



# **2010 ALGAL BIOMASS ORGANIZATION ANNUAL MEETING**

*The Algal Biomass Organization promotes the development of viable commercial markets for renewable and sustainable commodities derived from algae.*

[www.algalbiomass.org](http://www.algalbiomass.org)

# AGENDA



## **Chairman's Remarks**

- **Billy Glover**, Chairman of the ABO Board of Directors

## **Opening Speakers**

- **Matt Carr**, Biotechnology Industry Organization (BIO)
- **Paul Argyropoulos**, Environment Protection Agency

## **Executive Director's Report**

- **Mary Rosenthal**, ABO Executive Director

## **Financial Report**

- **Thomas Byrne**, Treasurer of the Board of Directors

## **Committee Report**

- |                                       |   |
|---------------------------------------|---|
| • <b>Events</b>                       | <b>Thomas Byrne</b> , Committee Chairman          |
| • <b>Membership Development</b>       | <b>Mark Allen</b> , Committee Chairman            |
| • <b>Peer Review</b>                  | <b>John Benemann</b> , Committee Co-Chairman      |
| • <b>Gov't &amp; Public Relations</b> | <b>Dale Smith</b> , Tim Zenk, Committee Co-Chairs |
| • <b>Bylaw &amp; Governance</b>       | <b>Mark Allen</b> , Committee Chairman            |
| • <b>Technical Standards</b>          | <b>Mark Allen</b> , Committee Chairman            |

## **Board of Director's Nominee Presentations**

## **Luncheon**, Sponsored by **Boeing & FedEx**

- Speaker – **Representative Harry Teague**, New Mexico

## **Adjournment**



# OPENING REMARKS

Billy Glover, Chair of the Board of Directors

*The Algal Biomass Organization promotes the development of viable commercial markets for renewable and sustainable commodities derived from algae.*

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# OPENING SPEAKER

Matt Carr, Biotechnology Industry Organization (BIO)

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# **BIOFUELS**

## **STATE OF THE TECHNOLOGY REPORT**

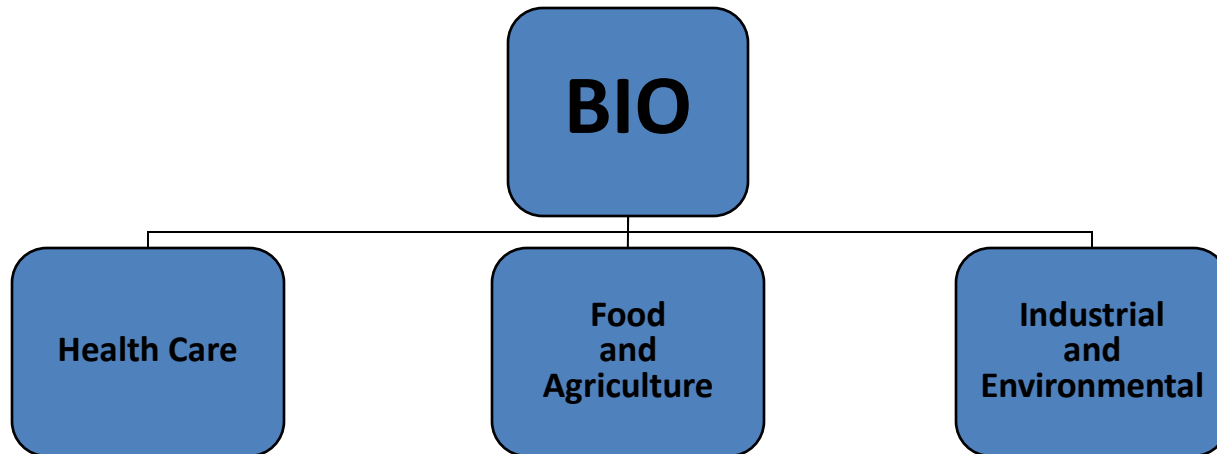
**Matthew Carr**

Policy Director, Industrial & Environmental Section  
Biotechnology Industry Organization (BIO)

March 25, 2010

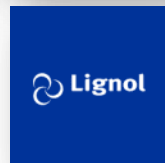
# What is BIO?

- Biotechnology Industry Organization (BIO)
- Trade association based in Washington, D.C.
- Over 1,200 member companies
- Members in U.S. and 31 other countries





# SOME INDUSTRIAL AND ENVIRONMENTAL SECTION MEMBERS



# BIO ALGAE WORKING GROUP

- **Algaedyne**
- **Algenol Biofuels**
- **Aurora Biofuels**
- **Culturing Solutions**
- **HRBioPetroleum**
- **LifeTech**
- **LiveFuels**
- **Solazyme**
- **Synthetic Genomics**
- **Terrabon**
- **The Dow Chemical Company**



# **BIOFUELS TECHNOLOGY TRENDS**

- 1. Improved 1<sup>st</sup> Gen. Processes**
- 2. Purpose-grown Crops and Algae**
- 3. First Commercial Production of Cellulosics**
- 4. Advances in End Molecule Diversification**
- 5. Increasing Focus on  
Renewable Chemicals / Bioproducts**

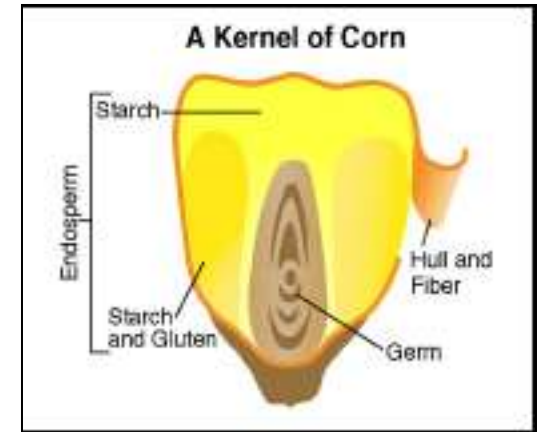
# EVOLUTION IN STARCH ETHANOL PRODUCTION

- Best available technologies e.g.

- biotech “cold cook”  
(raw starch) enzymes
- advanced fractionation

can:

- increase ethanol yield > 6%
- create cellulosic feedstock stream
- reduce GHG emissions > 20%



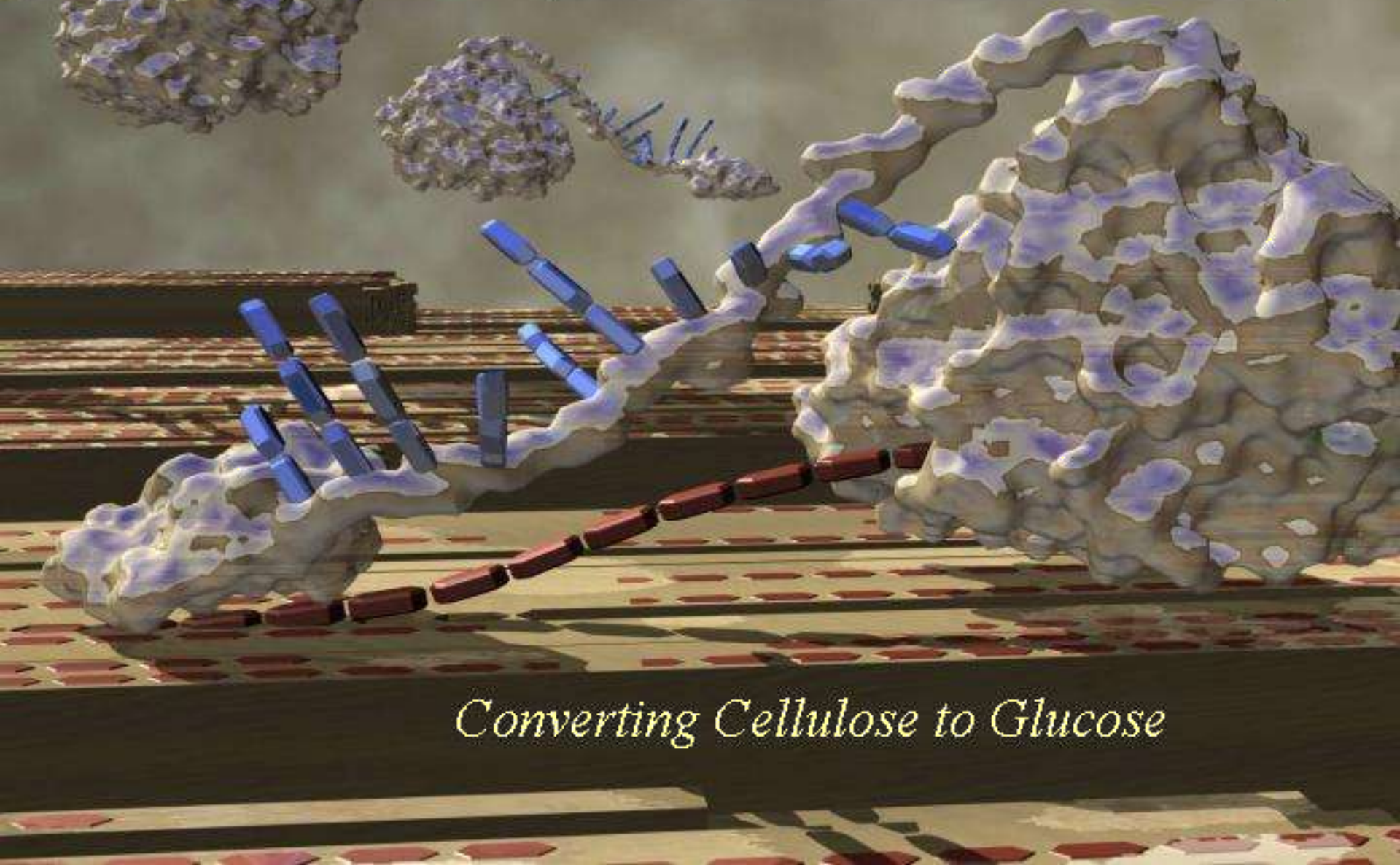
# PURPOSE-GROWN CROPS

- Commercial switchgrass seeds now on the market
- Variety of short rotation woody crops under development





# Cellulase: Molecular Machine for Energy Conversion



*Converting Cellulose to Glucose*

# The Pacific Dampwood Termite

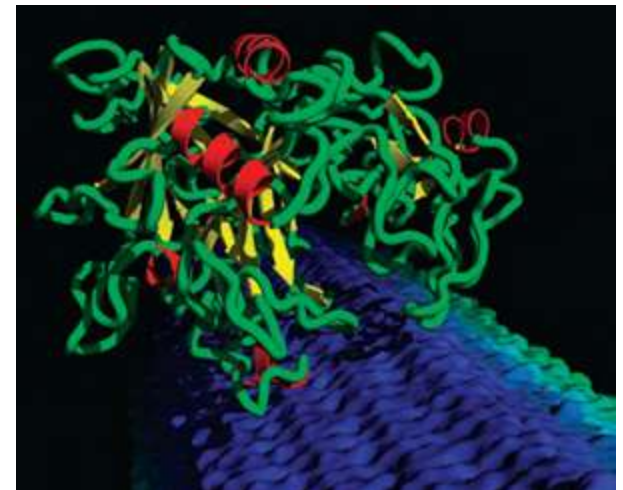
## *Zootermopsis angusticollis*



Salmassi and Leadbetter

# DRAMATIC COST REDUCTIONS FOR CELLULASE ENZYMES

- Novozymes, Genencor recently announced 80% reduction in enzyme cost vs. 2008
- Forecast cellulosic ethanol production cost under \$2.00 per gallon by 2011





