



## A Vision for Sustainability of Alternative Fuels for Aviation



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ÉCOLE POLYTECHNIQUE  
FÉDÉRALE DE LAUSANNE

*Energy Center*

# Sustainability: The Challenge



CHRIS MADDEN

# Biofuel Production: Sustainability Challenges

## Direct impacts

*Within the control of individual operators*

- Food security: direct local impacts, « food vs. fuel »
- Lifecycle GHG emissions
- Direct Land use change
  - ❖ Deforestation, biodiversity loss
- Conservation & biodiversity
- Pollution

## Indirect impacts

*Global, market-driven, outside the boundary of operator control*

- Indirect land use change
  - ❖ Deforestation, biodiversity loss
- Impacts on commodity markets, food/feed prices and food security



# ***Biofuel Legislation Developing Rapidly***

## **Biofuel incentives and mandates increasingly include sustainability provisions**

- ❖ European Union - Renewable Energy Directive (RED)
- ❖ United States - Renewable Fuels Standard (RFS2)
- ❖ The California Low Carbon Fuel Standard (LCFS)
- ❖ German Ordinance on Requirements for Sustainable Production of Biofuels (GER-Biokraft-NachV) - national implementation of EU RED
- ❖ Mexico: Norma Mexicana (NMX) on Sustainable Biofuels
- ❖ Numerous Countries in South America, Asia and Africa
- ❖ States and Municipalities throughout the world

# Lenders Seeking Sustainability Assurances

- ❖ International lenders and development banks are increasingly requesting sustainability assurances
- ❖ Inter-American Development Bank Developed a “Biofuel Sustainability Scorecard” based on the RSB Standard

The image shows a screenshot of the IDB Biofuels Sustainability Scorecard form. At the top left is the IDB logo. The title "IDB Biofuels Sustainability Scorecard" is centered, with a date of "Oct 19, 2009" on the right. The form contains several input fields: "Name", "Sponsor", "Longitude", "Latitude", "Total Project Cost", "Feedstock", "Hectares", "Biofuel", and "Version". Fields marked with an asterisk are required. Below the form is a "Keys" section with a color-coded legend: Excellent (green), Good (light green), Satisfactory (yellow), Potential risk (orange), Un satisfactory (red), and N/A (grey). The "ENVIRONMENTAL" section is highlighted in grey. Under "Project Site", there are two main categories: "Biodiversity" and "Invasive species". Each category has a list of assessment items with corresponding color-coded bars and radio buttons for selection. The "Biodiversity" section includes "No conservation value", "Moderate conservation value", "Natural Habitat", and "Critical Natural Habitat". The "Invasive species" section includes "Species is native and not invasive", "Species is non-native but domesticated", "Species is non-native and not invasive", "Species is native and invasive", and "Species is non-native and invasive". A footer at the bottom right of the form reads "Inter-American Development Bank | www.Iadb.org".

# *Ensuring Sustainability*

## **RSB Process**

1. Screen for impacts – engage stakeholders & experts
2. Mitigate / Improve
3. Continuous improvement

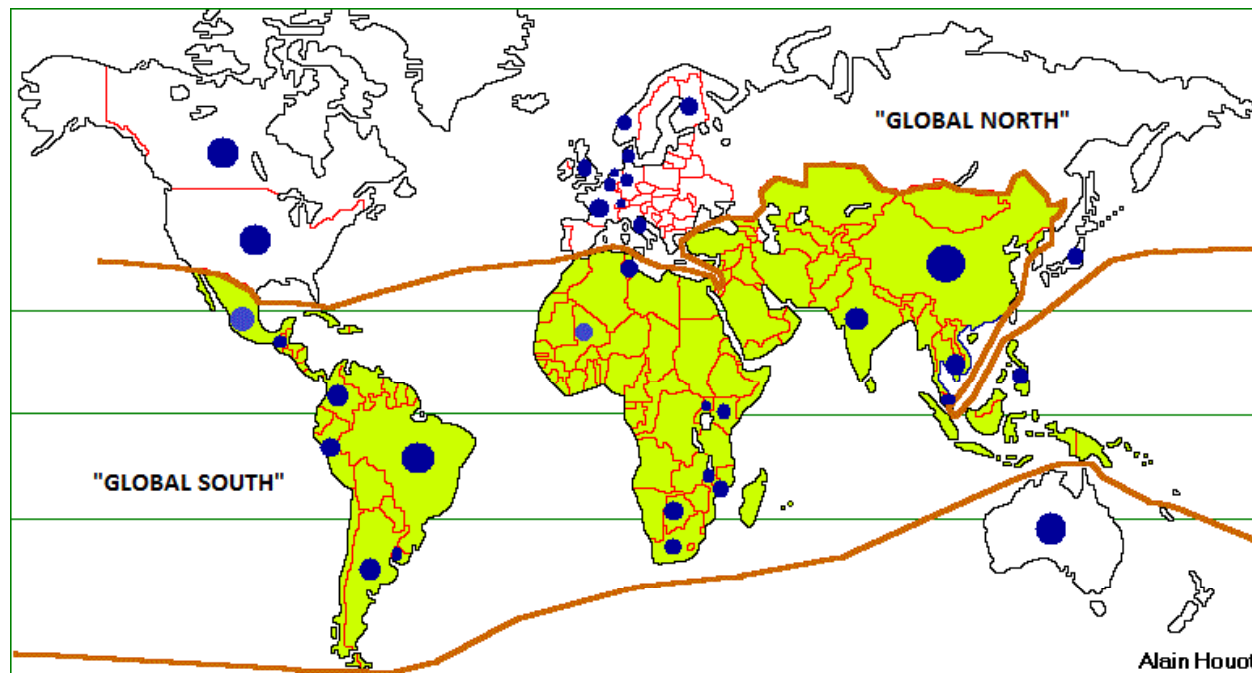
RSB Standard currently addresses the **Direct Impacts** within the boundary & control of the operator

