Global Biofuels Policy Developments: Current Status and Future Trends on Biofuels Specifications

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Presentation Overview

- About Global Biofuels Center/International Fuel Quality Center
- Feedstocks and biofuels market potential
  - Current ethanol usage and ethanol outlook to 2015
  - Current biodiesel usage and biodiesel outlook to 2015
- Policy Overview
  - Biofuels mandates by 2010
  - Current ethanol and biodiesel blending limits
- Biofuels Specifications
  - Current Status
  - Future Trends
  - Final Considerations

What do we do?

Global Biofuels Center (GBC)

- High-level multi-client service providing analysis and support to its membership, covering the following biofuels developments in three key areas for more than 70 countries around the world: **policy, market/production capacity and technology.**
- Biofuels types covered: ethanol, cellulosic ethanol, ETBE, biobutanol, biodiesel, renewable diesel (i.e., non-ester biodiesel)

International Fuel Quality Center (IFQC)

- Empowers members with analysis and information of about 150 countries on**: fuel quality and specifications, vehicle emission standards, refining implications, environmental legislation and regulations.**
- Ensures members complete coverage and interpretation of global transportation and fuel specifications development.
- **Both centers do not advocate any position, and provide a neutral forum to discuss current issues and network through events.**

GBC Membership

IFQC Membership

Market Overview

Feedstocks for Biofuels Production

100+ Feedstocks Contemplated Globally

Source: Global Biofuels Center, November 2008

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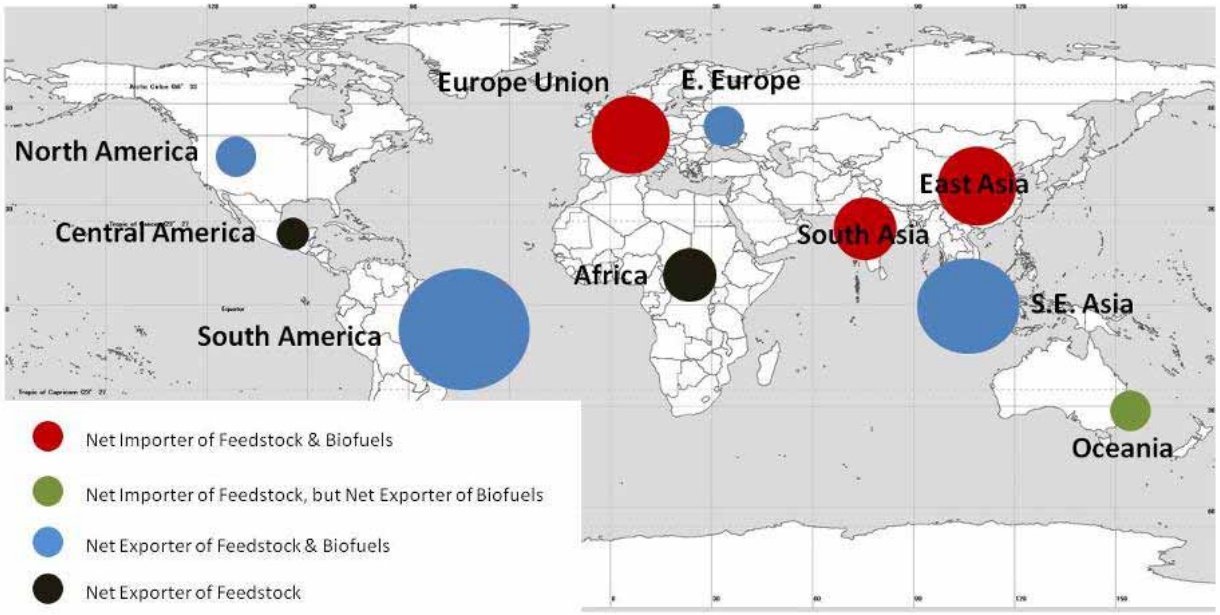
Feedstock and Biofuels Market Potential

