

**APPENDIX C:  
VISIONING DOCUMENT**

**RENEWABLE FUELS ROADMAP AND  
SUSTAINABLE BIOMASS FEEDSTOCK SUPPLY FOR NEW YORK  
Final Report**

Submitted to  
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and  
**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION**

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## TABLE OF CONTENTS

<b><u>Section</u></b>	<b><u>Page</u></b>
1 INTRODUCTION.....	C-1
2 ACHIEVING THE BIOFUELS VISION FOR 2030.....	C-1
3 PATHWAYS AND KEY MILESTONES.....	C-3
4 CONCLUSION.....	C-3
APPENDIX C-A – List of Participants.....	C-4
APPENDIX C-B – Vision Meeting Storyboard Results.....	C-6

## LIST OF TABLES

<b><u>Table</u></b>	<b><u>Page</u></b>
Table C-B-1. Group A – Key Drivers in New York State for Development of a Robust Biofuels Industry.....	C-6
Table C-B-2. Group A – Vision.....	C-6
Table C-B-3. Group A – Priorities for Achieving the Vision for the Biofuels Industry in New York State.....	C-7
Table C-B-4. Group B – Key Drivers in New York State for Development of a Robust Biofuels Industry.....	C-8
Table C-B-5. Group B – Vision.....	C-9
Table C-B-6. Group B – Priorities for Achieving the Vision for the Biofuels Industry in New York State.....	C-10
Table C-B-7. Group C – Key Drivers in New York State for Development of a Robust Biofuels Industry.....	C-11
Table C-B-8. Group C – Vision.....	C-12
Table C-B-9. Group C – Priorities for Achieving the Vision for the Biofuels Industry in New York State.....	C-13



## 1 INTRODUCTION

As a part of the *Renewable Fuels Roadmap and Biomass Feedstock Supply for New York*, NYSERDA sponsored a one-day Renewable Fuels Vision Meeting in Albany, New York. The meeting, held on January 29, 2009, was coordinated by the Pace Energy and Climate Center and Energetics Incorporated. The goal of the vision meeting was to create a cohesive, unified vision for biofuels in New York State that could serve as a platform for development of the biofuels roadmap. The vision process included presentations on d biofuels in New York; discussion and prioritization of technology, market, policy, and institutional issues that are impacting biofuels development in the state; and agreement on a vision for more robust market development and deployment of biofuels in New York.

A cross-section of experts representing key stakeholder groups, institutional organizations, and end-users of renewable fuels participated in the meeting. These individuals have the expertise and vision to help identify the long-term goals of a successful, sustainable New York biofuels industry. This vision will serve as a “compass” that provides direction to the roadmap and upon which implementation of the roadmap is measured.

## 2 ACHIEVING THE BIOFUELS VISION FOR 2030

The following vision was crafted at the workshop, representing a shared view of the future for biofuels development in New York State:

### **A VISION FOR BIOFUELS – 2030**

*By 2030, New York State will have a vibrant, world-class biofuels industry that*

- *Uses its highly diverse state and regional biomass feedstocks in the most sustainable manner possible;*
- *Cost-effectively and significantly reduces New York State greenhouse gas (GHG) emissions and petroleum imports while improving environmental quality;*
- *Has established New York state as the leader in education and technology research, development, and deployment (RD&D), making ongoing contributions to enhanced sustainability and the development of fuels that are almost genetically identical to conventional fuels but are significantly cleaner to use and that release minimal CO<sub>2</sub>. These fuels are commonly termed ‘next generation’ fuels;*
- *Has significantly contributed to economic revitalization throughout New York state, ensuring stable and secure communities; and*
- *Employs an efficient supply and distribution infrastructure to provide an economical, reliable fuel supply for all New Yorkers.*

Major findings of the visioning process include:

- The reduction of greenhouse gas emissions is a key metric for justifying biofuels use in New York State. Although the use of market-based emissions performance standards for doing so is implied, other options should be considered.
- The State must make an investment in biofuels research and development and in the research institutions that have the staff and capability to conduct this work.
- Public policy must include incentives for biofuels research, development, and market deployment. Without such incentives, it is unlikely that such work can be done.
- Sustaining education and training programs is key to a robust industry in New York State. Further encouragement of talent and development of curricula must occur across all levels of the educational system.
- Market certainty – demand, prices, and resources – is key to market success.