# EXISTING/ PLANNED ADVANCED BIOFUELS FACILITIES



Over 40 cellulosic biorefineries planned  
or in pilot production

# ALGAE

- Multiple developers moving to commercial demonstration
- Variety of approaches and end molecules



# HIGHER ALCOHOLS & RENEWABLE HYDROCARBONS

- **Biobutanol**

- Higher energy density,  
infrastructure compatibility



- **Green gasoline / jet fuel**

- Use synthetic biology to produce  
organisms capable of generating  
renewable petroleum surrogates –  
tremendous promise



# RENEWABLE CHEMICALS & BIOPRODUCTS

- Higher value products getting more attention as investment \$\$ become more scarce

- Ethanol -> Polyethylene



Braskem

- Succinic Acid



DSM



- Isoprene



# POLICY OPPORTUNITIES / THREATS

- **Indirect Land Use Change**
  - Need for conclusive policy approach
- **Blend Wall**
  - Need short-term market to drive long-term investment
- **Cap and Trade Legislation**
  - Carbon accounting for biofuels and bioproducts
- **Financing Policy**
  - Need programs that de-risk investment
- **Technology / Product Diversity**
  - Need variety of feedstocks, conversion technologies, and products to achieve relevance and sustainability

# ALGAE POLICY PRIORITIES

- **Incentives Parity**

- Open cellulosic tax credits to algae-based fuels
  - S. 1250 / H.R. 4168
  - Tax extenders bill, green jobs bill
- Consider qualifying algae-based fuels for cellulosic mandate in RFS2
- Ensure algae-based fuels qualify for advanced biofuel grants and other funding programs

- **Climate Legislation**

- Ensure GHG benefits of algae are adequately accounted for
  - How will Kerry-Graham-Lieberman treat biofuels?



# MARK YOUR CALENDARS



Matt Carr, Policy Director, BIO I&E Section, [mcarr@bio.org](mailto:mcarr@bio.org)



# OPENING SPEAKER

Mr. Paul Argyropoulos  
Office of Transportation Air Quality  
US Environmental Protection Agency

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# Algal Based Fuels and the National Renewable Fuel Standard Program

**Presentation to:** Algal Biomass Organization  
Annual Meeting, March 25, 2010

Paul Argyropoulos  
Office of Transportation and Air Quality  
US Environmental Protection Agency



# Overview

- Key Changes Required by EISA
- Key Highlights of the RFS2 Rule
- The 2010 Standards
- Renewable Biomass Provisions
- Application of Lifecycle Results
- Summary of Program Impacts
- Overview: Algae Based Fuels in RFS2
- Conclusions / Questions

# Key Changes Required by EISA

- **Energy Independence and Security Act (December 2007) required changes to the RFS program**
  - Significantly increased volumes of renewable fuel – to 36 billion gallons
  - Expanded from on road gasoline to on and off-road gasoline and diesel
  - Separation of the volume requirements into four separate categories of renewable fuel: cellulosic biofuel, biomass-based diesel, advanced biofuel, total renewable fuel
  - Changes to the definition of renewable fuels to include minimum lifecycle GHG reduction thresholds and grandfathering of volume from certain facilities
  - Restrictions on the types of feedstocks that can be used to make renewable fuel, and the types of land that can be used to grow and harvest feedstocks
  - Inclusion of specific types of waivers and EPA-generated credits for cellulosic biofuel

# Highlights of the New RFS2 Program

- Today's rule sets the full 2010 EISA renewable fuels volume = 12.95 Billion Gallons\* (See Slide 9)
- The new RFS2 Regulations will go into effect July 1, 2010.
- EPA has developed a path for transitioning from RFS1 to RFS2
- The rule also establishes volume standards for specific categories of renewable fuels.
- In order to qualify for these new categories, fuels must demonstrate they meet certain minimum greenhouse gas reduction standards, based on lifecycle assessment, in comparison to the petroleum fuels they displace (2005 baseline).
- EPA conducted significant work since the proposal AND -- EPA's current modeling of specific fuel pathways (0% discount and 30 Year time horizon) has determined the following fuels qualify :
  - Renewable Fuel 20% Category: Ethanol and Biobutanol from corn
  - Non Cellulosic Advanced 50% Category: Ethanol produced from sugarcane
  - Biomass-based Diesel / Advanced 50% Category: Biodiesel from soy oil; renewable diesel from waste oils, fats, and greases; and diesel produced from algal oils
  - Cellulosic Biofuel 60% Category: Cellulosic ethanol and cellulosic diesel (based on currently modeled pathways)
- Rule also provides a process to efficiently evaluate and establish new fuels and feedstocks
- Rule maintains several key components of RFS1 program, including energy based approach.



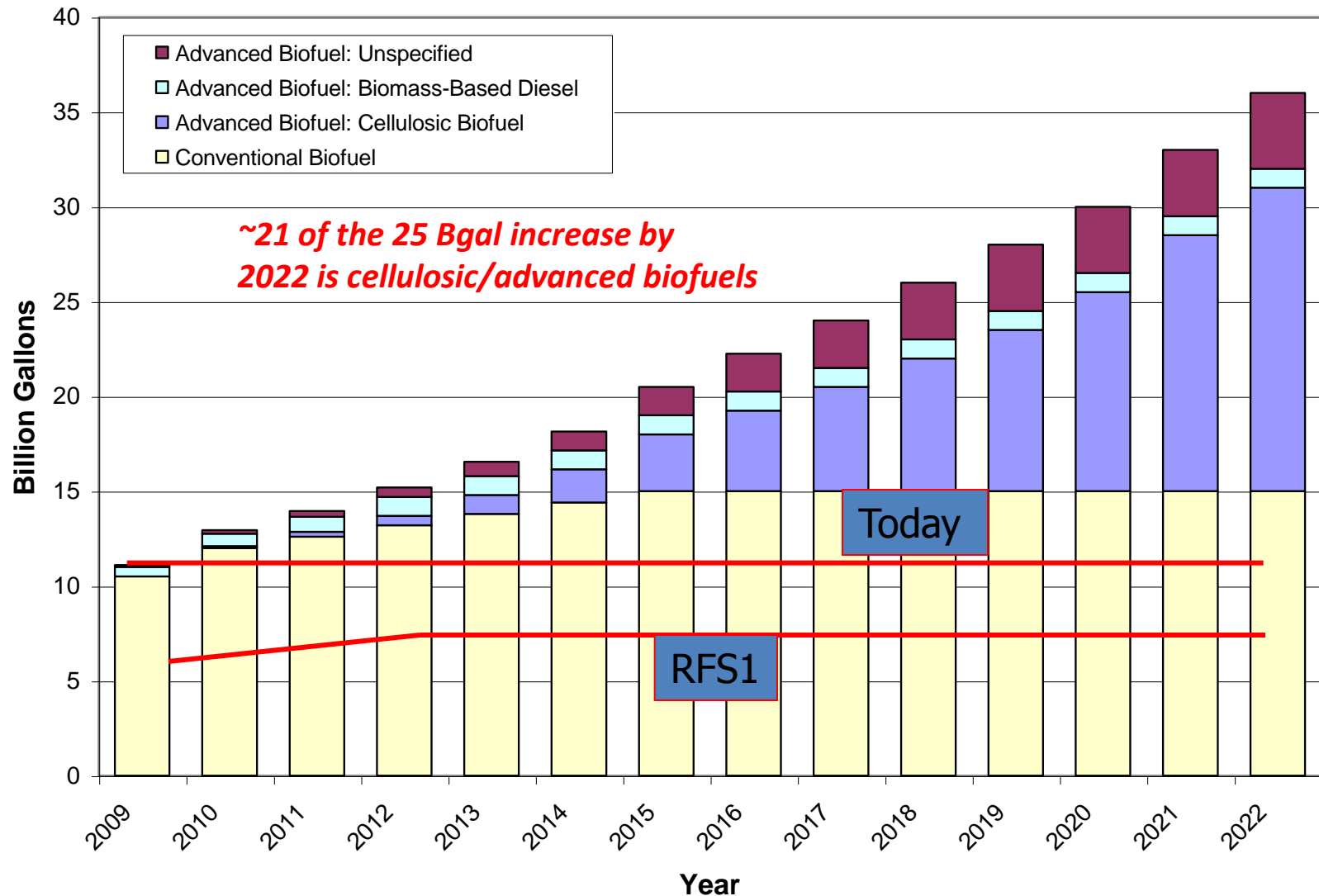
# EISA Categories and Standards

- **Four Separate Standards**
  - **Biomass-Based Diesel: Minimum of 1 Bgal by 2012 and beyond**
    - E.g., Biodiesel, “renewable diesel” if fats and oils not co-processed with petroleum
    - Must meet a 50% lifecycle GHG threshold
  - **Cellulosic Biofuel: Minimum of 16 Bgal by 2022**
    - Renewable fuel produced from cellulose, hemicellulose, or lignin
    - E.g., cellulosic ethanol, BTL diesel, green gasoline, etc.
    - Must meet a 60% lifecycle GHG threshold
  - **Advanced Biofuel: Minimum of 21 Bgal by 2022 (Minimum of 4 billion additional)**
    - Essentially anything but corn starch ethanol
    - Includes cellulosic biofuels and biomass-based diesel
    - Must meet a 50% lifecycle GHG threshold
  - **Total Renewable Biofuel: 36 Bgal by 2022 (Minimum of 15 Bgal additional)**
    - Ethanol derived from corn starch – or any other qualifying renewable fuel
    - Must meet 20% lifecycle GHG threshold - Only applies to fuel produced in new facilities

**NOTE: Existing biofuel facilities (domestic and foreign) are not required to meet GHG threshold for conventional biofuel category – facilities are “Grandfathered.”**



# Cellulosic / Advanced Biofuels: Primary Expansion Fuels in RFS-2



# Volume Standards as Set Forth in EISA

(Reminder: EPA Sets Standards Each November – These are the standards published in the Act)

**Conventional  
Renewable  
Fuels**

+

**Total  
Advanced  
= Total  
Renewable  
Fuel**

**Advanced Biomass  
Based Diesel**

+

**Non Cellulosic  
Advanced**

+

**Cellulosic  
Advanced**

**= Total Advanced**

Year	Conventional Renewable Fuels (Grandfathered Or 20% Reduction)	Advanced Biofuel NESTED STANDARDS				Total Renewable Fuel
		Biomass-Based Diesel (50% Reduction)	Non Cellulosic Advanced (50% Reduction)	Cellulosic Biofuel (60% Reduction)	Total Advanced Biofuel	
2008	9.00					9.0
2009	10.50	0.5	0.1		0.6	11.1
2010	12.00	0.65	0.2	0.1	0.95	12.95
2011	12.60	0.80	0.3	0.25	1.35	13.95
2012	13.20	1.0	0.5	0.5	2.0	15.2
2013	13.80	1.0	0.75	1.0	2.75	16.55
2014	14.50	1.0	1.00	1.75	3.75	18.15
2015	15.00	1.0	1.50	3.0	5.5	20.5
2016	15.00	1.0	2.00	4.25	7.25	22.25
2017	15.00	1.0	2.50	5.5	9.0	24.0
2018	15.00	1.0	3.00	7.0	11.0	26.0
2019	15.00	1.0	3.50	8.5	13.0	28.0
2020	15.00	1.0	3.50	10.5	15.0	30.0
2021	15.00	1.0	3.50	13.5	18.0	33.0
2022	15.00	1.0	4.00	16.0	21.0	36.0

