

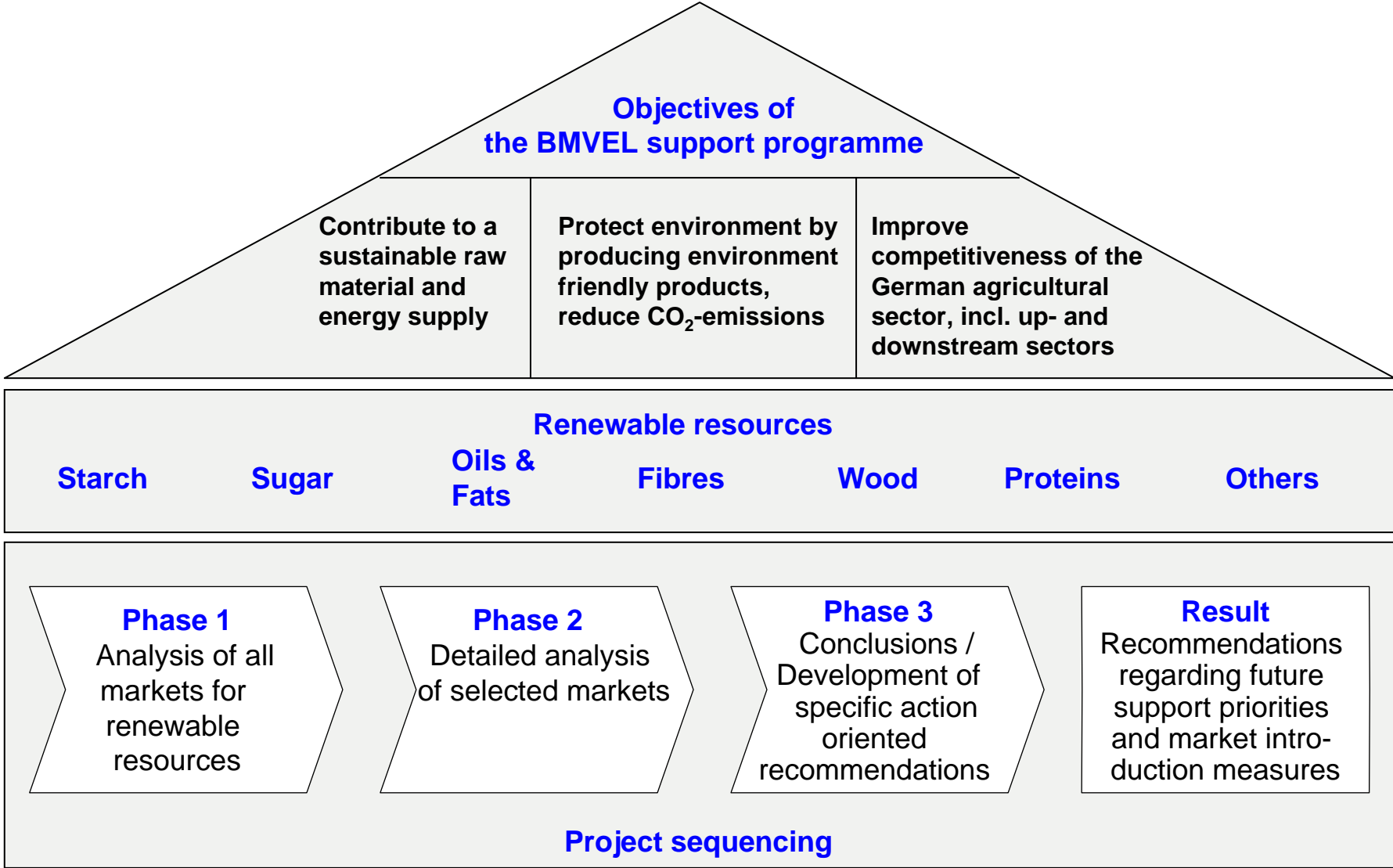
Market Analysis Renewable Resources

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The market study commissioned by FNR will provide strategic recommendations based on the identification of the most attractive markets



The study covers several markets and products. Starting point of the analysis are the customer requirements (I)



