RSB Monitoring and Evaluation System

RSB Outcome Evaluation Report

February 16, 2015

Version 1.0

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1. Introduction

The Roundtable on Sustainable Biomaterials (RSB) is an international organization, which develops and maintains the RSB Standard for sustainable production and processing of biomass and its derivatives, primarily bioenergy and bio-based products (biomaterials). The RSB Standard aims to comprehensively address environmental and socio-economic impacts of biomass production and processing, including but not limited to the production of biofuels. The RSB Standard is implemented through the certification of economic operators willing to demonstrate compliance with sustainable practices. The RSB Standard is also influential in the context of policy-making and regulations, as it is globally recognized as one of the most credible reference in terms of sustainability of biomass, biofuels and biomaterials.

The RSB became a member of the ISEAL Alliance in 2010 and embarked on a path towards compliance with ISEAL Impact Code, which describes good practices for the development of Monitoring & Evaluation Systems. The RSB certification system became operational in 2011 and the development of the RSB Monitoring and Evaluation System (M&E) started in 2012 in order for the RSB to measure its success over time in addressing environmental and socio-economic issues in biomass supply chain. The RSB M&E System collects relevant data from certified operators and the context in which they work. These data are evaluated through a set of impact indicators in order for RSB to measure its impact. How many hectares of sustainably managed land? How many employees working in safe and fair conditions? How many tons of avoided CO2 emissions? These are the questions the RSB M&E System is expected to answer.

This report describes the measured and extrapolated impacts and outcomes from the first years of implementation of the RSB certification system. These are analysed in light of the expected results and outcomes, as defined in the initial RSB "Theory of Change". Given the limited number of RSB certified operators, however, the outcome evaluation is consequently limited. This report will inform organizational learning, and is considered in organizational planning, standard revision and other internal board strategies and decision-making processes. Suggestions and feedback are welcome!

The RSB Evaluation Reports are approved by the RSB Board of Directors and updated biannually, following consultation of RSB Members, RSB Certified Operators, RSB Certification Bodies and Accreditation Body.

2. Evaluation Objectives and Scope

2.1 Objectives

This Impact and Outcome Evaluation Report aims to take a first look at the results obtained by the RSB over the early years of implementation of its certification system and compare them to the expected outcomes, as defined in the Theory of Change[1].

Specific objectives of this report are:

- Test and further improve the RSB M&E data collection system and impact indicators;
- Aggregate data from certified operators and analyse them to draw conclusions;
- Communicate upon the achieved impacts and outcomes of the RSB so far;
- Feed into the general strategic discussions of the RSB; and
- Comply with ISEAL Impact Code (Version 1.0)

2.2 Scope

This first Outcome Evaluation included all the operators certified by the RSB as of December 2014. Given the limited resources of the RSB, the impacts were only measured through the collection of data from audit reports and their interpretation.

It is foreseen that future Impact and Outcome Evaluations will include additional and external research and evaluations.

The impact indicators used in this report cover 2 years of production by RSB certified operators (from Quarter 4 2012 until Quarter 3 2014), based on the volumes reported quarterly to the RSB. Additional data were collected directly among certified operators; missing data from operators unwilling to share additional data were either extrapolated or not considered.

3. Methodological Approach

3.1 Impact Indicators

The RSB monitors its performance by processing data collected among its certified operators through a set of impact indicators, which cover all the environmental, social and economic issues described in the previous section. These data are aggregated into total amounts over the entire pool of RSB certified operators (e.g. total number of hectares with responsible soil management, total number of tons of avoided CO2, etc.). Aggregated numbers are then interpreted in terms of impacts and outcomes of the RSB Standard and Certification System.

RSB Impact Indicators include:

[1] http://rsb.org/activities-and-projects/monitoring-evaluation/

- The number of certified operators and associated feedstock, processing pathways, production volumes and hectares. The number of hectares and biofuel production volumes are reported directly by operators, whereas feedstock production volumes are extrapolated based on the maximum reported number of hectares and average crop yield in the country of operation (e.g. a sugarcane plantation of 2'000 ha in Brazil will produce an estimated 150'000 MT sugarcane per year, based on an average yield for Brazil of 75 MT/ha[2]);
- The amount of avoided CO2 emissions due to the displacement of fossil fuels by an equivalent amount of biofuels;
- The surface of soil under responsible cultivation practices;
- The number of certified operators contributing to improve food security and or socio-economic conditions in food insecure and/or poor countries;
- The surface of land cultivated outside of any area containing conservation values of local, regional or global importance.

