EU-Green Deal a Global Road Map?:
An international perspective on the impact of the F2F-strategy

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European Green Deal Impacts on Agriculture in the EU - and in Brazil, Webinar, 15.8.2023

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Global Food Systems in Disarray

Global Food Systems in Disarray

- Present food systems are characterized by major market failures
- Agriculture biggest contributors to climate change (21% of anthropogenic GHG),nitrogen pollution and biodiversity loss.
- Environmental damage caused by the current management of food systems amplifies disruption and can fuel political instability.

Food system transformation: EU-Green Deal a common road map?

- Innovative governmental mechanisms of global land use are needed.
- Innovative policy processes to implement food system transformation effectively.
- Political dialog among political leaders and stakeholders helpful.

F2F strategy

In particular, the EU-Commission suggest the following F2F-measures:

(1) Reduction of mineral fertilizer use by 20%

(2) Reduction of pesticide use by 50%

(3) Reduction of the N-balance surplus by 50%

(4) Share of ecological compensation conservation areas of at least 10%

(5) Share of organic farming of at least 25%

Ecological and economic impact of F2F: Summary of the Henning et al. 2021 study

Summary Henning et al. 2021 study: Impact of the F2F-strategy

F2F-Measures = production restrictions

- Complete F2F package (F2F)
- -20% mineral fertilizer (fertilizer)
- -50% pesiticides (pesticides)
- -50% nitrogen pollution
- >10% set-aside (landscape)
- >25% organic farming (organics)

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EU supply (in %)

Livestock			Crop		
Beef	Pork	Dairy	Cereals	Oilseeds	F&V
-20,3	-17,4	-6,3	-21,4	-20,0	-12,2
-2,1	-0	-0,1	-3,3	-4,0	-1,4
-2,7	-1,1	-0,9	-9,9	-11,7	-10,7
-17,1	-16	-5,4	-6,9	-4,3	-1,3
-1,7	-0,5	-0,5	-7,2	-5,5	-0,3
-1,2	0,02	-0,3	-4,0	-4,4	-3,4

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EU-Farm prices (in %)

Livestock			Crop		
Beef	Pork	Dairy	Cereals	Oilseeds	F&V
58,7	47,8	35,7	12,5	17,7	14,5
0,9	1,64	2,5	3,2	4,3	3,0
1,8	2,39	2,8	8,2	10,8	10,5
51,5	39,5	28,6	0,4	1,9	2,5
-1,1	0,53	0,2	3,5	4,0	3,5
-0,4	0,99	0,5	5,9	4,8	0,6

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EU-Net-Export (in%)

Livestock			Crop		
Beef	Pork	Dairy	Cereals	Oilseeds	F&V
-15,9	-14,1	-1,2	-10,3	-15,7	
-0,9	-0,7	-0,1	-3,6	-3,0	
-1,1	-0,9	-0,1	-8,2	-9,5	
-12,6	-13	-1,0	0,5	-2,7	
-0,3	-0,3	0,0	-5,5	-4,7	
-0,1	-0,1	0,0	-3,7	-3,7	

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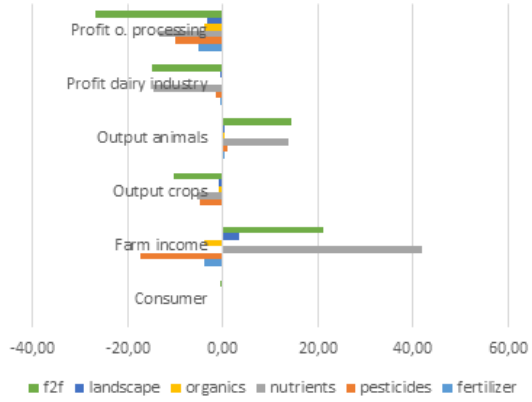
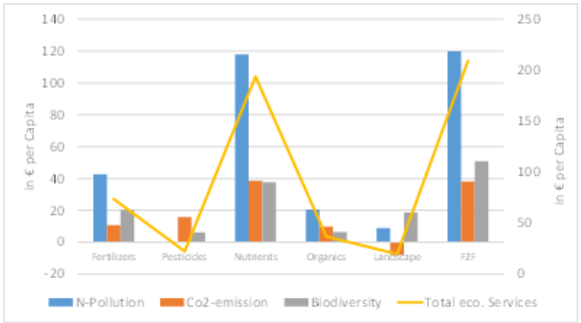
Non-EU-prices (in%)

