



OECD 2009 Workshop (Montréal)

Key Messages and Recommendations



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World Congress on Industrial Biotechnology and Bioprocessing
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Natural Resources
Canada

Ressources naturelles
Canada

Canada

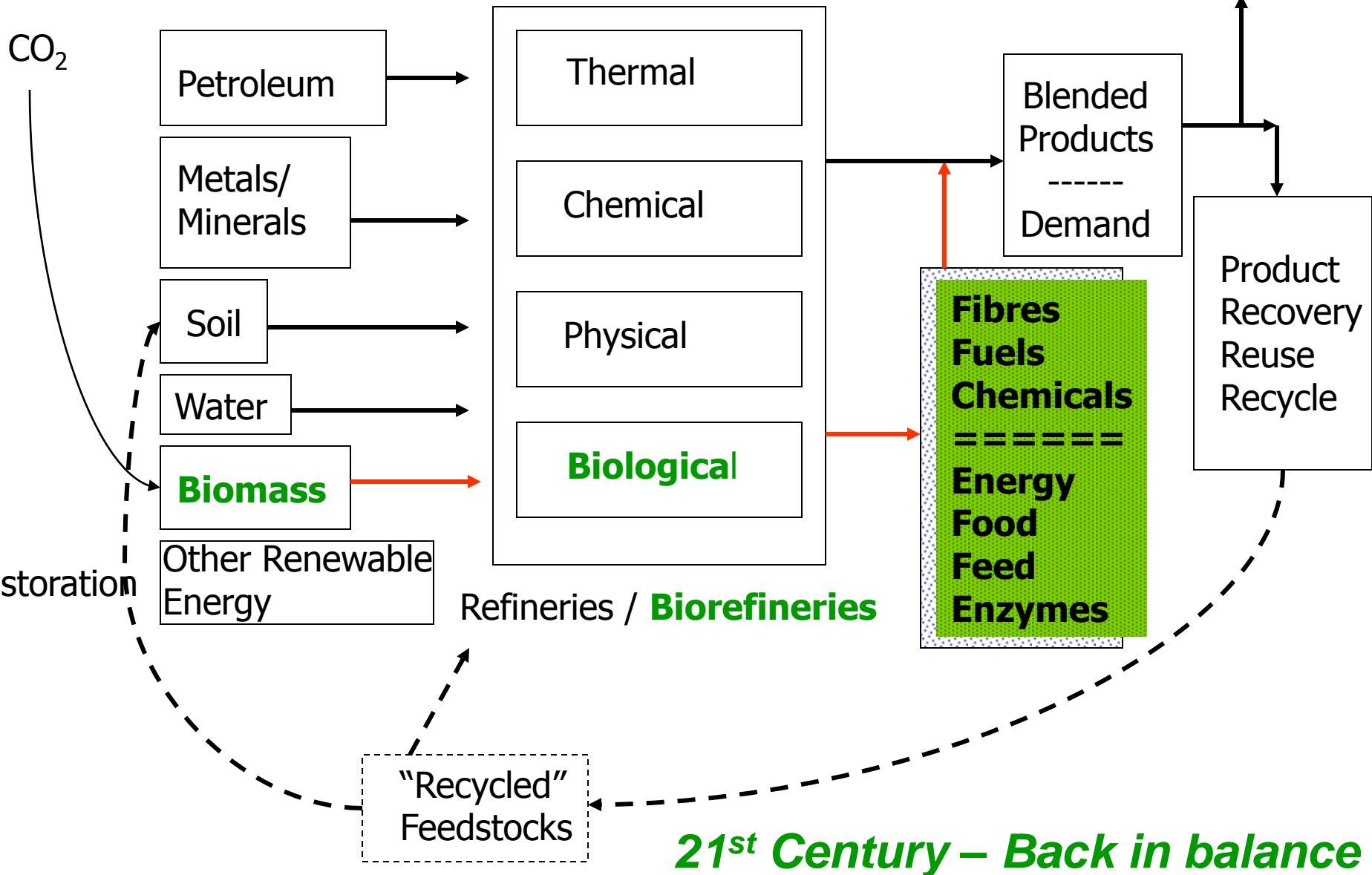
Outline



1. Why do we want to pursue a more bio-based economy ?
2. OECD 2009 Workshop (Montréal): Best Practices for Assessing the Sustainability of Bio-based Products
3. Key Messages for **Next Steps**

