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SWOT analysis of drivers and farms

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Wirelessinfo (WR-INFO)

Authors: Karel Charvat (WR-INFO), Pavel Gnip (WR-INFO), Matej Krocan (WR-INFO), Frank Dreger (ZALF), Walter Mayer (PROGIS), Spyros Fountas (CRTH)

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Abstract

D.1.2.2 analyzes stakeholders' opinion about external drivers, which was realized on the base of interviews provided by project partners on four experimental farms (mainly in language of stakeholders for better understanding of the problem).

There will be two main parts:

- Stakeholders opinion about influences of external drivers on their production
- Conclusion from stakeholders opinion

The stakeholder's opinion was based on interviews on four experimental farms and was based on the principles of SWOT analysis.

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1 Introduction

The objective of this study was to analyse stakeholders' opinion about external drivers using a SWOT analysis. The following list contains external drivers, identified in D1.1.1, in a previous stage:

- **Climate change** – and their influence on crop composition and management methods
- **Growing population** – will stimulate growing request on food and on energy
- **Energy cost** – will generate new requirements for new methods of energy production
- **Urbanization and land abandonment** – will lead to changes in society and land use
- **Quality of food** - requirements of citizens and market on higher quality of food production
- **Aging population and health problems** – will generate specific requirements on food production and diets
- **Ethnical and cultural changes** – will generate specific requirements on food composition (growing Muslim population in Europe, growing number of vegetarians)
- **Knowledge based bio economy** – will introduce new products and crops, including GMO
- **Regulations and standards** – agreed government norms for the production and use of energy and protection of the environment
- **Economic instruments** – market-based instruments (e.g., taxes, tradable permits) to internalize externalities and promote the cost-effectiveness of energy and environmental policies and measures
- **Subsidies** – phase-out of unproductive and distortive government subsidies (e.g. to energy, transport) and provision of transition supports where a need to ease environmental and social costs of change is necessary
- **Investments** – establishment of undistorted, cost-reflective prices in the energy market and conducive investment conditions to send the right signals to private investors
- **Partnerships and voluntary agreements** – joint public/private programmers to develop and deploy sustainable energy approaches with industry
- **Research and development** – government R&D and incentives to private R&D to promote innovation on energy for sustainable development
- **Information and communications** – campaigns to promote better understanding by the general public of the national and international energy and environment situation and future challenges

- **Assessments and scenarios** – sustainability assessments which identify synergies and trade-offs across the economic, environmental and social impacts of energy policy options
- **Valuation of ecological performances**, as long as costs are mainly externalized into the direction of the environment (including agriculture and forestry) and no legal framework exists, necessary changes will be slow.
- **National strategies** – good governance approaches based on whole-of-government decision-making, transparency, and understanding of the political economy of promoting change in energy systems
- **Politicians** including their political awareness of the existing situation and the necessary changes in the future, including impacts and changes due to environment or technology
- **Press** due to their influence on politicians and their role of being intermediate between public and politics
- **Education** including training and know-how transfer and the awareness of the necessary speed of future changes
- **Cooperation and integration models.** The complex chain in agriculture, biomass and environment as well as the complex structure of chain partners, their behaving addressing new targets including control.
- **International organizations** like World Bank, FAO, CGIAR, etc. with their power/non power to influence necessary changes.

The analysis of external drivers forms the base for roadmap for farm management system, which will be defined in next stage.

2 SWOT analysis of drivers and farms

The analysis was carried out interactively in cooperation with the project's pilot farms, below are the analysis documents from the three farms, Mespol Medlov in Czech Republic, Markinos farm in Greece and Bramstrup Gods in Denmark. This chapter summarises the main conclusions from the SWOT analysis. The complete SWOT analysis is shown in the annex in chapter 5. As was introduced in Deliverable 1.1.2 of FutureFarm project, we grouped drivers into next nine groups:

- Climate changes
- Demographic (Growing population, Urbanisation and land abandonment)
- Energy cost
- New demands on quality of food (Food quality and safety, Aging population and health problems Ethnical and cultural changes)
- Innovative drivers (Knowledge based bio economy, Research and development, Information and communication, Education, Investment)
- Policies (Subsidies, Standardisation and regulation, National strategies for rural development International Organisation,)
- Economy (Economical instruments, Partnerships, Cooperation and Integration and voluntary agreements)
- Sustainability and environmental issue (Valuation of ecological performances, Development of sustainable agriculture)
- Public opinion (Press, Politicians)

2.1 Climate changes

Driver	Climate change
Description of driver	The global climate change is external driver with long time influence on crop composition and management methods locally as well as world wide.
Conclusion from partners No clear opinion about this driver, since the changes are different in the different regions. It could open new possibilities of production in some countries; in other regions it could have negative influences on production.	
Classification 3. Not unified opinion of stakeholders about this driver	

2.2 Demographic

Driver	Growing population
Description of driver	External driver will stimulate a growing request on food with growing population and growing economy in the third countries. Comment will be focusing on growing needs of food in time and different continents.
Conclusion from partners The opinion of stakeholders is, that growing population could bring mainly new possibilities for farmers and that the market will grow	
Classification 2. Mainly Positive influence on farming sector	

Driver	Urbanization and land abandonment
Description of driver	In 2005 around 3, 2 billion people or 49 % of the population lived in urban areas. This trend will increase and the FAO forecast shows in 2030 4, 9 Billion people living in urban areas (60%).
Conclusion from partners There is not clear opinion on the impact of this driver. On one side it is expected, that this could bring new possibilities for an increasing in productivity and profit using new technologies, on the other side there will not be enough employers for production	
Classification 3. Not unified opinion of stakeholders about this driver	

2.3 Energy cost

Driver	Energy cost
Description of driver	During the last years the energy prices increased, especially for oil where the price increased with a factor 4-5 (USD 25 to 125/barrel), Oil (and gas) is (are) the driver(s).
Conclusion from partners Stakeholders are afraid of the influence on production of growing cost of energy. It seems, that they do not expect to gain from bio energy production, this aspect is not taken	

into much consideration.