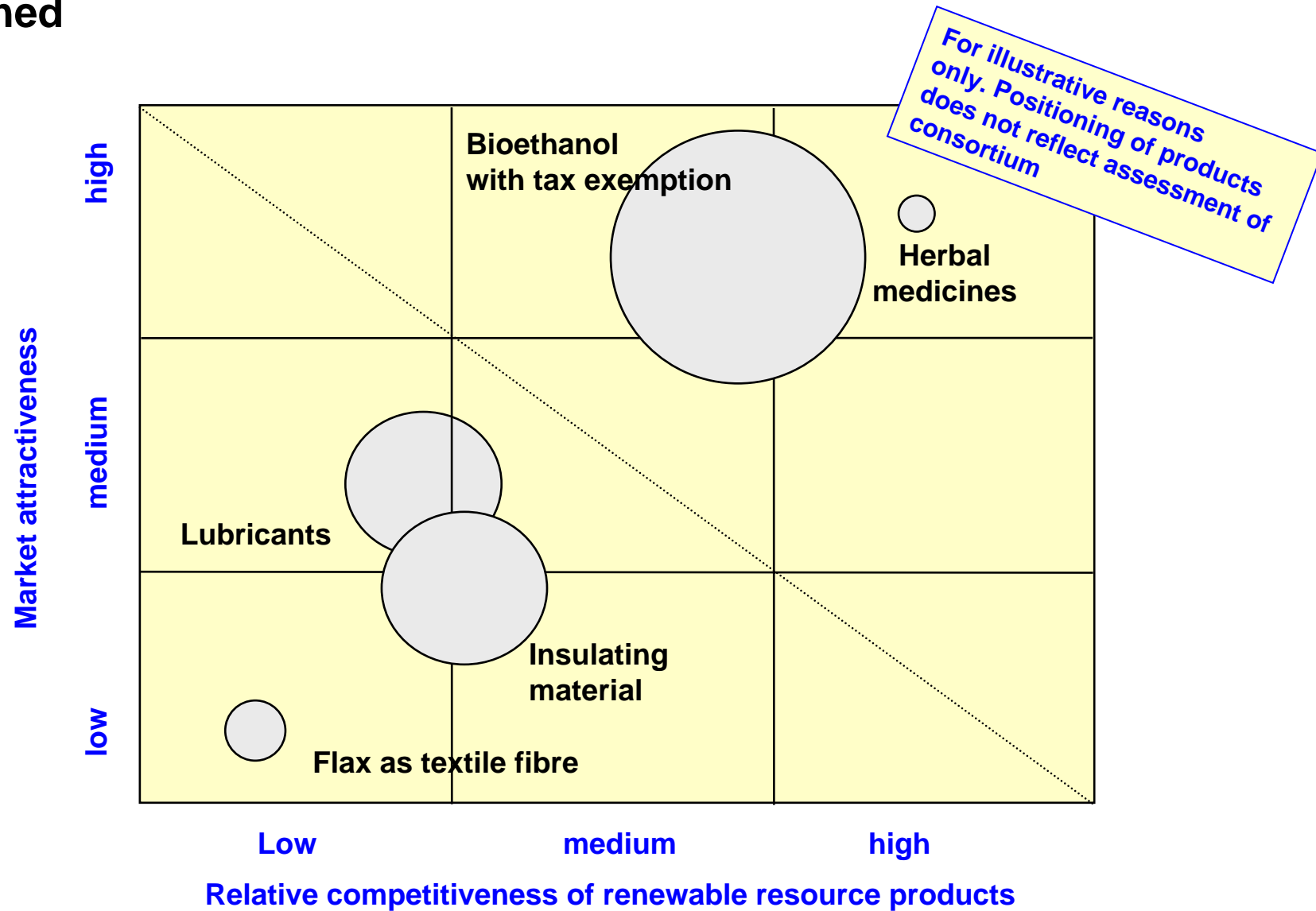
Market	Product examples
Energy	<ul style="list-style-type: none"> – Electricity produced out of solid and liquid fuel (lignocelluloses), biogas – Thermal energy produced out of solid and liquid fuel, biogas – Bioethanol, ETBE, biodiesel, vegetable oil, gaseous transportation fuels
Lubricants	<ul style="list-style-type: none"> – Hydraulic fluids – Gear oils, saw chain oils, shunting switch oils – Concrete release agents made out of rapeseed, sunflower or linseed oil, etc.
Construction material	<ul style="list-style-type: none"> – Wood for construction – Insulating material made out of flax, cannabis, reed and straw – Adhesive agents produced out of starch and sugar – Plaster and floor covering, panelling
Paints and coatings	<ul style="list-style-type: none"> – Oils and fats made out of rapeseed, sunflowers or linseed – Colours from plants
Pharmaceuticals and cosmetics	<ul style="list-style-type: none"> – Ethanol, oils – Sugar – Proteins out of rapeseed – Herbal medicines