Livestock			Crop		
Beef	Pork	Dairy	Cereals	Oilseeds	F&V
7,4	10,7	9,5	3,8	3,3	1,6
0,5	0,56	0,8	1,0	0,8	0,3
0,9	0,91	1,2	2,4	2,1	1,1
6,2	8,98	7,3	0,6	0,5	0,3
0,4	0,4	0,5	1,6	1,1	0,1
0,2	0,23	0,3	1,0	0,9	0,4

F2F impact on Welfare (in%)





F2F impact on Ecosystem services

Green Deal is potentially a Good deal:

- Total value of Ecosystem services by full implementation of Green deal 320 billion € [2000 €/ha or 750 € per capita]. Total farm profits 70 billon € or 442 €/ha.
- F2F strategy realized only ecosystem services of 93 billion € (30% of potential) with welfare losses of 70 billion €.

Key Challenges:

- **Efficient policy implementation** maximizing net-benefits: F2F measures are ad hoc and not validated by a scientific foundation with regard to the type of intervention as well as their scale. Static: Targeted policies. Dynamically: Incentives to invent and implement t.p. on supply and demand side (food waste).
- **Leakage effects**: F2F strategy imply decrease of emissions of about 30 percent. But about half of this will be lost because of the leakage effect: production moving to outside of Europe. **Land use change**: And the other half is lost because of land use changes. 1.5 Mio ha forest land is transformed into UAA.
- **Political feasibility**: cornerstones of the F2F strategy are collectively implemented by all member states. In this regard, it is also important to realize a fair distribution of costs and benefits resulting from the implementation of the Green Deal goals among the European member states and their individual regions as well as among the relevant socio-economic groups, namely farmers and consumers. The latter includes a fair distribution of cost and benefits among farmers and as well among consumers.

Smart Policies for Smart Food-Systems?

Efficient CAP-options beyond market and state.

Implementation of the Green Deal: What can politics do?

Basically three access points:

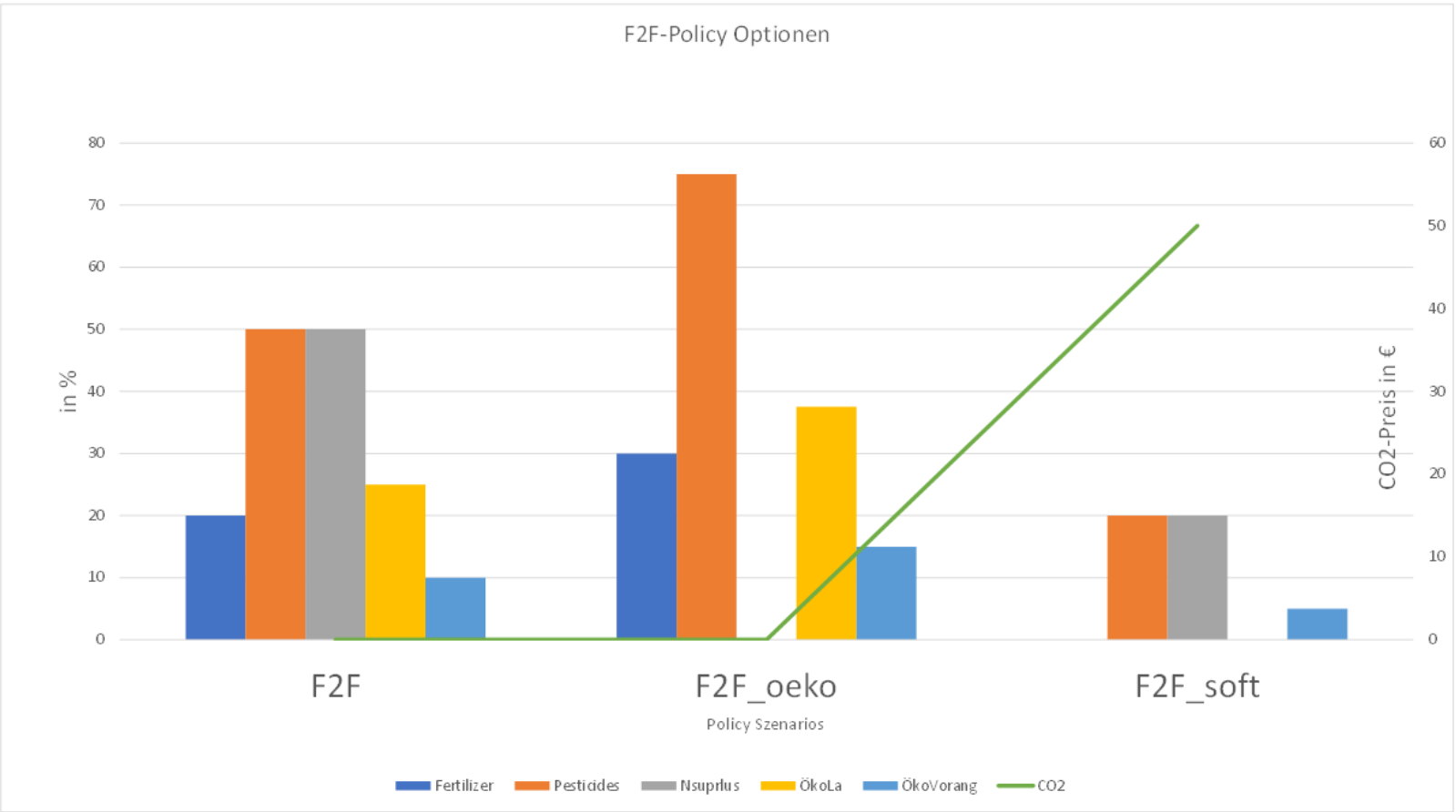
I. Farm production (regulation, subsidies-taxes, permits)
II. Consumption(Healthy-Diet, Food-Waste)
III. Trade (Import restrictions)