Classification

1. Mainly negative

2.4 *New demands on quality of food*

Driver	Quality of food
Description of driver	This driver will increase the food safety by widely using organic farming and integrated crop management approaches.
Conclusion from partners Requirements for better quality of food could increase profit of farmers, but it is not clear if consumers will be able and willing to pay at higher cost	
Classification 3. No unified opinion of stakeholders about this driver	

Driver	Agging population and health problems
Description of driver	The ageing of human populations has emerged as one of the most significant demographic processes of the present time.
Conclusion from partners The drivers are considered more from the point of view of problems, which these drivers could bring in production than potential higher demand for new and better production	
Classification 3. Not unified opinion of stakeholders about this driver	

Driver	Ethnical and cultural changes
Description of driver	The recent World Food Market's (WFM) showcased the latest authentic ethnic, specialty, halal, and kosher products. Population's interest in ethnic cuisine. Also requirements on vegetarian food are growing.
Conclusion from partners There are not clear opinions and no doubts or expectations from this driver	
Classification 4. Driver is not clear	

2.5 Innovative drivers (Education, Investment)

Driver	Knowledge based bio economy
Description of driver	Introduction of new products and crops, including GMO
Conclusion from partners The driver seems not to be well understood by partners	
Classification 4. Driver is not clear	

Driver	Research and development
Description of driver	government R&D and incentives to private R&D to promote innovation on energy for sustainable development
Conclusion from partners New methods and using knowledge will increase profit of agriculture	
Classification 2. Mainly positive opinion	

Driver	Information and communications
Description of driver	campaigns to promote better understanding by the general public of the national and international energy and environment situation and future challenges
Conclusion from partners IT will be tools, which could improve management and increase profit	
Classification 2. Mainly positive opinion	

Driver	Education
Description of driver	Including training and know-how transfer and the awareness of the necessary speed of future changes.
Conclusion from partners Better education could increase quality of employers and also management and decision making	

Classification 2. Mainly positive opinion

Driver	Investments
Description of driver	Establishment of undistorted, cost-reflective prices in the energy market and conducive investment conditions to send the right signals to private investors.
Conclusion from partners Increasing investment into farming sector will make this sector more competitive	
Classification 2. Mainly positive influence	

2.6 Policies National strategies for rural development International Organisation, Politicians)

Driver	Subsidies
Description of driver	Phase-out of unproductive and distortive government subsidies (e.g. to energy, transport) and provision of transition supports where a need to ease environmental and social costs of change is necessary
Conclusion from partners Subsidies are important influence on farms, but they also destroy competition on market. Any changes could make market more competitive, but could also decrease incomes of farmers	
Classification 3. Not unified opinion of stakeholders about this driver	

Driver	Regulations and standards
Description of driver	agreed government norms for the production and use of energy and protection of the environment
Conclusion from partners The driver could bring new possibilities for higher quality production, but also could increase bureaucracy	
Classification	

3. Not unified opinion of stakeholders about this driver
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Driver	National strategies
Description of driver	good governance approaches based on whole-of-government decision-making, transparency, and understanding of the political economy of promoting change in energy systems
Conclusion from partners The driver seems not to be well understand by partners	
Classification 4. Driver is not clear	

Driver	Politicians
Description of driver	including their political awareness of the existing situation and the necessary changes in the future, including impacts and changes due to environment or technology
Conclusion from partners The driver seems not to be well understand by partners	
Classification 4. Driver is not clear	

Driver	International organizations
Description of driver	Like World Bank, FAO, CGIAR, etc. with their power/non power to influence necessary changes.
Conclusion from partners The driver seems not to be well understand by partners	
Classification 4. Driver is not clear	

2.7 Economy

Driver	Economic instruments
Description of driver	market-based instruments (e.g., taxes, trade able permits) to internalize externalities and promote the cost-effectiveness of energy and environmental policies and measures
Conclusion from partners Opinion of stakeholders is, that the economical instrument could have both, positive and negative influences on farm management	
Classification 3. Not unified opinion of stakeholders about this driver	

Driver	Partnerships and voluntary agreements
Description of driver	Joint public/private programmers to develop and deploy sustainable energy approaches with industry.
Conclusion from partners It could guarantee safety on the market	
Classification 2. Mainly positive influence	

Driver	Cooperation and integration models
Description of driver	The complex chain in agriculture, biomass and environment as well as the complex structure of chain partners, their behaving addressing new targets including control.
Conclusion from partners It could guarantee safety on the market	
Classification 2. Mainly positive influence	

2.8 Sustainability and environmental issue

Driver	Assessments and scenarios
Description of driver	sustainability assessments which identify synergies and trade-offs across the economic, environmental and social impacts of energy policy options
Conclusion from partners The driver seems not to be well understand by partners	
Classification 4. Driver is not clear	

Driver	Valuation of ecological performances
Description of driver	As long as costs are mainly externalized into the direction of the environment (including agriculture and forestry) and no legal framework exists, necessary changes will be slow.
Conclusion from partners Valuation of ecological performances of farmers could be an important income source for the farming sector in the future.	
Classification 2. Mainly positive opinion	

2.9 Public opinion (Press)

Driver	Press
Description of driver	Due to their influence on politicians and their role of being intermediate between public and politics.
Conclusion from partners The driver seems not to be well understand by partners	
Classification 4. Driver is not clear	

3 Analysis of stakeholders opinion

There are some differences in stakeholder's opinion about external drivers, which are given by geographical conditions, size of farms, but also currently used systems, level of subsidies, etc. However it is possible to find some trends, which are common to all stakeholders. In principle we could divide external drivers on the base of stakeholders' opinion into four groups:

1. Drivers with mainly positive influence in farming
2. Drivers with mainly negative influence in farming
3. Drivers where could be expected both negative and positive influence
4. Drivers, where farmers are not able to give clear opinion or where it is not possible to predict their influence

3.1 *Mainly negative*

- **Energy cost** is expected to have mainly negative influence on cost of production. Production of energy is not consider as so important

3.2 *Mainly Positive*

- **Growing population** is expected, that will support market grow
- **Investments** is expected to have positive influence, but there is expected, that could exclude some farms from production
- **Partnerships and voluntary agreements and Cooperation and integration models** could bring higher stability
- **Research and development Information and communications, and Education**, will bring new opportunity, but could exclude some farms from production
- **Valuation of ecological performances**, will be mainly positive, but could bring different opportunities for different countries

3.3 *Both*

- **Climate changes**, - in some countries could have positive influence, but mainly in south countries could destroy production
- **Regulations and standards, Economic instruments, Subsidies**, they could influence production in both directions

- **Urbanization and land abandonment**, will bring new possibilities for some farms, but there could be problem with qualified employers
- **Quality of food**, - main question is, if people will be able to pay for higher quality of food
- **Aging population and health problems** could bring problems with employers, but could stimulate new products

3.4 Not clear

- **Knowledge based bio economy** – this terms seems to be difficult to understand for farmers
- **Assessments and scenarios**, seems to be not clear
- **International organizations, Politicians, Press, National strategies** – not predictable
- **Ethnical and cultural changes** seems to be not clear

4 Discussion

The provided exercises with the farmers demonstrate in some cases different opinion among farmers and expert's analysis (Report D1.1.2). As analysis of farmers answer show, their opinion is more influenced by short term expectation, then by long term vision. The answers are usually influenced by current expertise. Good example are answers related to cost of energy (analysis were realised before decreasing of costs). The growing cost of energy was direct risk for the farmers; the future potential from energy production was not so visible.

Some external drivers are not fully understandable or non predictable for farmers. So the farmers need knowledge about the possible future influence of these drivers on their production. From the analysis it is clear, that in the design of a farm management system it is necessary to take some of the external drivers into consideration; mainly drivers, for which it is possible in some way to quantify the future influence and where different possibilities on how to deal with this concrete external drivers can be offered to the farmers. It is important for the future management systems to offer qualitative information about different potential scenarios based on external drivers. An important fact is also that there is a number of drivers for which farmers had no opinion concerning whether they could bring positive or negative influences. In principle it is true, that both are possible. Therefore it seems important to have the chance to build different scenarios and by presenting these scenarios to farmers to be possible to adapt their management system on the base of new conditions.

It seems important, not to focus only on quantitative analysis for future systems, but also on scenarios building. This brings fort a need of access to external information and to transform this information into a usable by the farmers form.

Some drivers will have influence of farming system, but is it difficult to quantify influences on farm profit.

From the analysis it seems necessary to further elaborate on the following drivers:

- Energy
- Growing population
- Valuation of ecological performances,
- Climate changes,
- Regulations and standards, and Subsidies, they could influence production in both directions
- Quality of food

It is possible to find both quantitative and qualitative models, which will help farmers adapt their management and increase their profit. It will be important to provide the possibility of adoption of management methods to very fast changing conditions. Some changes could be shorter than the growing period and it is difficult to manage changes in production, but this could be reflected in farmers marketing strategy.

5 Annex –detailed SWOT analysis by partners

Driver	Climate change
<p>Description of driver</p>	<p>The global climate change is external driver with long time influence on crop composition and management methods in local and world wide.</p>
<p>Strengths Czech Republic Climate changes (global warming) can support crop production in areas with higher altitude and latitude, where limiting factor is temperature and number of days of crop season.</p>	<p>Strengths Greece</p> <ol style="list-style-type: none"> 1. Expanding agriculture production in higher latitudes. 2. Additional profit from higher commodity prices produced from higher uncertainty.
<p>Strengths Denmark More CO₂, higher temp. and less cold winters is an advantage for the Danish farmer</p>	<p>Strengths Germany Higher yield possible</p>
<p>Weaknesses Czech Republic Climate changes can be a cause of lack of water in local areas or locations with often thunderstorms or strong wind.</p>	<p>Weaknesses Greece</p> <ol style="list-style-type: none"> 1. Water deficiency, 2. Problems in tropics from higher temperatures
<p>Weaknesses Denmark Unusual weather as seen in the last 10 years makes farming more risky. Crops are most sensitive to draught from April to July, and heavy rains in July and August means loss of yield and quality at harvest and a rise in the costs of storing and drying. New diseases, weeds and insects known from central Europe have appeared in Denmark. Denmark is specially exposed to the rise of the sea level, and some fertile land areas will be lost if sea level rises more than 1 meter, assuming that the dikes will only be built to protect urban areas.</p>	<p>Weaknesses Germany Bad harvest if droughts are increasing, in some areas no agricultural production will be (economically) possible</p>
<p>Opportunities Czech Republic Possibility of growing new variety with higher productivity and resistant's to pests and diseases. New crops?!</p>	<p>Opportunities Greece</p> <ol style="list-style-type: none"> 1. New crops and products for specific regions and local markets. 2. Re-planning of present marketing nets.