Last century: Disrupted Cycles

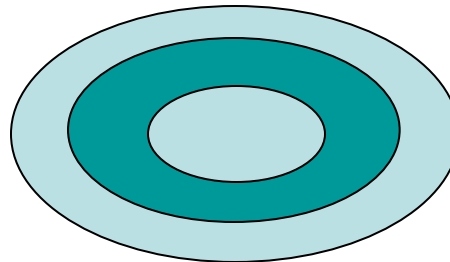
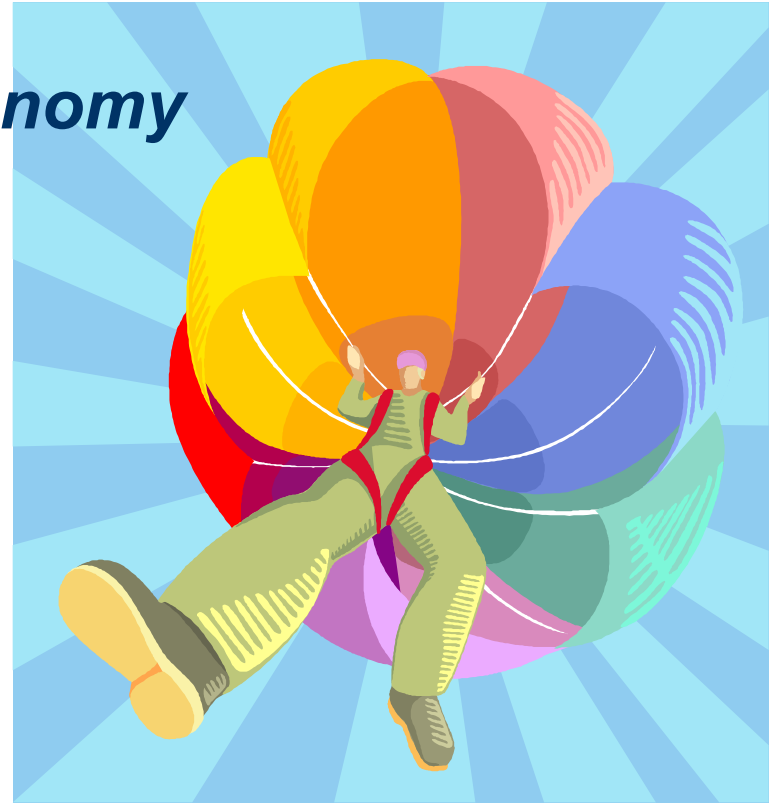
Pollution



We need to clearly define what are we aiming for with respect to ...

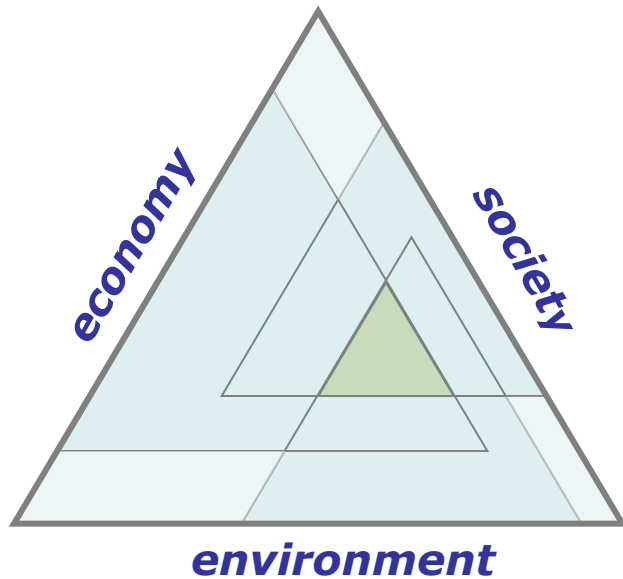
- *sustainable development*
- *bio-based “closed loop” economy*

