IBI REPORT FINDINGS: *STATE OF THE BIOCHAR INDUSTRY 2013*

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Biochar for Environmental Sustainability and Economic Development
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OVERVIEW

- Sources of information
- Data collected
- Key findings
- Future recommendations

2013 State of the Biochar Industry

A Survey of Commercial Activity in the Biochar Field

A report by the International Biochar Initiative (IBI)

International Biochar Initiative

by Stefan Jirka and Thayer Tomlinson, International Biochar Initiative

Published: March 2014

Data sources

1. Internet-based research
   - ~200 companies
2. Public surveys
   - ~30 respondents
3. Data from IBI members database

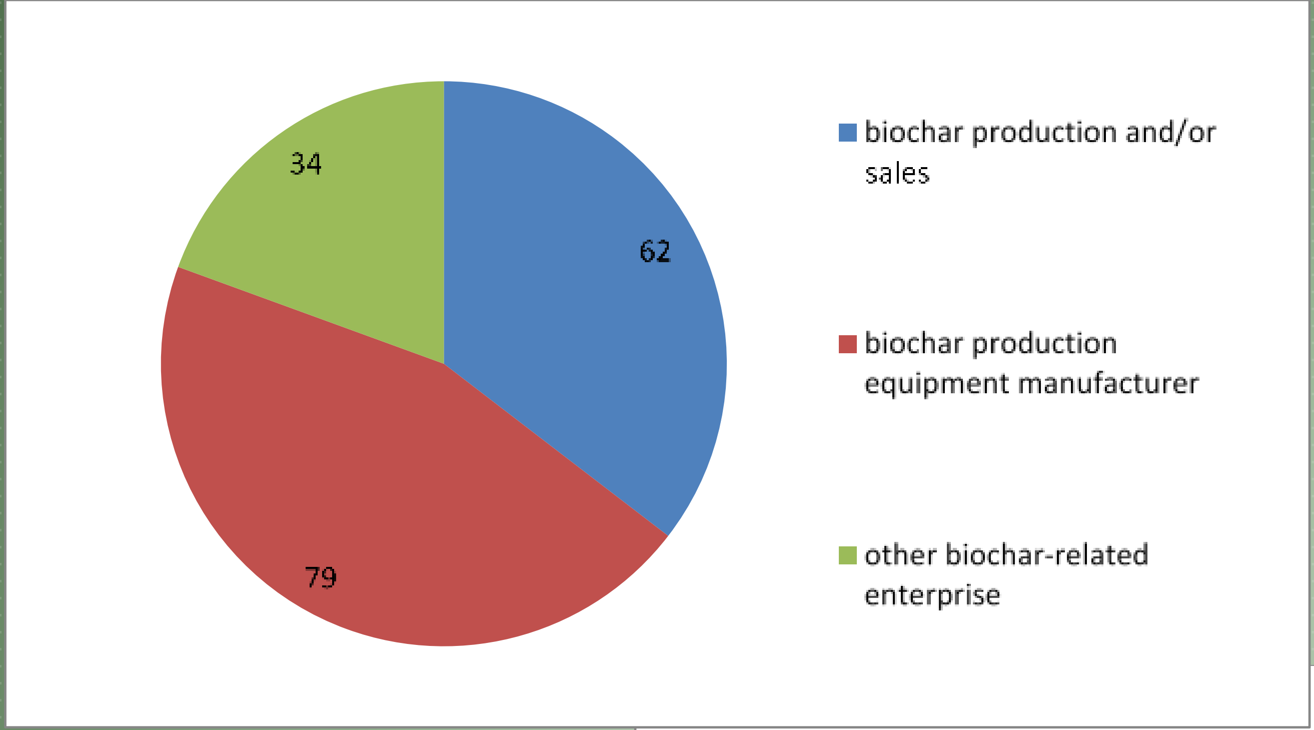

Figure 1. Companies in the biochar industry by sector

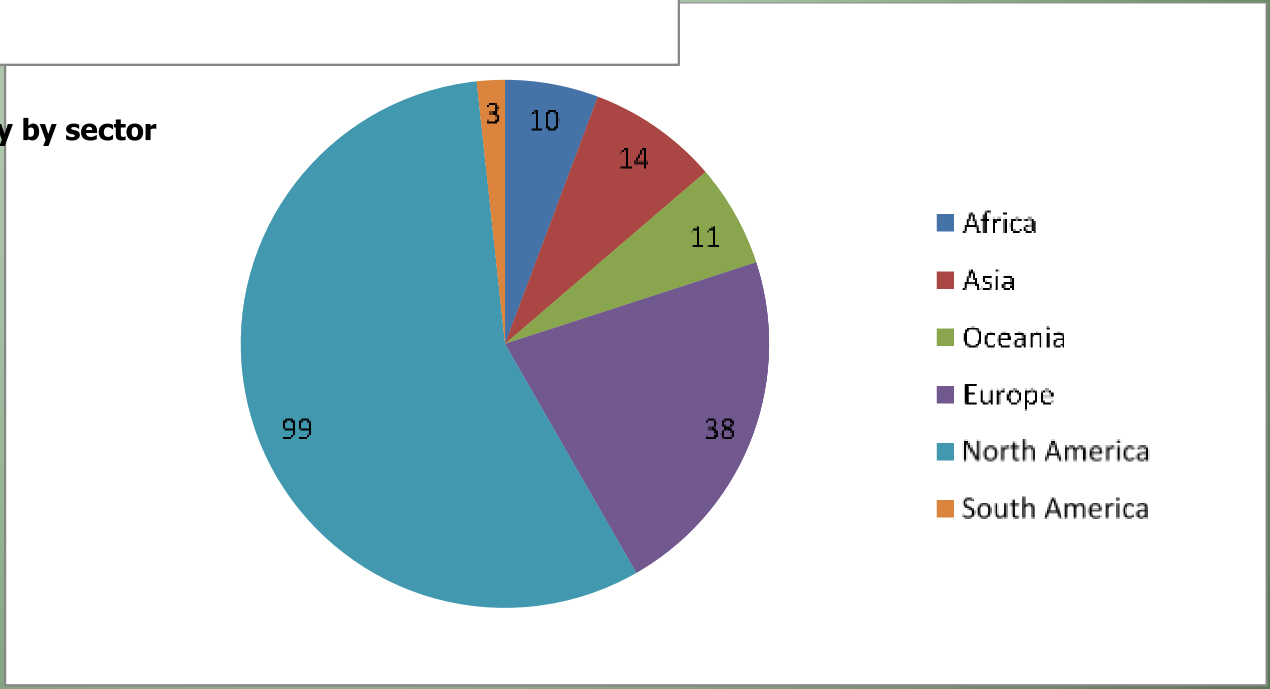

Figure 1. Geographic distribution of biochar businesses

Woody feedstocks are most common

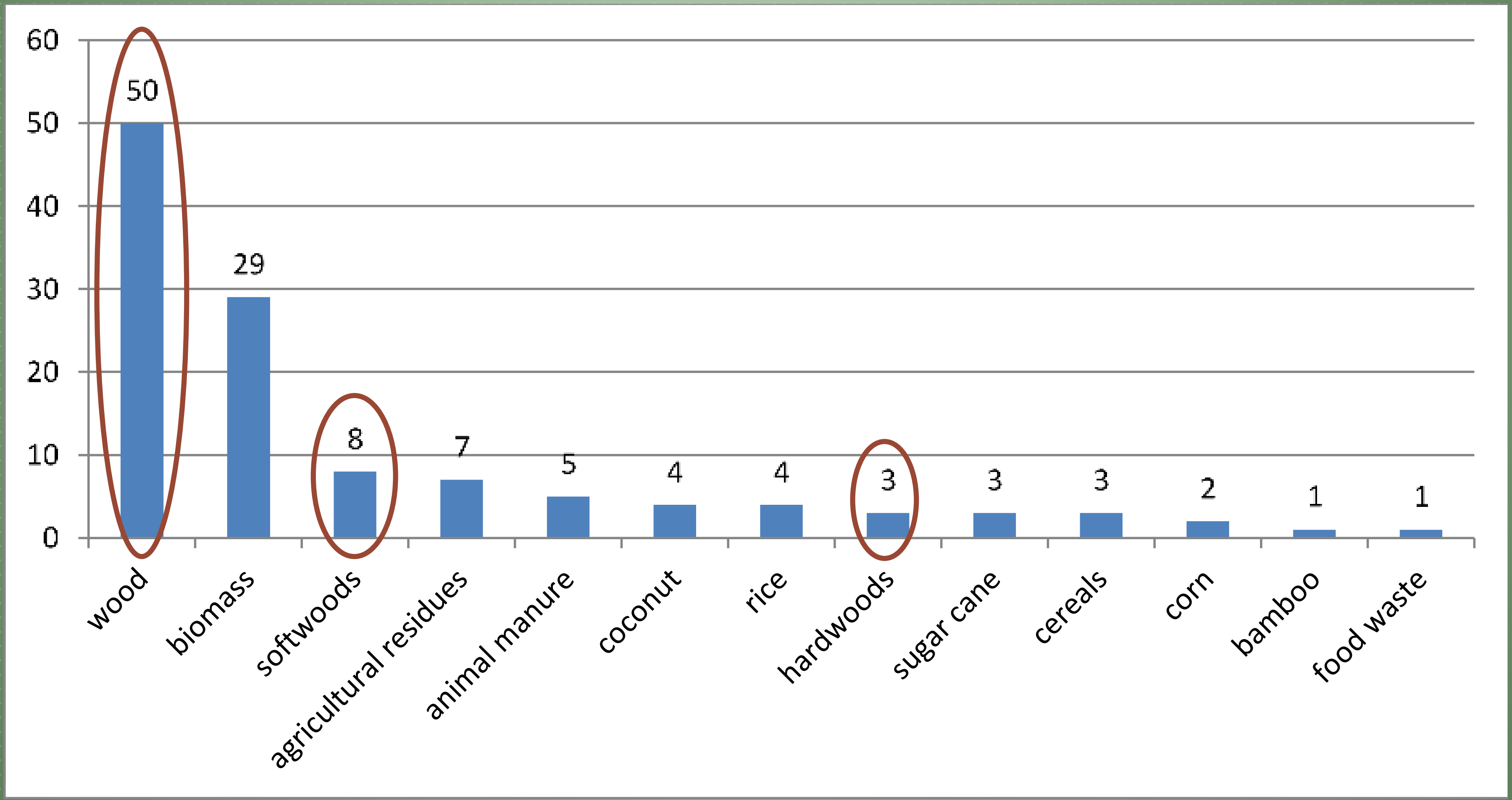