<p>Opportunities Denmark Farmers are increasing their profit by producing energy crops and straw and rapeseed. New crops such as maize can now be grown in DK, and crops are generally sold for much higher prices, because of a more demanding global market. Farmers may use the focus on climate change to be more accepted by the rest of the population</p>	<p>Germany</p> <ul style="list-style-type: none"> • modified cropping systems / cultivation methods • through higher temperatures in Germany later ripening cultivars can be planted • crop growing of new plants
<p>Threads Czech Republic Significant differences between years in Crop production, which is running in traditionally high productive fields according to amount and timing of rainfall.</p>	<p>Threads Greece</p> <ol style="list-style-type: none"> 1. Disasters 2. More critical and risky enterprise
<p>Threads Denmark Denmark's focus on pig production has shown very vulnerable, when the costs on fodder are going up.</p>	<p>Threads Germany Shortage of water, new pests and disease, new weeds, new dates for seeding and harvesting, influences to crop rotation</p>

Driver	Growing population
Description of driver	External driver will stimulate growing request on food with growing population and growing economy in the third countries. Comment will be focusing on growing needs of food in time and different continents.
Strengths Czech Republic Bigger interest about delivery of crop production on the market.	Strengths Greece <ol style="list-style-type: none"> 1. More need for food 2. Higher potential for increasing profits 3. Reduced commodity stocks
Strengths Denmark <p>The Danish population is not growing, but the country is a net exporter, so Denmark will benefit from an increasing global demand for food and other agricultural products</p> <p>In some countries the growth of the population goes together with growth in productivity and income, and thus more middle and high income consumers will buy more agricultural products with high prices (luxurious)</p> <p>A growing global population consumes more arable land for cities and urban structures, which means higher demands for Danish products</p>	Strengths Germany
Weaknesses Czech Republic As a local producer, we don't see any weakness	Weaknesses Greece <ol style="list-style-type: none"> 1. Reduced cultivated land 2. Increasing human hunger?
Weaknesses Denmark Growing population may be considered as the key problem globally, as it seems too hard to handle this growth in a sustainable way. Climate changes, destabilized countries, hunger and lack of recourse can be traced back to this originally positive human development	Weaknesses Germany
Opportunities Czech Republic Investigation to new machinery, IT	Opportunities Greece <ol style="list-style-type: none"> 1. More profitable production of

technologies and high productive crop varieties	<p>traditional crops</p> <ol style="list-style-type: none"> 2. Many countries from product exporters become importers
<p>Opportunities Denmark</p> <p>If a growing population goes together with growth in income, all Danish farmers will benefit from the increasing demand</p>	<p>Opportunities Germany</p>
<p>Threads Czech Republic</p>	<p>Threads Greece</p> <ol style="list-style-type: none"> 1. Increased energy cost 2. Decreased purchasing power 3. Economy depression
<p>Threads Denmark</p> <p>If a growing population does not go together with an increase in consumer income, only crop farmers will benefit.</p>	<p>Threads Germany</p>

Driver	Energy cost
Description of driver	During the last years the energy prices, but special focus to oil prices, increased a factor 4-5 (USD 25 to 125/barrel), other energy costs increased also but much less. Oil (gas) is (are) the driver(s).
Strengths Czech Republic Expensive energy and fuel are the cause of lower spend and saving in any production	Strengths Greece 1. Additional input of selling the crop residues for bio fuels 2. Higher environmental impact from the minimal machine activity.
Strengths Denmark The Danish infrastructure is good and export by truck, ship and plane is easy. The green energy sector is important, and there is a market for energy production based on pig slurry, straw and e.g. Rapeseed..	Strengths Germany new markets for energy plants
Weaknesses Czech Republic Growing costs in crop production and product transport	Weaknesses Greece 1. Reduce profits 2. Increases the operating capital (more risky) 3. Difficulties for small ag enterprises to make new investments in renewable energies
Weaknesses Denmark Energy costs are higher in DK than in many other European countries, which makes Danish farmers less competitive	Weaknesses Germany increasing energy costs will increase the price for production (e.g. fuel, seeds, fertilizer, ...) Costs for production will increase faster as the prices for products (e.g. corn, grain, ...)
Opportunities Czech Republic Investigation to machines and technologies with low fuel and energy consumption. Possibility to place energy crops to farm crop rotation.	Opportunities Greece 1. It is an opportunity to recalculate and re-modify the product prices. 2. It is a new field of importing new types of crops in the production (bio-crops)
Opportunities Denmark The high Danish energy costs and the developing green sector have given a “First Mover” advantage to the Danish farmer.	Opportunities Germany Energy production as a second income for the farmers

Threads Czech Republic Growing price of food	Threads Greece <ol style="list-style-type: none">1. It is possible for agricultural products to become very expensive reducing the consumption.2. Reduced profits
Threads Denmark Energy costs in heated animal housing makes livestock production in the Nordic countries less competitive. The high input/high income strategy of the typical Danish farm is less profitable when input prices rise such as energy costs.	Threads Germany Farmers might give up their farms because the higher costs costs grow faster than revenue

Driver	Urbanization and land abandonment
Description of driver	In 2005 around 3, 2 billion people or 49 % of the population lived in urban areas. This trend will increase and the FAO forecast shows in 2030 4, 9 Billion people living in urban areas (60%).
Strengths Czech Republic Less people in production support adoption of new technology in the farm production. Land abandonment is positive for common farmers in our area to increase common profitability in crop production.	Strengths Greece 1. More need for food 2. Higher prices – more profits 3. More field for ag enterprises to become larger and more profitable.
Strengths Denmark Urbanisation brings more farmers close to potential consumers	Strengths Germany
Weaknesses Czech Republic Farmers will miss a season people in the field. Land abandonment increase a first input to get field back to productive condition.	Weaknesses Greece 1. Less people working on fields with poor knowledge (less competition). 2. Reduced technical and social support. 3. Disconnection between the place of production and the place of consumption.
Weaknesses Denmark Urbanisation and land abandonment takes away arable land from farmers and newcomers are less willing to accept inconvenience from farm production such as smell or dust and noise. Farmers cannot compete with other kinds of land use such as town extension or recreational areas as golf courses etc. Urbanisation raises the price of land; by that the tax all Danish farmers have to pay every year and every time a farm is sold or even passed to the next generation.	Weaknesses Germany
Opportunities Czech Republic Adoption of IT technologies for controlling and automatic processing	Opportunities Greece 1. New markets emerging 2. Need for ICM and biological products.

