

From
the Earth.
To
the Earth.



Ministry of Agriculture, Nature and
Food Quality

Biobased Performance Materials

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Agenda

- Bio-based Economy: vision by the Dutch Government
- Main programme
- Biobased Performance Materials



Biobased Economy

Biomass as alternative for fossil resources

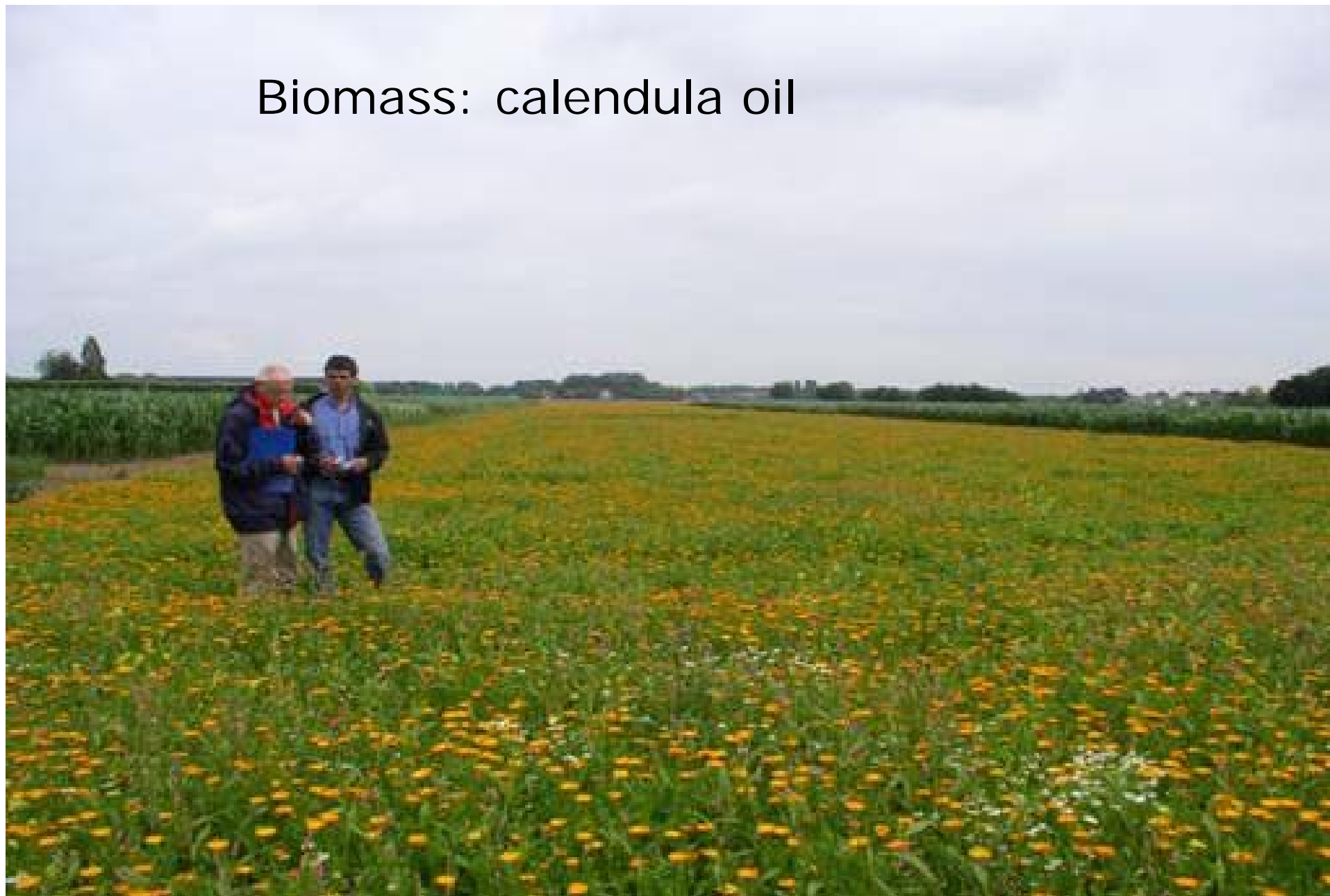
Fossil resources currently used for:

- Transport Fuels
 - Heating and electricity
 - Chemicals
 - Materials
-
- Why biomass: greenhouse gas reduction, decreased dependence on oil and gas producing countries
 - but also: profit!!!