- Energy self sufficiency ?
- Reduce greenhouse gases and other types of pollution ?
- Extend the life of non renewable resources ?
- Create employment ?
- Rural economic development ?
- Improved standard of living ?
- Improved wellbeing ?
- etc.



Where do we want to land ?

Ideally we want to understand the relationship *between the 3 dimensions*



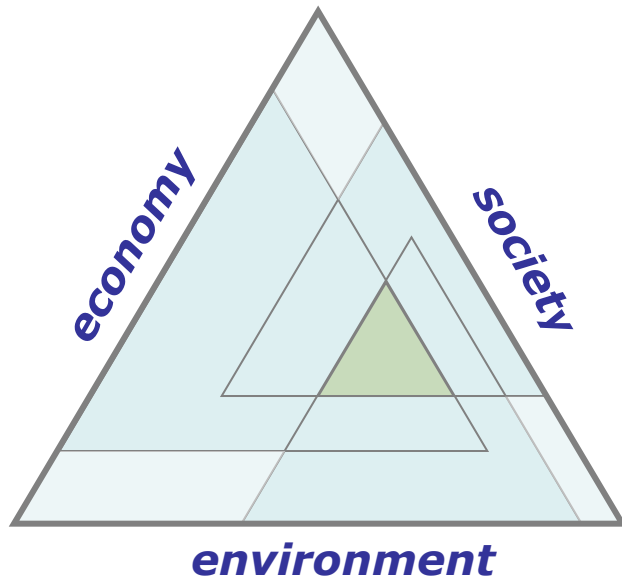
Source: Carlos Licon (2009)

But data are lacking at the sub-sector level:

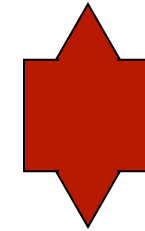


Bioenergy
Biofuels
Biochemicals
Biomaterials

However, we can agree on principles that will guide us to a “good landing”



Goal: Sustainable Development
(via use of renewable resources)



Principles



defined by Criteria



defined by Indicators

Source: Carlos Licon (2009)

Montréal Workshop (July 2009)



- OECD – Drs. Benedicte Callan, Alexandre Bartsev
- Purpose: Discuss best practices regarding the sustainability assessment of bioproducts, the need for international guiding principles and, if needed, what the principles might include, etc.
- 1.5 day workshop – mix of presentations by seasoned experts + break-out discussions with audience that included bio industry representatives, LCA practitioners, etc.
- *Note: environment bias to the discussion*

What was discussed ?



Expert Presentations

- Harvey Mead (CAN)
- Rob Anex (US)
- Michele Galatola (EC)
- Guido Reinhardt (GER)
- Joel Velasco (BRAZIL)
- Barbara Lippiat (US)
- Olivier Jolliet (US/SWITZ)
- Terry McIntyre (CAN)
- Kevin Boehmer (CAN)

3 Break-out Groups

Topics covered:

- Need to have common guiding principles ?
- Aspects to include in the principles
 - Assessment goal
 - Scoping
 - Indicators
 - Data gaps
- How to move ahead



Key Messages

(one year later!)

Q: Are these principles needed ?

Yes! “We should move ahead.”



1. *High level principles that guide assessments – i.e. how we consider sustainability in our decision-making related to the bio-economy*
2. *More detailed guidance for implementation*

Why ?