Challenges to achieving this vision include:

- Overcoming the technological barriers to using cellulosic biomass at a commercial scale.
- Lowering the costs for biofuels through simple pre-treatment and technologies like consolidated bio-processing.
- Building demonstration plants to test scaled-up technologies and verify the environmental, economic, and technological benefits.
- Gaining public, political, and academic support.
- Engaging the agricultural industry and forest community.

Achieving the 2030 biofuels vision for New York State will require attention to many priorities—both new initiatives and ongoing efforts that require additional resources—as identified by stakeholders across the industry. These priorities fall into five major categories:

- Technology research and development,
- Policy actions,
- Environmental sustainability,
- Economic stability and security, and
- Commercialization.

These priorities are described in more detail in Appendix C-B.

### 3 PATHWAYS AND KEY MILESTONES

Although the vision for the biofuels industry in New York State is not expected to be achieved until 2030, certain pathways and key milestones can be accomplished over the next two decades to keep the vision in focus and to ensure its final implementation. These pathways and milestones target the years 2015 and 2020 in a number of key areas:

- Significant cost-effective reductions in average carbon intensity and greenhouse gases while maintaining and improving environmental quality;
- Highly diverse and flexible feedstocks and biofuels production in place;
- Established processes to yield bioenergy from forests;
- Productivity increases in yield and conversion efficiencies for cost-effective biofuels market development;
- Sustainable, secure community and economic development through environmentally wise use of natural resources; and
- New York State established as a leader in biofuels technology research, development, deployment, and education.

### 4 CONCLUSION

The biofuels vision for 2030 can be attained with the support of both public and private sector organizations at the state, regional, and local level. New York State has a diverse feedstock and biofuels product infrastructure that can grow and mature with the support of public policy and educational institutions, which are committed to environmental sustainability, energy diversity, and commitment to long-term research, development, and demonstration. The State's already world-class educational system can be further strengthened to enhance the biofuels industry. A strong, sustainable, and secure biofuels industry in New York will result from these efforts.

APPENDIX C-A – LIST OF PARTICIPANTS

Renewable Fuels Vision Meeting  
List of Participants

*NYSERDA Board Room  
17 Columbia Circle  
Albany, NY 12203*

January 29, 2009

**Gerald Andritz**

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Conservation

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**Paget Donnelly**

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**John Ellersick**

Mascoma Corporation

**Christina Ficicchia**

New York City Lower Hudson Valley Clean  
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**Lauren Giles**

Energetics Incorporated

**Edward Gray**

Antares Group Incorporated

**Nathanael Greene**

Natural Resources Defense Council (NRDC)

**Ruth Horton**

NYSERDA

**Joel Howard**

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**Judy Jarnefeld**

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New York City Department of Transportation

**Sam Swanson**  
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**Mark Watson**  
NYSERDA

**Jeff Williams**  
New York Farm Bureau

**James Winebrake**  
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**John Zamurs**  
New York State Department of Transportation

APPENDIX C-B – VISION MEETING STORYBOARD RESULTS

**Table C-B-1. Group A – Key Drivers in New York State for Development of a Robust Biofuels Industry**

Drivers	Drivers/Barriers
Improve public health Political support GHG climate impacts Economic growth Strengthening national energy security Sustainability Rural community development Energy diversity Fuel use in vehicles and homes Green jobs (good jobs) Reduce reliance on imported oil Affordability criteria Educated workforce	Commitment to long-term research and development (R&D) Technology development (feedstock technology) Technology development (conversion technology) GHG/climate impacts Cost of food Fuel price volatility Cost of fuels Competing uses for feedstocks Availability of capital Biofuels distribution infrastructure Health impacts environmental justice Public support Federal renewable fuel standards Low carbon fuel standard (of the future) Economic incentives State and federal subsidies (loans and grants) State and federal tax policies Future demand for bio-based fuels Renewable portfolio standard in New York Competition for land (ownership, etc.) Unemployment and underemployment (especially in rural areas) Use of strong academic support (including agriculture extensions) Use of existing agricultural industry Use of preexisting skills: workforce Political support

**Table C-B-2. Group A – Vision**

2030
By 2030, a significant reduction in average carbon intensity of all fuels has been realized, contributing towards an overall reduction in GHG emissions. A highly-diverse feedstock and biofuels/bioproducts infrastructure is in place, including feedstock from forests. Productivity increases in yield and conversion efficiencies have made end products cost-competitive with close substitutes.