Biomass: grass (Miscanthus)



Biomass: calendula oil



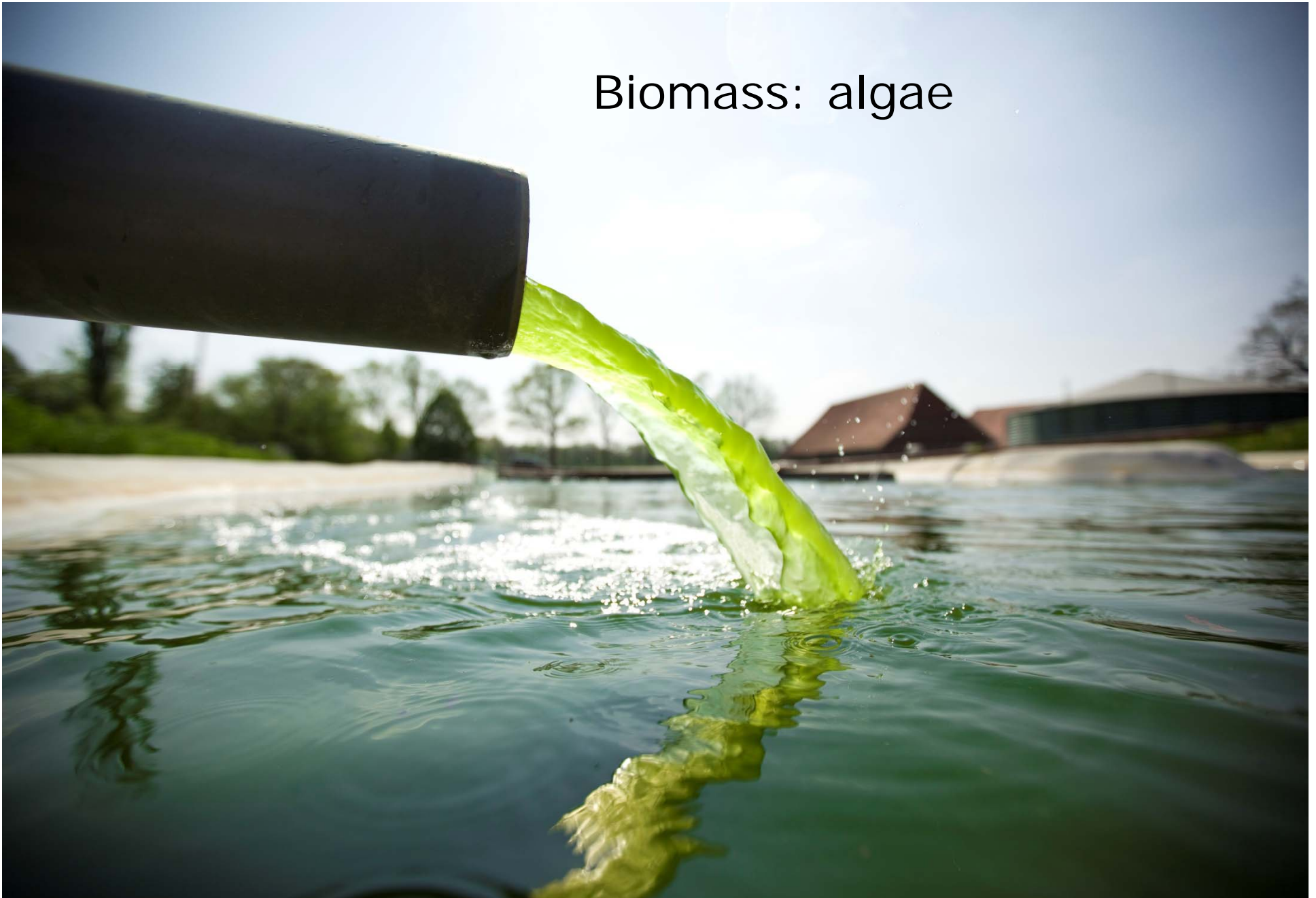
Biomass: hemp



Biomass: Jartropha



Biomass: algae





Biomass: others

- Wheat
- Palm oil
- Soy
- Rapeseed
- Sugar beet
- Sugar cane
- Etc.