Figure 1. Feedstocks reported by companies producing biochar

Table. Prices of pure and blended biochars[1] reported by companies

Price biochar ($US/kg) updated November 2013						
Country	N	Mean (Pure)	Mean (Blend)	Min	Max	Std Dev
Australia	1	3.44	-	-	-	-
Austria	1	0.68	-	-	-	-
Canada	2	3.47	-	1.50	5.45	2.79
Germany	2	3.40	1.85	1.85	3.40	1.10
Ghana	1	0.35	-	-	-	-
India	1	-	0.08	-	-	-
Ireland	1	-	3.40	-	-	-
Kenya	1	-	1.00	-	-	-
Philippines	2	0.09	0.10	0.09	0.10	0.01
South Africa	1	-	0.30	-	-	-
Spain	1	1.83	-	-	-	-
Sri Lanka	1	0.32	-	-	-	-
Switzerland	1	0.66	-	-	-	-
UK	4	5.06	0.41	0.41	8.85	3.55
USA	23	2.74	5.94	0.27	13.48	2.87
TOTAL	43	2.65	3.29	0.08	13.48	2.68

[1] Where companies offered different quantities and prices, the values reported here reflect the lowest price per unit quantity listed. Prices do not include any shipping or handling costs or VAT. The minimum, maximum and standard deviations were calculated across pure and blended biochars.
[2] Assumes 1 US quart (volume) = 1 pound (mass)

Table. Volumes of biochar product sales by region reported by companies over the previous 12 months

Region	Volume transacted (tonnes)	% market share	N
Africa	25	3.0	2
Asia	56	6.7	3
Europe	205	24.8	3
North America	542	65.5	8
TOTAL	827	100	16

Large- and mid-scale conversion technologies are most common

Table 3. Scales, examples, and numbers of biochar producing technologies

Scale	Capacity (throughput)	Example technology and use	N
large	>10 tons/day	Industrial pyrolysis plant used to produce heat energy for power generation and a biochar byproduct for wholesale	**30**
mid	1 – 10 tons/day	Mobile continuous feed pyrolyzer used to convert forestry slash in situ to biochar for forest soil regeneration	**29**
small	10 – 1000 kg/day	Batch retort kiln used by small farmers to convert agricultural residues to biochar for retail sale via niche outlets	**17**
micro	<10 kg/day	High efficiency biochar-producing cookstove used in developing countries to cook meals and produce biochar for home gardens	**8**

