

Result of Team 2:

Mobilisation biomass done right.

Making new value chains work for primary producers and soils.

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Team members:

- Dorette Corbey, Federation Bioeconomy NL, team leader
- Joop Groen, Viride, NL
- David Chiaramonti, RE-CORD | University of Florence, IT
- Frank Bergmans, MVO, NL
- Wibke Baumgarten, FNR, DE
- Paul Sinnige, NEA, NL

Introduction

The team started by 'mapping' its collective knowledge. The team includes scientific knowledge (i.e. on soils, on processing techniques), and practical knowledge (on business cases, on policies, on sustainability issues).

Our challenge is to identify ways to mobilise sustainable biomass 'rightly'. We defined 'done right' as starting at the bottom, or bottom up: the primary producer and the soil are crucial. We noticed that attention for the soil is frequently absent at workshops and scientific meetings on biomass supply. Also, we noticed that the focus of primary producers is often missing in analyses of biomass availability. The primary producers are key to increasing the availability of sustainable biomass. Moreover, sustainability issues differ from region to region. Farm scale, weather, soil, relief, infrastructure, legislation and organization of the supply chain can be critical issues to deal with. Due to climate change around the world action is needed to become more resilient against extreme weather conditions. Policies creating demand for biomass should always consider sustainable production as a starting point.

Our team noted that especially Africa is the continent where agriculture needs huge efforts to be developed. Done in the right way it can help to develop communities economically, while maintaining a fertile and healthy land base.

Mobilise more sustainable biomass

We listed several ways to mobilise more sustainable biomass:

- **Side streams:** until now in many parts of the world frequently unused
- **Marginal lands:** prevention of marginalisation is most important; marginal lands are degraded, abandoned, contaminated land, or land that cannot be maintained in an economically efficient way. Restoring of marginal lands is hard and is a long-term process, depending on the degree and severity of marginality.
- **Efficiency gains:** in large parts of the world agriculture is not efficient enough; new agriculture, precision methods can increase efficiency. A highly efficient land management is required, including soil and water management and fertilizing. This implies also closing nutrient cycles and avoiding external mass flows by export of

organic manure. Biogas plants, use manure on the farm and reduction of excessive nutrients on the farm level will have a positive impact.

- **Double cropping** is another example of better use of the existing land. With regard to the use of marginal land, an even more efficient land management is required, as especially water and nutrients, including soil organic matter are mostly limited.
- **Change diets:** if consumption of meat (cow and pork) decreases, huge gains in sustainable biomass availability will be possible. Land use for feed production will reduce significantly and will excessive nutrient (N and P) production.
- **Water plants and aquaculture.** High potential but still in need of much improvement and development.

We decided to elaborate the first two ways: use of side stream products and marginal lands.

Design Criteria value chains:

In order to elaborate the cases, we developed design criteria on top of the two criteria we already identified:

1. **Primary producer:** needs to improve his position
2. **Soil:** needs improvement or at least no deterioration. We identified preventing of marginalisation as a top priority.
3. **Business case** should work for all partners throughout the chain.
4. **Easy though adequate regulation on sustainability issues:** make regional actors responsible where possible.
5. **Innovation** done right: the direction of innovation is important: it should empower primary producers.
6. **Robust feedstock demand:** no agricultural business case can developed, if the farmer has no buyer.
7. **Robust feedstock supply:** no business case can be developed, if feedstock supply is insecure.
8. **Flexibility** in the energy system and avoid dependence on one supplier/source

We designed our cases by taking a regional perspective (EU-level or part of the EU, for instance Southern Europe or North-West Europe, or a sub-national region) and a global perspective. We identified two value chains that deserve further exploration. The first is a regional case that puts focus both on side streams and on prevention of marginalization. The second is global and points at side streams of sugarcane with attention to field/soil improvement.

1. Use of manure to improve land in Southern Europe:

Due to intensive animal breeding, the Netherlands produce excessive amounts of manure (including N and P). In contrast, the main problem in large parts of Southern Europe is the marginalisation of soil, i.e. nutrient leaching and loss in soil organic carbon. Manure is part of the solution: digestating of the manure plus blending or mixing it with biomass delivers green gas and an innovative soil improving digestate.