Big Markets: Europe, Asia; Big Suppliers: Americas, Asia

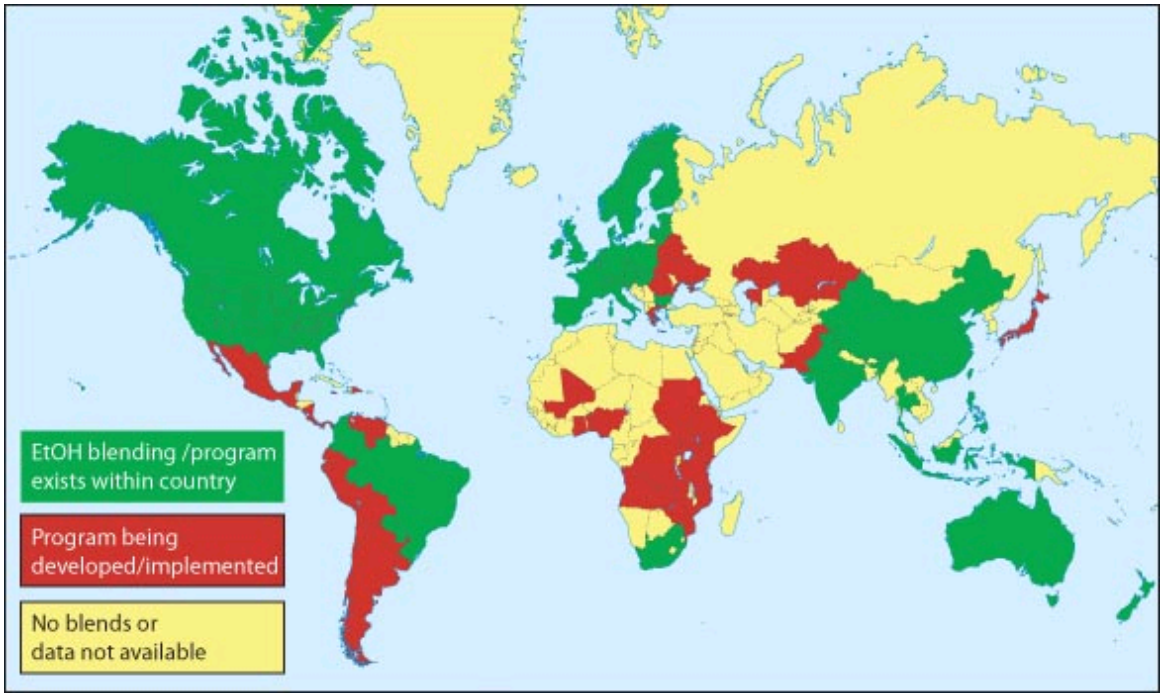


* Relative Size in 2015

Source: HEC/Global Biofuels Center & Global Strategic Service, Nov 2008

Current Global Ethanol Usage

25 Countries Blending Ethanol, Many Others Interested



Source: HEC/Global Biofuels Center, November 2008

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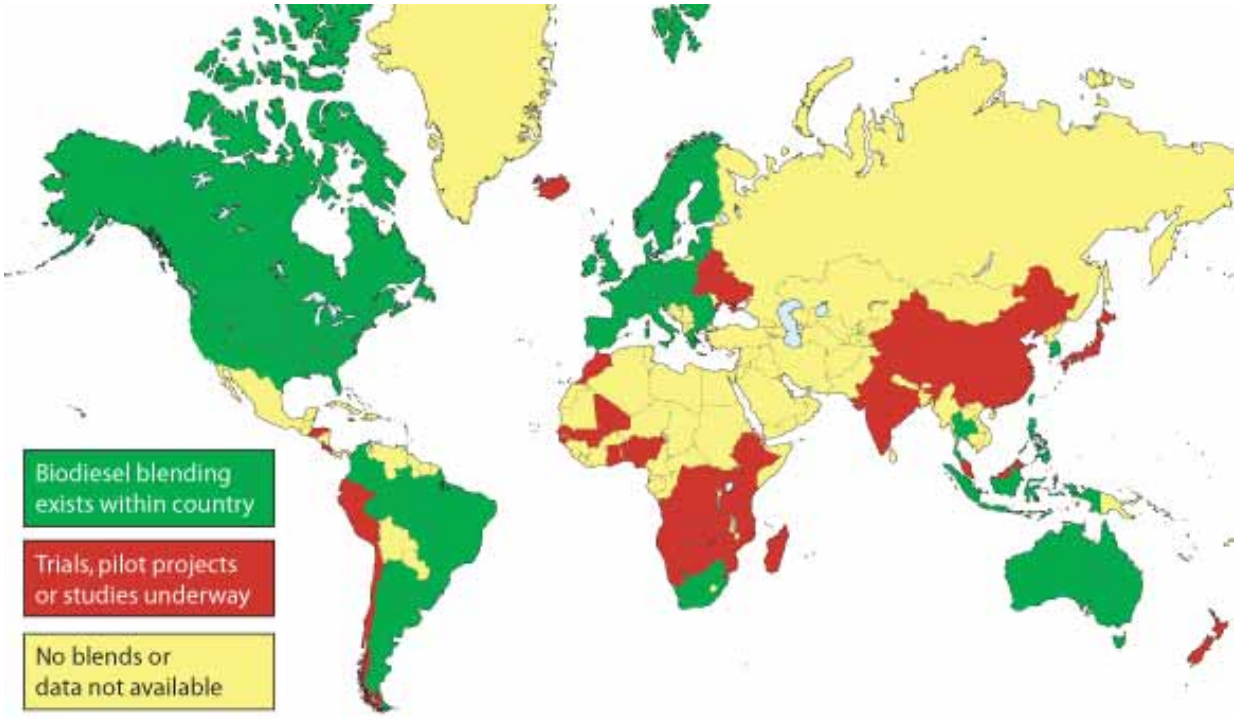
Current Global Biodiesel Usage

30 Countries Blending Biodiesel, Many Others Interested



Source: HEC/Global Biofuels Center, November 2008

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Policy Overview