Michele Galatola (EC) – “loss in stakeholder confidence”; Need international agreement to provide consistency, reduce data collection and assessment costs, avoid trade conflicts and improve assessment quality - increase our knowledge

- *Move quickly*
- *Carried out at the global – international level*
- *Build on lessons learned for 1st gen biofuels*

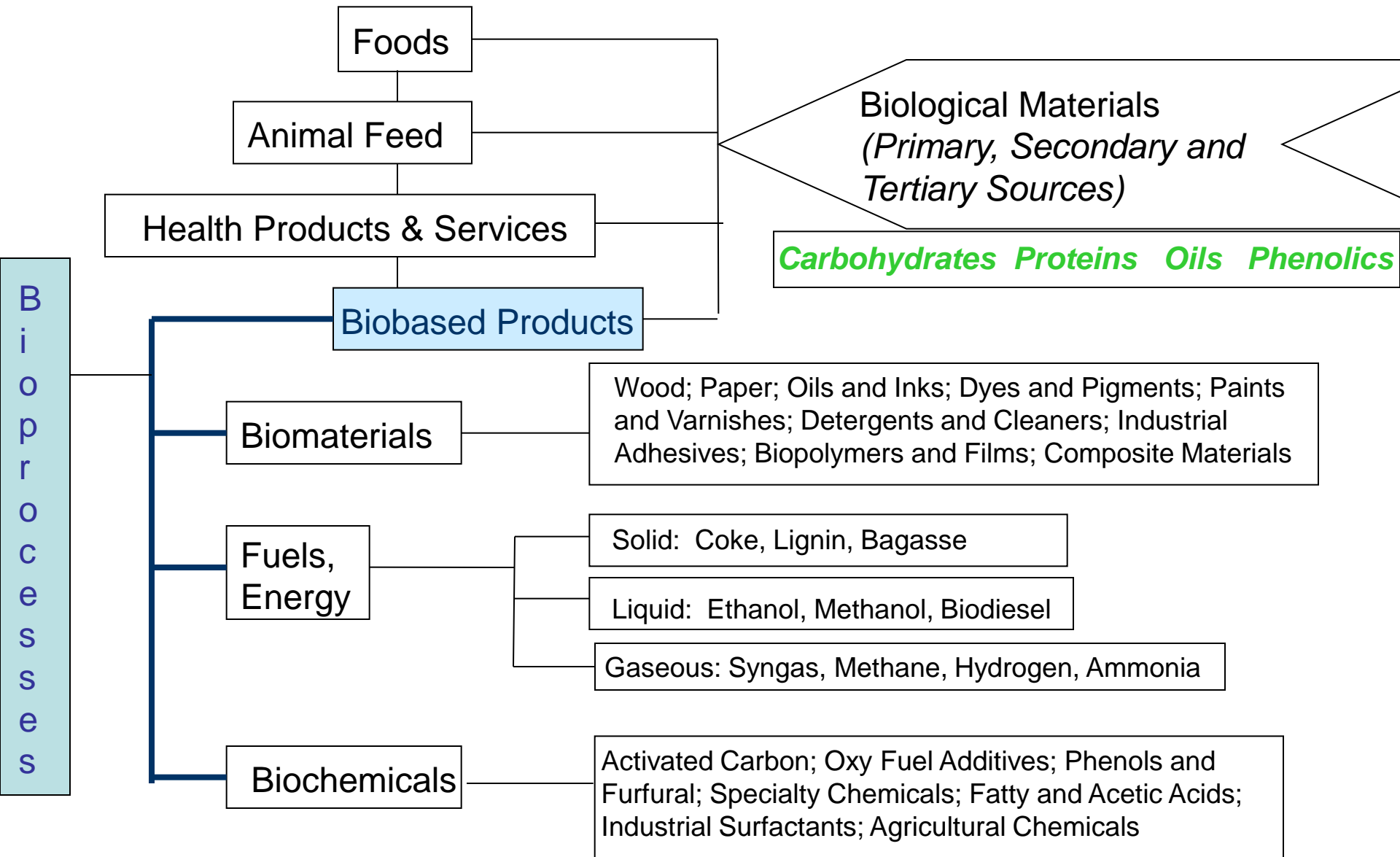
How ?