Most conversion technologies manufactured in North America and Europe

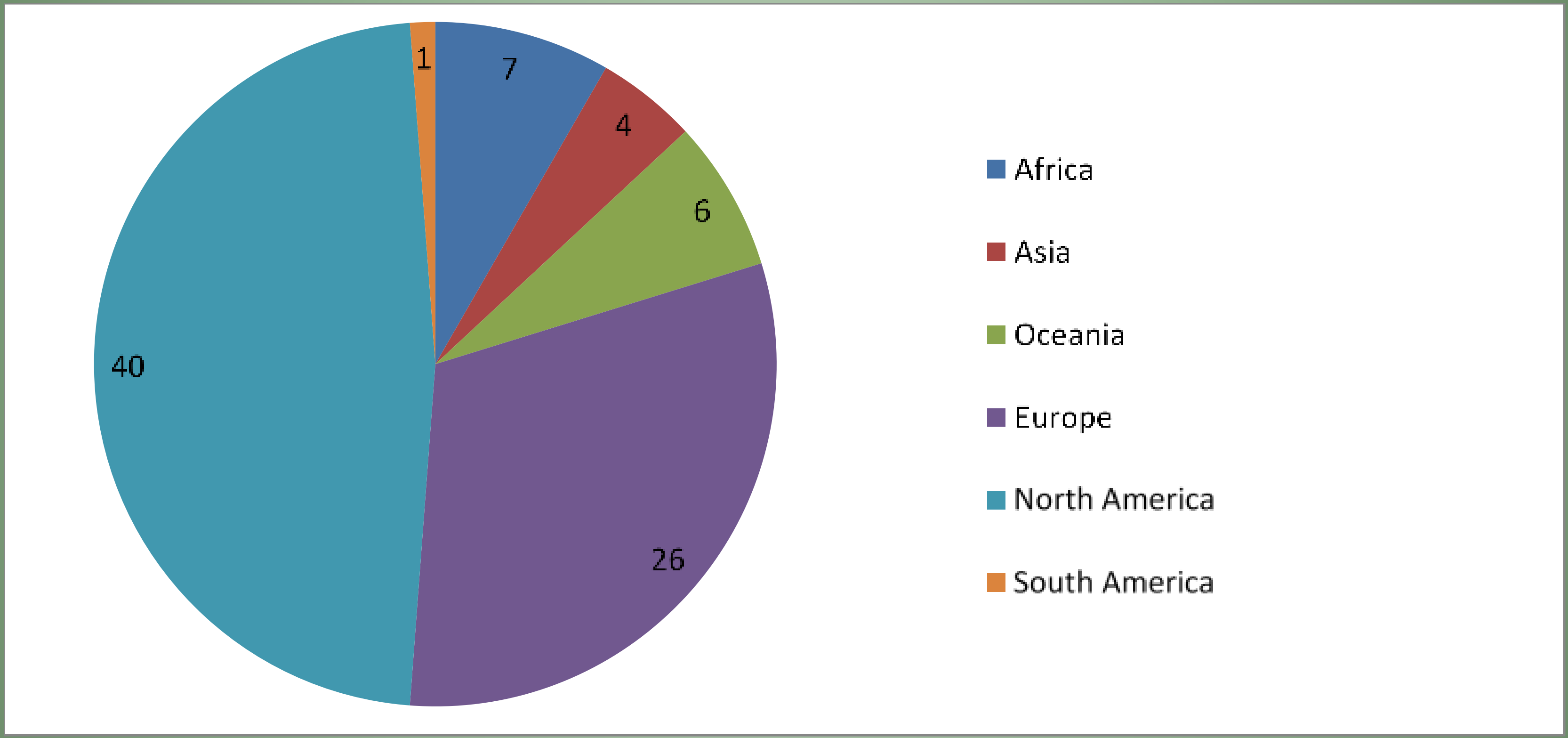

Figure 1. Numbers of companies producing or selling biochar production technologies by region (n=84)