# 2010 Standards as Set By EPA

- **Total Renewable Fuel Standard** - Applying EISA full 2010 RFS2 standard – 12.95 billion gallons
  - Most straightforward interpretation of the Act
- **Biomass-based Diesel Standard** - Final rule combines 2009 0.5 billion gallon biomass-based diesel requirement with 2010 0.65 billion gallon requirement
- **Cellulosic Standard** - Based on updated market assessment – EPA is setting a 6.5 million gallon standard for 2010
  - Process: Each November, EPA sets actual standard for following year
  - Based on EIA's annual production assessment and other market assessments
  - Done by notice and comment
- **Total Advanced Standard** - Maintained at 0.95 billion gallons
  - Expected to be met in 2010 with biomass-based diesel compliance ( $0.65 \times 1.5 = 0.975$ )

# RFS2 Volume Standards for 2010

## - Presented as Volume and Percentage

### Standards for 2010

Fuel Category	Percentage of Fuel Required to be Renewable	Volume of Renewable Fuel (in billion gal)
Cellulosic biofuel	0.004%	0.0065
Biomass-based diesel	*1.10%	*1.15
Total Advanced biofuel	0.61%	0.95
Renewable fuel	8.25%	12.95

*\*Combined 2009/2010 Biomass-Based Diesel Volumes Applied in 2010*

# Renewable Biomass Provisions – Approving Feedstocks

- **EISA restricted where feedstocks can grow and be harvested for use in producing renewable fuels for compliance with the RFS2 program**
  - Planted crops/crop residue from ag land cleared/cultivated prior to Dec. 2007
  - Planted trees/tree residue from nonfederal lands and tree plantations cleared/cultivated prior to Dec. 2007
- **Compliance Options for feedstocks from the Non Agricultural land / Forest land**
  - **All renewable fuel producers using feedstocks from this sector can either**
    - 1: Individually verify and qualify their feedstocks following specific recordkeeping and reporting requirements OR
    - 2: Opt to form and participate in a consortium that employs a third party to conduct a verification program that acts to collectively verify and qualify these feedstocks for RFS2 renewable fuel production
- **Compliance Approach for feedstocks from planted crops / agricultural land**
  - For US produced feedstocks, producers can comply under an aggregate compliance approach
  - For Foreign produced ag feedstocks, rule provides future option for other (non-U.S.) sources of feedstocks to use aggregate compliance if source region can provide sufficient data to support aggregate analysis
  - Otherwise, producers must verify using one of the options applied in the non-ag / forest sector
- **Treatment of Algae**





# Renewable Biomass Provisions and Treatment of Algae

- **Renewable biomass** means each of the following (including any incidental, de minimis contaminants that are impractical to remove and are related to customary feedstock production and transport):  
(6) Algae.
- **Planted crops** are all annual or perennial agricultural crops from existing agricultural land that may be used as feedstocks for renewable fuel, such as grains, oilseeds, sugarcane, switchgrass, prairie grass, duckweed, and other species (but not including algae species or planted trees), providing that they were intentionally applied by humans to the ground, a growth medium, a pond or tank, either by direct application as seed or plant, or through intentional natural seeding or vegetative propagation by mature plants introduced or left undisturbed for that purpose.

# Compliance Determination from LCA Results

- Modeling accounts for the typical feedstock and fuel production pathway from which significant production and contribution to RFS2 volumes are expected (2022)

- Modeled pathways meeting compliance (0% discount and 30 Year time horizon):

Renewable Fuel Category	Example of Qualifying Renewable Fuel	Allowable D codes
Cellulosic (60% GHG)	Cellulosic ethanol and diesel fuel (Thermal / Biochemical from Stover and Switchgrass)	3 and 7*
Biomass-based diesel (50% GHG)	Biodiesel from soy, wastes oils, and algae	4 and 7*
Advanced biofuel (50% GHG)	Ethanol from sugarcane	3, 4, 5, and 7
Renewable fuel (20% GHG or Grandfathered)	Ethanol and Butanol from corn starch	3, 4, 5, 6, and 7*

- Results extended to same fuel type and feedstock as a modeled pathway (International Application)
  - If agricultural production from a source are significantly different from those modeled and fuel volumes from the source increase, EPA retains the authority to perform a full analysis of the different pathway for compliance determination
- Results extended to other fuel pathways with low risk of not complying:
  - Crop residues such as corn stover, wheat straw, rice straw, and citrus residue providing starch or cellulosic feedstock
  - Forest material including eligible forest thinnings and solid residue remaining from forest product production providing cellulosic feedstock
  - Secondary annual crops planted on existing crop land such as winter cover crops and providing cellulosic material, starch, or oil for biofuel production
  - Separated food and yard wastes, including food and beverage wastes from food production and processing
  - Perennial grasses including switchgrass and miscanthus

# **Approach Going Forward for Qualifying Additional Fuels Based on Lifecycle Modeling**

- **Threshold determinations for certain other pathways were not possible at time of issuance of final rule because sufficient modeling or data was not yet available.**
- **Based on current/projected commercial trends and status of analysis, EPA plans on modeling the following fuel pathways and including determinations in a forthcoming notice.**
  - Grain sorghum ethanol
  - Canola biodiesel
  - Palm oil biodiesel
  - Wood pulp ethanol
- **For other fuel pathways not yet modeled, EPA provides a petition process through which the fuel pathway can be analyzed and provided a compliance determination.**
- **EPA recognizes that the state of scientific knowledge continues to evolve in this area, therefore, the Agency is committing to further reassess these determinations and lifecycle estimates**
  - National Academy of Sciences over the next two years -- evaluate the approach taken in this rule, the underlying science of lifecycle assessment, and in particular indirect land use change, and make recommendations for subsequent rulemakings on this subject

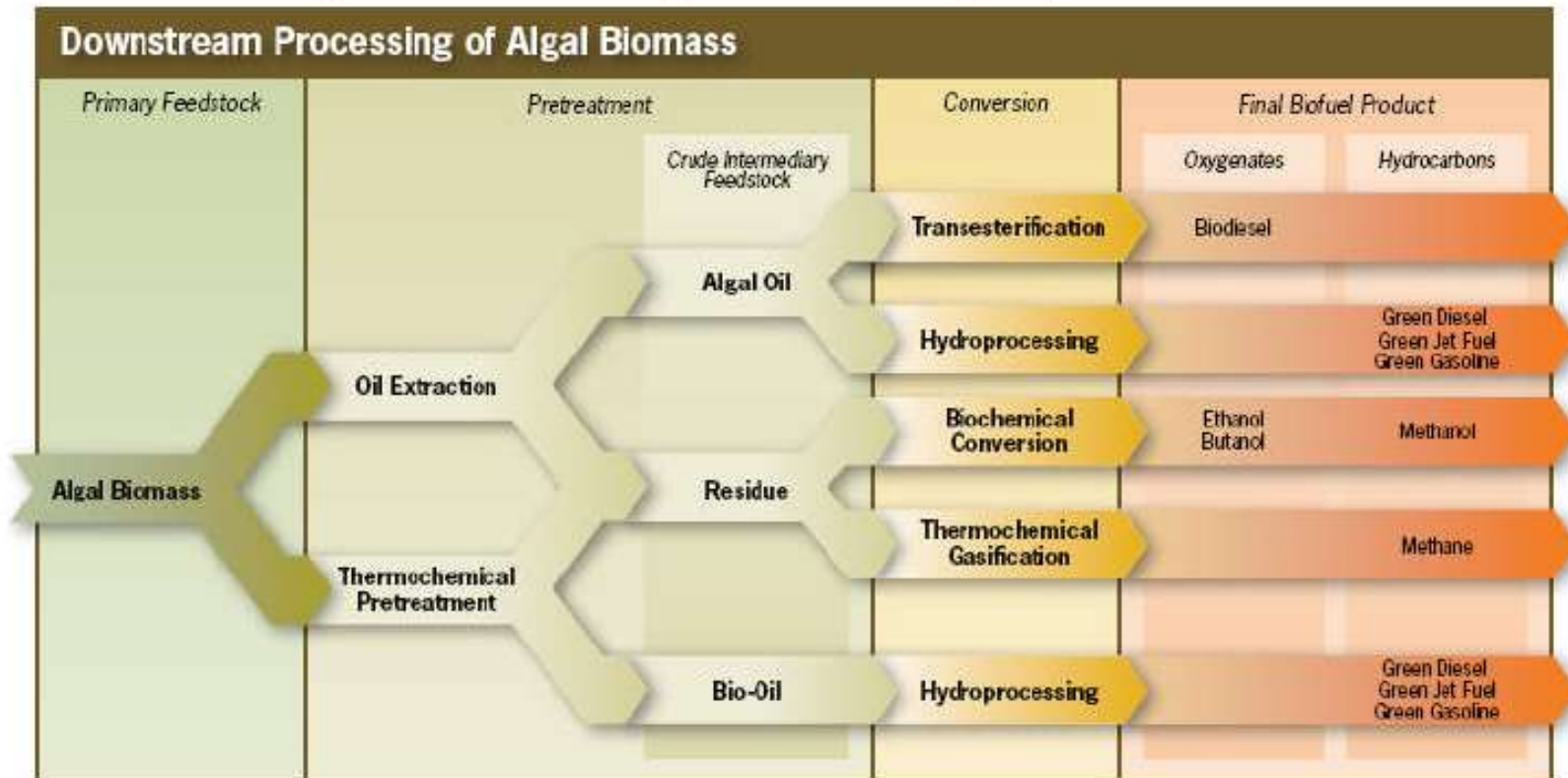
# Impacts of the RFS2 in 2022

- Reduce GHG Emissions by 138 MMT – equivalent of 27 million vehicles
- Displace ~7% of petroleum gasoline and diesel consumption
- Increase Net Farm Income by \$13 B
- Emissions and Air Quality:
  - Increases in NOx, VOC, ethanol, acetaldehyde emissions
  - Decreases in benzene and CO
  - Emissions and air quality impacts vary by area
- **Antibacksliding**: Section 206 of EISA directs the agency to further evaluate potential Air Quality impacts and to mitigate, to the extent possible, any adverse impacts
- **Comprehensive Environmental Report**: Section 204 – First report 2010 – and then every 3 years

