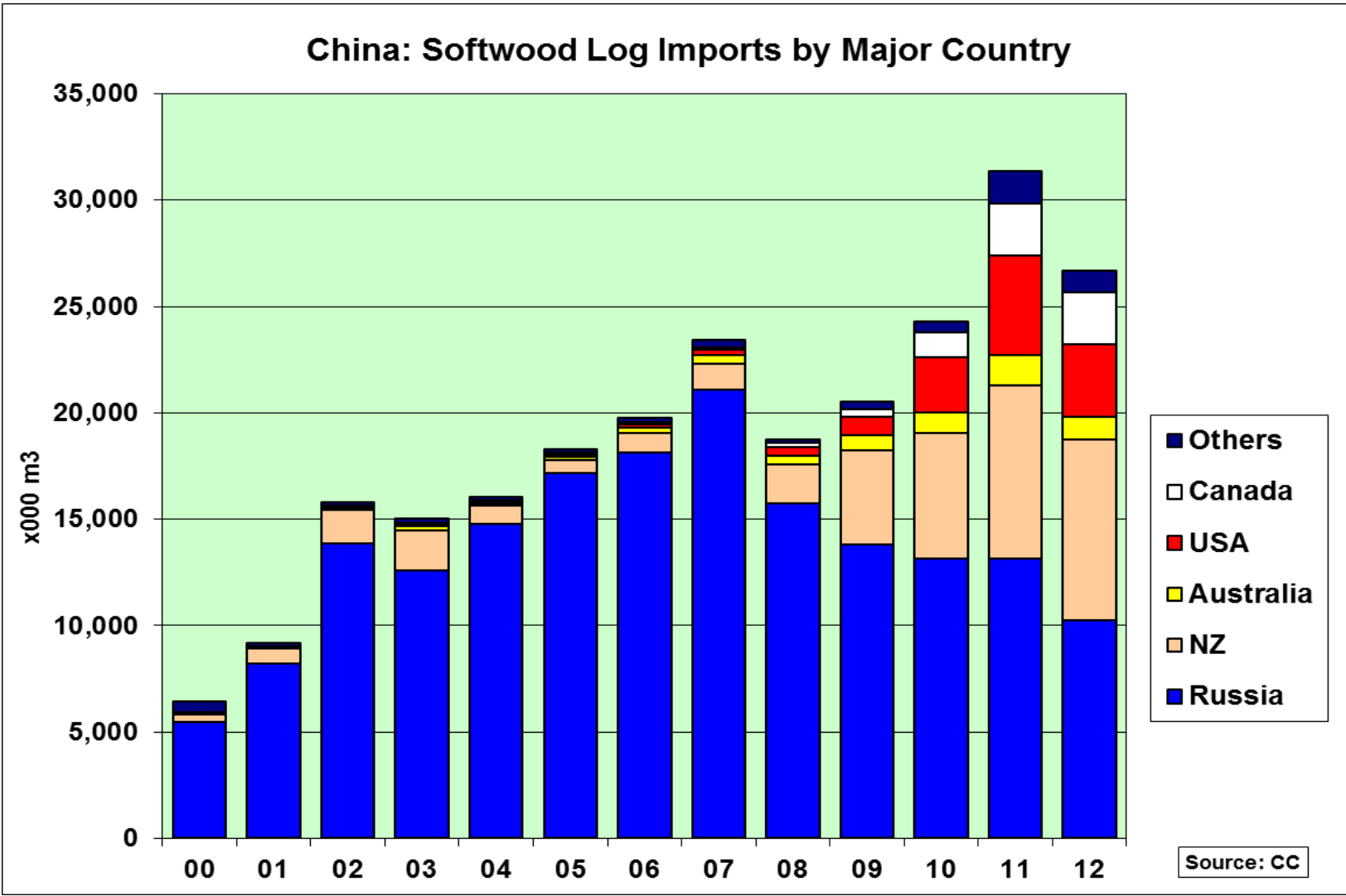
- ▲ Economic growth in China has been driving growth in the global demand for forest products.
 - Especially true due to the declining demand for most paper products in North America, Europe and Japan.
 - Since 1992, China has added ~1.25 million tonnes of paper & paperboard capacity..... ~50% more than the total current installed capacity in the United States.