The full list of Impact Indicators is included in Section 8.2 of the RSB M&E Public System Report.

3.2 Data Collection

At the onset of the M&E system, RSB uses the online tools filled out by the certified operators, such as their application form, screening tool and public audit summaries. Data are collected on a continuous basis.

As the types of data collected vary by operation type (e.g. feedstock producer, biofuel producer), the impact indicators include a "Data Level" identifier, with Level 1 collected from all RSB certified operators, and Level 2 collected from only a certain type of certified operators. Level 3 would represent an in-depth study for only a handful of selected operators (indicators for this category are still to be defined). In the future, Level 3 will be used to represent indicators developed to answer evaluation questions as part of any impact studies conducted.

Additional data (i.e. not included in public audit report, screening tool, etc.) are collected among operators on a voluntary basis.

3.3 Interpretation and Evaluation

The results obtained through the aggregation of data from certified operators are interpreted and evaluated in light of the expected impacts and outcomes, as defined in the RSB Theory of Change. It is generally assumed that the aggregated surfaces/volumes are fully compliant with RSB sustainability principles & criteria. The reported volumes of biofuels are based on certified operators directly producing biofuels. An extrapolation of additional volumes feedstock producers contribute to is also included.

[2] Source: FAOSTAT http://faostat3.fao.org/home/E

Possible causes are identified to explain the differences between the expected and actual impacts/outcomes.

4. Outcome Evaluation

4.1 General Trends

As of October 2014, 17 companies, representing 23 operation sites, located in 14 countries, received RSB certification. Figure 1 describes the percentage of RSB certified operation sites dedicated to each step of the biofuel supply chain (Sustainability requirements in the RSB Standard apply to 1) feedstock production; 2) feedstock processing; 3) biofuel production; and 4) biofuel blending/distribution. Traders and other intermediaries are not represented in this chart). For example, 43% of RSB certified operations are biofuel production (e.g. biodiesel or ethanol making) and 26% feedstock production (e.g. crop cultivation). *Note: one RSB certified operator may be involved in several operation within the same certification scope (e.g. feedstock production and processing).*

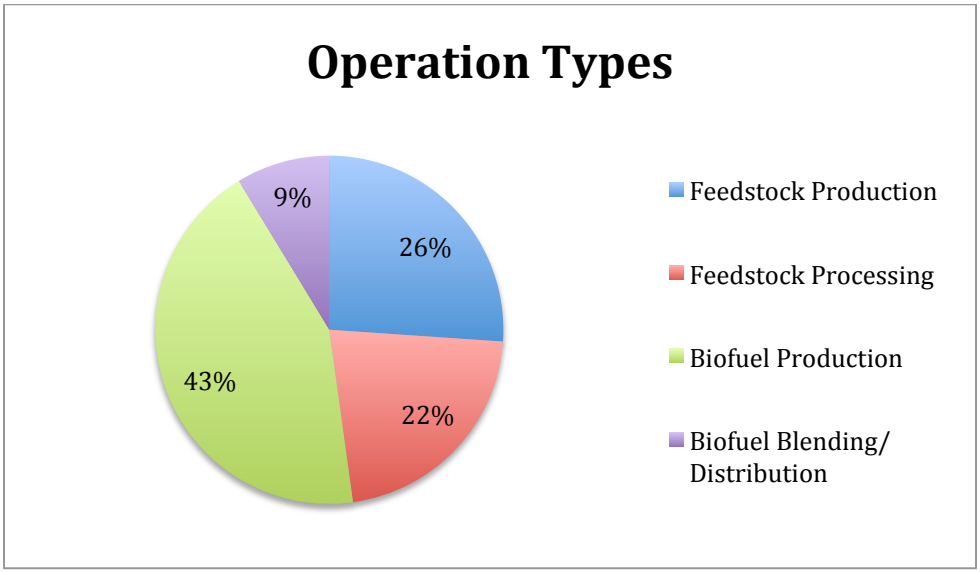

Figure 1: Operation Types (RSB Certified Operators)

Figure 2 shows that a majority of RSB certified operators (64%) fall either in the medium or large category. See Annex I for the different size categories.