Message 2. Acknowledge the starting point and complexity.



- Earth has a limited carrying capacity, and is severely stressed in some places.
- Biosphere: Sharing of land and water ways
 - Ecosystem services (natural cycles)
 - Habitat
 - Food, building materials, energy
- Globalized production chains
- “Mosaic” – regional heterogeneity
- Science, systems analysis and other tools have provided a *partial understanding* of biochemical cycles, social systems and our impacts
- *Rob Anex “we will not have all the info needed by policymakers”*

Biological Resources Providing Ecosystem Services +



* Figure adapted from Kamm

Message 3. These are areas of *rapid expansion*.



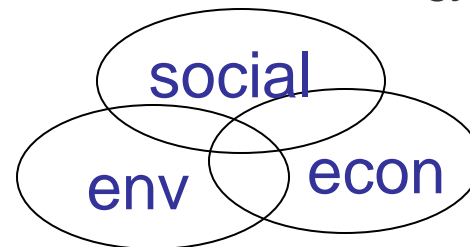
- Understanding is growing very rapidly in both:
 - **bio area** (science, technologies, scale up experience, etc.)
 - **sustainability science** (multidisciplinary systems work)
- Many processes underway related to **biofuels** assessment
 - Principles, criteria, assessment tools, datasets, etc. (e.g. CEN, Roundtables, GBEP, ISO, etc.)
 - Have greater understanding of the role of biomass production (i.e. agricultural inputs, land use change)
 - Confusion – which process, what does all this mean, etc.
- How do we keep on top ?
 - *Engage people from these processes ?*
 - *Look for synthesizers ?* e.g. Global Biorenewables Research (GBR) - Luuk van der Wielen (NL)

Message 4. Sustainable Development (*Sustainability*) is about more than CO₂.



- Focus of biofuels assessments has mainly been on energy balance, and lifecycle greenhouse gas (GHG) emissions
- Joel Velasco (UNICA): “cost, what land are you using, how much land, does this affect food production, has people’s income changed, what social investments have been made ?”
- *Current Initiatives recognize the 3 dimensions. Examples:*
 - *CSD: Sustainable Production and Consumption*
 - *Environmental Product Declaration (EPD)*
 - *New ISO Standard for Sustainability Criteria for Bioenergy*

*Interrelationship between
3 dimensions:*



Message 5. Should agree on the requirements for a good assessment.



- Unanimous: Adopt **life cycle thinking** approach to avoid burden shifting to other stages, addressing single issues, etc.
- Barbara Lippiat (US) proposed:
 1. Use consensus standards, LCA and LCC.
 2. Indicators should be science-based, peer reviewable and performance-based.
 3. Metrics should be transparent and comparison-enabling.
 4. Data should be consistent and reproducible.
- *People want “clarity” and assurances that they are doing the right thing.*
- *Although the subject is complex, assessments should have “sufficient rigour” and “oversight”.*

Message 6. LCA = Recognized Tool for Estimating Potential Environmental Loading

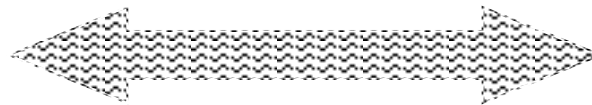


- Widespread use of LCA software as a design tool, for product comparison, and development of policies and incentives
- Biofuels area – LCAs are mostly used for CO₂/GHGs; not yet extensively used for other indicators (e.g. eutrophication, acidification, biodiversity, etc.)
- LCAs of 1st gen biofuels have shown that the feedstock production stage can have a major impact on the overall GHGs.
- Bioproduct LCAs show that not all bioproducts have the same impact (e.g. CO₂ reduction per land area).
- No bioproducts are superior in all environmental aspects.
- Uncertainty of the LCA result is not typically reported.
- Results depend on the datasets, the allocation rule and other decisions, system complexity, etc.
- Need MORE experienced interpreters!
- *ADEME (France) – Dec 2009 report on methodological choices for bioproduct LCAs – available in english and french*

Message 7. Effective communication of goals and results is essential.