<p>Opportunities Denmark Urbanization can bring more farmers close to potential consumers of locally produced products and goods.</p>	<p>Opportunities Germany</p>
<p>Threads Czech Republic Worth condition for investment to IT nets, support and rural production, less of work offer.</p>	<p>Threads Greece</p> <ol style="list-style-type: none"> 1. Danger of the destruction of the social structure in rural areas. 2. Less possible for urban people to begin ag enterprises
<p>Threads Denmark Abandoned rural villages could become a problem and this process is irreversible.</p>	<p>Threads Germany</p>

Driver	Quality of food
Description of driver	This ext. driver will increase the food safety by widely using organic farming and integrated crop management approaches.
Strengths Czech Republic No chemicals and fertilizer is used in crop production.	Strengths Greece <ol style="list-style-type: none"> 1. Giving additional value to products with higher quality. 2. Higher need for quality products. 3. Higher potential for small ag businesses to become more profitable based on higher quality products. 4. Reduced environmental impact when producing products with higher quality.
Strengths Denmark Denmark produces agricultural products of good and reliable quality	Strengths Germany
Weaknesses Czech Republic Organic farming ensure enough production for common marked, even future market	Weaknesses Greece <ol style="list-style-type: none"> 1. Need for change of agricultural practices to produce higher quality products. 2. The quality is more expensive to produce. 3. Need for better certification systems.
Weaknesses Denmark If global welfare decreases, quality food producers will not be paid for	
Opportunities Czech Republic ?	Opportunities Greece <ol style="list-style-type: none"> 1. New markets 2. Healthier products
Opportunities Denmark Traceability could be improved also by automation, it also improves the reliability Environmental quality can be enhanced for example by organic production Story telling is underestimated in the Danish production, Farm sales, direct contact with the consumers.	Opportunities Germany

Threads Czech Republic Products from organic farming are more depend on after harvest processing.	Threads Greece 1. For people not to afford for higher price of quality.
Threads Denmark If the marked changes, investments in quality production will be lost. Cooperation through all sectors is necessary but not practiced	Threads Germany

Driver	Aging population and health problems
Description of driver	The ageing of human populations has emerged as one of the most significant demographic processes of the present time.
Strengths Czech Republic People on management positions with long time experiences	Strengths Greece 1. More need for food 2. Higher prices – more profits
Strengths Denmark Health is a strong driver for quality production, by good control, research, education	Strengths Germany
Weaknesses Czech Republic Farming is miss young people in manager positions	Weaknesses Greece 1. Young people not wiling to cultivate. 2. Need for customization of the market products (more types, more recipes).
Weaknesses Denmark For DK aging can be a problem Aging population might cause lack of labor.	
Opportunities Czech Republic Combining practical experiences with IT tools in farm production models	Opportunities Greece 1. New markets emerging 2. Need for ICM and biological products.
Opportunities Denmark Production of healthy food	Opportunities Germany
Threads Czech Republic Takes more time to adopt a IT technology to production	Threads Greece 1. Danger of the destruction of the social structure in rural areas. 2. Less possible for urban people to begin e.g. enterprises. 3.
Threads Denmark Possible conflict of interest between research and production	Threads Germany

Driver	Ethnical and cultural changes
Description of driver	The recent World Food Market's (WFM) showcased the latest authentic ethnic, specialty, halal, and kosher products. Population's interest in ethnic cuisine. Also requirements on vegetarian food are growing.
Strengths Czech Republic	Strengths Greece 1. New markets due to globalization 2. Products going to larger markets
Strengths Denmark	Strengths Germany
Weaknesses Czech Republic	Weaknesses Greece Reduced different types and flavors.
Weaknesses Denmark A small and homogeneous population with a big global exportation is sensitive towards ethnical and cultural global differences.	
Opportunities Czech Republic New crops for marked with high productivity	Opportunities Greece 1. Bigger markets abroad 2. New products for cultivation
Opportunities Denmark Production of special products for specific ethnical and cultural consumer groups.	Opportunities Germany
Threads Czech Republic Farm production is also focused on milk production, which could be influenced	Threads Greece 1. Danger of the big corporations to expand and destroy the competence. 2. Danger for traditional products to eliminate.
Threads Denmark Boycotting	Threads Germany

Driver	Knowledge based bio economy
Description of driver	Introduction of new products and crops, including GMO
Strengths Czech Republic Simple model for crop production, reduction cost on chemicals in crop protection.	Strengths Greece
Strengths Denmark Denmark is principally against GMO production as well as functional foods. Natural functional food could be a niche production.	Strengths Germany
Weaknesses Czech Republic Government restriction and risk of planting, reduction of production for food market	Weaknesses Greece
Weaknesses Denmark When consumers request cheap products or raw materials, import of these products cannot be forbidden.	Weaknesses Germany
Opportunities Czech Republic New machines for treatment and measurements.	Opportunities Greece
Opportunities Denmark This area could be enhanced more and better by information and society driven development, not multi industrial interests.	Opportunities Germany
Threads Czech Republic Reduction of arable field for food production on location, new variety of pest and diseases in surround environment	Threads Greece
Threads Denmark Global introduction of GMO and functional foods.	Threads Germany