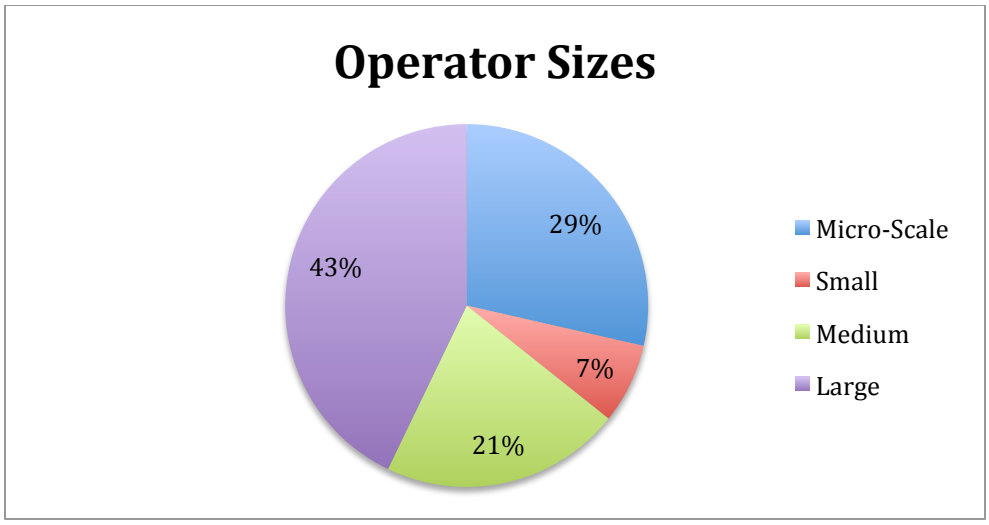

Figure 2: Size Pattern for RSB Certified Operators

RSB Certified Operators are producing/processing a wide range of feedstock and raw material, as described in Figure 3. To date, sugarcane is the most frequently used raw material based on the proportion of operators working with sugarcane (23% of RSB certified operators are either producing or using sugarcane in their operations), followed by Used Cooking Oil (UCO) and jatropha seeds.

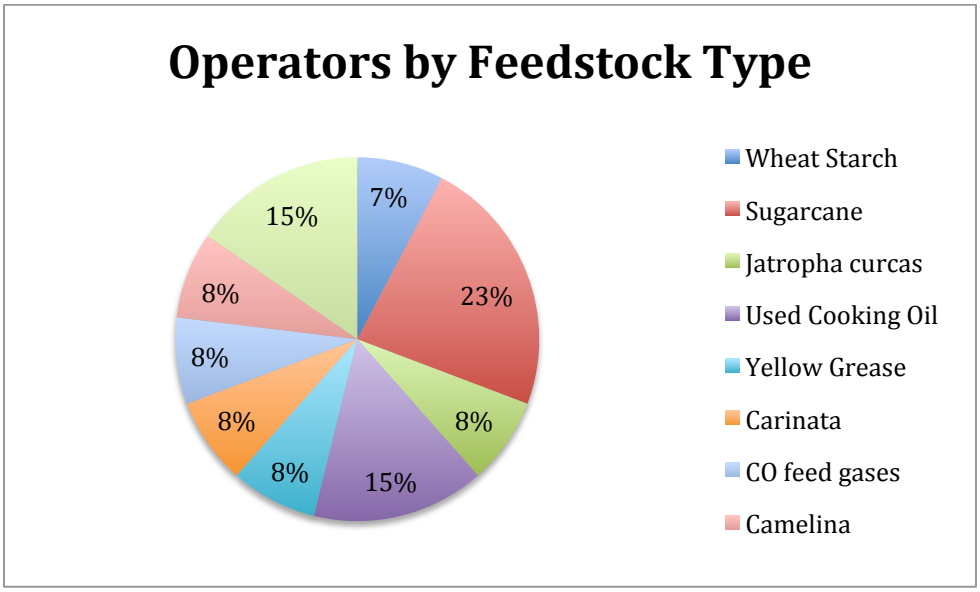

Figure 3: Feedstock Categories among RSB Certified Operators

4.2 Impact Evaluation

The impact of the RSB Standard on biofuel and biomaterial supply chains is evaluated over the period of concern (See 2.2) through:

- The total surface (in ha) cultivated by RSB certified feedstock producers;
- The total estimated amount of feedstock produced (MT) by RSB certified feedstock producers;
- The total amount of biofuel produced (MT) by RSB certified biofuel producers.