Other goods and services related to biochar

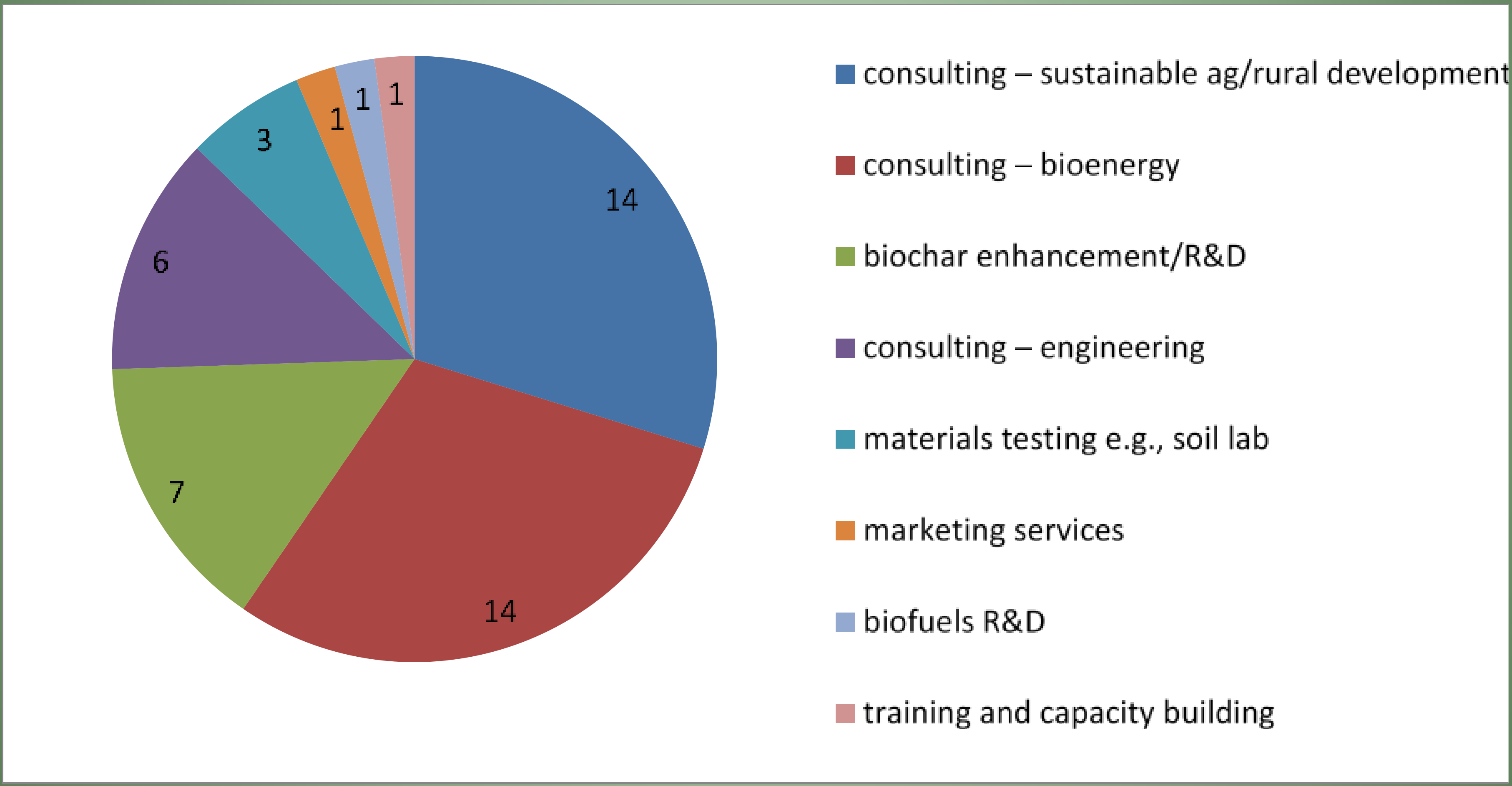

Figure 1. Types of services offered in the biochar space as listed by survey respondents (n=27)