This value chain benefits the dairy producers: the manure gets a value. And it benefits the soil, resulting in better and more productive agriculture.

The technique is ready to apply (and is already applied on a small scale)

It is not happening on a sufficient scale because of lacking incentives and uncertainty of product (the digestate).

Solutions should include:

- Better incorporation of soil protection in the Common Agricultural Policy (CAP)
- Intermediate companies who introduce standardisation.
- Financial incentives (subsidy, market creation)
- Social dialogue with farmers and end-users

This value chain meets our design criteria. Apart from benefitting both primary producers and soils, the application is innovative and robust. The gas and digestate producing company can be held responsible for sustainability.

2. Global side streams: the case of straw of sugarcane

Main problem is that straw of sugarcane is now burned or (more frequently) left on the field where it reduces yield: it is collected in a corner of the fields where it rots and produces GHG emissions.

Solution: intermediate companies collect the straw and process the material into green pellets. This pretreatment makes side streams a biomass commodity and it includes standardisation. The intermediate companies should be obliged to take part of the processed product back to the field, thus ensuring return of nutrients to the soil. The solution benefits producers in two ways. First, straw has a value instead of being a yield-reducing problem and second, the producer receives soil improving product of the intermediate pellet producer.

What is needed is a downstream market creation. That is relatively easy in Brasil, where agro-industry is settled, it is less easy in parts of Africa. Green pellets can be shipped and further processed in biorefineries. It is the feedstock for a whole range of products.

This value chain fulfills the design criteria: the intermediate companies (green pellet producers) can be held responsible for sustainability issues. The product is innovative, it is a robust and guaranteed feedstock for refineries, and has a very high potential.

Final remarks

In order to make the value chains work in practice some conditions are necessary.

- Primary producers (farmers) need a business case that entitles them to produce crops as well as maintain a fertile and resilient soil. This implies:
 - Access to right quality inputs (nutrients, water, seeds) and services to support their company (financial services)
 - Access to right information on farming (Knowledge transfer)
 - Products sold for a price that reflects all necessary cost to produce sustainably and ensures continuation of the company (including green services)

We noted that farmers hardly participate in discussions on sustainable supply: their voice is not well heard. Moreover, the needs and focus of farmers differ from region to region. Also, there is gap between big farmers on one hand and small holders on the other when it comes to access to knowledge and quality inputs.

- Intermediate companies are crucial to make the bio-economy work. They can:
 - Contribute to standardisation

- Create commodities
- Be responsible for sustainability and guide producers
- Guarantee soil protection and soil improvement where needed
- Intermediate companies will need a down stream market. This implies
 - Financial incentives (as in the manure case)
 - Better market for biobased product or bio-energy and biofuels (as is in the sugarcane case)
- Sustainability issues are real but there are also solutions:
 - Incorporate sustainable practice in regular legislation and practice, especially within the EU: include soil protection in CAP and REDII
 - Work with bilateral agreements with third countries in order to guarantee sustainable production.
 - If this not possible: rely on intermediate companies and provide them with clear guidelines.
 - Investment in increasing sustainable biomass availability on existing and marginal land is an important step to release the pressure on high value nature areas and a way to decrease the need for deforestation.
- Policy-integration at the EU-level is necessary
 - The bio-economy includes agriculture, energy, industry, transport, forestry and more. In order for sectors to become interlinked, it is necessary to integrate policies. DG Tren and DG Agri should team up to guarantee an integrated approach, in cooperation with DG ENVI to guaranteed sustainability.
 - Make biomass more attractive in the EU, decrease prices, reduce administrative burden...
- Urgency is needed: there is no time to waste. Solutions are there and need to be implemented. This may need a better communication on biomass. The cases we discussed provide perfect examples because they create win-win-win situations. They indeed benefit the climate, the producers and the soils (resources). That is a strong message!