The total surface covered by RSB certified feedstock production represents approximately **20'750 Ha**. It can be extrapolated that a similar amount of land:

- Was not converted out of a "no-go" or a "no-conversion" area (i.e. primary forest, peatland, high conservation value area, etc… (*See Principle 7 in RSB-STD-01-001*) after of January 1, 2009.
- Preserves or does not currently harbor conservation values of local, regional or global importance.
- Is under responsible soil/water management practices.
- Was acquired legally, without forced displacement and based on a free prior and informed consent.

The estimated amount of feedstock produced out of this total surface over the period of concern (2 years) is 2'264'000 MT.

Over the time period covered by this report, RSB-certified operators produced an approximate total of **390'500 MT of biofuels**. As above, it can be assumed that this amount was produced in compliance with the RSB Sustainability Principles & Criteria, for example:

- Environmental and social impacts were evaluated and mitigated;
- The involved workers[3] operated in safe and fair conditions;
- Water resources were neither depleted nor contaminated;
- The use of hazardous technologies, waste and chemicals was controlled rigorously.

The amount of avoided tons of CO2 through the production of biofuel by RSB certified operators over the period covered by this report is of approximately **439'500 MT CO2 equivalent**. This amount is calculated as follows:

a) Total production of RSB compliant biofuels over this period: approx. 390'000 MT, which is almost entirely composed of bioethanol;
b) Bioethanol has an energy content of approx. 25 GJ/MT[4]
c) The total production of RSB compliant biofuels can therefore be considered equivalent to 390'500 x 25 = 9'750'000 GJ

[3] At least 1'000 workers, based on limited feedback from certified operators

[4] http://en.wikipedia.org/wiki/Energy_content_of_biofuel

d) This amount of energy displaces an equivalent amount of energy provided by fossil fuels, with an average greenhouse gas intensity of 90 kg CO2-equivalent per GJ
e) RSB compliant biofuels are assumed to emit 50% less greenhouse gases over their life-cycle, compared to their fossil counterpart, i.e. they save 45 kg CO2-equivalent per GJ
f) The total amount of energy calculated in c) is therefore equivalent to (9'750'000 x 45)/1000 = 439'500 MT of avoided CO_2 equivalent.

In addition, operators located in poor countries and/or food insecure regions implement specific measures to reduce local poverty and/or food insecurity. For example, Addax Bioenergy established the Farmer Development Program (FDP), under which 2000 ha of community rice fields have been developed at no cost to the communities. As part of the FDP, Addax Bioenergy has also trained over 2,428 smallholder farmers through its Farmer Field and Life Schools (FFLS), which aim to sustainably improve food security through better adapted farming methods[5].

4.3 Outcome Evaluation

The reported outcomes can be analysed against the expected short-term outcomes, as defined in the RSB Theory of Change. Tables 1 and 2 describe how the measured/extrapolated impacts and subsequent outcomes match the intended short-term outcomes based, respectively on the defined sustainability issues and supporting strategies. The differences between the intended and actual short-term outcomes are interpreted and explained.

Sustainability Issue	Intended Short-term Outcomes (by end of 2014) – as per Theory of Change	Actual Short-term Outcomes (Evaluation)	Interpretation/Remarks
Labor and Human Rights Social and Economic Development (Services) Stakeholder Engagement &	• A worker population that benefits from fair treatment • In regions of poverty, poverty decrease among stakeholders	• Workers employed in RSB-certified operations benefit from safe and fair working conditions. • Certified operators located in regions of poverty implement specific measures for poverty	It is too early to directly measure the decrease in poverty of the stakeholders directly involved in operations but one may assume that they have more stable and higher wage than