- ▲ Since the mid-1990s, China's timber supply deficit has been growing at more than 15%/year
 - Reached roughly 160 million cubic metres (Roundwood equivalent) in 2013
 - ⇒ Greater than Canada's total harvest of ~145 million m³
 - Expected to exceed 200 million m³ by 2020
 - More than half the deficit is for the pulp & paper sector



- ▲ China's timber supply deficit has grown despite the fact that it has by far the greatest area in timber plantations in the world.
- Chinese plantations are typically slower growing compared to other regions, and the harvest from many will not enter the industrial wood stream.

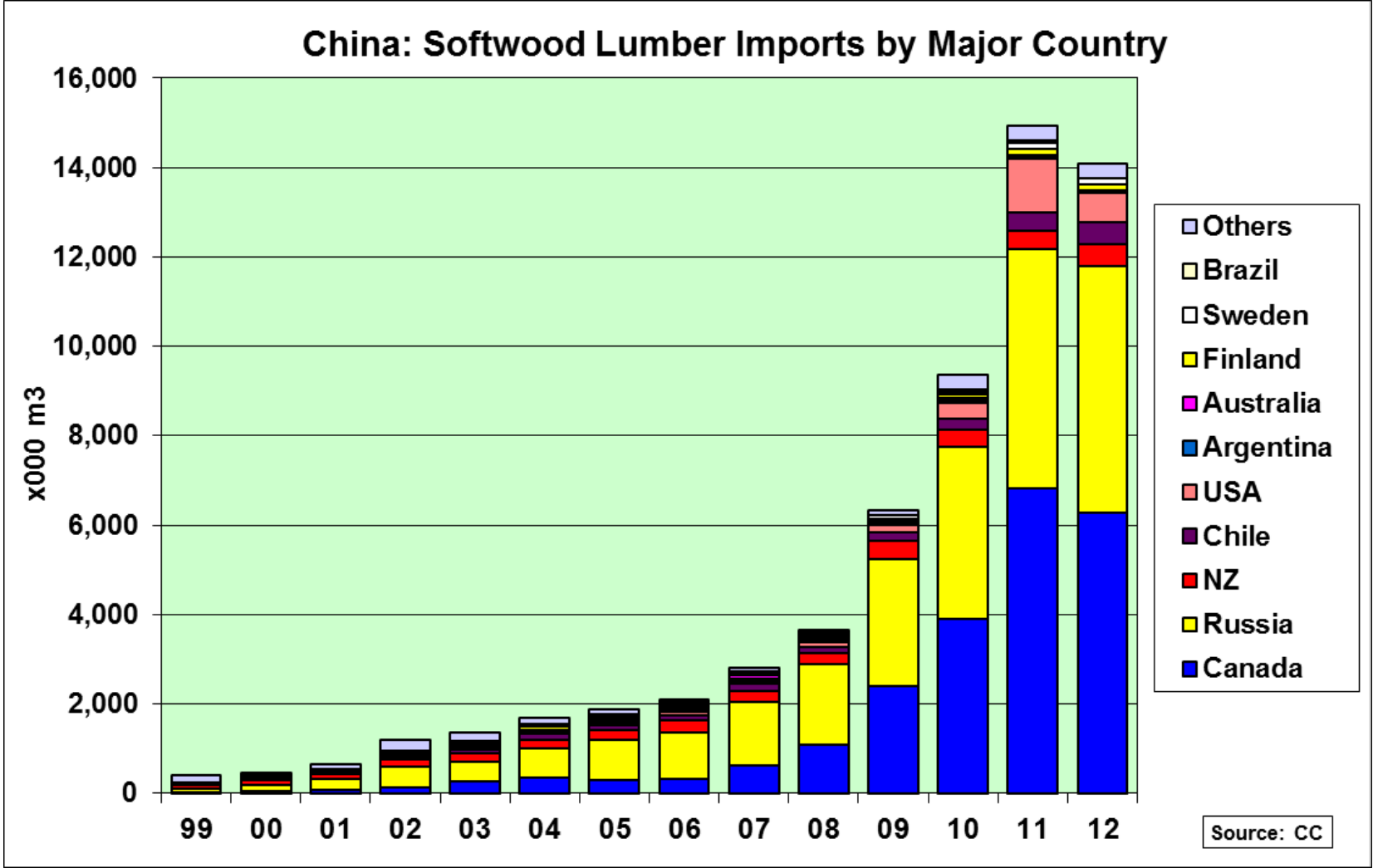




China's imports of softwood logs has already increased ~5x since 2000, and it is expected to continue to soar.

Source: Russ Taylor Wood Markets Inc.





China's imports of softwood lumber have risen even more dramatically than its imports of logs, and the upward trend is expected to continue. We expect an increasing share of processed products like lumber.

Source: USDA, Wood Watchers, Inc.

Overseas Investment in Timberland by Chinese Companies

- According to Chinese data, more than 500 companies have been involved in forestry sector projects in more than 20 countries, meeting the government's advice to "Go Abroad".