Driver	Regulations and standards
Description of driver	agreed government norms for the production and use of energy and protection of the environment
Strengths Czech Republic Lower competition in the farm location for crop production	Strengths Greece <ol style="list-style-type: none"> 1. Safer products for the consumers 2. More confidence to people to consume. 3. Healthier and clearer competence between producers. 4. Protection of the environment.
Strengths Denmark Makes it possible for the agricultural sector to react on problems.	Strengths Germany There are the same regulations and standards in the whole EU, preferable worldwide for quality standards of end-products
Weaknesses Czech Republic More difficult to run farm business, more difficult to start farm business	Weaknesses Greece <ol style="list-style-type: none"> 1. Higher bureaucracy. 2. Many standards with incompatibilities between them. 3. Increases the final cost and production time.
Weaknesses Denmark Stimulates bulk production Complicates original ideas Stops or forces some farmers to seek to less regulated countries.	Weaknesses Germany Regulations and standards are often not valid worldwide; imports from low-wage countries and therefore fail of quality standards in many cases
Opportunities Czech Republic Investigation to IT technologies and sensor controlling	Opportunities Greece <ol style="list-style-type: none"> 1. Higher product value when agree with standards. 2. New market challenges
Opportunities Denmark Farmers and agro industry can use Danish regulations and standards as competition parameters through the many Danish co operations as ARLA or Danish Crown	Opportunities Germany Sustainability of production can be taken into consideration
Threads Czech Republic Many changes in regulations and production standards	Threads Greece <ol style="list-style-type: none"> 1. Many traditional farmers unwilling to obey to them.

	2. Increase of the operational costs.
Threads Denmark Frightening newcomers and innovation	Threads Germany Discrimination through additional local regulations

Driver	Economic instruments
Description of driver	market-based instruments (e.g., taxes, tradeable permits) to internalize externalities and promote the cost-effectiveness of energy and environmental policies and measures
Strengths Czech Republic Lower competition in local crop producers	Strengths Greece 1. Giving financial boost to e.g. enterprises to invest. 2. Leads to more productive enterprises due to higher operational capital.
Strengths Denmark Denmark has a good credit system, is a financially stable country, low inflation. Farmers are respected	Strengths Germany
Weaknesses Czech Republic More paper work to get permission for any thing	Weaknesses Greece Increases the economic dependence.
Weaknesses Denmark Taxes are very high in DK It is difficult for the younger generation to inherit, due to high taxes	
Opportunities Czech Republic Adoption of IT technology and sensor networks for data collection and data processing	Opportunities Greece New production activities
Opportunities Denmark New forms of ownership, agriculture owned by foundations or co-operations.	Opportunities Germany
Threads Czech Republic Complication and troubles on crop model changes to achieve different goals on the market	Threads Greece 1. Danger of the uncontrollable investment.
Threads Denmark Advantages of personal ownership can be difficult to maintain.	Threads Germany

Driver	Subsidies
Description of driver	Phase-out of unproductive and distortive government subsidies (e.g. to energy, transport) and provision of transition supports where a need to ease environmental and social costs of change is necessary
Strengths Czech Republic Safety farm business	Strengths Greece <ol style="list-style-type: none"> 1. Gives the ability to farmer to sell in a price bellow production cost. 2. Boost the farmer to produce more. 3. One more reason for the farmer to protect the environment. 4. Gives more power to the whole agricultural market-chain.
Strengths Denmark Stabilizes the income Could help environment, nature, by national initiatives	Strengths Germany securing the company's existence
Weaknesses Czech Republic Takes down competition between countries – keep up regulation via government	Weaknesses Greece <ol style="list-style-type: none"> 1. Keep in place the less competitive enterprises. 2. Difficulties for the social public to accept them. 3. Many farmers remain unwilling to follow the markets.
Weaknesses Denmark Stimulates non-competitive production Difficult to change, has big consequences	Weaknesses Germany bad distribution, subsidies for wrong things, very complicate to get them
Opportunities Czech Republic Time to investigate to progressive tools	Opportunities Greece <ol style="list-style-type: none"> 1. Gives the base for a farmer to try new methods and crops. 2. Direct the farming industry in a desirable point. 3.
Opportunities Denmark Farmers should/could learn more about applying them	Opportunities Germany more money for research
Threads Czech Republic	Threads Greece

<p>Government keep regulation on the market not a market itself</p>	<ol style="list-style-type: none">1. May produce conflicts and disputation from other social and economic parties to preserve them.2. A possible cutting to them may lead to many ag businesses to become unprofitable.
<p>Threads Denmark A lot of rural development funding is used for non-farm projects.</p>	<p>Threads Germany Subsidies will be reduced to zero; subsidies for wrong things;</p>

Driver	Investments
Description of driver	Establishment of undistorted, cost-reflective prices in the energy market and conducive investment conditions to send the right signals to private investors.
Strengths Czech Republic Growing productivity in crop production	Strengths Greece <ol style="list-style-type: none"> 1. Leads to more competitive businesses. 2. Makes the job less tough. 3. Increase automation. 4. Increase the better control of many tasks in the production. 5. Increase profitability. 6. Maybe helps to protect the environment.
Strengths Denmark Financial good-will for agro investments. Highly developed modern production system	Strengths Germany new technology getting more and more expensive; better conditions of work
Weaknesses Czech Republic Investment to different crop production model, need next investment to get back to food production model	Weaknesses Greece <ol style="list-style-type: none"> 1. Needs for huge amount of capital. 2. More critical economic and decision tasks. 3. Maybe increases the unemployment.
Weaknesses Denmark Interests on investments in Denmark have been higher due to the fact that DK is not in the Euro zone	Weaknesses Germany Reduction in staff; better qualification necessary; higher risk of investments
Opportunities Czech Republic Growing farm production	Opportunities Greece Easier transition to new production systems and methods.
Opportunities Denmark	Opportunities Germany elevated concentration of production
Threads Czech Republic Possibility of low competitiveness on the market without investment	Threads Greece <ol style="list-style-type: none"> 1. Danger of the uncontrollable investment.