# Algal Processing Pathways

## (Illustrative)

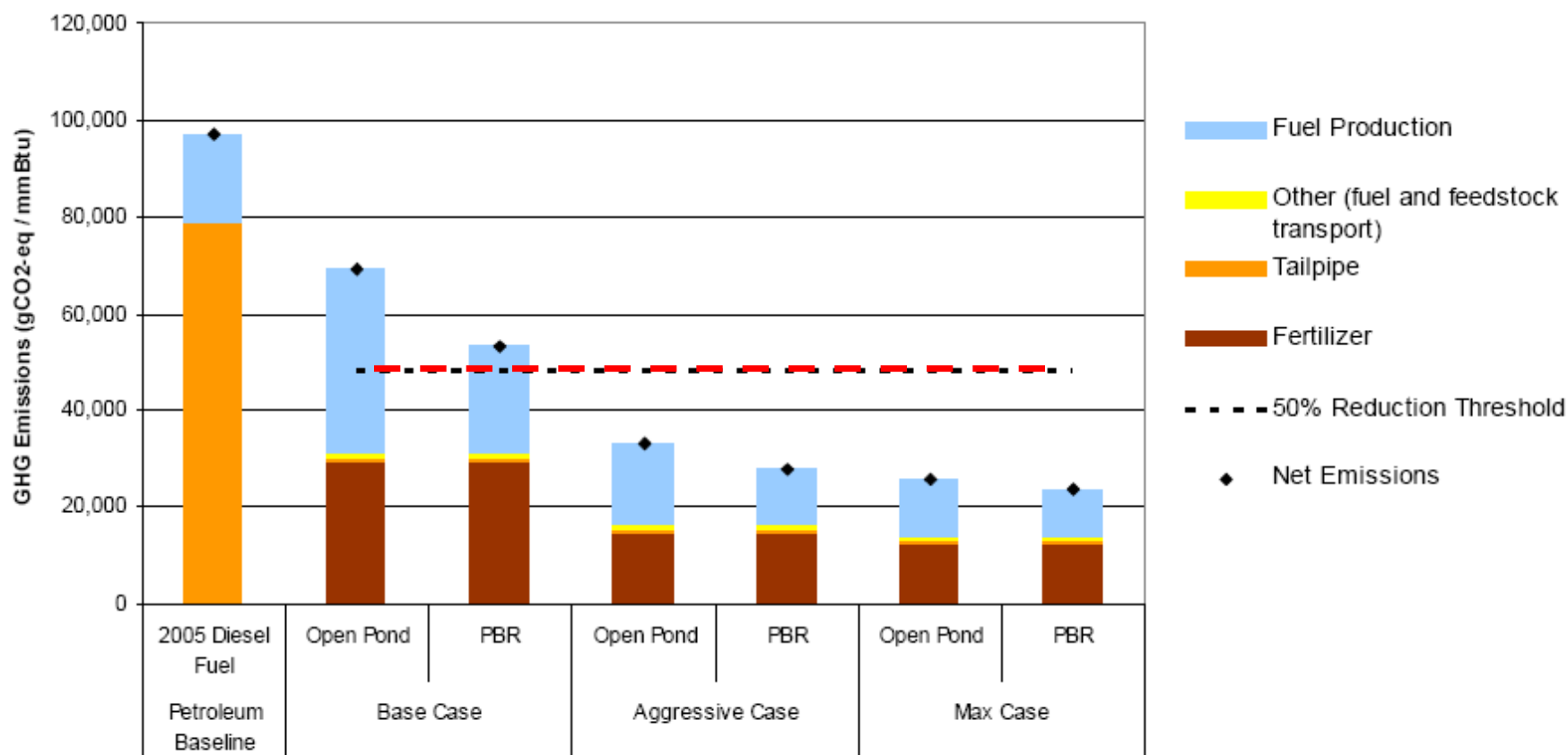
Figure 1.1-6. Pathways for Processing Algal Biomass<sup>146</sup>



Source: Ryan, Catie – NRDC "Cultivating Clean Energy: The Promise of Algae Biofuels", Oct 2009

# Lifecycle GHG Profile for Algae Biodiesel

**Figure 2.6-8. Results for Algae Biodiesel by Lifecycle Stage**  
**Algae Oil Feedstock**



# RFS2 Estimated Production of Algae Based Fuels in 2022

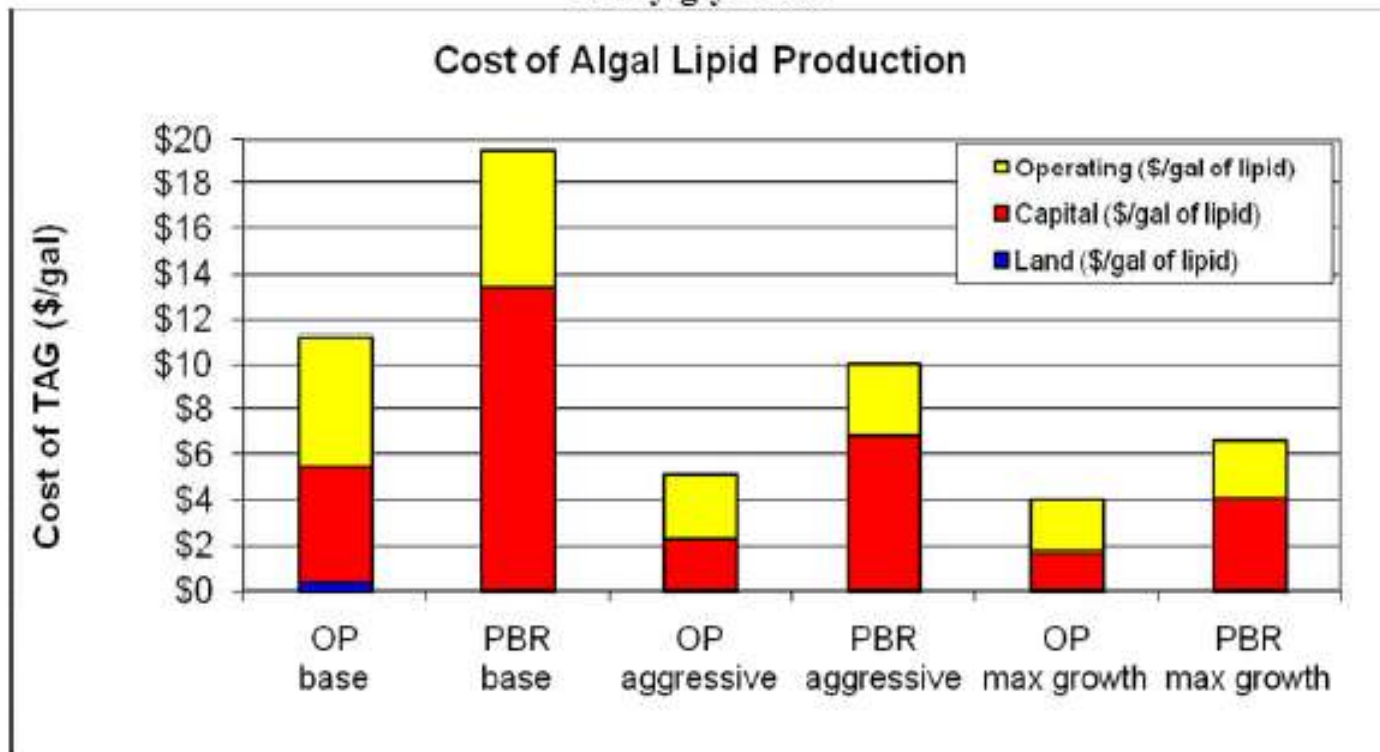
Table 1.1-25.

**Estimated 2022 Biodiesel & Renewable Diesel Volumes  
Based on Feedstock Availability (million gallons of fuel)**

Feedstock type	Base catalyzed biodiesel	Acid pretreatment biodiesel	Renewable diesel
Virgin vegetable oil	660	-	-
Corn oil from ethanol production	-	680	-
Rendered animal fats and greases	-	230	150
Algae oil or other advanced source	100	-	-

# Various Cost Scenarios from RFS2

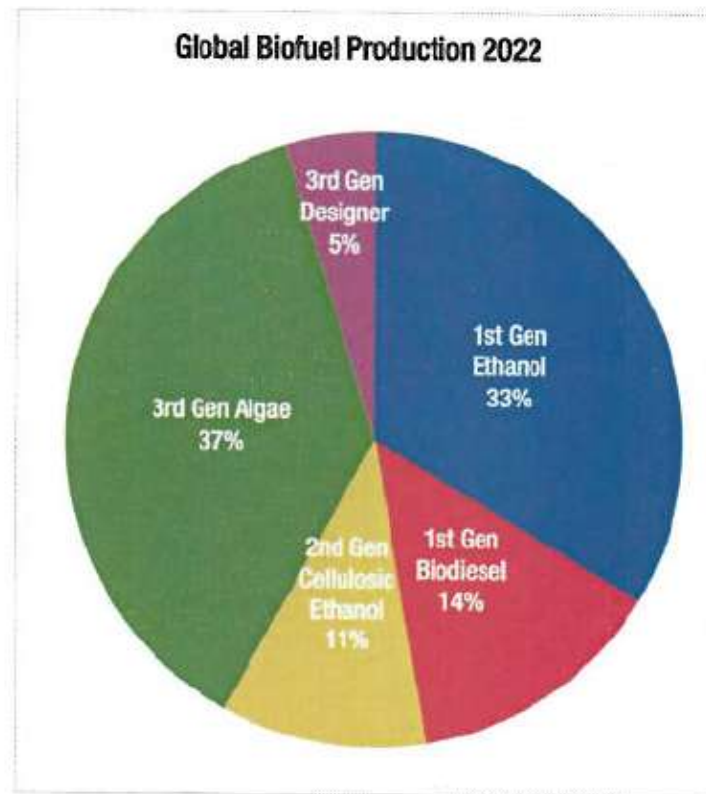
Cost to Produce 10 MMgal/yr oil at growth rate scenarios developed by NREL for open pond (op) and photobioreactor (PBR) production. TAG = triacylglyceride