- The largest area of overseas timber harvesting rights has been in Russia, and the largest share of investments have been by Chinese State Owned Enterprises and their partners.
- The China Development Bank handles most of the financing for these investment projects outside the country, many of which involve some type of wood processing facility in addition to standing timber.



Overseas Investment in Timberland by Chinese Companies

- The success rate for Chinese overseas timber investments has been extremely low.
- While most Chinese companies prefer “frontier” countries such as Russia, West Africa and parts of South America, recently more focus has been on plantation-based countries like New Zealand.



ROLE OF BIO-ENERGY



What Drives Investment in Bio-energy?

Four Key Variables:

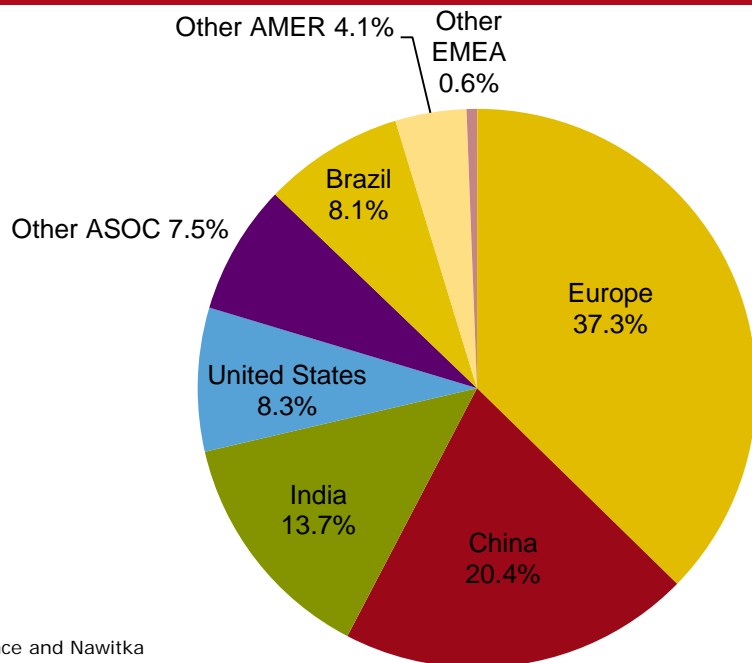
1. Price of Fossil Fuels
2. Cost and Quality of the Resource
3. Efficiency of the Conversion Technology
4. Public Policy



Global Investment in Biomass-based Power

- Globally, ~\$95 billion has been invested in bio-based power since 2005 – a very large sum. Europe has been investing the most, followed by China.
- If we believe the national targets for 2020, there will be upward pressure on the global price of biomass, and significant international trade will be needed.
 - EU expects to double its biomass power capacity to ~26 GW.
 - China expects to triple its to 18 GW.