- Good communication is essential for better understanding that can generate the knowledge needed to effect the right changes.
- It is important to be able to communicate the assessment goals and results to wide range of audiences with different needs.
- It is challenging to reduce a complex story to one paragraph or to a 30 second sound bite!
- More effort is required both by senders and receivers.



- *Engage science communicators.*
- *Mini-education of policy makers, users of information, etc.*
- *Avoid “it’s the panacea” statements, correct misinterpretations, etc.*

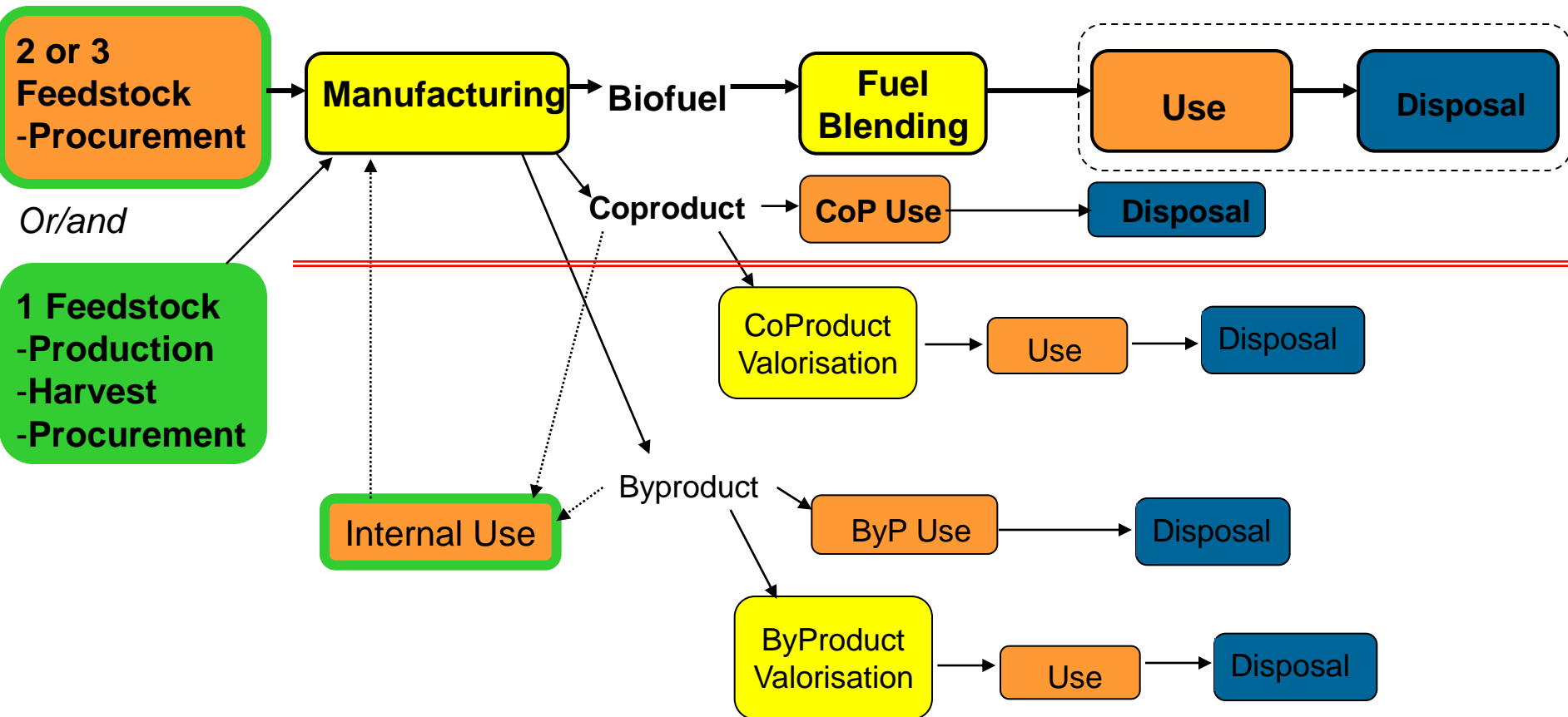
Message 8. Need to commit to improved understanding and resolving the gaps.



