## Industry Advisory Board - Since Inception

<table>
<thead>
<tr>
<th>A to C</th>
<th>C to G</th>
<th>G to M</th>
<th>M to P</th>
<th>P to S</th>
<th>S to Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cargill</td>
<td>DUPONT</td>
<td>LESAFFRE GROUP</td>
<td>POET</td>
<td>SAINT-GOBAIN</td>
<td>‘TORAY’</td>
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<tr>
<td>BASF</td>
<td>EVONIK INDUSTRIES</td>
<td>Jowat</td>
<td>novozymes</td>
<td>Michelin</td>
<td>Innovation by Chemistry</td>
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<tr>
<td>ASHLAND</td>
<td>DSM</td>
<td>International Flavors &amp; Fragrances</td>
<td>USDA</td>
<td>REG</td>
<td>Sustainable Bioproducts</td>
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<tr>
<td>Chevron Phillips Chemical Company</td>
<td>IFF</td>
<td>genomatica</td>
<td>opxbio</td>
<td>TechSource</td>
<td>Biorenewables</td>
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<td>Allylix</td>
<td>Elevance</td>
<td>North Carolina Agricultural Research Service</td>
<td>USDA Bioenergy</td>
<td>River Glen</td>
<td>VariFAS</td>
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<td>CONAGEN</td>
<td>Cibus</td>
<td>Iowa Corn Growers Association</td>
<td>NCBA</td>
<td>Pareto Biotechnologies</td>
<td>Biorenewables</td>
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<td>EndicottBiofuels</td>
<td>GlycosBio</td>
<td>mbi</td>
<td>PureOleo</td>
<td>SB Biorenewables</td>
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<td>&amp; BioBusiness Alliance of Minnesota</td>
<td>GlucanBio</td>
<td>OmegaChea</td>
<td>Pine Creek</td>
<td>Sumatra Biorenewables</td>
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Center for Biorenewable Chemicals
One Year Away from Zero Members

- Members stayed between 1 year and 8 years
- Recruit, Reward, Retain.
- Stagger start/renewal date when sign agreement.
- Tiered membership offers valuable flexibility.

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<thead>
<tr>
<th></th>
<th>Strategic</th>
<th>Full</th>
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<tbody>
<tr>
<td>Large</td>
<td>$25,000</td>
<td>$50,000</td>
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<tr>
<td>Medium</td>
<td>$12,500</td>
<td>$25,000</td>
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<tr>
<td>Small</td>
<td>$2,500</td>
<td>$5,000</td>
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<tr>
<td>Startup</td>
<td>$500</td>
<td>$1,000</td>
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*S To be negotiated on a case-by-case basis.
ERC’s need an active IAB with sufficient diversity to add value to the center.

- Recruit
- Train
- Reward
- Retain
Core Needs

Understand why companies are members. They are not all the same.

- Clear Understanding of Industry Membership Benefits & Costs, and your Membership Agreements
- Solid Knowledge of your ERC’s Science & Technology
- Classy Brochure with your ERC Story
- Convincing PowerPoint Presentation with Great Slides

- Consistent Credibility with your ERC Management Team and University Admin
- Build Links to the Broad Industry of your ERC
- Dialogue & Good Relations with your Industry Member Folk
- Patience, Perseverance, Persuasion, Passion & Vision
Build a database of company names, connections, contact info and notes.

- Spreadsheet is good start.
- Next level is a CRM database.
- Will need a database to track invoices. Best if CRM and Invoice are integrated.
- ILO’s that exit leave a challenge behind.

Zoho CRM
Recruit

Find key decision makers. Industry folk move jobs. Track with LinkedIn.

- Cold calls do not work.
- CDA is sometimes a problem.
- Use your IAB and Faculty.

- Emails, connections, business meetings lectures, brochures.
- Imperative to reach the “right person” as senior as you can get. Build many connections.
- Follow-up with conference call and campus visit.
- Invite select guests to Annual Meeting (Fee & CDA).
Train

- Explain, describe and summarize.
- Often get new people to member meetings.
- Legal side and patents and internet access and strategy and SWOT.
- Build a good rapport with your IAB.
Reward

Respond effectively to emails or phone calls. Listen, evolve, make friends.