Global Asset Financing in Biomass Power
(2005 – 2013 Q3)



\$95 billion
invested since
2005



Global Wood Pellet Shipments



- **Europe & Asia are the centers of global biomass demand.**
- **N. America is the largest source of supply, but new supply regions are emerging – including Africa**



Note: Dotted cycles represent the major demand centres; the strength of the arrows is relative to their importance as trading routes.
Source: Bloomberg New Energy Finance, IEA.

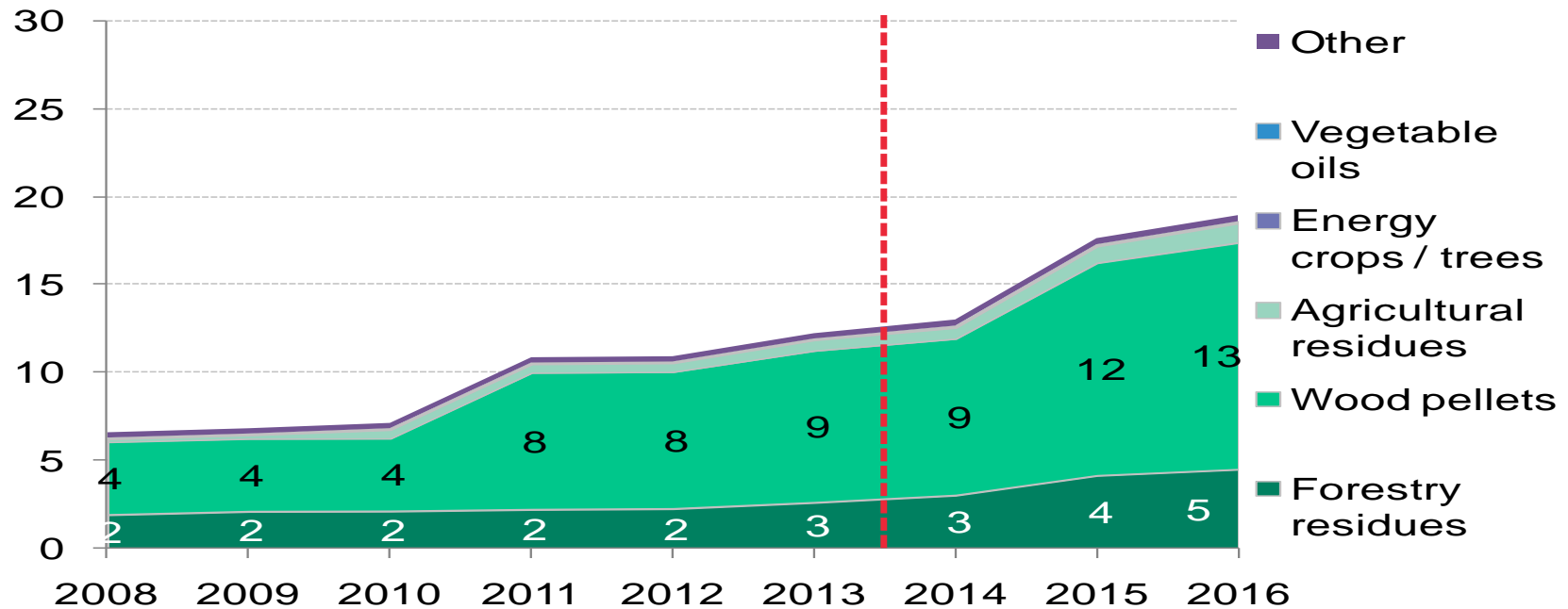
Sustainability of biomass supply is becoming an increasingly important business issue for the European power utilities.