Key Policy Issues

How do we get it right?

- **Biofuels targets moving forward despite current controversies**
  - We could see delays for biodiesel due to lack of non-food feedstock
  - Targets still volumetric with moves toward those that are GHG-based
  - New targets in U.S. and Europe consider emerging technologies

- **We ultimately expect trade controversies to heat up…**
  - European v. U.S. on biodiesel tax credits ("splash and dash")
  - Brazil v. U.S. on ethanol tariffs and subsidies
  - Europe vs. South America/Asia on sustainability schemes

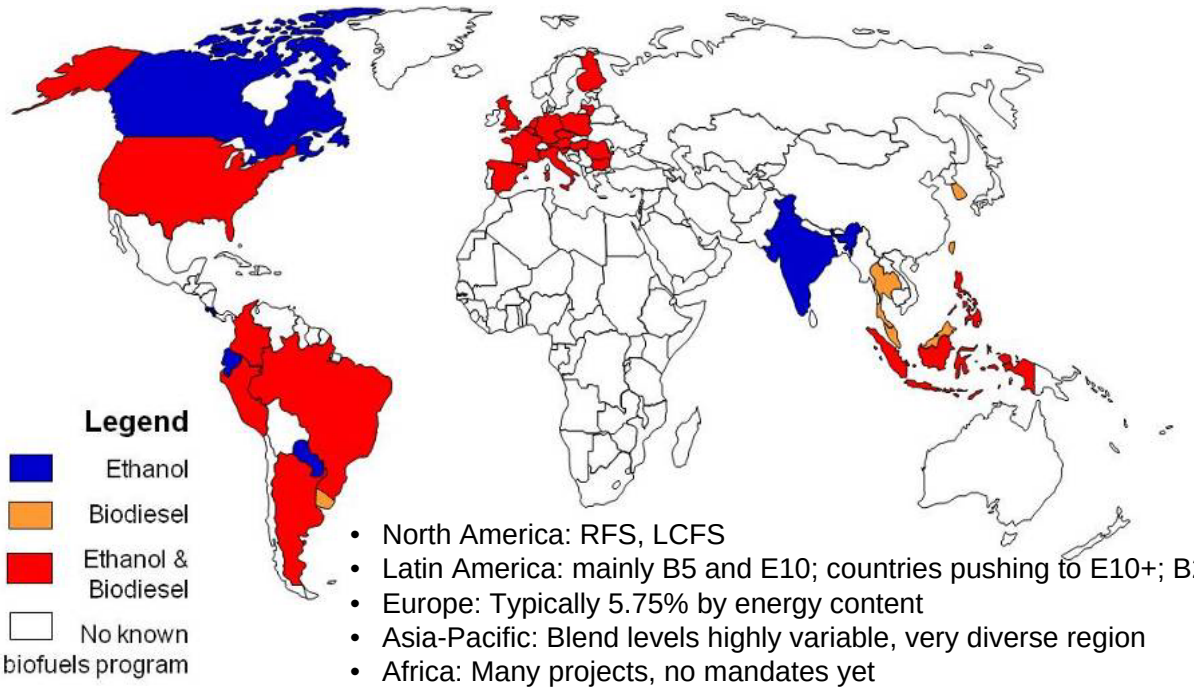
  ….very likely that disputes will land before the WTO