Threads Denmark Very vulnerable for increased interest (like now)	Threads Germany high need of investment will lead to cutback of farms
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Driver	Partnerships and voluntary agreements
Description of driver	Joint public/private programmers to develop and deploy sustainable energy approaches with industry.
Strengths Czech Republic Safety local market for farm production.	Strengths Greece
Strengths Denmark	Strengths Germany Increase power. More competitive form. Better product quality. Increase the exchange of knowledge
Weaknesses Czech Republic	Weaknesses Greece
Weaknesses Denmark	Weaknesses Germany Different mentalities. Incompatibilities in the methods of production
Opportunities Czech Republic Clear future for investment	Opportunities Greece
Opportunities Denmark	Opportunities Germany Information exchange.
Threads Czech Republic Decreasing possibility of food production	Threads Greece
Threads Denmark	Threads Germany

Driver	Research and development
Description of driver	government R&D and incentives to private R&D to promote innovation on energy for sustainable development
Strengths Czech Republic New tools, machines, technologies and strategies are adopted	Strengths Greece
Strengths Denmark Can have major impact on the agricultural primary production sector Funding is focused on actual problems	Strengths Germany Generates new methods and procedures Gives the ability for producing alternative products with additional characteristics. Gives answers to many problems. Lead to safer products.
Weaknesses Czech Republic	Weaknesses Greece
Weaknesses Denmark Lack of contact between research and practice. Research is kept private until the commercial phase, no influence.	Weaknesses Germany Need for additional capitals. Need for experimental land and labor.
Opportunities Czech Republic Possibility of new patents, advance in competition	Opportunities Greece
Opportunities Denmark Create alliances between research + farmers+ producers for equipment, new technology, new solutions Keep research environment in the country Use farmers for dissemination.	Opportunities Germany Higher value and more competitive products
Threads Czech Republic	Threads Greece
Threads Denmark EU funding often to difficult to achieve, especially when in direct contact to the farmers. Too few partners are active in this field. Funding focus can be populist or political	Threads Germany Difficulties to transfer the knowledge to commercial products.

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Driver	Information and communications
Description of driver	campaigns to promote better understanding by the general public of the national and international energy and environment situation and future challenges
Strengths Czech Republic Work and decision making with high quality data and information, Quick data transport for using.	Strengths Greece
Strengths Denmark Common platform/ use in the Danish agriculture, as well as the advisory system Large scale units formed by the structural development of the last years give better possibilities to introduce. Danish farmers are in principle positive about the idea of using ICT – especially Auto Steering Systems. GPS is now commonly used, good contact, good and reliable equipment.	Strengths Germany Better synchronization of the agricultural tasks. Faster information update for new methods, product and input prices, etc. New technology equipment for automation and decision making in a more accurate way. Better control of the whole farm. More profitable precision farming operations. More accurate and specific knowledge of the field soils (sensors).
Weaknesses Czech Republic Less educated persons in IT technologies and communications	Weaknesses Greece
Weaknesses Denmark Urban enterprises are favored by ITC business, agriculture is not granted high speed connection. Agricultural equipment is not at focus within construction industry. Conservative opinions amongst advisory system, and no stimulation because of lack of competition in advisory services.	New investments- money
Opportunities Czech Republic Automatic system of data collection, data processing and data using	Opportunities Greece
Opportunities Denmark Solutions are becoming profitable	Opportunities Germany Increase the yields.

<p>Precision agriculture based on ITC is still in the marked, slow but steady developing decrease of pesticide use. Better connection to consumers through the internet</p>	<p>Increase profits</p>
<p>Threads Czech Republic</p>	<p>Threads Greece</p>
<p>Threads Denmark Level of ambition should fit all involved in the production process, you can't surpass the weakest link Consequence of failure or mistake can be enormous because of the relative large economic impact of cross compliance to subsidies.</p>	<p>Threads Germany Increase the technology complexity.</p>

Driver	Assessments and scenarios
Description of driver	sustainability assessments which identify synergies and trade-offs across the economic, environmental and social impacts of energy policy options
Strengths Czech Republic Stable market and safety surround environment	Strengths Greece
Strengths Denmark	Strengths Germany Better control and moderate of the farming system. More accurate predictions. Lead to more profitable decisions – operations. Reduces the possibility of something going wrong. More familiar with different and unacceptable conditions.
Weaknesses Czech Republic Higher demand on education of farm management	Weaknesses Greece
Weaknesses Denmark Often too general and not interesting for agricultural enterprise. First when assessment becomes demand through legislation and rules.	Weaknesses Germany Time and labor to model them. An inaccurate model can produce a serious damage in the enterprise economy.
Opportunities Czech Republic Less risk in spent money in investigation	Opportunities Greece
Opportunities Denmark	Opportunities Germany Try and simulate the behavior of the farming system in new conditions. Find new balance points after many try and error tests
Threads Czech Republic Less possibility of changes in farm business, close community in business	Threads Greece
Threads Denmark	Threads Germany Danger for disaster after wrong results of

	an inaccurate model.
Driver	Valuation of ecological performances
Description of driver	As long as costs are mainly externalized into the direction of the environment (including agriculture and forestry) and no legal framework exists, necessary changes will be slowly.
Strengths Czech Republic Stability of environment and slowly changes for the future, Cancelling of dangerous and high risk treatment.	Strengths Greece
Strengths Denmark Can be used for branding Danish products, needs traceability. Organic farming is dependant on valuation	Strengths Germany More accurate economic model of the farming production system. More confidence in farming operations. More believable in the public opinion. Helps the farming systems to become more environmental friendly.
Weaknesses Czech Republic Decreasing of crop yield	Weaknesses Greece
Weaknesses Denmark Gives national interests priority, no international competition	Weaknesses Germany Possible lead to wrong results due to fuzzy procedures.
Opportunities Czech Republic Stabile investment and profit form crop production	Opportunities Greece
Opportunities Denmark Favours "front runners" Stimulates story telling	Opportunities Germany Lead to incorporate ecological procedures. Lead many farmers to biological production.
Threads Czech Republic Less product on food market	Threads Greece
Threads Denmark Trustworthiness in product can be destroyed by accident	Threads Germany To become over susceptible in ecological issues and ignore the business profitable.