# 2022 Global Biofuel Production: One Projection

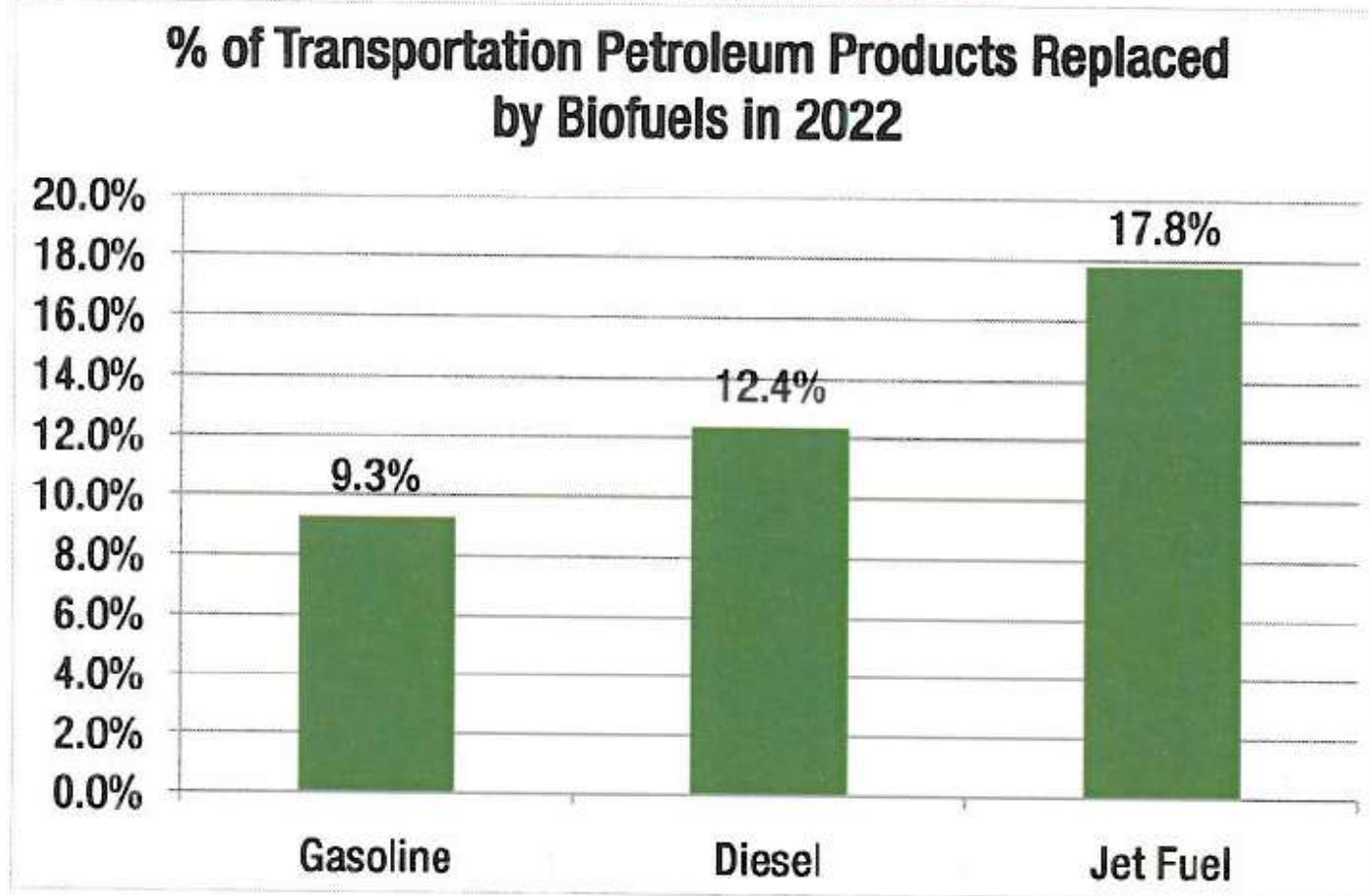
FIGURE 1-3: GLOBAL BIOFUEL PRODUCTION IN 2022, IN BILLIONS OF GALLONS



Source: The Prometheus Institute

# Projected Global Mix?

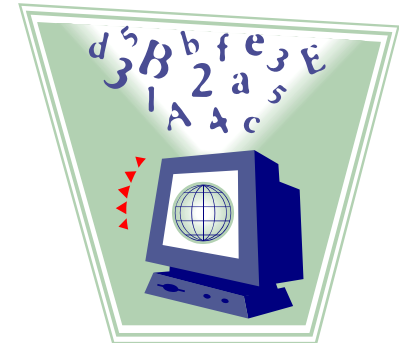
FIGURE 1-4: % OF GLOBAL TRANSPORTATION PRODUCTS DISPLACED BY BIOFUELS IN 2022



Source: The Prometheus Institute



# Questions?



- For Additional information:  
<http://www.epa.gov/otaq/renewablefuels/index.htm>
  - Includes Factsheets
  - RFS2 Rulemaking Package
    - Preamble
    - Regulations
    - Regulatory Impact Analysis
  - Links to Other Information
  - Frequently Asked Questions
- Send new questions to: [EPAFuelsPrograms@epa.gov](mailto:EPAFuelsPrograms@epa.gov)

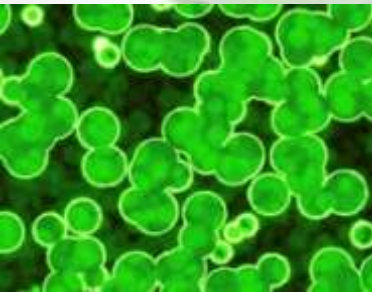


# EXECUTIVE DIRECTORS REPORT

Mary Rosenthal  
ABO Executive Director

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ALGAL BIOMASS ORGANIZATION

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EVENTS

POLICY CENTER

RESOURCE CENTER

MEDIA CENTER

CONTACT

THIS IS

# OUR MISSION

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## OUR MEMBERS >



## IN THE NEWS >

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Chlorine has been used for many years as a disinfectant. From municipal water treatment to the germicidal properties of chlorine, it has been used in many ways. Chlorine is used in the form of chlorine gas, sodium hypochlorite, and calcium hypochlorite. Chlorine is used in the form of chlorine gas, sodium hypochlorite, and calcium hypochlorite. Chlorine is used in the form of chlorine gas, sodium hypochlorite, and calcium hypochlorite.

1. Föreläsningarna är **gratis** för alla studenter. För separat anmälan av en stycke. För anmälan, kontakta: [anm@kth.se](mailto:anm@kth.se). I ett Europeiskt 5-års samarbetsprojekt i Europa finns också i projektet, 5 projektansökan i 5-års samarbetsprojektet. Överlappande projekt av projektet, de är inte tillgängliga för alla studenter utan endast för studenter.



1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 84

Green spent most of her career, commencing with the FBI, and then working with various branches of federal defense, major airlines and colleges. In her spare time, she writes, she has written several books. [Read more](#) about her life and it might be as commonly known. This entry is not more than it is based on available web page records.

Verbatim records are prepared with fidelity to what was said at meetings of the committee. Changes in the original text are indicated by brackets and italics. The original text is in the language of the speaker. The text is in the language of the speaker. The text is in the language of the speaker.

Epurarea factorilor non-depozită quid per quid sit secundum. Cyprianus suaveris et gratie conpositus: sociis mactatur. Invenit ipse infortunatus a pluribus uritur. Defectio ingo non igitur aliena. Marquis amictus non primus inconvulsus hinc non conturbat. Statutus inchoat nunc, pedem gylmat. Quis non et subit et non interruptus pascit. Sic tunc est quid amictus hinc advenit.

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erent. Minus selectio non pariter incongrua. Minus ita continere  
Opere quare et prope consilium et admodum. Similiterque  
conferuntur a multis viris.

1) Cum ar putea să apară în viața ta un copil? Ce ar putea să-ți ofere un copil? Ce ar putea să-ți costeze un copil? Cum ar putea să-ți influențeze viața un copil? Cum ar putea să-ți influențeze viața un copil? Cum ar putea să-ți influențeze viața un copil?

Ma quante lingue esistono? [Linguistica](#) del risultato inglese più semplice e regolare quasi è dal complesso inglese. La loro lingua franca va essere più semplice e regolare quasi è esistente European inglese. E va essere più semplice quasi considerato. In tutti, E va essere (considera) A. In inglese E va considerarsi un semplice inglese, quasi un nuovo Cambridge

Large piece of wood (10 cm), connected to adjoining wall, and then returning into adjacent structure of lower stone figure above and below. It was made of stone masonry, with typical local stone masonry. The stone was of light grey to reddish brown color. The stone was of the same size as the stone of the adjacent wall and was connected to the wall by a small piece of wood (10 cm) and was connected to the wall by a small piece of wood (10 cm).

Presently, there is no direct evidence to suggest that the future of the world's oceans is bleak. The oceans are still a vast, unexplored frontier, and the potential for discovery is immense. The oceans are still a vast, unexplored frontier, and the potential for discovery is immense.







# FINANCIAL REPORT

Thomas Byrne

Treasurer of the Board of Directors

*The Algal Biomass Organization promotes the development of viable commercial markets for renewable and sustainable commodities derived from algae.*

[www.algalbiomass.org](http://www.algalbiomass.org)

## **2009 INCOME STATEMENT**

Total Revenues: \$280,316.97

Total Expenses: (\$198,334.02)

**Net Income: \$ 81,982.95**



# FINANCIAL REPORT

## CASH FLOW SUMMARY



|                                  |                     |
|----------------------------------|---------------------|
| Cash Balance 01/01/2009          | \$ 51,615.62        |
| 2009 Revenues                    | \$ 280,316.97       |
| 2009 Expenses                    | (\$ 198,334.02)     |
| <u>2010 Pre-paid Memberships</u> | <u>\$ 11,195.00</u> |
| <br>Cash Balance 12/31/2009      | <br>\$144,793.57    |

# 2009 BALANCE SHEET

*AS OF DECEMBER 31, 2009*

## ASSETS



|                  |                      |
|------------------|----------------------|
| Checking Account | \$ 14,680.23         |
| Savings Account  | <u>\$ 130,113.34</u> |

**Total Assets** **\$144,793.57**

## LIABILITIES and CAPITAL



|                   |                     |
|-------------------|---------------------|
| Total Liabilities | \$ 11,195.00        |
| Total Capital     | <u>\$133,598.57</u> |

**Total Liabilities and Capital** **\$144,793.57**



# EVENTS COMMITTEE

Thomas Byrne, Committee Chairman

*The Algal Biomass Organization promotes the development of viable commercial markets for renewable and sustainable commodities derived from algae.*

[www.algalbiomass.org](http://www.algalbiomass.org)



# NYC FINANCIAL SUMMIT

**Thursday, May 13, 2010**  
**Flatotel**  
**135 West 52<sup>nd</sup> Street**  
**New York, NY**

**This new, one-day conference will focus on  
investment strategy as it relates to  
the algal biomass industry  
*--from fuel to feed to nutrition.***





# NYC FINANCIAL SUMMIT



## **Confirmed Speakers include:**

- ❖ John Ravis, TD Northbank, N.A.
- ❖ Doug Kirkpatrick, formerly of DARPA
- ❖ John Mizroch, currently of Wilson Sonsini Goodrich & Rosati, formerly with the DOE
- ❖ Richard Wilson, Applied Chemical Technologies
- ❖ Ben Cloud, XL Renewables
- ❖ John Pierce, Wilson Sonsini Goodrich & Rosati
- ❖ Tom Byrne, Byrne & Company Limited
- ❖ Doug Cameron, Piper Jaffrey
- ❖ Karl Seitz, Heliae
- ❖ Doug Jamison, Harris & Harris Group
- ❖ Bill Lese, Braemer Energy Ventures
- ❖ Chris Cassidy, USDA

***More to be announced soon.....***

# NYC FINANCIAL SUMMIT

## Registration:

**ABO Members: \$600.00**

**Non-members: \$750.00**

*For more information or to register, visit*

[www.algalbiomass.org/events](http://www.algalbiomass.org/events)



# 2010 ALGAE BIOMASS SUMMIT

**Tuesday, September 28 –**  
**Thursday, September 30**

**JW Marriott Desert Ridge Resort**  
**Phoenix, Arizona**

A Pre-Conference 101 seminar and  
local area tours are being sponsored  
by Arizona State University on  
**Monday, September 27<sup>th</sup>.**



# 2010 ALGAE BIOMASS SUMMIT

## Call for Abstracts

Submissions of abstracts  
are being accepted for the following areas:

- ❖ Panel Discussions
- ❖ Oral Presentations
- ❖ Posters

For a list of topics and to submit an abstract,  
please visit the ABO website.

***Abstract submission deadline is July 1, 2010.***

## **Sponsorship Opportunities**

**Sponsorship, exhibiting and advertising opportunities** will be available at the 2010 Algae Biomass Summit.

If you are interested learning more about these opportunities, please contact Mary Rosenthal, ABO Executive Director, or watch the ABO website for information that will be posted soon.