The study covers several markets and products. Starting point of the analysis are the customer requirements (II)

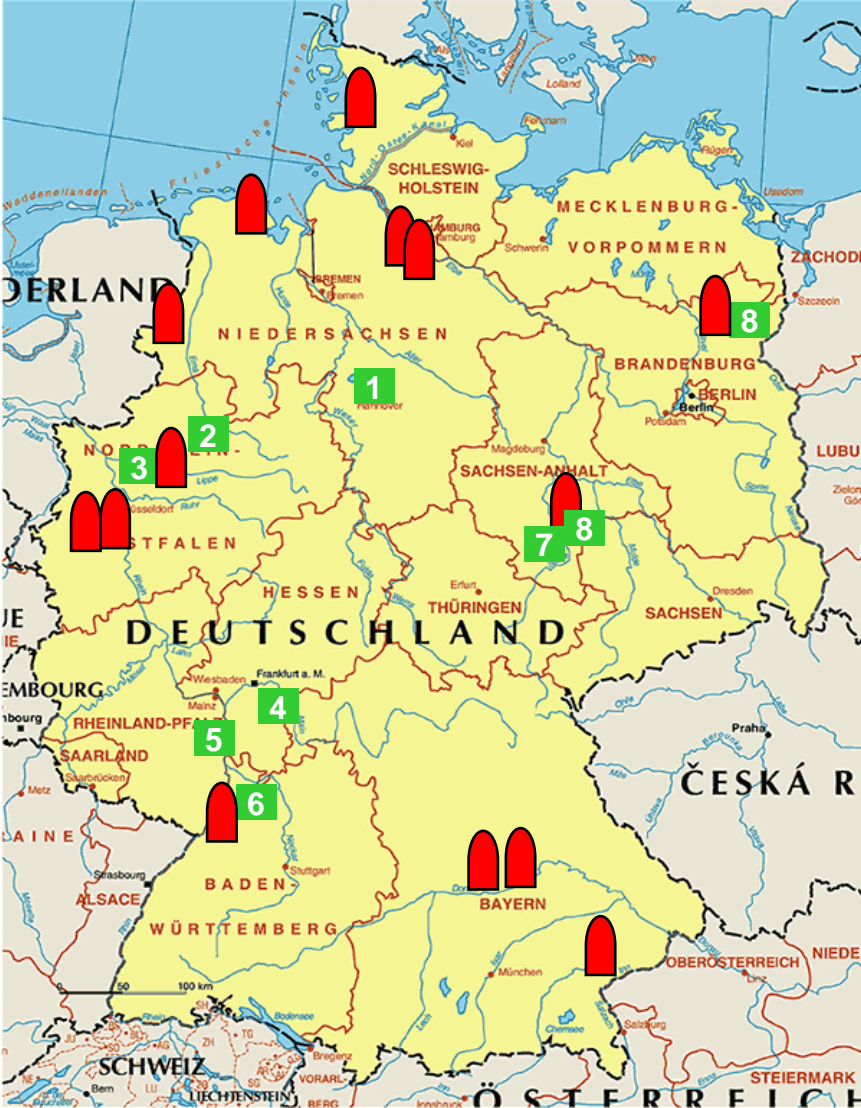


Market	Product examples
Chemical industry	<ul style="list-style-type: none"> – Polymers – Polyoles – Organic acids
Detergents and cleaning products	<ul style="list-style-type: none"> – Tensides
Packaging material and moulded pulps	<ul style="list-style-type: none"> – Packaging material for different applications (food, consumer products, transport) – Moulded pulps for different applications (structure, chassis, leisure) – Fibre interconnections
Textiles	<ul style="list-style-type: none"> – Vegetable fibres out of flax and cannabis for industrial applications – Vegetable fibres for clothing, carpets and other applications
Others	<ul style="list-style-type: none"> – Furniture – Wood for chip trays – Cellulose for different applications

At the end of phase 1 of the project, market attractiveness and competitiveness of the different renewable resource products will be defined



New investments in bioethanol plants change the structure of the entire German ethanol industry



Ethanol producers and capacity estimates

drink the best
drive the rest!

