Agriculture and Agri-Food Canada | Agriculture et Agroalimentaire Canada

Canada

IEA Task 42
LEEAFF Sustainability Assessment of Biorefinery

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Our Vision

Driving innovation and ingenuity
to build a world leading agricultural and food economy
for the benefit of all Canadians.

Our Mission

Agriculture and Agri-Food Canada provides leadership
in the growth and development of a competitive, innovative
and sustainable Canadian agriculture and agri-food sector.

IEA Brochure - New Triennium

- Biorefinery definition: sustainable processing of biomass into a spectrum of marketable products and energy.
  - Can we make it "standard" to include the TBL-3 pillars of sustainability in biorefinery descriptions, data collection, etc.?

(Vienna, Nov 2011)

Conclusions (Vienna, Nov 2012)

- Biorefineries can be a more sustainable means to an end.
  - Comparative advantage (e.g. renewability) – other forms of development
- How do we show this ?
- Different ways to define sustainability
  - All complex and data intensive
- Consistently talk about the TBL dimensions of sustainability in our Task 42 work
  - LEEAFF is one option

Overview

- LEEAFF – biorefinery assessment tool
- Developments in 2013
- Review Proposed Approach
- Next Steps in 2014

Sustainability Assessment: LEEAFF

Land Use

Environment

Feedstock

Employment

Financial
- *including product markets*

Acceptability

Developments in 2013 "Guidance"

- ISO 13065 Sustainability Criteria for Bioenergy (5th Plenary in Stockholm - Sept 2013)
  - 3 Dimensions of sustainability
  - Environmental: Lifecycle GHG, Air, Soil, Biodiversity, Water, Waste, Energy
  - Scorecard: e.g. economic operator has a soil management plan (Y or N)
  - What to include vis-à-vis sustainability , but does not indicate direction
  - Started in 2009: long time to reach consensus (science and policy)

- OECD Recommendation of the Council on Assessing the Sustainability of Bio-Based Products (released Fall 2013)
  - http://webnet.oecd.org/OECDACTS/Instruments/ShowInstrumentView.aspx?InstrumentID=283&InstrumentPID=298&Lang=en&Book=
  - Council Recommendation (quasi mandatory)
  - 3 dimensions of sustainability
  - Consensus among relevant stakeholders
  - Product end of life considerations

Developments in 2013 “Evaluation Tools"

- EU Prosuite http://www.prosuite.org/
  - integrative approach and evaluation tool to assess the sustainability of new technologies
  - 5 mutually exclusive impact categories that represent the environmental, economic and social dimensions of sustainability
    - HUMAN HEALTH
    - SOCIAL WELL BEING
    - PROSPERITY
    - NATURAL ENVIRONMENT
    - EXHAUSTIBLE RESOURCES

Common Trends

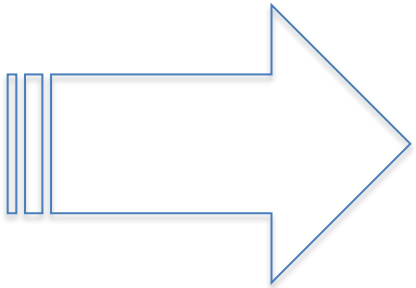
- Science-based
- Developed through consensus
- 3 broad dimensions are addressed (Environmental, Social, Economic)
- Lifecycle basis (especially for GHG)
- Many years and resources to develop.

- At high level, there is general agreement.

GBEP ENVIRONMENTAL	GBEP SOCIAL	GBEP ECONOMIC
1. Lifecycle GHG emissions	9. Allocation and tenure of land for new bioenergy production	17. Productivity
2. Soil quality	10, Price and supply of a national food basket	18. Net energy balance
3. Harvest levels of wood resources	11. Change in income	19. Gross value added
4. Emissions of non-GHG air pollutants, including air toxics	12. Jobs in the bioenergy sector	20. Change in consumption of fossil fuels and traditional use of biomass
5. Water use and efficiency	13. Change in unpaid time spent by women and children collecting biomass	21. Training and requalification of the workforce
6. Water quality	14. Bioenergy used to expand access to modern energy services	22. Energy diversity
7. Biological diversity in the landscape	15. Change in mortality and burden of disease attributable to indoor smoke	23. Infrastructure and logistics for distribution of bioenergy
8. Land use and land-use change related to bioenergy feedstock production	16. Incidence of occupational injury, illness and fatalities	24. Capacity and flexibility of use of bioenergy

Question of Implementation

1. Data intensive or data not yet formally collected
2. Experience at local and regional level



Operational
Meaningful
Actionable

"So What?"

LEEAFF = conceptual framework

LEEAFF Dimension	Economic	Environmental	Social
Land Use and Use of other natural resources (water, soil)		X	X (access to resources)
Environmental Benefits and Impacts		X	X (health)
Employment	X		X
Acceptance			X
Financial	X		
Feedstocks (material and energy)	X	X	

LEEAFF framework expands on the three fundamental pillars – economic, environmental and social - to address the questions that are most frequently raised in the development process, be it by engineers, financiers, policy makers, and the broader public.

Proposed Approach

1. Scorecard or Questionnaire

- Qualitative and quantitative information on 6 dimensions:

Land use	Acceptance
Environment	Financial
Employment	Feedstocks

2. IEA Task 42 Members to contact one biorefinery (from their respective country list)

   Guiding questions; Inquiry: Do you assess? How?

Proposed Approach

3. Revise questionnaire and tool – resource list
4. IEA Task 42 members to approach other biorefineries in country
5. Write up findings from each country
   - Xx biorefineries have conducted an LCA (GHG emissions) … use yy methodology … to assess
   - Links to classification system (e.g. platform X)
6. Draw conclusions - Make recommendations
7. Include in Fact Sheet, Brochure, etc.

Next Steps

Comments on approach – *Is it feasible?*

- If yes, MW (CAN) to provide draft questionnaire with list of tools.
  - Host webinar to review the documents (March 2014)
- Members agree to approach one biorefinery (April and Oct 2014)
- Review results at next Task 42 meeting.