Working towards addressing **Indirect Impacts** in the next version of the RSB Standard

- Indirect impacts expert group
- Collaboration with WWF International, Ecofys, other project partners on developing a *Low Indirect Impacts Biofuels* Module

## ***RSB Global Participation***

- All documents in the RSB Standard are developed through a multi-stakeholder discussion. Decisions are taken by consensus.



RSB is active in over 30 countries and has interested stakeholders throughout the world

## ***Sustainable Aviation Fuel Users Group (SAFUG)***

- Active RSB Member;
- Formed in September 2008 with support from the RSB;
- Objective: Accelerate the Development and Commercialization of Sustainable Aviation Fuels;
- Group members agree to a Sustainability Pledge, that they support verifiable sustainability metrics consistent with and complementary to the RSB Principles & Criteria;





## ***Global Aviation Biofuels Road Mapping Activities***

The Roundtable on Sustainable Biofuels participated in a number of road mapping exercises throughout the world in 2010-11 sponsored by Boeing and local partners:

- *Plan de Vuelo* with Aeropuertos y Servicios Auxiliares (ASA) in Mexico City;
- Sustainable Aviation Fuels Northwest (SAFN) in the Pacific Northwest;
- Flight path to sustainable aviation in Australia and New Zealand;

# The RSB GHG Calculator

- The Greenhouse Gas Calculator measures emissions of biofuels for each lifecycle production step, from farming to final fuel distribution.
- Calculation Methodologies supported include:
  - ❖ RSB Method
  - ❖ EU Renewable Energy Directive (RED)
  - ❖ CH (MinOEV) Swiss standard (for tax-relief)
  - ❖ USA RFS2 – default data
  - ❖ California (LCFS) – default data
- Directly  
[www.rsb-services.com](http://www.rsb-services.com)

Roundtable on Sustainable Biofuels

HOME

IDENTITY DATA

- Identity data

PRINCIPLES CRITERIA

- Principles and Criteria Information
- Principles and Criteria Questionnaire

RISK ASSESSMENT

- RSB Risk Assessment Information
- RSB Risk Assessment Questionnaire
- RSB Risk Assessment Results

N fertilizer data

No N fertilizer used

No N fertilizer used

OR

Only total known:

Total amount of N fertilizer in kg/ha/a.

OR

N fertilizer:  Amount:

Type of mineral fertilizer used Amount of mineral fertilizer used in kg N/ha/a

# The RSB Standard

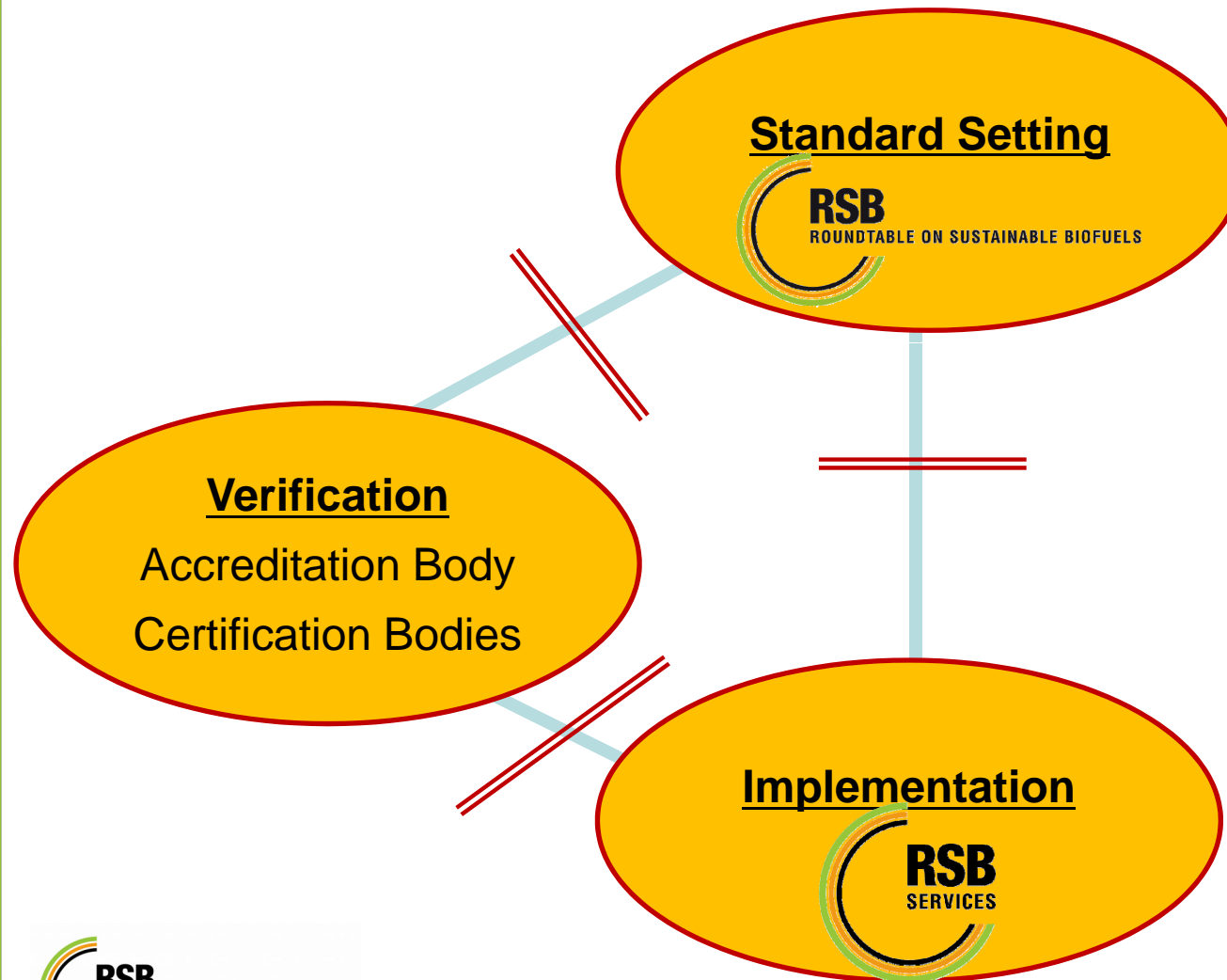
**Global, multi-stakeholder certification standard on sustainability and biofuels applicable to all feedstocks and biofuel types**

- ❖ Covers **entire supply chain**
- ❖ Applies to **all feedstocks** + enables **geographic & crop specific adaptations**
- ❖ **German authority BLE has formally recognized RSB as prove of compliance with German RED regulations (18 March 2011)**
- ❖ **EU RED Compliance – EC Recognition July 19, 2011**
- ❖ **New South Wales, Australia** - adopted the RSB standard 2009
- ❖ **California LCFS is using RSB Principles as a framework** and the **California Energy Commission** is a RSB member
- ❖ **RSB Tool** incorporates global GHG calculators for various international regulations



RSB Tool

# *RSB System – Balance of Power*



## Separating these three central functions:

1. avoids conflict of interest, and
2. ensures consistent, credible, and transparent implementation of the different parts of the RSB certification systems

# RSB Certification Partners

Certification Body Applications to date:



SGS



SCS  
SCIENTIFIC CERTIFICATION SYSTEMS



Industrie Service



Control Union Certifications  
Member of Control Union World Group



Rainforest  
Alliance



GUTcert  
member of the **afnor**  
GROUPE



BUSINESS  
ASSURANCE



NCS  
International

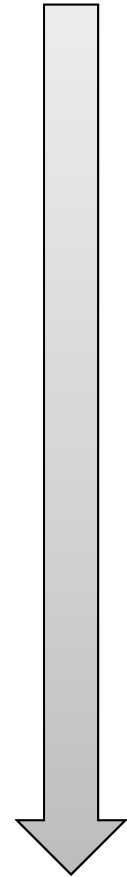


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## *Regulatory Comparison*

### **Indexing of Agricultural and Industrial Processing Regulation to the RSB**

1. Identify areas of overlap between the RSB standards and the relevant regulations
2. Verify the credible enforcement of environmental and social regulation
3. Indicate the type of evidence of legal compliance which may be used to show compliance with the RSB standards (e.g. legal permits).



## ***Auditor Training Courses***

- ❖ Courses held in 2011 in Switzerland, Mexico and Malaysia
- ❖ Approximately 40 RSB Auditors Trained Thus Far
- ❖ 14 Different Certification Bodies participated, including:  
GHD, TÜV SÜD, Intertek, Scientific Certification Services, SGS, FuturePast, Degart Global, DNV, COVERCO, DQS, Rainforest Alliance, VerifAvia, NCS
- ❖ 19 Different Countries Represented:  
Australia, Germany, USA, Poland, Colombia, UK, Spain, Portugal, Brazil, Guatemala, Mexico, Sri Lanka, India, Indonesia, Malaysia, Thailand, The Philippines, France, Argentina

## *Beginning of Certification Activities*

First Applicants to the RSB Systems Recently Received

- Wastewater-to-Ethanol Project in Australia;
- Jatropha plantation in Mexico;
- Sugarcane production in South America;

**First audits are starting to take place now**

Exciting news about RSB Services coming very soon!



*Thank you!*



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