1		60,000 m ³
2		40,000 m ³
3		177,000 m ³
4		66,000 m ³
5		7,200 m ³
6		25,000 m ³
7		260,000 m ³
8	Sauter	280,000 m ³

Refinery

Markets and products analysed are very different as can be seen when comparing extremes like bioethanol and herbal medicines



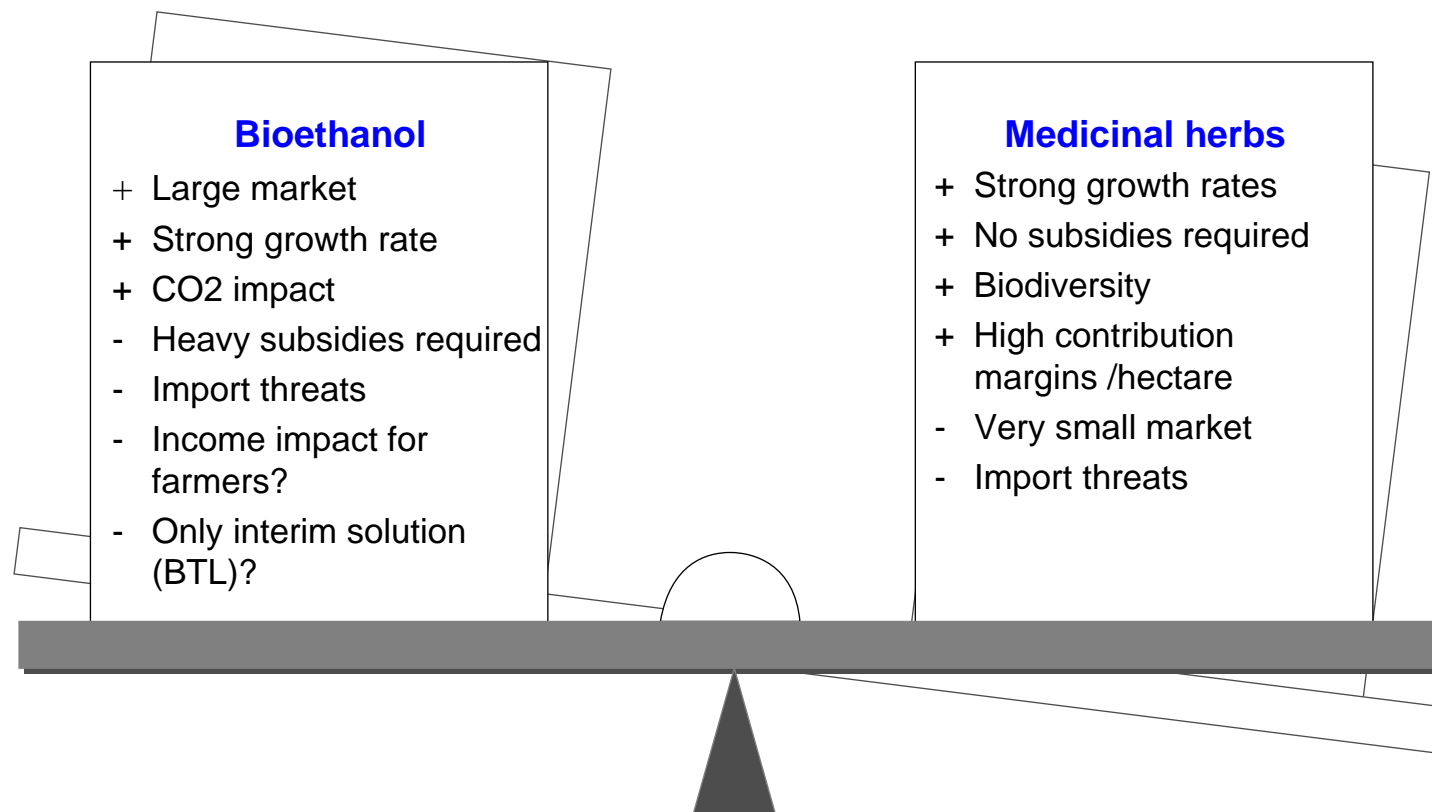
Bioethanol

- „Artificial“ market which was created by law in 2003
- Market started in 2004, very strong growth rates
- The market is very large. „Theoretical“ market potential:
 - 5 vol.% bioethanol in the German gasoline market: 1.7 mill. m³, equals a market value of approx. 765 mill. €
 - 0.37 mill. m³ bioethanol demand in the ETBE market, equals a market value of approx. 166 mill. €
 - Thus, the overall market potential is 931 mill. €
- These figures do not take into account:
 - E-10
 - „Diesohol“
 - FFVs
 - any exports

