

Summary

WBC Research Themes

Review & Update

Theme B

Theme B: Alternate Materials Technology

Successful research projects will address the use of non-traditional materials or combinations of materials to produce wood-based composites. Use of alternate technologies may establish the viability of alternate raw materials for improved product performance and/or lower costs. Outcomes of research for this theme will support individual member efforts to improve existing products, develop new products, or identify new markets.

Subtheme B.1. Raw Materials

1. Increased use of (high-density) hardwood species, especially beech in Germany
2. Combining wood with other lignocellulosic and non-lignocellulosic materials
3. Addition of high performance materials for special applications (example: use of carbon fibers in bridges or other structures)
4. Materials with low/no formaldehyde emissions
5. Lignin-based byproducts
6. Alternative feedstock for use in existing products
7. Non-petroleum chemical feedstock
8. Non-organic binders

Subtheme B.2. Sourcing

1. Regional differences in lignocellulosic supplies
2. Input streams that do not compete with traditional wood composites

Subtheme B.3. New Market Development

1. Substitution of wood-based materials into traditionally non-wood markets
2. Evaluating new materials that have lower embodied energy (the sum of the energy required to produce the material) than traditional wood composites
3. Markets that extend beyond North America
4. Natural fiber insulation materials

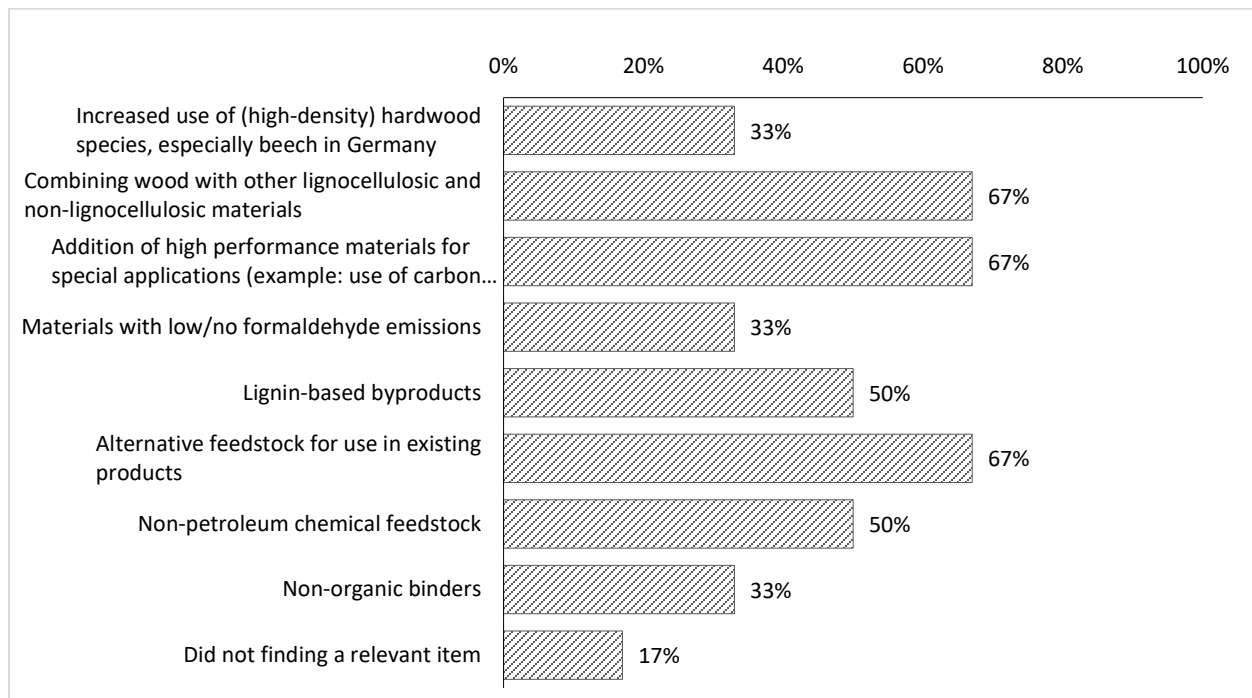
Theme B: Alternate Materials Technology

Response Rate 56%

Question 1. Subtheme B.1. Raw Materials contains several items, please choose the ones that are important/relevant for your field of work (check all that apply):