- **Food prices have spiked over the last year…now we know biofuels were not to blame**
  - What about the next time?

- **GBC members and HEC clients (particularly governments)** struggling with key question: "How do we get it right?"

Biofuels Mandates in 2010

Mandates So Far Continue to Move Forward



- North America: RFS, LCFS
- Latin America: mainly B5 and E10; countries pushing to E10+; B20
- Europe: Typically 5.75% by energy content
- Asia-Pacific: Blend levels highly variable, very diverse region
- Africa: Many projects, no mandates yet

Source: HEC/Global Biofuels Center, January 2009

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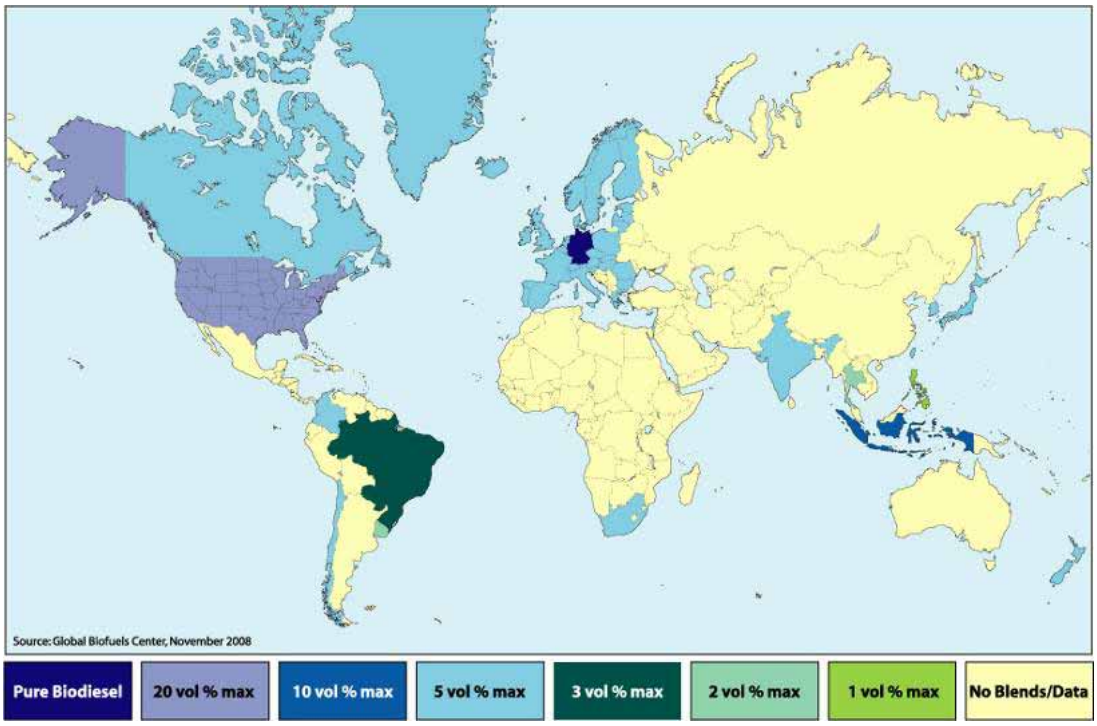
Current Global Biodiesel Blending Limits

Blend Limits Generally Less than 5 vol%



Source: Global Biofuels Center, Nov 2008.
These are specified, legislated and regulated limits.