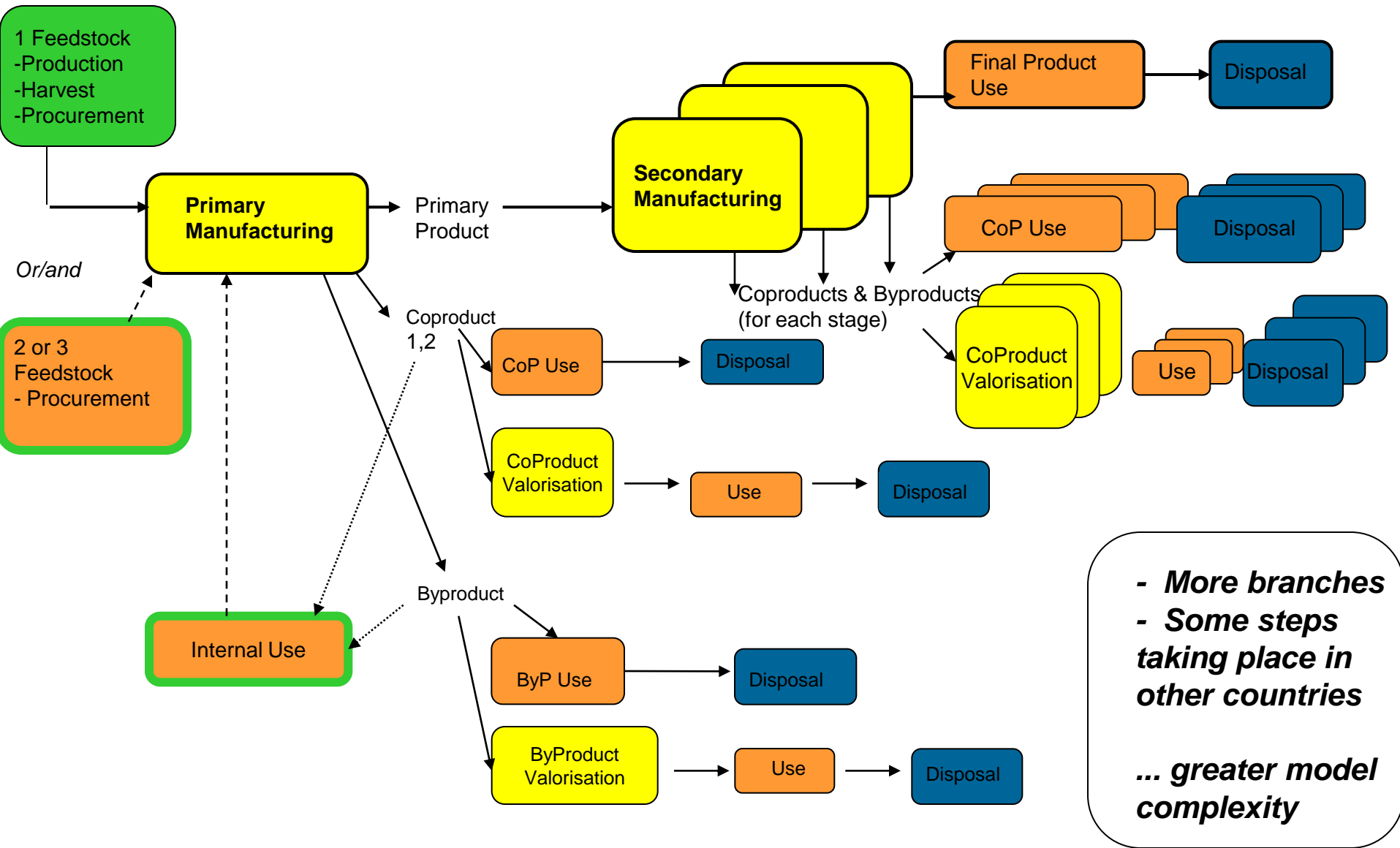
- Financial commitment to develop the good datasets that improve our understanding.
- Data in public or private domain ?
- Data on feedstock issues: aquatic and terrestrial; N and P; indirect land use change, etc.
- More complex bioproducts usually have multiple stages of manufacturing
- (non-fuel) Bioproducts require information on product use and end of life
- Databases need to be current and geographically specific
- Initiatives underway: UN Lifecycle initiative, EPD, etc.