**Table C-B-4. Group B – Key Drivers in New York State for Development of a Robust Biofuels Industry**

Positive Drivers	Negative Drivers	Could Go Either Way
Improved workforce Economic stimulus Federal incentives Energy price volatility (consumer) National security Efficiency incentive for vehicles/homes Reliance on imported oil Rural community growth Substitute prices Energy demand Economic sustainability Environmental sustainability Community sustainability Strengthening national energy security Energy diversity Public interest Commitment to long term R&D university support	Infrastructure Lack of engagement with agriculture (AG)/forest community Price volatility/producer lack of long-term contracts Feedstock prices	Low income housing growth Fuel use demand in vehicles and homes Renewable portfolio standard in New York Carbon Cap and Trade Low carbon fuel standard Regional Greenhouse Gas Initiative (RGGI) Political support Feedstock availability GHG climate impacts

**Table C-B-5. Group B – Vision**

2030
<p>By 2030, New York State has a robust renewable fuels economy built on</p> <ul style="list-style-type: none"><li>– Sustainable use of New York and regional resources and reduced greenhouse gases, while maintaining and improving environmental quality;</li><li>– A world-class R&amp;D program in-state that continues to seek next-generation biofuels; and</li><li>– Strong, sustainable, and secure community and economic development to<ul style="list-style-type: none"><li>– Invest in R&amp;D;</li><li>– Achieve sustainability through evolving performance standards;</li><li>– Build an efficient supply and distribution infrastructure; and</li><li>– Enact effective and enabling public policies, including incentives.</li></ul></li></ul>

**Table C-B-6. Group B – Priorities for Achieving the Vision for the Biofuels Industry in New York State**

Economic Stability and Security	Policies	Distribution Networks	Energy Independence and Security
Stabilize New York fuel prices ♦♦ Create fuel diversity Recognize interconnectivity of markets – Establish an integrated Great Lakes supply/demand market Biofuel availability in every city Allow renewable fuels to compete in market Job creation (and retention) Establish supply commodity-based market	Develop pragmatic environmental criteria (with life cycle) ♦♦ Biomass produced with voluntary, incentive-based standards that benefit entire value chain ♦ Reward performance (avoid “picking winners”) ♦ Develop a balance between supply/demand at state level Prioritize (also adjust) energy options that maximize the use of New York resources Consistent regional policy and incentives	Built (in place) efficient feedstock distribution network ♦♦♦♦♦	Reduce reliance on oil ♦♦♦ Increase energy independence ♦♦ Provide energy security
R&D	Financing/Funding	Environmental	Sustainable Energy Production
<ul style="list-style-type: none"> <li>World class R&amp;D program in state                              ♦♦♦♦♦</li> </ul>	<ul style="list-style-type: none"> <li>Seed next generation of bio-based fuels by financing “R&amp;D portfolio standards”                              ♦</li> <li>Require impact analysis                              ♦</li> <li>Adequate public financial support to address near and mid-term market barrier</li> </ul>	<ul style="list-style-type: none"> <li>Reduce GHGs while improving/maintaining environmental quality                              ♦♦♦♦♦♦♦♦♦♦</li> <li>Provide ecosystem benefits carbon capture biodiversity                              ♦</li> <li>Enhance New York’s forest health and carbon sequestration potential</li> <li>Improve environmental quality air water soil</li> <li>25% reduction in transport carbon footprint</li> </ul>	<ul style="list-style-type: none"> <li>Promote sustainable use of New York’s resources (land, forests, water, and energy)                              ♦♦♦♦♦♦♦♦♦♦</li> <li>Develop sustainability standards that balance energy and environment (“E&amp;E”) and society needs                              ♦♦</li> <li>Influence national sustainable/environmental criteria (and how they are implemented)                              ♦</li> </ul>

**NOTE: Diamond symbol indicates number of persons in the workgroup designating the item as a priority.**

**Table C-B-7. Group C – Key Drivers in New York State for Development of a Robust Biofuels Industry**

Drivers	Drivers/Barriers
Reliance on imported oil GHG/climate impacts Strengthening national energy security Energy diversity Sustainability Improved workforce; jobs creation Renewable portfolio standard in New York State Northeast low-carbon fuel standard Commitment (potential funding) to long-term R&D Economic stimulus Rural community economic growth Fuel use in vehicles and homes (affordability/availability) Low-income housing growth Political support Legislative mandates Tax incentives Regard for future generations Interests of future generations Use New York State resources Need for long-term view Consumer understanding of impacts Technology advances Land availability in New York State (not or under-used) New mobility expectations	Oil price volatility Fear and anxiety Public support