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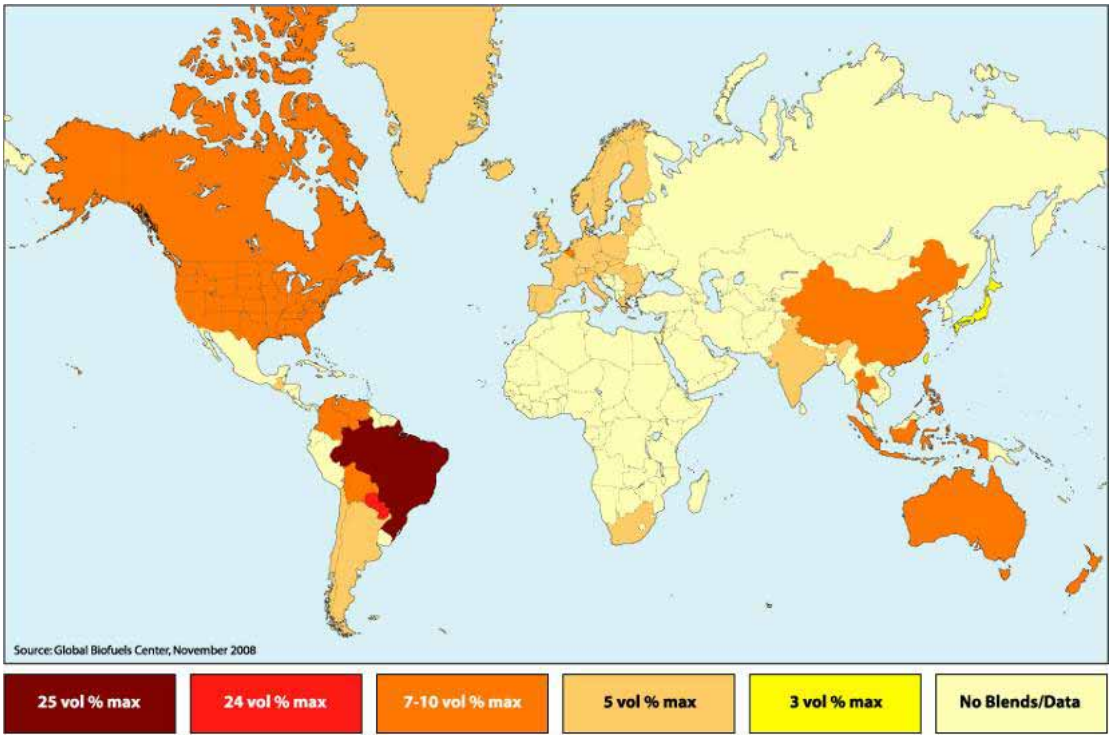
Current Global Ethanol Blending Limits