Items	Count	Percentage
Increased use of (high-density) hardwood species, especially beech in Germany	2	33%
Combining wood with other lignocellulosic and non-lignocellulosic materials	4	67%
Addition of high performance materials for special applications (example: use of carbon fibers in bridges or other structures)	4	67%
Materials with low/no formaldehyde emissions	2	33%
Lignin-based byproducts	3	50%
Alternative feedstock for use in existing products	4	67%
Non-petroleum chemical feedstock	3	50%
Non-organic binders	2	33%
Did not finding a relevant item	1	17%
Increased use of (high-density) hardwood species, especially beech in Germany	2	33%
Combining wood with other lignocellulosic and non-lignocellulosic materials	4	67%

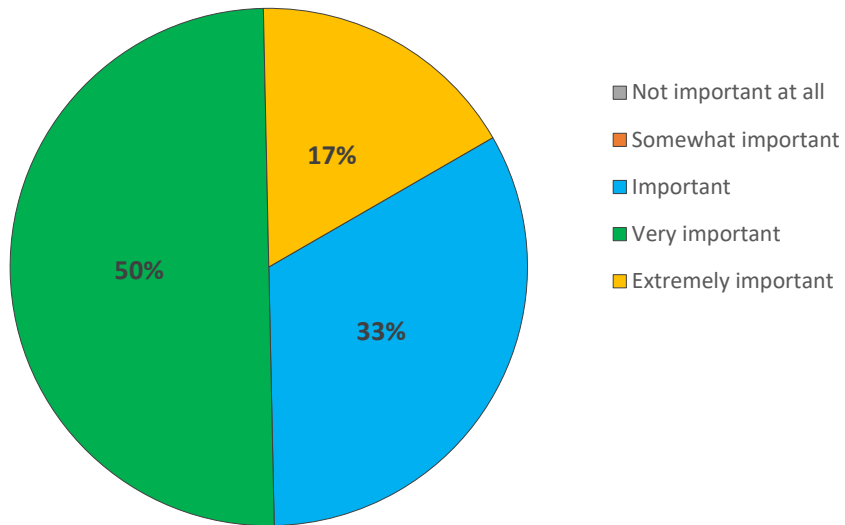
Subtheme B.1. Raw Materials Important/Relevant Items



Question 2. Please rate the importance of **Subtheme B.1. Raw Materials** for your field of work:

Level of Importance	Count	Percentage
Not important at all	0	0%
Somewhat important	0	0%
Important	2	33%
Very important	3	50%
Extremely important	1	17%

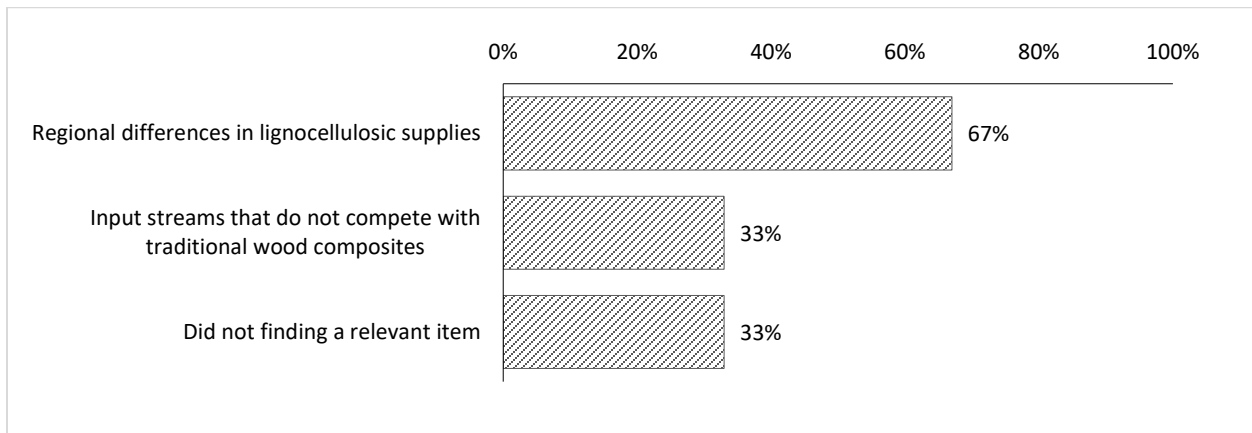
Level of Importance **Subtheme B.1. Raw Materials**