[5] [5]http://www.addaxbioenergy.com/food-security.php

Sustainability Issue	Intended Short-term Outcomes (by end of 2014) – as per Theory of Change	Actual Short-term Outcomes (Evaluation)	Interpretation/Remarks
Consultation Land Rights	directly involved in operations	reduction (5 POs located in countries with an IHDI lower than 0.59 or an HDI lower than 0.74, as per 2013 values[6]).	the average in this region.
Food Security	Increase in areas for food production in food-insecure regions	The only RSB-certified operator located in a food insecure region is implementing a food security program (currently 2 located in areas of moderate or alarming food insecurity[8]; Addax Bioenergy is implementing **2'000 ha** of community rice fields[9])	It is too early to directly measure the decrease in food insecurity in this region.
Water (incl. Water-use rights) Soil Conservation (Biodiversity, Ecosystem Services) Air Pollution	Increase in areas where soil erosion reduction and quality improvement practices and water conservation practices are implemented	• About **20'750 ha** are cultivated using responsible soil management practices • All certified operators comply with Principle 9, i.e. no contamination of water resources and no depletion of local resources.	This figure only includes RSB-certified feedstock producers.
GHG Emissions	Reduction of Greenhouse Gas emissions	The amount of avoided tons of CO2 through the production of biofuel by RSB certified operators over the period covered by this report is of approximately **439'500 MT CO2 equivalent**.	
Use of Technology, Inputs, and Management of	Decrease in use of highly-hazardous pesticides	None of the RSB-certified operators and RSB-certified cultivation areas (20'750 ha) are	The only reported non-compliances were minor and concerned the lack

[6] http://hdr.undp.org/en/data
[8] http://www.ifpri.org/tools/2013-ghi-map
[9] http://www.addaxbioenergy.com/food-security.php

Sustainability Issue	Intended Short-term Outcomes (by end of 2014) – as per Theory of Change	Actual Short-term Outcomes (Evaluation)	Interpretation/Remarks
Waste (also an economic issue)		using any chemical listed as prohibited under Principle 11.	of information or procedure on the use of chemicals, inappropriate storage of chemicals or workers not wearing safety equipment. All these non-compliance were closed.
Enterprise Resilience	• Increased resilience of certified companies • Increase income for certified companies	No data available	Biofuel markets further deteriorated with the economic crisis and oil price surge.

Table 1: Intended vs Actual Short-term Outcomes (Sustainability Issues)

Supporting Strategy	Intended Short-term Outcomes (by end of 2014) – as per Theory of Change	Actual Short-term Outcomes (Evaluation)	Interpretation/Remarks
Uptake of the RSB Standard and Certification System	• Certification reaches 30 operators • Low Indirect impact biofuels (LIIB) module completed • An intuitive, implementable and operational certification system in place for biomaterials built around the RSB Principles & Criteria – a system which is practical, with easily-understood requirements	• Certification of 17 operators • Low Indirect impact biofuels (LIIB) module in progress • A certification system in place for biomaterials built around the RSB Principles & Criteria	RSB has not reached its target for uptake of certification in 2014. While the rate of certification is comparable to 2013, 2014 has been a transition year for RSB. Focus on sales will be stepped up in 2015.
Multi-stakeholder	• Streamlined development of	• The streamlining of the RSB standard	The expected outcomes are almost fulfilled. The slight

Supporting Strategy	Intended Short-term Outcomes (by end of 2014) – as per Theory of Change	Actual Short-term Outcomes (Evaluation)	Interpretation/Remarks
dialogue and enabling environment	standard (with adoption and launch of Version 3.0 of the RSB Standard by end of 2015) • Membership expanding to Biomaterials	follows the expected schedule. Slight delay over certain documents. • RSB Members include biomaterials companies (e.g. European Bioplastics, Dupont, etc.)	delays observed in the streamlining are due to an internal reshuffling of priorities, leading to a lower manpower than initially envisioned.
Market Engagement, Communications and Outreach	• 15 Large companies engaged with RSB to develop public commitments supporting RSB certification • First regional workshop completed	• About 10 Large companies developed public commitments supporting RSB certification: Air France, Total, SAFUG (32 airlines), Virgin Atlantic, LanzaTech, the Hawaii Electricity Company (HECO), Imperium Renewables, Airbus, Swiss Airlines • First regional workshop completed (Public session during the Assembly of Delegates – Sept 12)	The number of large companies developing public commitments towards the RSB is lower than initially planned (certified companies were not included unless a commitment towards RSB was made publicly, in addition to certification). However, RSB has made significant progress in engaging key market players and public commitment to RSB should increase in 2015.
Regulatory policy advocacy	• Increased instances of governments procuring RSB-Certified biomaterials	The number of governments procuring RSB-certified biomaterials remains unchanged.	A limited amount of resources was eventually invested in lobbying among governmental bodies, as other priorities were identified.
Smallholder	• 10 smallholder groups engaged in project development	• 31 families • First smallholder group undergoing	The level of support required by smallholder groups turn out to be more

Supporting Strategy	Intended Short-term Outcomes (by end of 2014) – as per Theory of Change	Actual Short-term Outcomes (Evaluation)	Interpretation/Remarks
Certification	• First smallholder group certified	RSB certification	intense than originally scheduled. The development of the RSB standard and certification for smallholders is still under development, which prevents a more important enrolment of smallholder group at this stage.