Implementation of Green Deal: What can politics do?

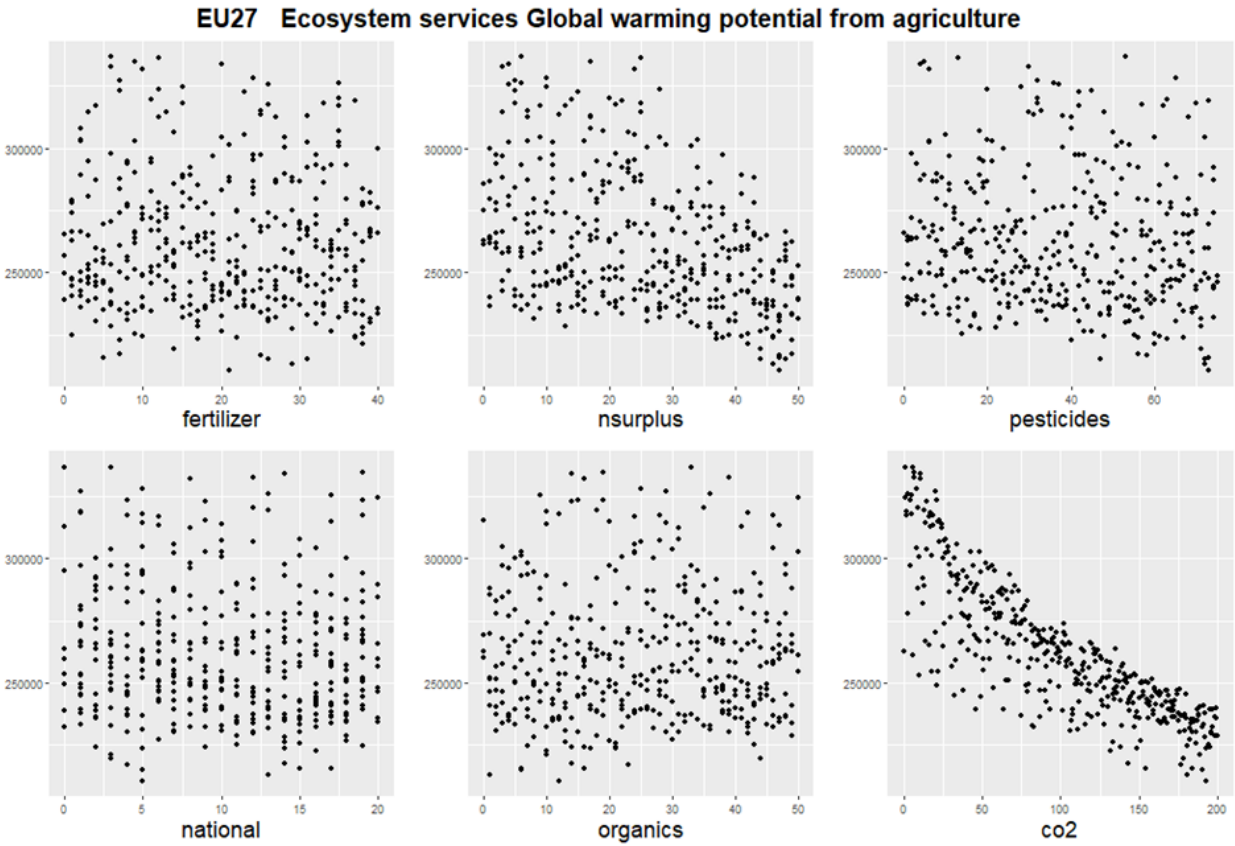
Components of an optimal F2F-implementation strategy?