- 70% of the pellets consumed in the UK must come from “sustainably managed” sources – third party certified.
- Implications for regional sourcing of biomass.



- UK is the most attractive market for biomass in Europe.
- Best estimate is that the UK will increase its consumption of biomass for power to ~18 million ODMT (+50%) by 2016 – big increase in expected imports, but can we believe it?
- This is down from an estimate of 26 million ODMT (+ ~115%) made back in November 2012. Estimates have been revised downward due to project cancellations – reflects policy uncertainty
- We think most forecasts of biomass demand in Europe are too high.

Biomass Demand in the UK (million ODMT)



Note: Wood pellets are mostly made from sawdust; the sudden increase in wood pellet demand in 2012 is due largely to the coal-to-biomass conversion of Tilbury (750MW).

Source: Bloomberg New Energy Finance, Nawitka .



Potential Biomass Demand for Power in Asia

- China, Japan & S. Korea have all stated objective of reducing carbon emissions by co-firing biomass with coal.
- If they follow-through, the impact on biomass demand would be significant – especially in China

Change in Biomass Demand Associated with Replacing 1% of Coal Consumption (for Power)

Country	Wood Pellets (million ODMT)	Equivalent Biomass Demand from a 550,000 tpy Kraft Pulp Mill (# of mills)
S. Korea	1.4	2/3
Japan	2.0	1
China	50.2	25

Source: Asian Market for Wood Pellets, Biomass Magazine, Allen Brackley , April 2013



Potential Biomass Demand for Power

China

- Aggressive targets in 12th Five Year Plan – realistic or only an aspiration? (power rate ~12 cents/KWh).

Japan

- Fundamental policy shift in response to Fukushima disaster, backed up by very attractive power rates (28 cents/KWh).

Developing Economies

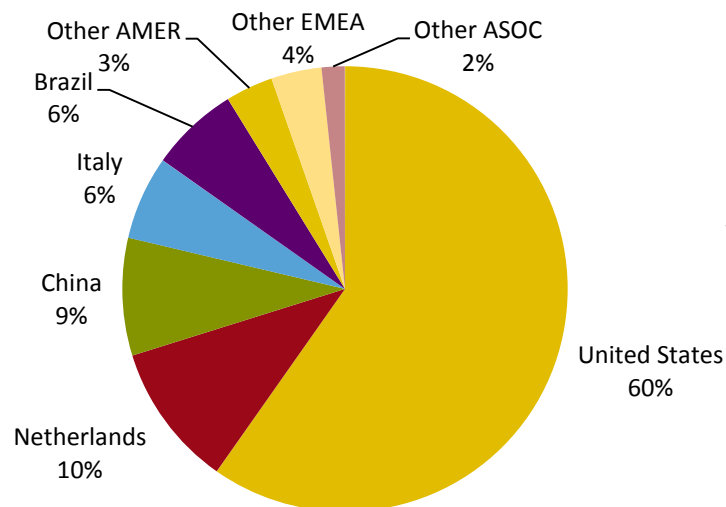
- Biomass is an increasingly attractive source of electricity – especially when combined with other sources of low cost renewable power like wind and solar.
- A stable supply of electricity is a necessary condition for investment in local manufacturing.