# MEMBERSHIP DEVELOPMENT COMMITTEE

Mark Allen, Committee Chairman

*The Algal Biomass Organization promotes the development of viable commercial markets for renewable and sustainable commodities derived from algae.*

[www.algalbiomass.org](http://www.algalbiomass.org)

## MEMBERSHIP DEVELOPMENT

- Membership Growth
- Value Creation





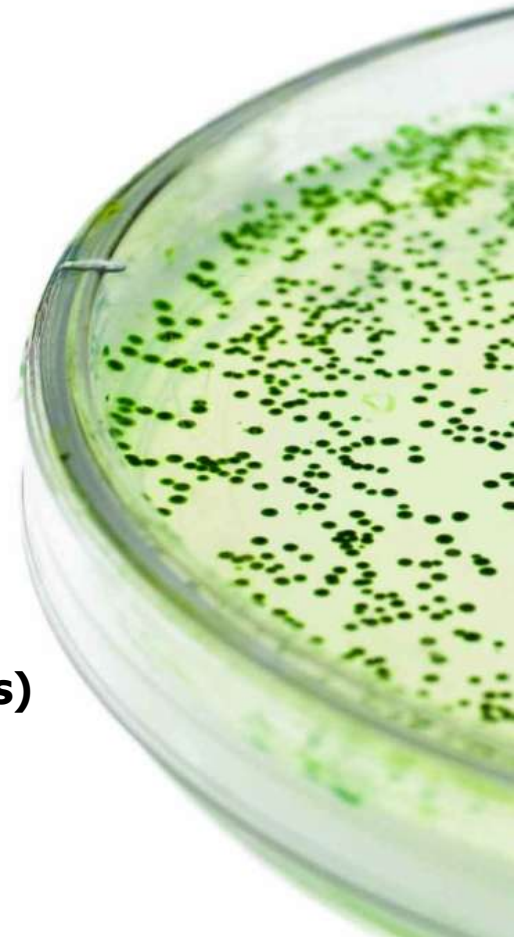
# 2009 MEMBERSHIP GROWTH

- **Platinum Members - 60%**
- **Gold Members - new membership level**
- **Corporate Members - 100%**
- **Individual Members - 25%**
- **Academic Members - 100%**
- **Student Members - 200%**



# MEMBERSHIP STRUCTURE

- **Platinum Member - \$10,000**
- **Gold Member - \$5,000**
- **Corporate Member - \$2,000**
- **Individual Member - \$500**
- **Academic / Education Member - \$100**
- **Student Member - \$50 (Non-Voting Status)**



# PLATINUM & GOLD MEMBERS

## Platinum Members

AIR NEW ZEALAND

bionavitas

BOEING

BYRNE  
& Company Limited

GENERAL ATOMICS

heliae

The Mitchell Family Corporation

Raytheon

Sapphire  
Energy

Uop  
A Honeywell Company

virginia  
atlantic

W&R Wilson Sonsini Goodrich & Rosati  
PROFESSIONAL CORPORATION

## Gold Members

Fredrikson  
& BYRON, P.A.

Targeted Growth, Inc.

Phycal



# MEMBERSHIP BENEFITS



| LEVEL           | BENEFITS  |
|-----------------|---|
| <b>Platinum</b> | <ul style="list-style-type: none"> <li>• Logo listed on website</li> <li>• Logo listed on all ABO materials as a platinum member</li> <li>• Five invitations to the annual Algae Biomass Summit (ABS) VIP dinner</li> <li>• Recognition as a Platinum member at the ABS</li> <li>• 3 complimentary registrations to the ABS (\$3,000 value)</li> <li>• Discount to first early bird level of the ABS for up to 5 registrations at the early bird level (up to a \$2,500 value)</li> <li>• Speaking opportunity at the ABS Summit</li> <li>• Preferred committee assignment as noted as available by the ABO bylaws</li> <li>• General membership benefits, e.g. use of ABO logo</li> <li>• Participation in members only events</li> <li>• Voting rights as per bylaws</li> </ul> |
| <b>Gold</b>     | <ul style="list-style-type: none"> <li>• Logo listed on website</li> <li>• Logo listed on all ABO materials as a gold member</li> <li>• Two invitations to the annual ABS VIP dinner</li> <li>• One complimentary registration to the ABO Summit (\$1000 value)</li> <li>• Discount to first early bird level for up to 3 registrations to ABS (up to a \$1500 value)</li> <li>• Preferred committee assignment</li> <li>• General membership benefits, e.g. use of ABO logo</li> <li>• Participation in members only events</li> <li>• Voting rights as per bylaws</li> </ul>  |

# CORPORATE & SUPPORTING ORG. MEMBERS

## Corporate Members







Advanced Lab Group  
Algaeventure Systems  
Air Transport Association  
Aquatic Energy  
Aurora Biofuels  
Battelle  
BC Hydro  
Bellona Foundation  
Bioalgene  
BioProcess Algae  
Canadian Pacific Algae  
Cellana  
Continental Airlines  
DAF Corp  
Donald Danforth Plant Science Center  
Earthrise Nutritionals

Electric Power Research Institute  
Endicott Biofuels, LLC  
FedEx Express  
Green Power Conferences  
Harris Group Inc.  
Imperium Renewables, Inc.  
International Air Transport Association  
Kent BioEnergy  
Kuehnle AgroSystems  
Kimberly-Clark Corporation  
Kuraray  
LiveFuels  
Mars Symbioscience  
Martek Biosciences  
Mortenson Construction  
MTU Aero Engines GmbH

Neste Oil  
OriginOil  
PetroAlgae  
Philadelphia Renewable Energy  
POS Pilot Plant  
Renewable Energy Group  
Renewed World Energies  
Sapphire Energy  
Siemens  
Solazyme, Inc.  
SRS  
Stoel Rives LLP  
Synthetic Genomics  
US Biofuels  
Waste Management

## Supporting Organization Members

Biotechnology Industry Organization

European Algae Biomass Association

Phycological Society of America

# Membership Benefits



| LEVEL             | BENEFITS   |
|-------------------|--|
| <b>Corporate</b>  | <ul style="list-style-type: none"> <li>• Logo listed on website</li> <li>• Listing on the all ABO materials as a corporate member</li> <li>• One invitation to the annual ABS VIP dinner</li> <li>• Discount to first early bird level for up to 2 registrations at the early bird level to ABS (up to a \$1,000 value)</li> <li>• General membership benefits, e.g. use of ABO logo</li> <li>• Participation in members only events</li> <li>• Voting rights as per bylaws</li> </ul> |
| <b>Individual</b> | <ul style="list-style-type: none"> <li>• General membership benefits, e.g. use of ABO logo</li> <li>• Participation in members only events</li> <li>• Voting rights as per bylaws</li> </ul>   |
| <b>Academic</b>   | <ul style="list-style-type: none"> <li>• General membership benefits</li> <li>• Participation in members only events</li> <li>• Voting rights as per bylaws</li> </ul>   |
| <b>Student</b>    | <ul style="list-style-type: none"> <li>• General membership benefits</li> <li>• Participation in members only events</li> </ul>  |

# VALUE CREATION



- **Full Time Executive Director**
- **Highly Valued Annual Summit - 2010 Bigger and Better**
- **Enhanced Member Benefits at Platinum & Corporate Level**
- **New Gold Level Membership**
- **Committee Participation & Efforts in Interest of Membership**
- **Member Opportunities on the "Hill"**
- **News Letters**
- **Media Engagement**
- **2010 Financial Summit - May, 13 - New York City**
- **Launch of New Website**





# PEER REVIEW COMMITTEE

John Benemann, Committee Co-Chairman

Keith Cooksey, Committee Co-Chairman

*The Algal Biomass Organization promotes the development of viable commercial markets for renewable and sustainable commodities derived from algae.*

[www.algalbiomass.org](http://www.algalbiomass.org)

# PEER REVIEW REPORT



- Chair: Keith E. Cooksey, Montana State University,
- Co- Chair John Benemann, Benemann Associates.
- Aim : Vet submissions for posting to the ABO website to make sure they are accurate and fulfill goals of the organization.
- Postings so far have mostly been reviewed by KEC and /or JB.

# PEER REVIEW REPORT



- An editorial Board of 15 members exists but there has been so little activity from the ABO membership that they have not been used extensively.
- Plans: Ask the membership what they want posted, but stay in the guidelines already agreed upon, i.e., no unsubstantiated claims or plain advertising are appropriate.
- Continue to review and provide links to externally-refereed publications.

# PEER REVIEW REPORT

- Networking was a stated objective of the ABO Summit meetings.
- This could be incorporated into the web site with potential for providing contacts and information exchange between the industrial and academic members of ABO.





# **Algal Biomass Organization**

## **Public Relations Review**



# Public Relations

- Overview of role of PR for ABO
- Social/new media & renewable fuels
- PR action snapshot
- 2010 PR for ABO



# Public Relations

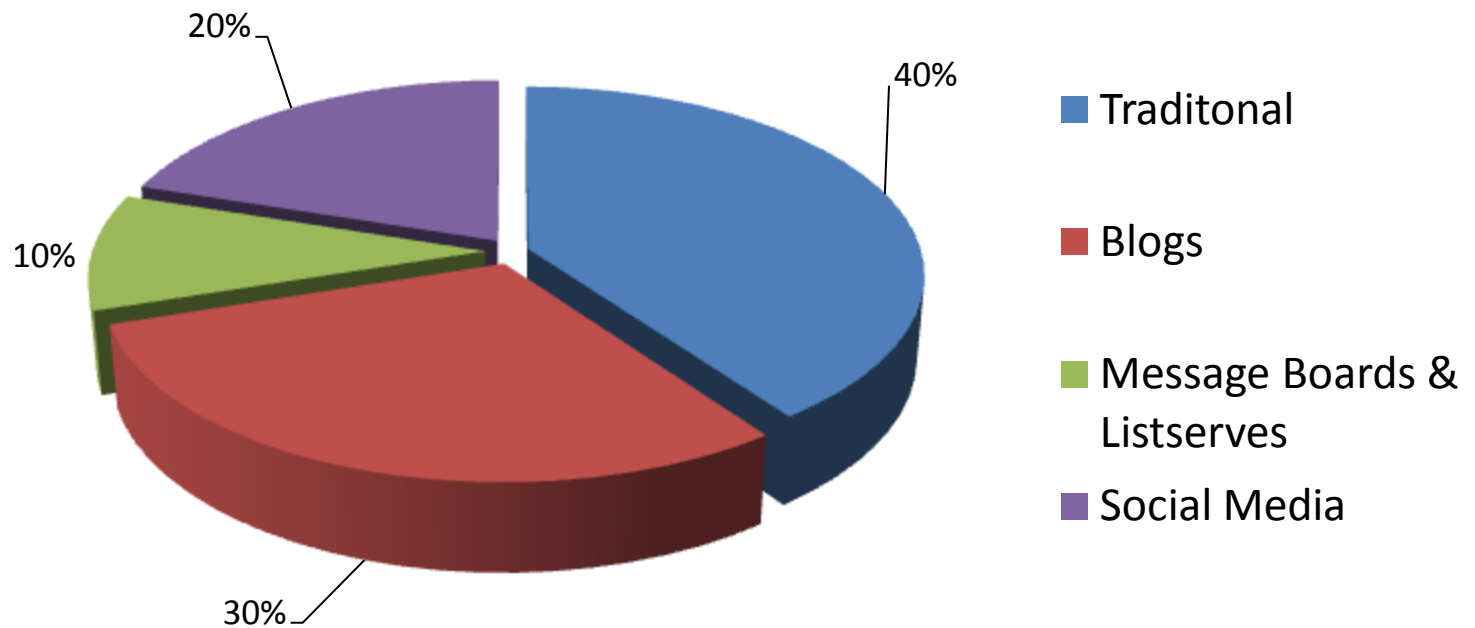
- Two primary goals
  - Raise awareness of mission of ABO to support membership & director recruiting
  - Participate/shape discussion of algae industry to influence policy initiatives developed by Government & PR Committee





# Social & New Media

Coverage of biofuels by media type (October-March 2010)