Blend Limits Generally 10 vol% or Less



Source: Global Biofuels Center, Nov 2008.
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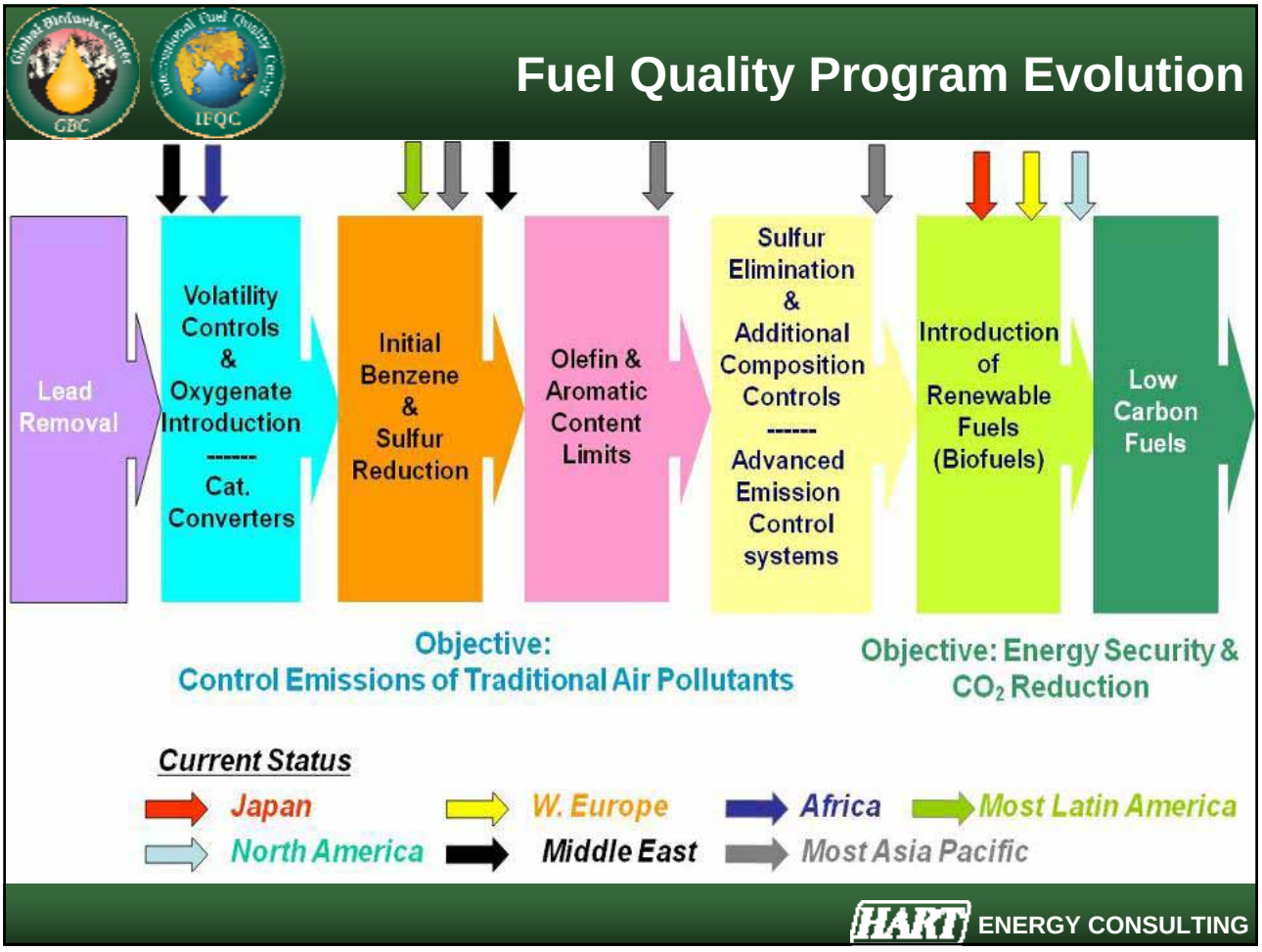
Summary

- How will **policy framework evolve** to support increased biofuels usage and in particular absorb excess supply (especially for biodiesel)? Governments are struggling to find the right set of policies to promote biofuels without harming other industries (food) and the environment.
- **Sustainability**: Issue will continue to grow in importance in coming years, could have implications for exporting countries in the developing world.
- **Cheap feedstocks** are a critical challenge to creation of domestic/global export markets, especially for biodiesel…alternative commercial-scale feedstocks a few years away.
- **Global overcapacity** exists in both ethanol and biodiesel markets for the time being and there will be global industry consolidation…some countries may establish higher blending limits to absorb this excess capacity and promote market development.