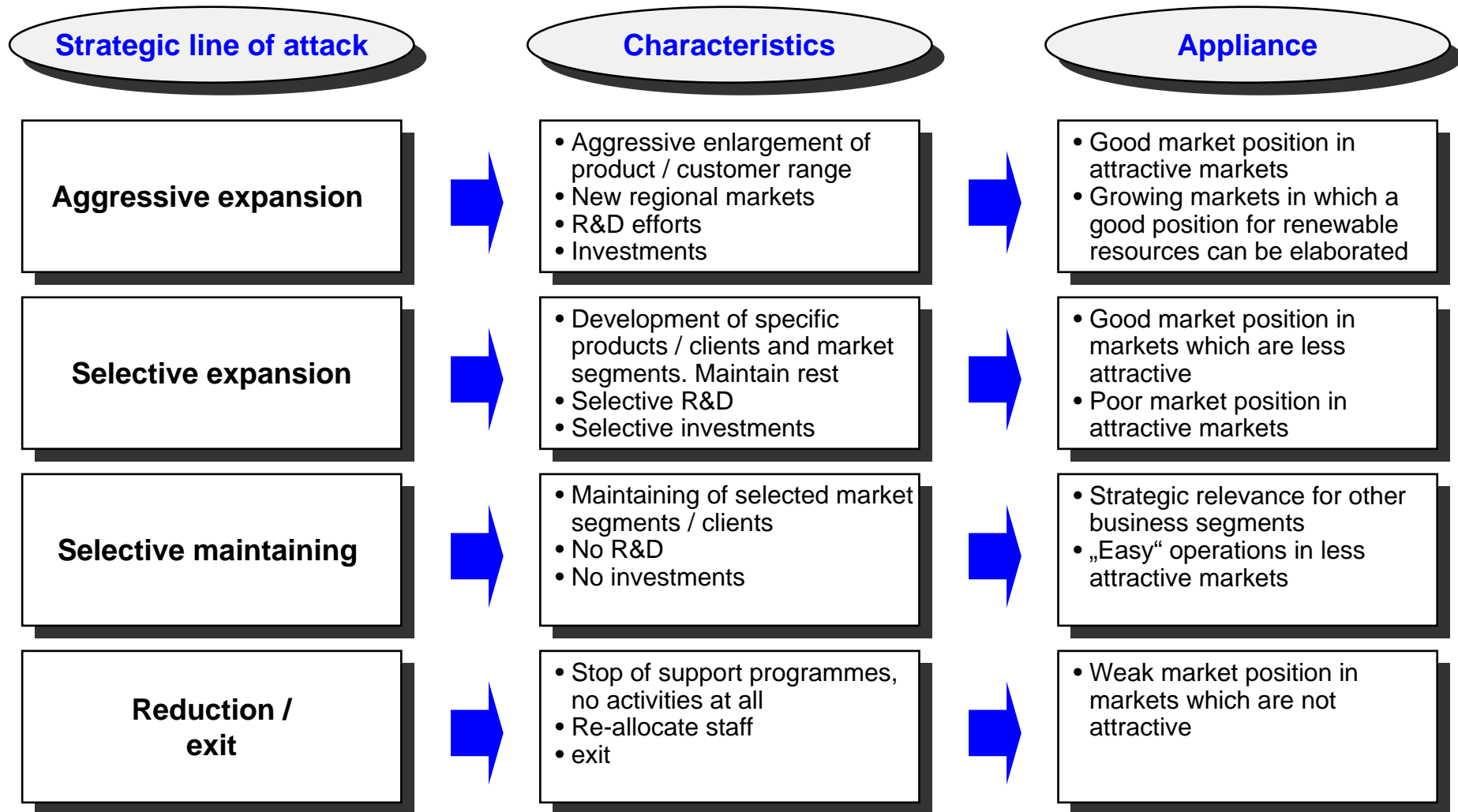
Herbal medicines

- Consumer driven market
- Continuous market growth since several years
- German phytopharmaceutical industry is in a leading international position
- Overall market size for herbal medicines is estimated to be 130 mill. €
- Imports dominate, accounting for 90 -95 % of the overall market
- Thus, the overall turnover achieved by German farmers with herbal medicines is only 10 mill. €

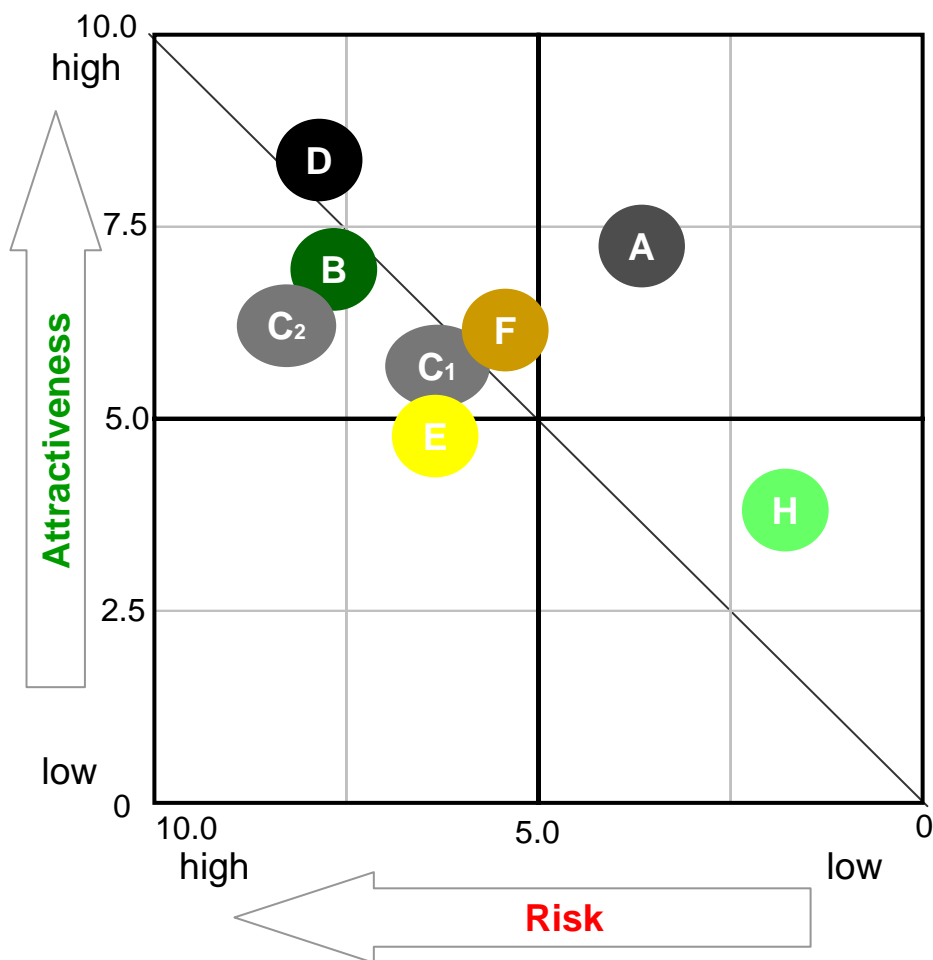
Which markets and products are attractive, which are less attractive?



For each renewable resource market, one of four strategic lines of attack can be considered



meó proposes to assess the strategic options along the dimensions attractiveness and risks



Attractiveness

- Fit with overall BMVEL strategy x %
- Market size x %
- Market growth x %
- Income opportunities for farmers x %
- CO2 impact x %
- Sustainability x %
- ...

Risk

- Dependency on political decisions x %
- Adaptability to changing market conditions x %
- Time needed for realization x %
- Financing requirements x %
- ...