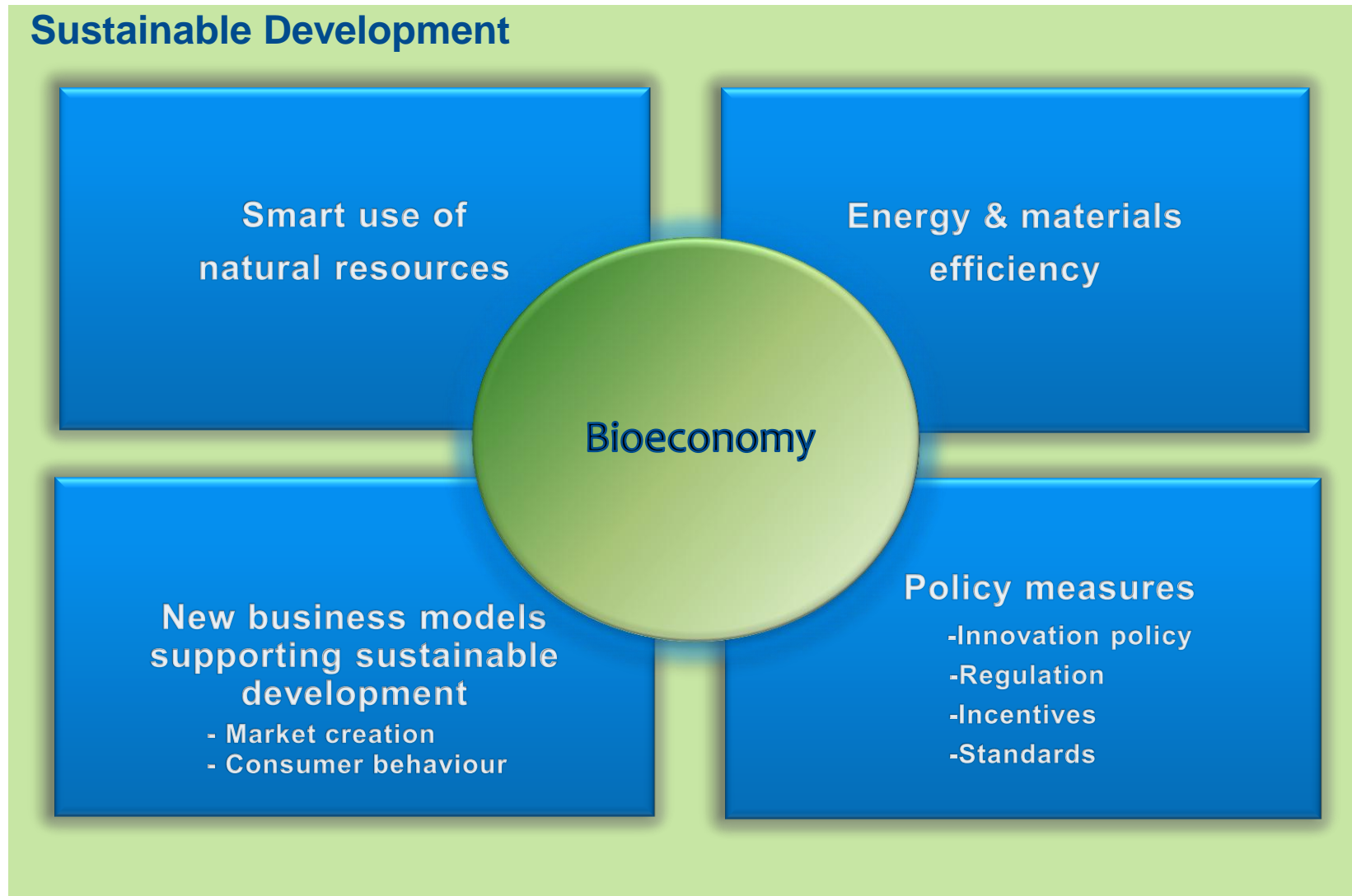


Bioeconomy – what's the game and how to create the team?

Dr Mika Aalto, Director
Forest and Chemical Industries
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Bioeconomy – what is the game?