- Annual meetings are very important.
- Newsletters and webinars are very effective.
- Impossible to provide all information about an ERC to the membership.
Retain

Members that leave do not come back.

• Improve your program over time so that there is always a next level.
• Build multiple relationships with members.
• IAB Seed projects from membership fees.
• Sponsored research, internships, mentoring all build a deeper root in the ERC.
• Find creative ways to not lose a member.
Thank you!!
Problem – Solution – Challenges

Scaled to 20M Gallons/Day
Derisked
Multiple Molecules

Alkanes
Aromatics
Cycloalkanes

Less Scaled to 0.2M Gallons/Day
Not Derisked
Single Molecules

Glucans
Xylans
Lignin
Innovation Ecosystem

Faculty, Students & Management Team

Startups, Members & Innovation Partners

Ideas → 1-5 Yrs (Concept Generation) → 2-5 Yrs (Knowledge & Patents) → 4-10 Yrs (Product R&D) → 2+ Yrs (Commercialization)
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<td>Larger</td>
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<td>Smaller</td>
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Existing Petrochemicals

ETHYLENE
- maleic anhydride
- ethanol
- ethylene
- ethylene dichloride
- vinyl chloride
- ethylene oxide
- ethylene glycol
- a-olefins
- vinyl acetate
- ethanolamines
- diethylene glycol
- butene-1
- 1,4-butanediol

PROPYLENE
- propylene
- acrylonitrile
- propylene oxide
- acrylic acid
- n-butanol
- isopropanol
- propylene glycol
- 2-ethylhexanol
- methyl ethyl ketone

BENZENE
- benzene
- nitrobenzene
- cyclohexane
- adipic acid
- caprolactam
- linear alkylbenzene
- cumene
- phenol
- acetone
- bisphenol-A
- methyl diphenyl diisocyanate
- aniline
- ethylbenzene
- styrene

METHANOL/GLYCEROL
- glycerol
- methanol
- methyl tert-butyl ether
- formaldehyde
- acetic acid
- methyl chloride
- Chloroform
- methyl methacrylate

XYLENE
- toluene diisocyanate
- phthalic anhydride
- o-xylene
- terephthalic acid
- p-xylene
- butadiene

Alkanes/Cycloalkanes/Aromatics
Ecosystem Accelerator

- Students gain real insight into project and startup concept planning.
- At least one startup from each Entrepreneurship Course.
- Startups need mentoring and require funding.
- CBiRC’s startups have accessed over $5m of funding since 2011.
IP Portfolio & Technology Translation

CBiRC

BIOBASED
FOUNDRY

OmegaChea

CORPS

VariFAS

Sustainable Solutions

Center for Biorenewable Chemicals
Different Stages

- **Stage 1.** Formation and Foundation
- **Stage 2.** Develop & Refine
- **Stage 3.** Refine & Optimize
- **Stage 4.** Redefine & Mature
- **Stage 5.** Graduate to Sustainable Center