- Optimal Mix and scale of F2F-measures
- Alternative measures on supply side
- Supporting measures: demand side
- Supporting measures: trade

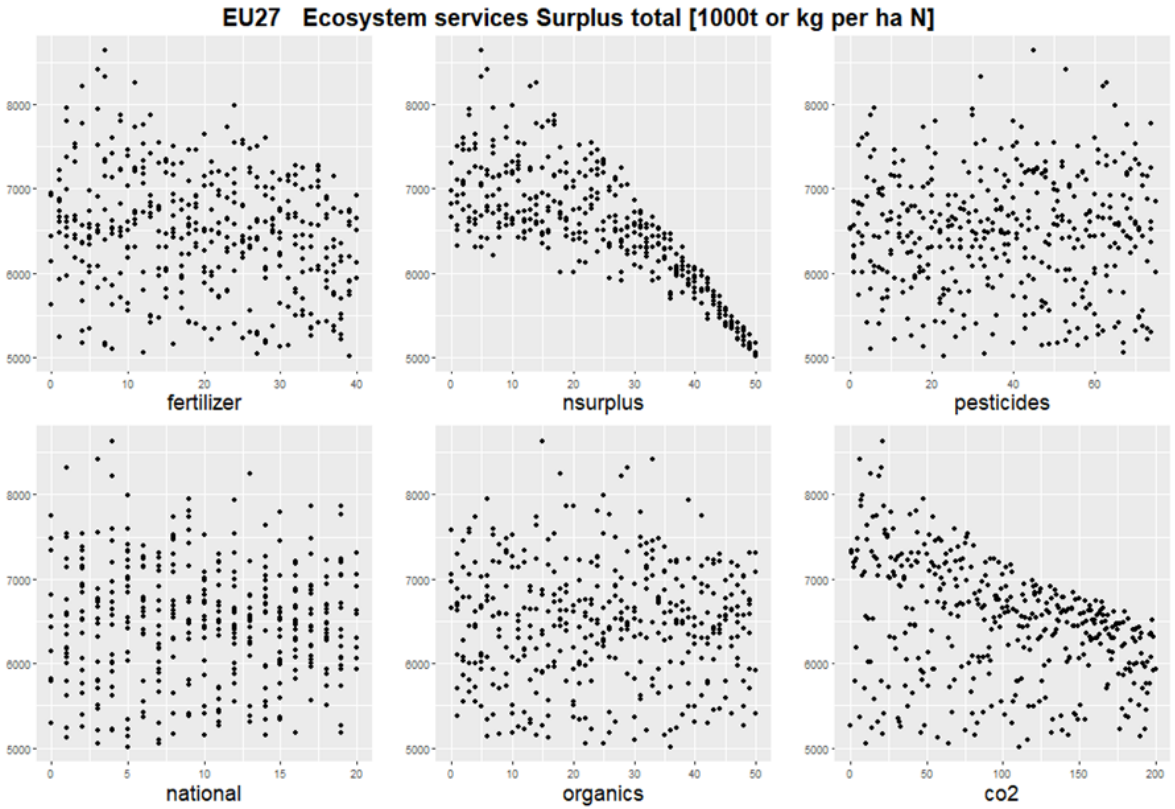
Two narratives for optimal F2F-Options



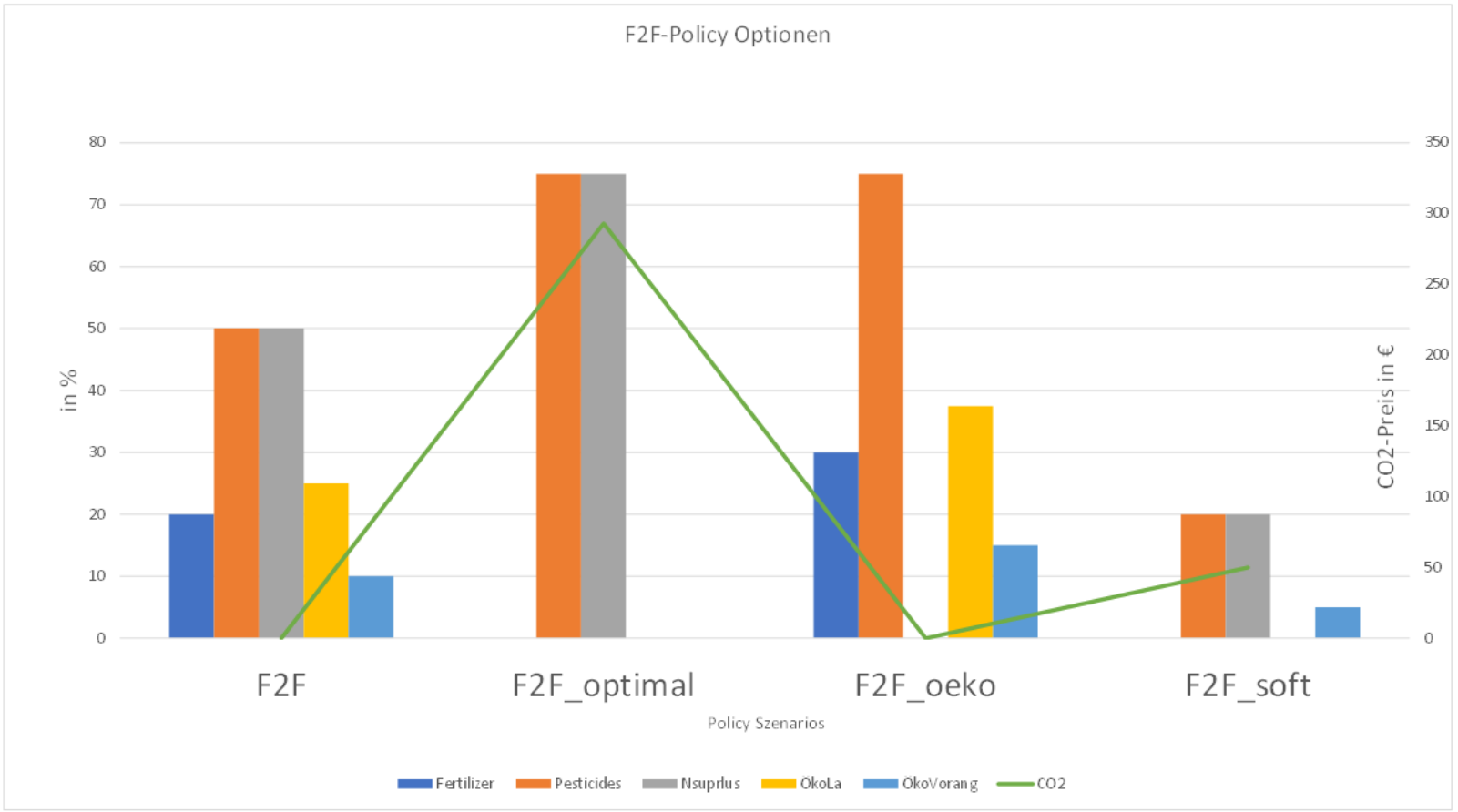
Ecological Farming not effective against climate change!