Many components of the bioeconomy are old, but there is even more that is new

- How will we satisfy future needs of the society under the current population growth and increasing demand from the growing economies? There has to be a **paradigm change** in the ways we operate and consume.
- **Comprehensive view** on the sustainability of all material needs, use and recycling in our societies globally
- The global material streams will change, and this will renew the respective **value networks**
- There will be **new business opportunities**, for example
 - Resource efficient solutions for refining natural resources, and in the whole production chain
 - New materials and chemicals from biomass
 - "Old" materials and chemicals from biomass
- **Consumer behavior** is paving the way to the green economy
- Bioeconomy will not be realized by developing the individual parts alone, a **systemic view and approach** is an absolute precondition for success

Many major companies are showing the way

▪ UPM - the Biofore Company

- **Biofore:** Bio stands for future orientation, sustainable solutions and good environmental performance. Fore stands for forest and the company's position at the forefront of development.
- The company has just announced the investment in BioVerno biorefinery, which will produce 100 000 t/a wood-based advanced traffic biofuels, production will start in 2014

▪ Stora - Enso

- **Rethink:** Stora Enso's new identity symbolises the company's commitment to creating a sustainable future for our planet by developing innovative solutions based on renewable materials
- The company announced in May 2011 the investment in Microfibrillated cellulose (MFC) pre-commercial plant

▪ Neste Oil

- **Refining the future:** Neste Oil is an oil industry pioneer in refining and marketing cleaner traffic fuels.
- The company has NExBTL renewable diesel refineries in Porvoo (2007), Singapore (2010) and Rotterdam (2011)

Bioeconomy makes a considerable part of the Finnish national economy

	Output Mill. €	Value added Mill. €	Persons employed
Agriculture, hunting	4 409	1 327	98 500
Forestry	4 524	3 222	21 500
Fishery	160	92	1 900
Food industry	10 594	2 478	37 900
Timber, wood products	6 077	1 273	28 800
Pulp & paper	14 260	3 118	26 900
Other industries	7 599	2 857	46 100
Energy production	2 659	1 270	5 500
Water supply & treatment	469	293	2 400
Bioeconomy in total	50 751	15 930	269 500
National economy in total	375 478	161 504	2 525 300
Share of bioeconomy	13,5	9,9	10,7

Finnish bioeconomy in 2008 estimated by Statistics Finland (translated from Biotalous Suomessa – arvio kansallisen strategian tarpeesta, 2010)



And about half of the bioeconomy consists of forest industry value chains

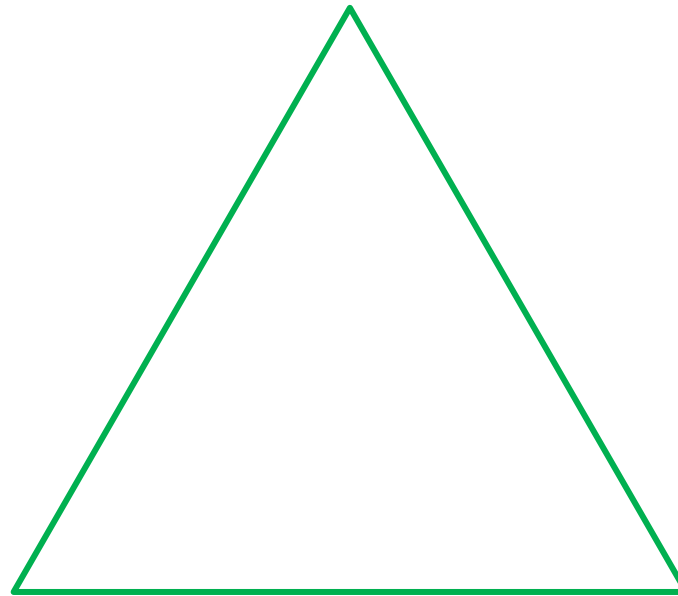
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The winners will play the game on many fields