Question 3. Subtheme B.2. Sourcing contains several items; please choose the ones that are important/relevant for your field of work (check all that apply):

Items	Count	Percentage
Regional differences in lignocellulosic supplies	67%	4
Input streams that do not compete with traditional wood composites	33%	2
Did not find a relevant item	33%	2

Subtheme B.2. Sourcing Important/Relevant Items

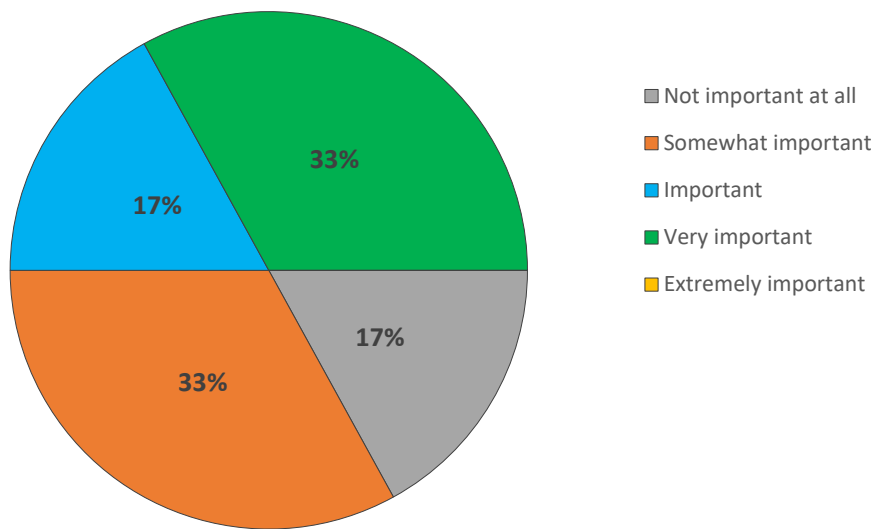


Question 4. Please recommend a new item(s) for **Subtheme B.2. Sourcing**. Please add a short definition for the item(s).

- *Non-wood resources for use in building products*

Question 5. Please rate the importance of **Subtheme B.2. Sourcing** for your field of work:

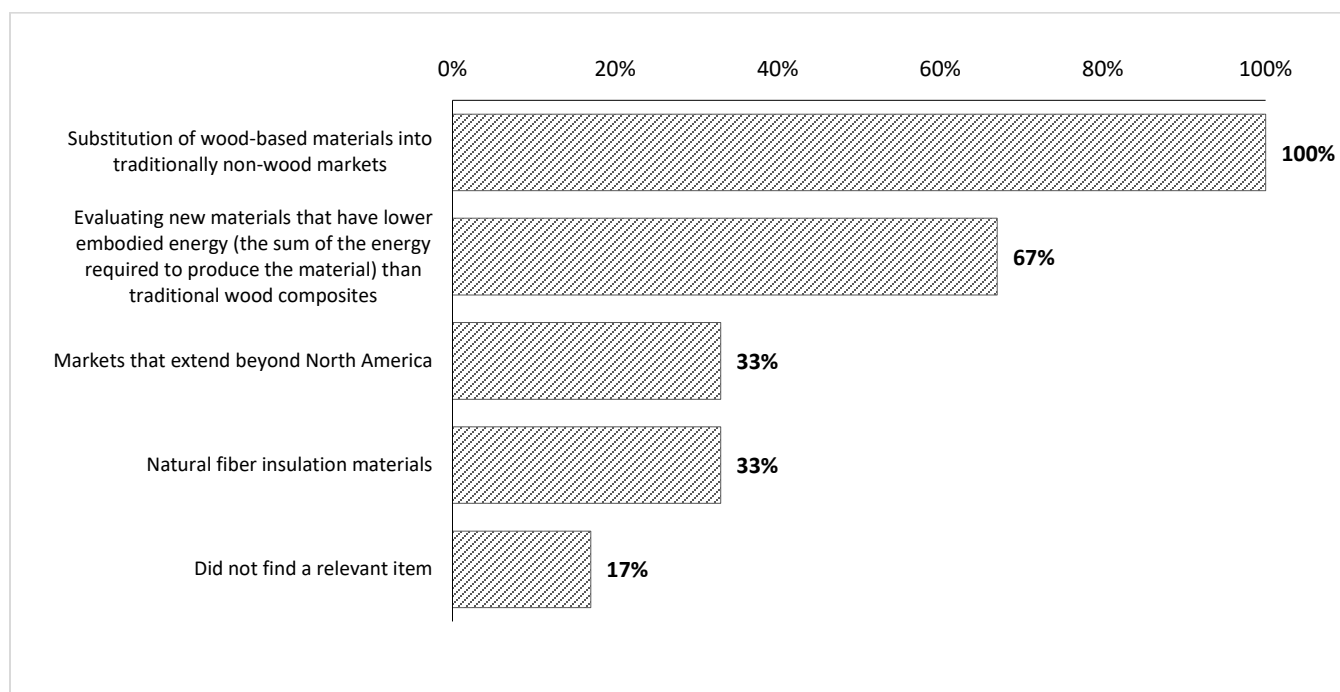
Level of Importance	Count	Percentage
Not important at all	1	17%
Somewhat important	2	33%
Important	1	17%
Very important	2	33%
Extremely important	0	0%