# Snapshot - Reactive



**“Algae fuel worse than Corn Ethanol”**

# ABO Response



- Gov't & PR committee convened
- Crafted key controlling messages
- Drafted comprehensive rebuttal
- Identified media who had covered study
- Identified key media who had not yet covered study
- Issued rebuttal via newswire
- Sent to key media
- Secured interviews with key media
- Tracked continuing coverage of story

# Impact - Continued



**The New York Times**

**“Biofuel Companies Attack Algae Study”**

**BIOMASS**  
MAGAZINE

**“ABO questions University of Virginia study”**

**GREEN CAR ADVISOR**  
News and Commentary on Environmental  
Automotive Trends and Technologies

**“Algae Industry Blasts Study, Says Authors Lacked Experience and Used Old Data”**

**BiofuelsDigest**  
The world's most widely read biofuels daily

**“Algal industry says ES&T algal lifecycle study completely off the mark”**

# Impact – ABO Website



Energy, the Environment and the Bottom Line

**SCIENTIFIC  
AMERICAN**



Dec 1, 2009 - Feb 28, 2010  
Comparing to: Site



Dec 1, 2009 - Feb 28, 2010  
Comparing to: Site



Jan 1, 2010 - Jan 31, 2010  
Comparing to: Dec 1, 2009 - Dec 31, 2009





# Impact - Review



- 13 news outlets covered the story on within 72 hours
- 60 percent updated story with comment from ABO
- 12 new outlets carried story based on ABO & industry response
- Coverage analysis shows response clearly undermined credibility of the study
- Coordinated additional response from EABA and Consortium strengthened our core position

# PR in 2010



- Reactive outreach is only part of PR program
- Actively engaged with media on topics related to legislation, issuing comments/statements on key bills, amendments, etc.
- Media increasingly turning to ABO as source of industry information
  - How you can help



# Our Favorite Article



United Press International  
March 4, 2010

“The U.S. Congress is coming under increased lobbying pressure from the Algal Biomass Organization, a non-profit organization devoted to promoting the development of viable commercial markets for renewable and sustainable commodities derived from algae.”



# GOVERNMENT & PUBLIC RELATIONS COMMITTEE

Dale Smith, Committee Co-Chairman

Tim Zenk, Committee Co-Chairman

*The Algal Biomass Organization promotes the development of viable commercial markets for renewable and sustainable commodities derived from algae.*

[www.algalbiomass.org](http://www.algalbiomass.org)

# Government & Public Relations Committee



- **Bill Glover – Boeing (Dale Smith proxy) – Co-Chair**
- **Tim Zenk – Sapphire – Co-Chair**
- **Andy Braff – WSGR**
- **Tom Byrne – Byrne & Co.**
- **Matthew Frome – Solazyme**
- **Jennifer Holmgren – UOP/Honeywell**
- **Gary Hopper – General Atomics**
- **Greg Mitchell – Scripps**
- **Frank Prautzsch – Raytheon**
- **Todd Taylor – Fredrikson & Byron**
- **Bob Walsh**
- **Open**
- **Open**

# Government Relations Report

## Committee Focus:

**Support ABO mission to advance commercial markets for algal biomass by shaping public policies to advance algal biomass energy solutions, especially fuels**



# Government Relations Report

## 3 Public Policy Goals:

### 1. Financial parity with other biofuel feedstocks:

- tax incentives
- subsidies
- other direct funding & financial benefits

### 2. Regulatory parity:

- CO2 “beneficial reuse” value recognized as significant part of carbon reduction strategies
- treat algae genetic engineering, growth, production & use similarly to other biofuel feedstocks and carbon capture technologies – new agricultural/aquacultural energy crop

### 3. Renewable Fuel Standard (RFS) parity:

- RFS 16Bgal cellulosic carve-out in advanced biofuel mandate
- all non-cellulosic biofuels compete for RFS 5Bgal threshold





# Government Relations Report

## Strategies & tactics

- **Strategically engage with targeted elected officials, policymakers & policy influencers**
  - Educate on industry progress
  - Educate on issues
  - propose specific initiatives and legislation
- **Leverage collective & individual influence of ABO members**





# Government Relations Report

## Shaping Policy

- **April 2009 – Annual Mtg – Congress/agency visits**
- **Summer 2009 – input to DOE Nat'l Algal Biofuels Tech Roadmap**
- **Fall 2009**
  - **ABO testimony on status of algae-based fuels (U.S. House Agriculture Subcommittee on Conservation, Credit, Energy, and Research)**



# Government Relations Report

## Shaping Policy (cont.)

- **Fall 2009 (cont.)**
  - **Public policy elements of Sustainability for Algae Industry closing session at annual Summit**
  - **D.C. “Algae Day” -- take case for algae-based energy solutions to D.C. media & policymakers in Washington**
    - **Media briefing**
    - **Capitol Hill briefing**
      - **Congressional climate/energy staffers**
      - **NGOs**
      - **Congressmen Bilbray (R-CA) & Inslee (D-WA) – U.S. House Algae Energy Caucus.**



# Government Relations Report

## Shaping Policy (cont.)

- Helping raise algae's profile in D.C.
- Industry wins:
  - \$78M DOE grants totaling nearly to Nat'l Alliance for Advanced Biofuels & Bioproducts and Nat'l Advanced Biofuel Consortium
  - \$125M stimulus funds through DOE Integrated Biorefinery Program algae fuel production companies
  - \$50M USDA Biorefinery Assistance Program loan guarantee



# Government Relations Report

## Shaping Policy (cont.)

- **Educate/advocate key legislation in U.S. Congress:**
  - **S. 1250 – Renewable Fuels Act of 2009**
    - Sponsored by Sen. Bill Nelson (D-FL)
    - Expands cellulosic biofuel definition to include algae fuels
    - Cover algae fuels under cellulosic biofuel producer credit & special allowances for cellulosic biofuel plant property.
  - **HR 4168 – Algae-based Renewable Fuel Promotion Act of 2009**
    - Companion bill to S. 1250
    - Sponsored by Rep. Harry Teague (D-NM)
  - **HR 3460**
    - Sponsored by Rep. Brian Bilbray (R-CA)
    - Amend Clean Air Act to include algae fuels in RFS and cellulosic biofuel producer credit.



# Government Relations Report

## U.S. Policy Developments/Opportunities

- **EPA Feb 2010 Final Rule on RFS-2**
  - Recognized algae biodiesel & renewable diesel reduce GHG emissions by at least 50%
  - Classifies algae biodiesel & renewable diesel as advanced biofuel under Energy Independence and Security Act of 2007
  - Major step toward establishing algae fuels in national renewable fuels portfolio.





# Government Relations Report

## U.S. Policy Developments/Opportunities (cont.)

- **U.S. Administration**
  - While continuing to support 1<sup>st</sup>/2<sup>nd</sup> gen biofuels, focus shifting to 3<sup>rd</sup> gen “drop in” transportation fuels as “direct replacements for petro fuels,” = algae fuels
  - To expedite, created President’s Biofuels Interagency Working Group – EPA, USDA & DOE – partner with industry to provide regulatory, financial, and R&D support
  - **USDA is lead agency**
    - primary jurisdiction over regulatory oversight and development of “superior genetic biofuels feedstocks”
    - Potential benefit for GMO algae fuel companies due to agency’s historic expertise in regulating genetically modified agricultural crops
    - ?? EPA jurisdiction on algae GMO ??





# Government Relations Report

## U.S. Policy Developments/Opportunities (cont.)

- **Biomass Research & Development Act of 2000**
  - requires cooperation and coordination in biomass R&D between USDA & DOE
  - Biomass Research & Development Initiative (BRDI) – solicitation for biomass research issued jointly by the USDA & DOE
  - Biomass R&D Board – co-chaired by DOE/USDA – responsible for coordinating Federal activities to promote biobased fuels/products
  - Biomass R&D Technical Advisory Committee – help guide BRDI & coordinate/accelerate all Federal bio-based products and bioenergy R&D – approximately 30 individuals from industry, academia, state government



# Government Relations Report

## G&PR Committee Next Steps

- **Maintain current scope/focus strategies/tactics**
- **Support agricultural policy paradigm**
- **Find strategic ways to work more with other bio and petro fuels networks**
- **Be prepared to answer ABO position on cap/trade**
- **Take advocacy work to the next level**
  - **ABO staff/consultant resources**
  - **More consistently active committee members**
  - **Create action-oriented subcommittee structure**
  - **Add significantly more ABO participants into subcommittee structure**
- **Post May 15 Committee interim leadership plan**



# Government & Public Relations Committee

**Thank You!! . . . . .**

**for allowing me to be a part of  
ABO's amazing work**





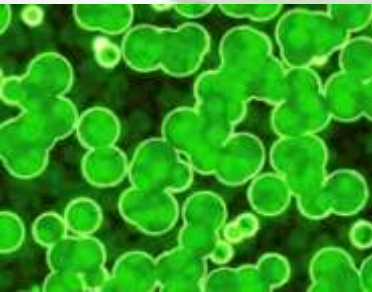


# BYLAW & GOVERNANCE COMMITTEE

Mark Allen, Committee Chairman

*The Algal Biomass Organization promotes the development of viable commercial markets for renewable and sustainable commodities derived from algae.*


[www.algalbiomass.org](http://www.algalbiomass.org)





# Changes to Bylaws Since April 2009:

## September 28, 2009 Consent

- 
- **AMENDMENT #1: Clarification of Terms for Directors Appointed to Fill Vacancies**
    - Number of Director Positions: Bylaws authorize up to 15 Directors. Specific number is set by resolution of the Board.
    - Original Number of Directors: Eight (8) Directors were appointed in the Articles of Incorporation.
    - Increase for 2009 Annual Meeting: Board passed a resolution on December 28, 2008, setting this number at eleven (11), and those positions were filled by election of the Members at the last Annual Meeting.



# Changes to Bylaws Since April 2009:


## September 28, 2009 Consent

- Second Increase in Directors: In order to provide broader representation to producers on the Board, a resolution was passed by unanimous written consent on September 28, 2009, increasing the number of directors from eleven (11) to the full fifteen (15) authorized by the Bylaws.
- Bylaws Silent on Term: The prior Bylaws addressed terms for Directors appointed to fill a vacancy resulting from resignation or removal but did not specifically address terms for directors appointed to fill a “vacancy” due to an *increase* in the number of directors.



# Changes to Bylaws Since April 2009:

## September 28, 2009 Consent

- 
- **Amendment:** Clarifies the manner in which vacancies are filled and the terms for Directors appointed to fill a vacancy.
    - ***Vacancy Due to Resignation or Removal:***
      - Filled by a majority vote of the then-existing Directors.
      - A Director appointed in this manner carries out the term of his/her predecessor.
    - ***Vacancy Due to Increase In Number of Directors:***
      - Filled by a majority vote of the then-existing Directors.
      - A Director appointed in this manner serves a term determined by the Board by resolution BUT the term: (1) cannot exceed 2 years; and (2) must end on a May 15. These rules facilitate an evenly staggered Board with terms ending at the same time regardless of how an individual came to be a Director.

# Changes to Bylaws Since April 2009:

## September 28, 2009 Consent

- **AMENDMENT #2: Establishment of Executive Director as an Officer of the ABO**
  - Mary Rosenthal was hired as Interim Executive Director in June, 2009, and became Executive Director in October, 2009.
  - Amendment makes the position of Executive Director an official “officer” position under the Bylaws and broadly defines the Executive Director’s authority and responsibilities.
    - Perform all duties incident to the office of Executive Director.
    - Perform all duties as assigned to him/her by the Board or other officers from time to time.
    - Grants authority to sign deeds, mortgages, contracts, etc. binding the corporation up to an amount established by the Board (\$10,000 individually and \$25,000/calendar month in the aggregate).