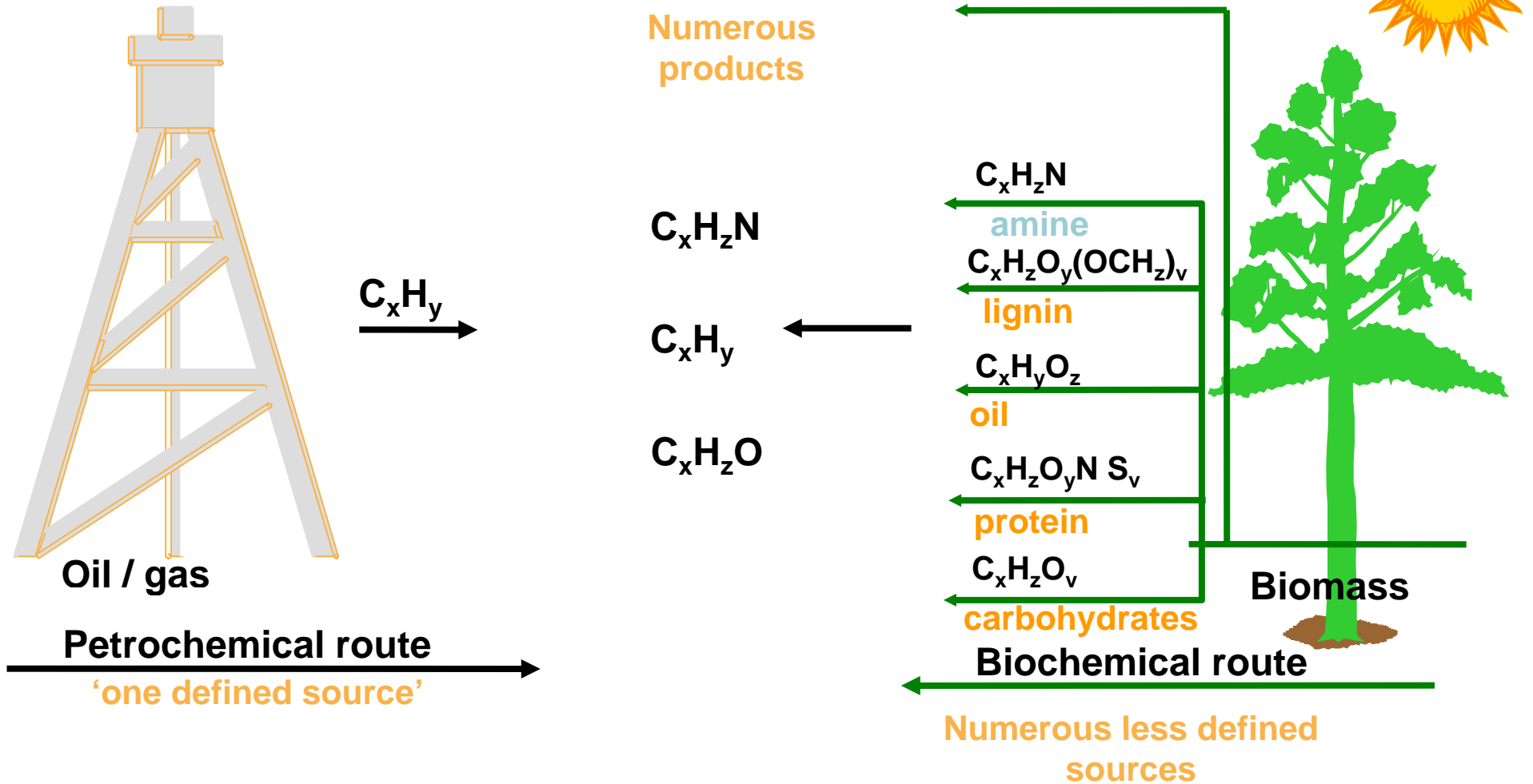
But also:

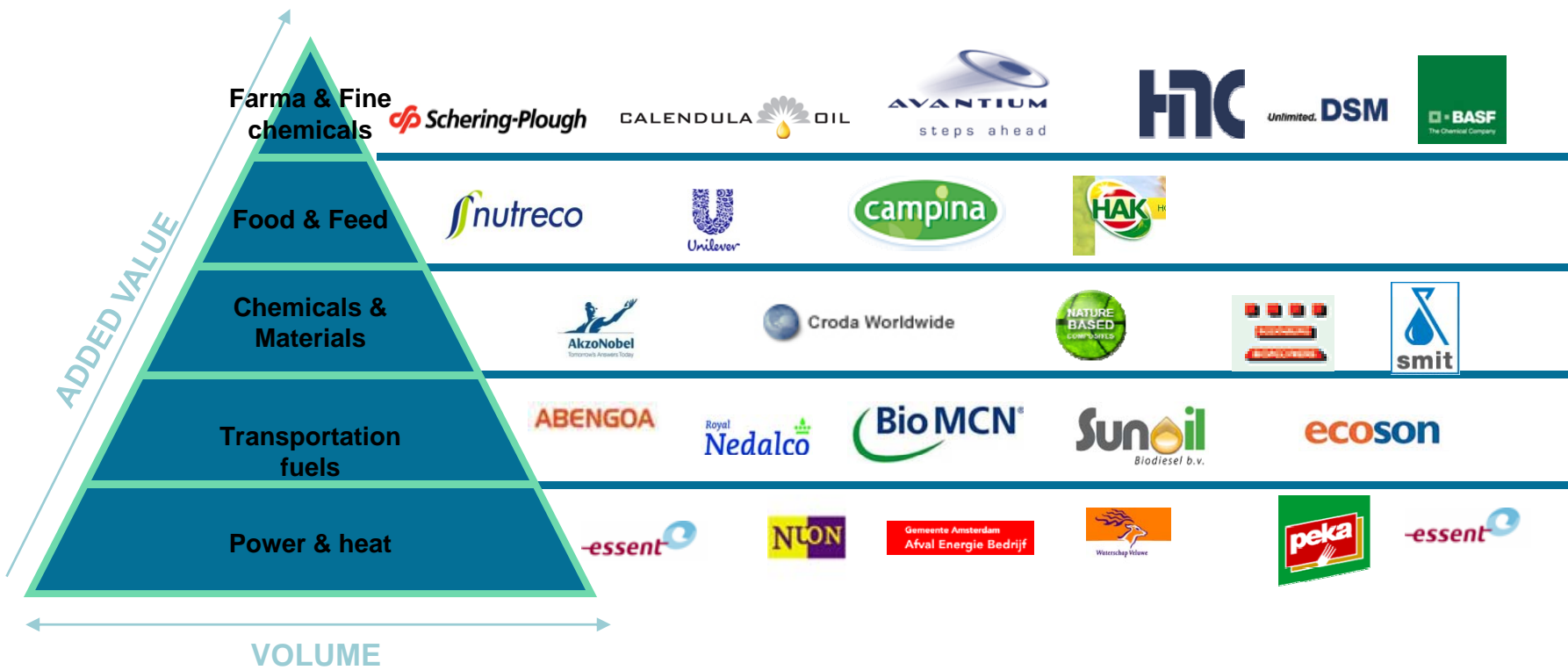
Side streams from food industry, manure from farms...



source: Wageningen University, Prof. Dr. Johan Sanders, 2006

Biorefinery concept







Energy in NL: about 3000 PJ in 2000

10 % used as resource for non-energy purposes in chemicals/materials

10 % used for process to produce those chemicals/materials

80 % for other purposes

So: 20 % for chemicals/materials!

(Rabou et al, 2006)

biobased plasticizers
(to soften plastics)



Biobased plastics



New products: water treatment



Bio-ethanol production (from straw)



Construction materials



Additives (colour)





Main programme (running)

- Biorefinery tender: 10 mln. Focus on pilot en demonstration, 13 projects, biomass for new products
- SBIR: 8 mln. Euro focus on SME's, 50+ projects mainly on product development: bio- polymers, -composites, -paints, -gas etc.
- Sustainable biomass: 10 mln. Euro, 7 projects for the first tender, second tender to be decided
- Biobased Performance Materials: 8 mln. Euro (next slide)



Biobased Performance Materials

- Programme with a subsidy of 8 mln. euro by Dutch Government
- Cooperation with industry, SME and research (about 30 members)

Aim will be to direct the research as such that this will lead to:

- 3-5 polymers with a high potential market volume (> 100,000 tonnes/year) and
- 1-2 higher priced advanced functional polymers.

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Why investing in this research programme?

- At this moment the overwhelming part of all organic (carbon based) chemicals produced by the chemical industry is used in or converted into all kinds of polymeric materials.
- Reduction of fossil resources and greenhouse gas emissions
- But as well opportunities for agricultural-, chemical- and related industries!



Future of bio-polymers & new government

To be decided, but...

The priorities (and opportunities?) given by the new government
Rutte-Verhage:

- 'Top' areas selected: food, life sciences, chemical, logistics, energy:
opportunities for biobased developments and a such biopolymers



Approach: drawing agenda's for the future

- 1) Biobased applications & technology: biofuels, biopolymers, paints, lubricants, construction materials etc.
- 2) Biomass, what biomass needed?
- 3) Policy & research agenda
- 4) International strategy



For discussion (3 issues)

1) Future policies:

- Fiscal?
- Subsidies?
- Legislation?

2) Focus of the policies (area's):

- Biorefinery (separation of biomass) like the KP7 call or more 'product' development like BPM or SBIR?

3) Sustainability: LCA



Future policies

- Both advantages and disadvantages of fiscal, financial (subsidies) or legislation:
 - Level playing field between non-energy & energy?
 - Investments in NL/EU required...
 - Available funds (both private and public) limited?



Focus of policies

Biomass production – separation – product development – market development?



Sustainability of biopolymers

- There are several relevant LCA-criteria;
 - Technological innovation and market scale will change analyses eg:
 - CO2 reductions will be higher,
 - Land per ton biopolymers will be reduced
 - Etc.
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- Conclusion: sustainability important, but subject to change and never fully 'objective'
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- Question is: how to deal with this in the triangle government, industry - research?