- *Where data are lacking, use “semi-quantitative and qualitative” instead of avoiding the indicator all together (to keep on radar screen)*

Example: 1st generation Biofuel Biorefinery



More complex biorefinery systems



Recommendations

Let's get moving *together*



- Define where we want to go to re: sustainable development using more renewable resources and closed loop cycles.
- There should be an international effort to develop, agree on and implement guiding principles.
- The timing is good. There is greater willingness, openness, and understanding than ever before.
- We should connect with active groups in this area – biofuels, sustainable resource management, SD community.
- We should include economists, social scientists and SD practitioners.
- Communicate, check understanding, and recommunicate.
- *Rob Anex's reminder: "The perfect is the enemy of the good."*
- *Let's get ready for Rio+20 and showcase how efficient, more bio-based economies can contribute to green growth !*

... and let's aim high !



- We need greater clarity. *What does this information mean ?*
- Advocate “fuller” cost accounting – valuing environmental and social attributes – as part of all of our accounting systems.
- Work towards an understanding of the interconnections between the 3 dimensions of sustainability for more informed, transparent decision-making.
- On the environment side, remember that it's about more than carbon. It's about how human activities change the *rates of* natural cycles, move substances to different places and create compounds into different forms.
- Aim to be restorative and to repair the earth in places it is damaged. *Go beyond minimizing negative impact.*
- Make the time to specify your goals, and to revisit them on a regular basis.
- Strive to understand our collective impact. Impact of all countries using more renewables and closing their material loops, etc.

Thank you for your attention !



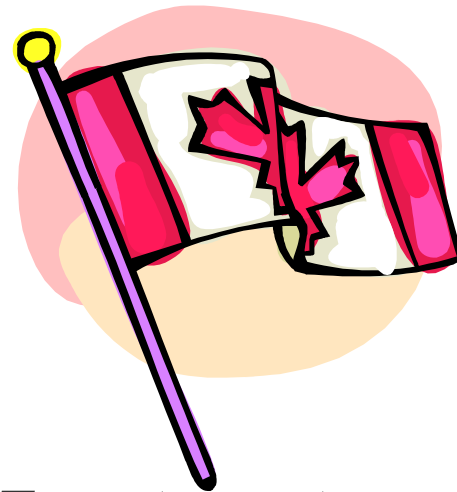
- We are pleased to hear your comments or questions.
- To become involved, contact: **Alexandre Bartsev (OECD) alexandre.bartsev@oecd.org**

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- *'Looking forward to seeing you in Toronto next year ... and in Rio for the Earth Summit in 2012 !*