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<th></th>
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<tbody>
<tr>
<td>ERC Years -2 thru 0</td>
<td>ERC Years 1 thru 3</td>
<td>ERC Years 4 thru 6</td>
<td>ERC Years 7 thru 10</td>
<td>ERC Years 10+</td>
</tr>
<tr>
<td>Formation and Foundation</td>
<td>Define and Develop</td>
<td>Refine and Optimize</td>
<td>Redefine and Mature</td>
<td>Graduate to Sustainable Center</td>
</tr>
<tr>
<td>ERC STAGES &amp; YEARS CONCEPT</td>
<td>Stage 1. ERC Years -2 thru 0 Formation and Foundation</td>
<td>Stage 2. ERC Years 1 thru 3 Define and Develop</td>
<td>Stage 3. ERC Years 4 thru 6 Refine and Optimize</td>
<td>Stage 4. ERC Years 7 thru 10 Redefine and Mature</td>
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<tr>
<td>Ideation and Formation</td>
<td>Work closely with ERC Founders and University advisors to develop ideas within context of NSF ERC Guidelines. Help define ERC opportunity.</td>
<td>Define and develop ERC concept working closely with ERC Management Team.</td>
<td>Refine ERC concept working closely with ERC Management Team.</td>
<td>Redefine Center concept based around a vision of future sustainability.</td>
</tr>
<tr>
<td>Member Recruitment</td>
<td>Secure letters of intent from future industry members. Identify key individuals to work with.</td>
<td>Develop active outreach process through business connections, technical summits, outreach presentations, fliers and brochures. Underrepresented membership structure based on company size, varying benefits.</td>
<td>Develop recruitment efforts with a greater emphasis on maximizing ability to retain key members.</td>
<td>Redefine recruitment and retention around a future sustainability strategy.</td>
</tr>
<tr>
<td>Commercialization of IP</td>
<td>Begin to define strategy to retain members through engagement in center activities including newsletters, websites and other informational tools.</td>
<td>Develop ideas around joint projects, testbeds, and other ERC opportunities.</td>
<td>Maximize ERC company interaction and benefits. Cultivate interest in joint projects, involvement in testbeds, and other ERC opportunities. Value and mechanisms of establishing multiple points of contact in firms.</td>
<td>Redefine recruitment and retention around a future sustainability strategy.</td>
</tr>
<tr>
<td>Intellectual Property</td>
<td>Begin to define testbeds and cross project integration alongside a strategy for commercialization.</td>
<td>Develop industry R&amp;D needs alongside ERC needs in testbeds, integrate industrial input from project inception, using project management tools (timelines, go/no-go points, cross project integration, etc.).</td>
<td>Meet Industry R&amp;D needs alongside ERC needs in testbeds, integrate industrial input from project inception, using project management tools (timelines, go/no-go points, cross project integration, etc.). Strategies for increasing sponsored research projects with industry.</td>
<td>Redefine commercialization strategy around a future sustainability strategy.</td>
</tr>
<tr>
<td>Innovation Strategy</td>
<td>Begin to identify key local innovation partners and infrastructure</td>
<td>Develop paths to entrepreneurship activities in the ERC and University, connecting to local, state, regional economic development and incentive programs and role of investment groups such as Angels, VCs.</td>
<td>Cultivate entrepreneurship activities in the ERC and University, connecting to local, state, regional economic development and incentive programs and role of investment groups such as Angels, VCs.</td>
<td>Redefine innovation strategy around a future sustainability strategy.</td>
</tr>
<tr>
<td>Education Programs</td>
<td>Begin to identify strategy to develop valuable education programs</td>
<td>Start student mentoring programs, short courses and workshops for industry. Certificate programs and distance leaning models, Faculty and student exchange, active promotion of industrial recruitment of graduates.</td>
<td>Refine student mentoring programs, short courses and workshops for industry. Certificate programs and distance leaning models, Faculty and student exchange, active promotion of industrial recruitment of graduates.</td>
<td>Redefine education strategy around a future sustainability strategy.</td>
</tr>
</tbody>
</table>
**Strategy: Define and Refine**

<table>
<thead>
<tr>
<th>Goals</th>
<th>Define, Develop, Refine and Optimize</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strategy and Ideation</strong></td>
<td>Define, Develop, Refine and Optimize CBiRC, Work Closely with Leadership Team</td>
</tr>
<tr>
<td><strong>Innovation</strong></td>
<td>Cultivate Innovative Culture, Entrepreneurship Course, Translational Research, Startup Companies, Innovation Partners, Angels and VCs</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td>Student Spotlights, Industry Internships, Distance Learning, Exchange, Student Mentoring, Recruitment</td>
</tr>
<tr>
<td><strong>Member Recruitment</strong></td>
<td>Industry Outreach, Summits, Conferences, LinkedIn, Connections, Site Visits</td>
</tr>
<tr>
<td><strong>Member Retention</strong></td>
<td>Newsletters, Networking, Poster Competition, Student Seminars, Technology Fair, Technology Transfer, Two-Way Confidentiality, Sponsored Research, Internships</td>
</tr>
<tr>
<td><strong>Commercialization of IP</strong></td>
<td>Integrate Industry Input, Invention Disclosures, NSF Translation Research Grants, Startup Companies</td>
</tr>
<tr>
<td><strong>Intellectual Property</strong></td>
<td>Invention Disclosure Process, Align with Offices of IPTT,</td>
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