Global Next Generation Biofuel Investments

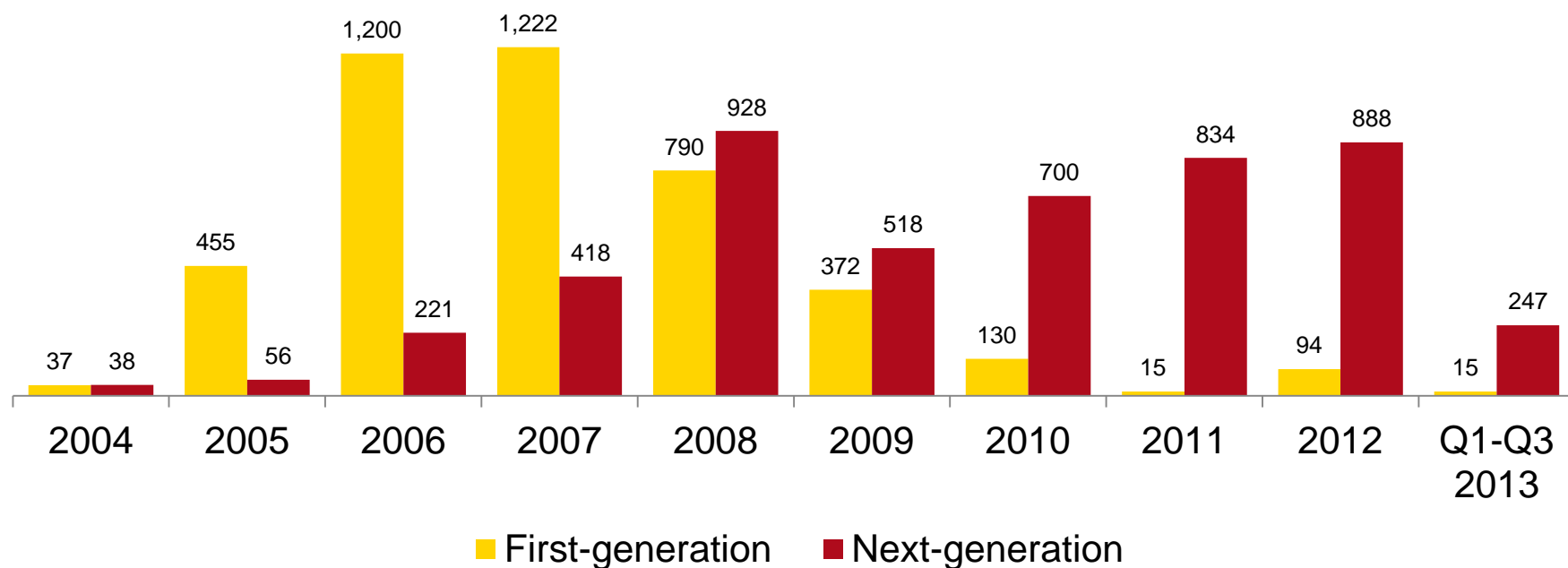
- ▲ The U.S dominates the investments in this field
- ▲ Going forward, we expect the biggest investments to be in the U.S. and Brazil.

Global Asset Financing in Second-Generation Biofuels, by Country (2005-2012)



~\$3.6 invested since 2005

Investment in biofuels by Venture Capital, 2005–2013 (\$m)



▲ Annual Venture Capital & Private Equity investments in Next-Generation Biofuels exceeded \$800 million in 2011 and 2012. However, it fell to ~\$400 million in 2013 due to policy uncertainty..

▲ More than ten smaller commercial-scale plants producing advanced cellulosic biofuels will start-up in 2014/15. It is becoming a reality, and will likely be common within 10 years.

Source: Bloomberg New Energy Finance and Nawitka

Key questions asked by investors about bio-energy investments:

1. Has the management team commercialized a new technology/developed a project before?
2. What is the value proposition?
3. If it is a new technology, how strong is the IP protection?
4. Is there a clear market for the output? Is there a big enough opportunity to matter?



Key questions asked by investors about bio-energy investments (cont.):

- 5. How much biomass is available, and at what delivered cost?**
- 6. How capital intensive is your technology? (eg., Cap Ex/litre)**
- 7. For a given technology, is it proven at commercial scale? If not, what are the scale-up risks?**
- 8. Is it profitable both with, and without, government support?**



Merci!
Thank you!