R&D&I

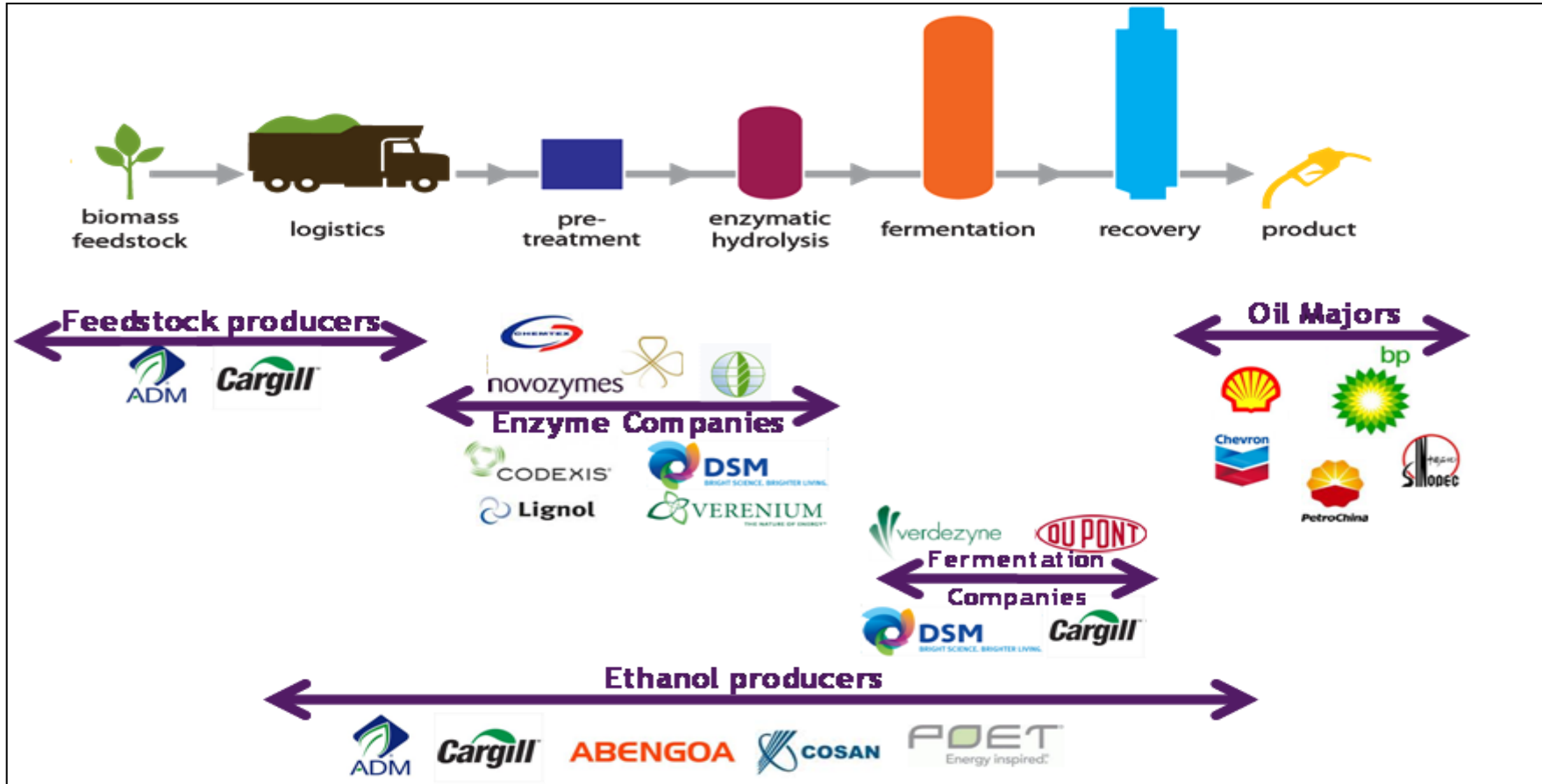


**Market
development**

**Policy
tools**

From fragmentation to integration: Industry

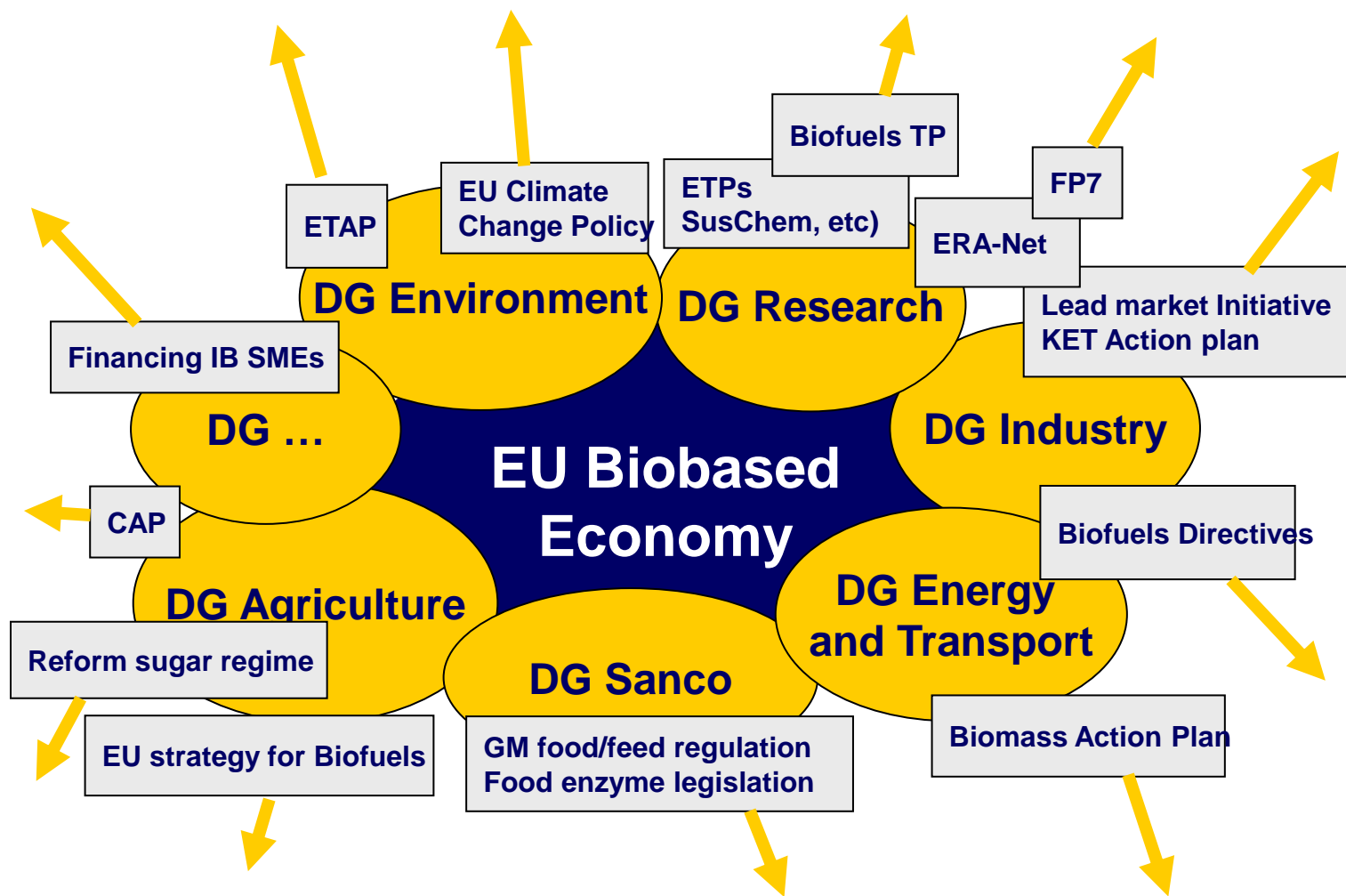
Bio-based value chain: multidisciplinary, multi-company



License to operate...



From fragmentation to integration: Policy making (EU nited in Diversity)



System approach is required between all relevant EU parties to arrive at coherent and transformative policy!

How to build the team? (some preliminary ideas)

- **EU Commission**
 - **True teampplay** between different bodies of the commission
 - **Broad innovation concept**, for example co-creation, consumer orientation, pilots & demonstrations
- **Ministries**
 - **Organize the game on national level**, coordinated and coherent actions
 - **Policy tools**: regulation, standardization, taxes, incentives, subsidies
- **Funding organizations**
 - **Look at the big picture**: RDI alone will not solve the problem. We need new ways of cross-industrial and multidisciplinary co-operation; a systemic view and systemic solutions are also needed.
- **Companies**
 - **Show the way**, there will be new business opportunities, and the early birds will catch the worms
 - **Act sustainably** and tell the customers and public how good you are in it
- **Researchers**
 - Look where your special knowledge will most benefit the overall picture; **need-based and solution-oriented mindset**
- **Consumers**
 - Change your **consumption pattern**: save, recycle, favour sustainable products