Question 6. Subtheme B.3. New Market Development contains several items; please choose the ones that are important/relevant for your field of work (check all that apply):

Items	Count	Percentage
Substitution of wood-based materials into traditionally non-wood markets	100%	6
Evaluating new materials that have lower embodied energy (the sum of the energy required to produce the material) than traditional wood composites	67%	4
Markets that extend beyond North America	33%	2
Natural fiber insulation materials	33%	2
Did not finding a relevant item	17%	1

Subtheme B.3. New Market Development Important/Relevant Items

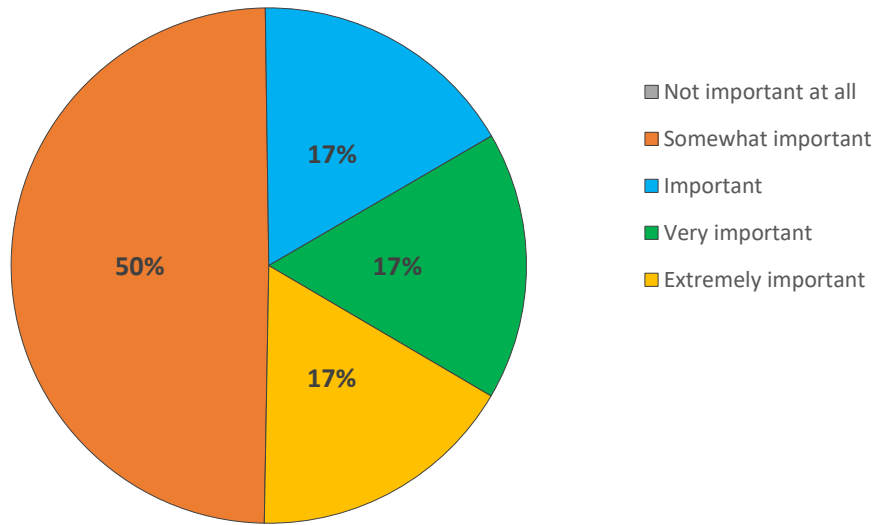


Question 7. Please recommend a new item(s) for **Subtheme B.3. New Market Development.** Please add a short definition for the item(s).

- [See Comments](#)

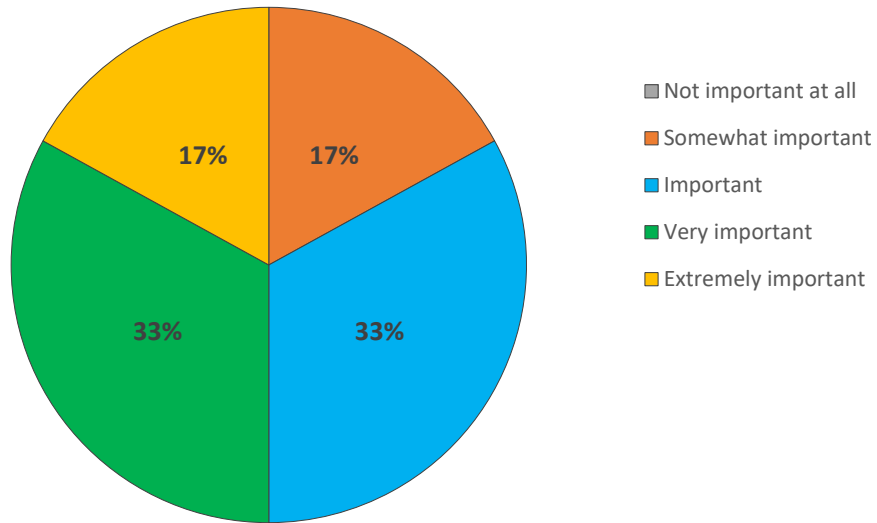
Question 8. Please rate the importance of **Subtheme B.3. New Market Development.** for your field of work:

Level of Importance	Count	Percentage
Not important at all	0	0%
Somewhat important	3	50%
Important	1	17%
Very important	1	17%
Extremely important	1	17%



Question 9. Overall, please rate the importance of theme **Theme B: Alternate Materials Technology** for your field of work:

Level of Importance	Count	Percentage
Not important at all	0	0%
Somewhat important	1	17%
Important	2	33%
Very important	2	33%
Extremely important	1	17%



Suggestions & Comments

Suggestions

Please provide suggestions to improve and update research theme **Theme B: Alternate Materials Technology**, subthemes, and items. In **purple** items modified or eliminated, in **blue** items added:

B. Alternate Materials Materials Technology

Successful research ~~projects~~ will address the use of non-traditional materials ~~and/or~~ combinations of materials to produce wood-based composites. Use of alternate technologies ~~may establish the viability of alternate raw materials for improved product performance and/or lower costs~~ could make alternate raw materials a more viable option to improve product performance, increase production efficiency, lower product cost, and reduce product emissions. Outcomes ~~of research for this theme from Research Theme B~~ will support individual member efforts to improve existing products, develop new products, ~~or identify new markets~~ and expand product offerings.

Current	Suggested
B. Alternate Materials Technology	B. Materials Technology
Subtheme B.1. Raw Materials 1. Increased use of (high-density) hardwood species, especially beech in Germany 2. Combining wood with other lignocellulosic and non-lignocellulosic materials 3. Addition of high performance materials for special applications (example: use of carbon fibers in bridges or other structures) 4. Materials with low/no formaldehyde emissions 5. Lignin-based byproducts 6. Alternative feedstock for use in existing products 7. Non-petroleum chemical feedstock 8. Non-organic binders	Subtheme B.1. Raw Materials 1. Evaluating underutilized wood species. 2. Combining wood with other lignocellulosic and non-lignocellulosic materials. 3. Adding high-performance materials for special applications. a. Carbon fiber in structural applications. 4. Identifying materials with low/no formaldehyde emissions. 5. Developing uses for lignin-based by- products. 6. Studying the effects of alternative feedstock for use in existing products: a. Non-petroleum chemical feedstock. 7. Non-organic binders.

Current	Suggested
<p>Subtheme B.2. Sourcing</p> <ol style="list-style-type: none"> 1) Regional differences in lignocellulosic supplies 2) Input streams that do not compete with traditional wood composites 	<p>Subtheme B.2. Sourcing</p> <ol style="list-style-type: none"> 1) Evaluating regional differences in lignocellulosic materials. 2) Determining the causes of differences in recycled raw materials. 3) Non-wood resources for use in building products
<p>Subtheme B.3. New Market Development</p> <ol style="list-style-type: none"> 1) Substitution of wood-based materials into traditionally non-wood markets 2) Evaluating new materials that have lower embodied energy (the sum of the energy required to produce the material) than traditional wood composites 3) Markets that extend beyond North America 4) Natural fiber insulation materials 	<p>Subtheme B.3. Market Opportunities</p> <ol style="list-style-type: none"> 1) Identifying barriers and requirements for substitution of wood composites in traditionally non-wood markets. 2) Evaluating the requirements for markets outside of North America. 3) Identify test methods, review relevant codes, note any gaps, and formalize new methods as needed (<i>See comments</i>).

Comments

Please comment on how to improve and update research theme **Theme B: Alternate Materials Technology**, subthemes, and items.

Regarding Subtheme 3. Market Development:

- *New Products will need to meet existing codes and/or codes and test methods will need to be developed for new products. Project should note any gaps in meeting codes for proposed new products.*
- *Identifying relevant test methods to evaluate new products and review pertinent codes that need to be met will be important. Working with ASTM to formalize new, relevant test methods could be part of the work.*