Biofuels Specifications: Current Trends

Fuel Quality Program Evolution



Fuels & Biofuels Specifications

Asia Pacific

Fuels

- Sulfur levels range from 10 to 2000 ppm for gasoline and 10 to 10000 ppm for diesel.
- Most countries in 50 ppm to 500 ppm fuel sulfur range
- 2009: trend to lower sulfur levels: South Korea, Australia, New Zealand, Hong Kong with 10 ppm sulfur fuels

Biofuels

- Common ethanol and biodiesel blending limits at E10 and B5
- Most countries have set ethanol and biodiesel blending limits, some with separate blend specs (China, India, Indonesia, Japan, S.Korea)
- 2009: Ex. Philippines will adopt specs that will allow B2 and additional grade in E10.

Fuels & Biofuels Specifications

European Union

Fuels

- 10 ppm gasoline and diesel as of January 2009 in EU & EFTA/EEA
- New directive adopted:
  - ✓ Gasoline , diesel and gas oil specifications
  - ✓ Ethanol (E5-10) and biodiesel (B7) grades
  - ✓ Monitoring and reduction of life cycle GHG per unit of energy by 6% (indicative 10%) by 2020

Biofuels

- Maximum ethanol content increased from 5 vol% (E5) to 10 vol% (E10)
- E5 remains on the market until 2013 or longer
- Biodiesel FAME up to 7 vol % (higher, if member states decide)

Fuels & Biofuels Specifications

North America

Fuels

- Diesel Specification ASTM D975: allows addition of up to 5 vol% biodiesel (B5)
- Gasoline Specification (up to E10), ASTM D4814: lowering volatility requirements for ethanol blends

Biofuels

- Biodiesel Blendstock Specification, ASTM D6751
- New Biodiesel Blend Specification, ASTM D7467: covers biodiesel blends of 6 vol% to 20 vol% (B6-20)
- 2009 Outlook:
  - ✓ Renewable Fuel Standard 2 Rulemaking (Mid-Level Blends)
  - ✓ California Low Carbon Fuel Standard (LCFS)
  - ✓ Northeast States LCFS

Fuels & Biofuels Specifications

Latin America

Fuels

- From 30 to 2000 ppm in gasoline and from 30 to 8000 ppm in diesel.
- Major players are gradually reducing sulfur: Mexico (30 ppm diesel), Chile (80 ppm diesel). Argentina and Brazil implementing 50 ppm diesel by 2012.

Biofuels

- Ethanol blend mandates range from E5 to E25, mainly at E10 levels. Biodiesel mandates range from B2 to B5.
- Argentina recently introduced specifications for ethanol, preparing for E5 . Peru set specifications for B2 mandatory blends (2009).
- 2009: at least three more countries in the region are planning to adopt biofuels mandates: DR, El Salvador & Mexico – new fuel specs expected.

Global / Regional Harmonization Efforts

Lots of Activities …Who Are the Players?

- **International Biofuels Forum**
  - U.S., EU, Brazil…other countries could be included going forward
  - Successful in facilitating dialogue among stakeholder countries
- **World Wide Fuel Charter**
  - Global auto industry, led by ACEA, JAMA, EMA and the Alliance
  - Statement about optimal fuel needed for optimal vehicle performance
- **BIOREMA**
  - Brazil, U.S. (NIST), European Commission, the Netherlands and UK
  - Development of test samples for inter-laboratory comparisons to biofuels reference materials and test methods in 2008-2010 timeframe
- **Regional**
  - RTCA: Reglamento Tecnico Centro Americano
  - APEC: Recommendations to develop harmonized B5 spec
  - ASEAN Automobile Federation proposing B100 spec for region

Final Considerations

• More and more countries worldwide are trying to improve fuel quality on gasoline and diesel by lowering sulfur levels in fuel. Although advanced countries are already discussing low carbon fuels and other measures, sulfur still remains a focal point in fuel quality improvement.

• With new biofuels mandates taking place in different regions (and blend limits being pushed higher to absorb excess capacity around the world), more countries will adopt new fuel specifications for ethanol and biodiesel and their respective blends.

•There are lots of harmonization efforts globally, but concrete results are yet to be seen.

•For biodiesel, due to difference in feedstocks, it will be very difficult to establish a harmonized specs, but there's some positive movement in Asia.

•For ethanol, EU, US and Brazil are currently engaged in dialogue to create a global ethanol standard.

Thank you! Questions?

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