Table 2: Intended vs Actual Short-term Outcomes (Supporting Strategy)

5. Conclusions and outlooks

This Outcome Evaluation Report is relatively limited given the low number of RSB certificates issued to date. However, the intended short-term outcomes are relatively at match with what the data collected through the audit documentation allow extrapolating. As expected, the environmental and social impacts of RSB-certified operations are generally positive.

As the number of RSB-certified operators and the available amounts of RSB-compliant biofuels and biomaterials will increase over time, it is expected that the reported positive impacts (e.g. surfaces of protected lands, number of workers under safe and fair conditions and avoided tons of greenhouse gases) will increase proportionally.

Due to the limited resources allocated to the RSB M&E System and data collection process, the results described in this report shall be seen as indicative trends rather than an accurate reflection of reality. The main limitations of this report are:

- The evaluated impacts and outcomes are derived from the volumes and surfaces reported by RSB certified operators. These volumes and surfaces were then combined with the requirements certified operators must comply with in order to extrapolate surfaces of protected land, workers under safe conditions, etc. This approach constitutes a notable simplification of the reality of operations. In the future, the actual impacts should also be measured on the field through direct observations.

- Only from the volumes reported quarterly by RSB certified operators are used. These volumes may only represent a share of the total production by these operators. Therefore, it can be assumed that RSB certified operators are responsible

for a larger amount of protected areas, workers under safe conditions and GHG savings, for example.

- Every liter of RSB certified biofuel is assumed to save 50% greenhouse gas emissions compared to its fossil counterpart, which is the minimum threshold for compliance with RSB Principle 3. One may assume, though, that RSB certified operators actually achieve greater savings (e.g. sugarcane ethanol typically saves around 70%, Used Cooking Oil more than 80%, etc.). The reported figure of 439'500 avoided tons of CO2 equivalent can therefore be considered conservative.

- One of the most critical questions is: *How much of the reported environmental and social benefits can the RSB be credited for?*
  Given the fact that the RSB is still in its early days, with a limited momentum in the market, it is generally assumed that RSB certification serves rather as a formal and credible recognition of best performing operators than a driver of changes. Thus, it could be argued that a significant share of the sustainability benefits described in this report would exist without RSB certification, in particular avoided greenhouse gas emissions. However, it could be expected that the RSB will progressively gain momentum among biofuel operators with lower performance levels and push them to improve the sustainability of their operations to receive RSB certification. In such a scenario, the RSB could be credited of an increased share of the positive impacts and outcomes brought about by RSB-certified operators.

- None of the unintended changes described in the Theory of Change (Section 3.4) were observed to date. The verification of whether these unintended changes actually occur will likely require *ad hoc* field investigations among certified operators and stakeholders located in their region of operations several years down the road.

Given the limited scope and relative uncertainty around the impacts and outcomes reported in this report after only a few years of implementing RSB certification, no significant change is to be expected in the RSB strategy for certification and business development based on it. Deeper and more complete evaluations will be performed as a critical mass of RSB certified operators is reached and their social and environmental impacts become more significant. The reported impacts and outcomes, although limited, are relatively at match with the intended impacts and outcomes initially envisioned in the Theory of Change, which tends to show that the RSB is heading towards the right direction to achieve the envisioned mid-term and long-term goals to contribute to a sustainable bio-based economy.

6. Annex I: RSB Participating Operators - Size Categories

Product	Feedstock	Feedstock	Feedstock	Biofuel
Operation	Farm Producer (ha total agricultural production)	Estate Producer (ha total agricultural production)	Processor (metric tons/year of all feedstocks)	Producer (million litres of biofuels/year)
Large	75 – <500	≥10,000	≥500,000	≥100
Medium	NA	3,000 – <10,000	50,000- <500,000	10- <100
Small	10-<75	500 – <3,000	5000 - <50,000	1- <10
Micro	<10	NA	<5,000	<1