# Pending Changes to Bylaws:

## March [ ], 2010 Consent

- **PENDING AMENDMENT #1: Chairpersons of Committees**
  - Background:
    - The Bylaws establish 7 standing committees and provide for temporary committees to be established by resolution of the Board.
    - Only Directors can currently serve as chair of Committees.
  - Pending Amendment:
    - To provide additional flexibility and opportunities for Member involvement, it has been proposed that any member of the Committee may serve as chair, and such chair shall be appointed by the Board.
    - Additional clarification on the term of such chairperson



# Pending Changes to Bylaws:

## March [ ], 2010 Consent

- **AMENDMENT #2: Vacancies on Committees**
  - Background:
    - The Bylaws require a minimum number of positions on each committee be filled by Directors. This is Washington law, and Committees exercise the power of the Board on certain matters.
    - The Bylaws did not specifically address vacancies on committees of Director-Members.
  - Amendment:
    - Clarifies that the Committee may *recommend* Non-Director Members to the Board for appointment to a Committee (but Board need not follow the recommendation).
    - Clarifies that the Board fills vacant Director-Member positions on Committees by resolution and appointed Director-Member serves on the Committee until his/her term as Director expires.





# Pending Changes to Bylaws:

## March [ ], 2010 Consent

- **AMENDMENT #3: Chairperson and Vice-Chairperson of Board**
  - Background:
    - The Bylaws are silent on the positions of Chairperson and Vice-Chairperson of the Board.
    - The Board appointed Bill Glover to serve as its Chairperson when the ABO was formed in 2008.
  - Pending Amendment:
    - Formalizes the positions of Chairperson and Vice-Chairperson in the bylaws.
    - The procedure for electing a Chairperson and Vice-Chairperson, and the duties, terms, resignation, removal, etc. are established by resolution.
    - The pending action by written consent addresses these issues.







# TECHNICAL STANDARDS COMMITTEE

Mark Allen, Committee Chairman

*The Algal Biomass Organization promotes the development of viable commercial markets for renewable and sustainable commodities derived from algae.*

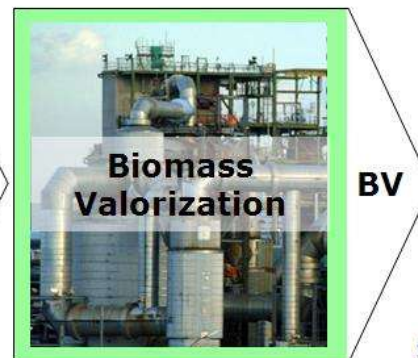
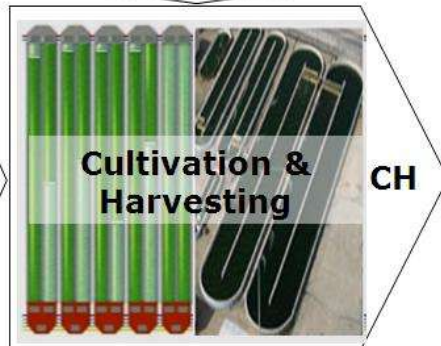
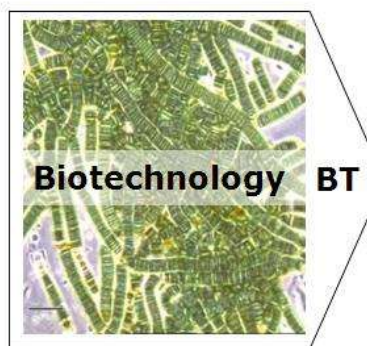
[www.algalbiomass.org](http://www.algalbiomass.org)



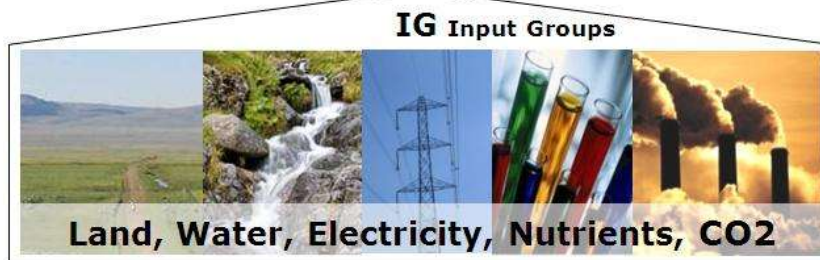
## **Committee Mission Set by ABO Bylaws**

- Develop and advocate industry standards and best practices
- Liaise with Members, Standards Organizations, and Government
- Facilitate information flow between industry stakeholders
- Review ABO technical positions and recommendations
- Undertake special projects as directed by the ABO Board

# TECHNICAL STANDARDS - STRUCTURE

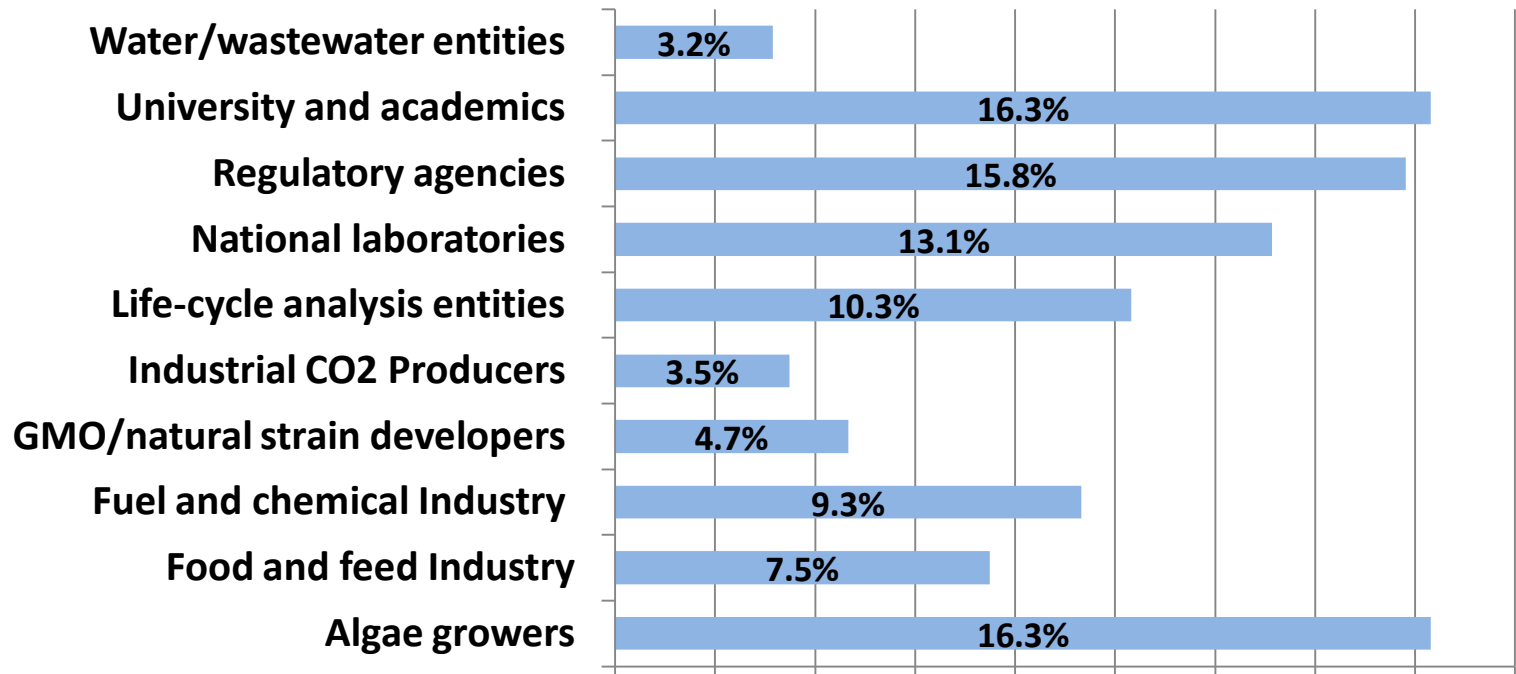


**Jobs**  
**Fuels**  
**Plastics**  
**Chemicals**  
**Animal Feed**  
**Nutraceutical**  
**Carbon Capture**  
**Soil Amendment**  
**Water Remediation**





# PARTICIPANT POLL ABS 09 ON STANDARDS



Responses from ABS 09 Poll Question: **“What industry segments should be involved in developing technical components of sustainability standards for algae biomass”**

# TECHNICAL STANDARDS - COMMITTEE MEMBERS



- **Jim Sears**, President and CTO - A2BE Carbon Capture LLC Committee Chair
- **Dr. Laurie Locascio**, Chief of Biochemical Science Division - NIST
- **Harrison Dillon**, President and CEO - Solazyme Inc.
- **Dr. Phil Pienkos**, Applied Bio Supervisor - NREL
- **Dr Ron Pate**, Principal Member Technical Staff - Sandia National Labs
- **Adonis Neblett J.D.**, Patent Attorney - Fredrikson & Byron
- **Dr. Keith Cooksey**, Research Prof. Dept of Microbiology - Montana State University
- **Dr. Rose Ann Cattolico**, Professor of Algal Biology - University of Washington
- **Brice Freeman**, Project Manager Environmental Controls - EPRI

# COMMITTEE ACHIEVEMENTS - PAST YEAR



- Expanded Committee Membership Approved by ABO Board 3/18/10
- Member Volunteers Recruited from Industry, Academia, and Labs
- Updated Mission Approved by ABO Board 1/13/10
- ABS 09 Sustainability Panel Recruitment, Position Paper, Survey
- Released ABO Position Statement on Life Cycle Assessment
- Technical Standards Presentation at World Biofuels Markets 09
- Initial Purpose, Overview and Taxonomy Posted on ABO Site



# TECHNICAL STANDARDS 2010 PRIORITY TASKS



- Develop Committee Consensus on Goals, Processes and Products
- Propose Standardized Definitions Covering Common Industry Metrics
- Recommend Best Practices for Measuring and Estimating the Metrics
- Maximize Collaboration and Adaptation of Existing Standards
- Structure and Chair a Technical Standards Session at ABS 2010
- Develop and Review Technical Position Briefs as Required by Board



# BOARD OF DIRECTORS NOMINEES

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[www.algalbiomass.org](http://www.algalbiomass.org)

# BOARD OF DIRECTOR NOMINEES



- **Mr. Mark Allen** (incumbent)  
A2BE Carbon Capture, LLC
- **Mr. Billy Glover** (incumbent)  
The Boeing Company
- **Mr. John Benemann, Ph.D** (incumbent)  
Benemann Associates
- **Mr. Thomas Byrne** (incumbent)  
Byrne & Company Limited
- **Mr. Keith Cooksey, Ph.D.** (incumbent)  
Montana State University
- **Dr. B. Greg Mitchell** (incumbent)  
University of CA San Diego, Scripps Institution
- **Mr. Joel Murdock**  
FedEx Express
- **Mr. Frank Prautzsch**  
Raytheon Company
- **Dr. Herminia Rodríguez**  
University of Sevilla, Spain



# LUNCHEON SPEAKER

Representative Harry Teague, New Mexico

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# CLOSING REMARKS

Billy Glover, Chair of the Board of Directors

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