Perceived market barriers by sector

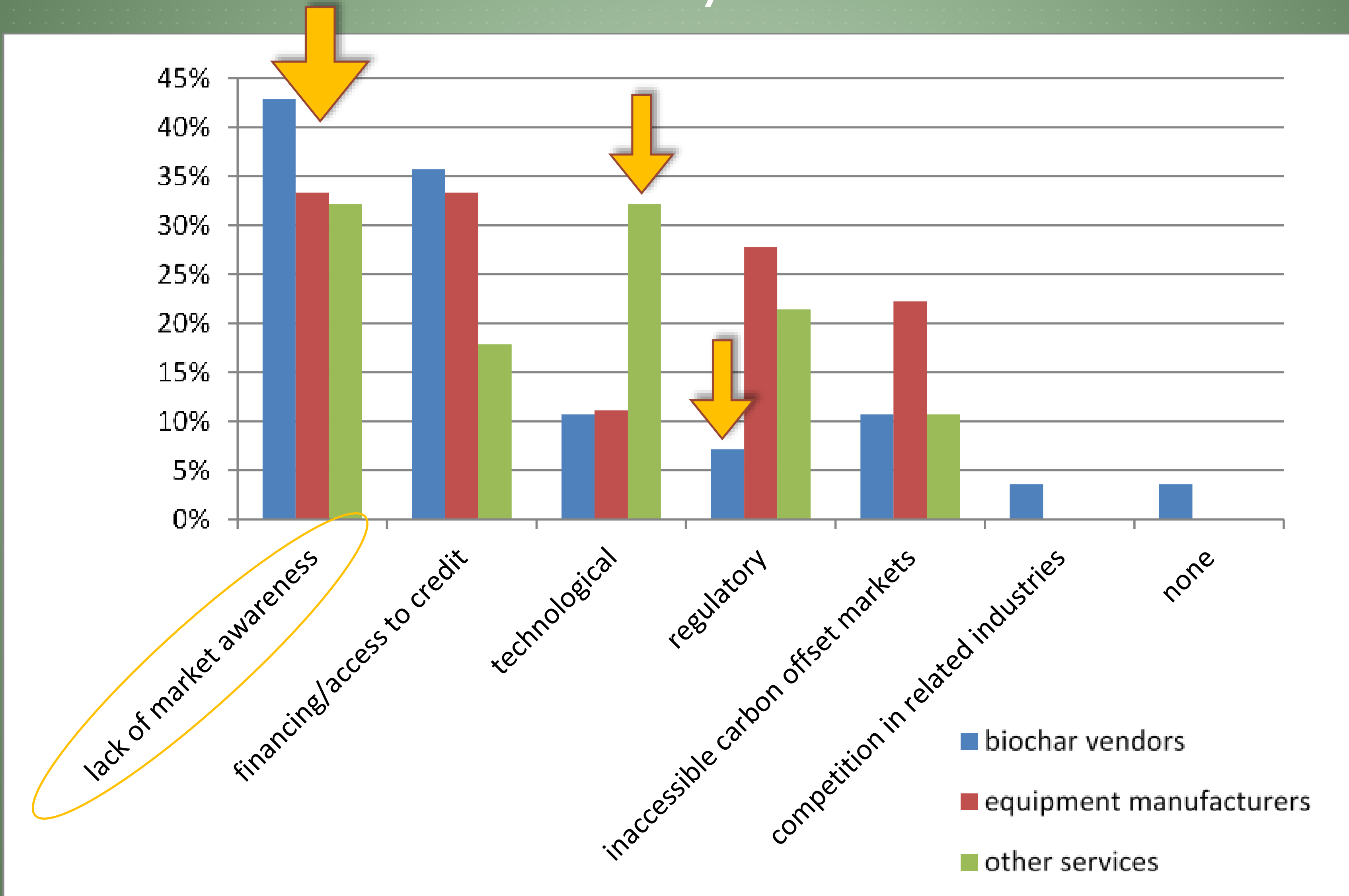

Figure 13. Perceived barriers to market development for biochar vendors (blue), equipment manufacturers (red), and purveyors of biochar-related services (green) (total n=74)

Key findings

1. Biochar industry is in a fledgling state
   - Most enterprises sell small volumes locally for end uses such as gardening and tree care
   - Biochar has yet to make a substantial entry into large-scale agricultural operations

2. Retail prices range from $0.08 to $13.48 per kg for blended and unblended biochars

3. Volumes of biochar sales totaled 827 metric tons
   - 90% of those transactions in North America and Europe with the remainder in Asia and Africa

Key findings (continued)

4. Woody biomass is by far the largest source of feedstock

5. Scales and types of biochar production technologies being developed and marketed range widely
   - micro-scale cookstoves → to large-scale industrial facilities

6. Barriers to industry expansion:
   i. **lack of consumer awareness,**
   ii. **technological constraints, and**
   iii. **access to financing**

Recommendations for Future Industry Growth

Create biochar decision support systems	• match biochars to specific soil and cropping scenarios
Conduct long-term field trials	• demonstrate agronomic benefits of biochar to farming community
Invest in technology R&D & alternative financing mechanisms	• decrease the cost of production equipment
Enhance international collaboration	• e.g., share business case studies
Increase education and outreach	• grow awareness of biochar potential amongst stakeholders

Next steps

- IBI plans to make this an annual report
  - Collecting data and conducting surveys in Summer 2014

- Identified gaps
  1. Case studies of operational biochar businesses in different geographic regions
  2. Higher survey participation → *in 2013 only ~20% of biochar businesses in IBI database participated in the survey*
  3. Identify reasons for businesses entering and leaving the biochar space