**Table C-B-8. Group C – Vision**

2030
<p>In a carbon-constrained environment, develop a vibrant, world-class New York State biofuels industry that</p> <ul style="list-style-type: none"><li>– Uses our natural resources in the most sustainable manner possible;</li><li>– Cost effectively and significantly reduces New York State GHG emissions and petroleum imports;</li><li>– Has established New York State as the leader in education and technology RD&amp;D;</li><li>– Has significantly contributed to economic revitalization throughout New York State; and</li><li>– Produces an economical, reliable fuel supply for all New Yorkers.</li></ul>

**Table C-B-9. Group C – Priorities for Achieving the Vision for the Biofuels Industry in New York State**

Scale	Technology	Infrastructure	Sustainability Climate Change
<p>Balance scale to cost and resource in New York State ◆◆◆◆</p> <ul style="list-style-type: none"> <li>- Develop appropriately sized plants with local-regional distribution</li> <li>- Develop plants scaled for regional biomass to deliver biofuel to regions</li> </ul> <p>Small scale and geographically dispersed ◆◆</p>	<p>Efficient, cost-competitive, and sustainable ◆</p> <p>Seamlessly deliver adequate product to the public ◆</p> <p>Cut by 65% the average pound of carbon dioxide equivalent per passenger mile in New York State (per person) ◆</p> <p>Achieve technology that is feedstock neutral and adaptable to competitive pressures, fostering continual efficiency improvements</p> <p>Achieve reliable biofuels supply that serves 2030 technology needs</p> <p>Exclusively focus on 2<sup>nd</sup> generation as long as cost-effective</p> <p>Deploy diverse biofuels transportation means</p> <p>Achieve proven technologies</p> <p>Derive meaningful metric, e.g., miles per joule, joules per acre, gals./acre</p> <p>Output fuel that is flexible and adapted to changing markets</p>	<p>Water, rail, road systems (and more) that move feedstocks efficiently to conversion plants</p>	<p>Ensure science-based, comprehensive criteria on GHG emissions of biofuels and co-products ◆◆◆◆◆◆</p> <p>Develop biofuels systems that continue to evolve and become increasingly sustainable ◆◆</p> <p>Only impose land use constraints that are limited in their scope and allow for optimal supply opportunity</p> <p>Ensure that air is clean(er); water is clean(er)</p> <p>Achieve a system to deliver biofuels sustainably for New York State, the nation, and world.</p>

**NOTE: Diamond symbol indicates number of persons in the workgroup designating the item as a priority.**

**Table C-B-9. Group C – Priorities for Achieving the Vision for the Biofuels Industry in New York State (continued)**

Production	Feedstocks	Markets	Policy
<p>Replace 30% of fossil petroleum used in state with biofuels produced in New York State ◆</p>	<p>Develop and implement a well-planned, systems-based approach to using our natural resources in the most efficient manner possible ◆◆◆◆◆◆◆◆</p> <ul style="list-style-type: none"> <li>– Optimize feedstocks, including waste</li> <li>– Use diverse New York State feedstocks, e.g., wood, dedicated energy crops grown on marginal lands</li> </ul> <p>More effectively use existing feedstock</p>	<p>Achieve mature market status (phase out government support by 2030)</p> <ul style="list-style-type: none"> <li>– By 2030, price supports would no longer be necessary; policy would instead be continually evolving to minimize negative environmental impacts</li> </ul> <p>In a mature (feedstock) market, resource goes to those who get most value out of it.</p> <p>Develop a New York State biofuels supply that the public understands and uses with confidence (preferring it to alternatives)</p> <p>Export New York State expertise worldwide (technology &amp; education cluster)</p> <p>It makes people feel good about themselves</p>	<p>Need comprehensive, long-term policies to support and maintain (seed to end use) ◆◆◆◆◆◆◆◆◆◆</p> <ul style="list-style-type: none"> <li>– Exercise persistence and determination for several decades</li> </ul> <p>Invest in biofuels research and development (labs, schools, colleges) (20 years) ◆◆</p> <p>Support energy independence ◆◆</p> <p>Do not support other fuel industries (e.g., coal, nuclear) that have no New York feedstocks or basis ◆</p> <p>Create green jobs ◆</p> <p>Make sure economic, social and environmental benefits are distributed to many segments of society</p> <p>Certainty: Establish policies, incentives, regulations, etc. with science-based life-cycle assessments and long time scale</p> <p>Develop and implement legislation and policy for New York fuel (i.e., biofuels from New York)</p> <ul style="list-style-type: none"> <li>– Support New York State resources and New York State growth</li> </ul>

**NOTE: Diamond symbol indicates number of persons in the workgroup designating the item as a priority**