Driver	National strategies
Description of driver	good governance approaches based on whole-of-government decision-making, transparency, and understanding of the political economy of promoting change in energy systems
Strengths Czech Republic Advice and high ability of farms competitiveness on the open market	Strengths Greece
Strengths Denmark	Strengths Germany Reduce the production costs through investments in local infrastructure. Could help enterprises in handicapped areas and the local economies. Make better adjustment of the support according every area needs.
Weaknesses Czech Republic National strategies can limit access on open international market	Weaknesses Greece
Weaknesses Denmark	Weaknesses Germany Incompatibility between different strategies in Europe. May increase the gap between farms in different countries.
Opportunities Czech Republic	Opportunities Greece
Opportunities Denmark	Opportunities Germany For every country to protect the traditional products and methods. To market their different product in the common market.
Threads Czech Republic Government restriction in crop production	Threads Greece
Threads Denmark	Threads Germany May kink the competitive environment between different countries.

Driver	Politicians
Description of driver	including their political awareness of the existing situation and the necessary changes in the future, including impacts and changes due to environment or technology
Strengths Czech Republic Short time advice on the market	Strengths Greece
Strengths Denmark	Strengths Germany Knowledge of the local problems. Voice of the local community-industry in upper levels. Can help to make changes positive to agricultural businesses.
Weaknesses Czech Republic Law and regulations	Weaknesses Greece
Weaknesses Denmark	Weaknesses Germany Many times choose to act according the political and not the social profit. Difficult to promote decisions to help economy and businesses when are in conflict with personal interests.
Opportunities Czech Republic	Opportunities Greece
Opportunities Denmark	Opportunities Germany To distinguish local problems.
Threads Czech Republic Difficulties in any adoption of new technologies and tools	Threads Greece
Threads Denmark	Threads Germany May kink the rules of the free market.

Press	Press
Description of driver	Due to their influence on politicians and their role of being intermediate between public and politics.
Strengths Czech Republic	Strengths Greece
Strengths Denmark Are independent and have tremendous influence	Strengths Germany Knowledge of the local problems. Voice of the local community-industry in upper levels. Can help to make changes positive to agricultural businesses. Can help the public opinion to understand the problems of farming industry. Can train the public to understand the difficulties and needs of the farming enterprises.
Weaknesses Czech Republic Short time decision making	Weaknesses Greece
Weaknesses Denmark Do what they like, unreliable.	Weaknesses Germany Many times they are uncontrollable and act to support different economic interests.
Opportunities Czech Republic	Opportunities Greece
Opportunities Denmark Farmers should start their own information system by web sites or open house arrangements	Opportunities Germany They are the link with urban people.
Threads Czech Republic Limited choice of decision	Threads Greece
Threads Denmark	Threads Germany

Driver	Education
Description of driver	Including training and know-how transfer and the awareness of the necessary speed of future changes.
Strengths Czech Republic Less troubles with running and adoption of new technology and people communication	Strengths Greece
Strengths Denmark Form the future	Strengths Germany Gives the background to a farmer to make better decisions and organization of his farm. Better understanding of the environmental impacts of every farming operation. Better collaboration between farmers and other social parties.
Weaknesses Czech Republic Less chance for non educated people working in the farm management	Weaknesses Greece
Weaknesses Denmark Random and unexplainable choice of students for what they want to study, no interest in agriculture	A higher educational person is unwilling to follow farming industry.
Opportunities Czech Republic New technology and development can be easily adopted on the farm production	Opportunities Greece
Opportunities Denmark Agriculture could be promoted in education Agriculture should not be separated from other disciplines, is integrated with biology, physics, economy etc.	Opportunities Germany To make urban people familiar with environment and agricultural practices.
Threads Czech Republic Slowly running changes in the farm production	Threads Greece
Threads Denmark No new generation of farmers.	Threads Germany

Driver	Cooperation and integration models
Description of driver	The complex chain in agriculture, biomass and environment as well as the complex structure of chain partners, their behaving addressing new targets including control.
Strengths Czech Republic Stabile situation on investment and farm production for long time period	Strengths Greece
Strengths Denmark	Strengths Germany Higher bargaining chip. More competitive form. Better product quality. Increase the exchange of knowledge.
Weaknesses Czech Republic High dependency on IT technologies and service people, possibility of using a data in unexpected and competitors field	Weaknesses Greece
Weaknesses Denmark	Weaknesses Germany Different mentalities. Incompatibilities in the methods of production
Opportunities Czech Republic	Opportunities Greece
Opportunities Denmark	Opportunities Germany Information exchange
Threads Czech Republic Less changes of crop production or energy production on the farm	Threads Greece
Threads Denmark	Threads Germany

Driver	International organizations
Description of driver	like Word Bank, FAO, CGIAR, etc. with their power/non power to influence necessary changes.
Strengths Czech Republic International decision support and new space on the market	Strengths Greece
Strengths Denmark	Strengths Germany Increase the exchange of knowledge. Applies common standards. Better control. Homogenize actions
Weaknesses Czech Republic	Weaknesses Greece
Weaknesses Denmark	Weaknesses Germany Not taking care of local differences.
Opportunities Czech Republic	Opportunities Greece
Opportunities Denmark	Opportunities Germany Information exchange
Threads Czech Republic	Threads Greece
Threads Denmark	Threads Germany To equalize and destroy the local distinctiveness.