Ecological Farming not effective against N-pollution



F2F-Options


F2F-Policy Optionen
in %
CO2-Preis in €
80
70
60
50
40
30
20
10
0
350
300
250
200
150
100
50
0
F2F
F2F_optimal
F2F_oeko
F2F_soft
Policy Szenarios
Fertilizer
Pesticides
Nsuprlus
ÖkoLa
ÖkoVorang
CO2

Economic and ecological impact of different F2F-options

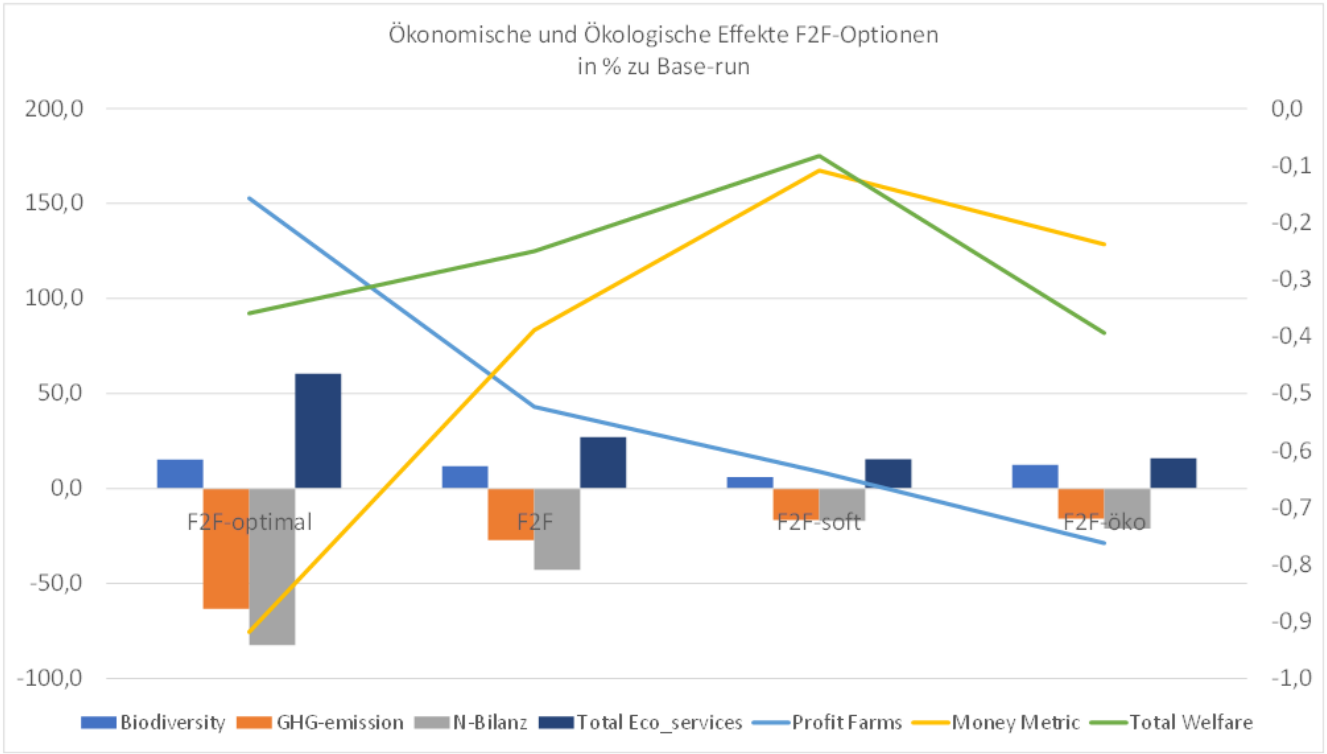
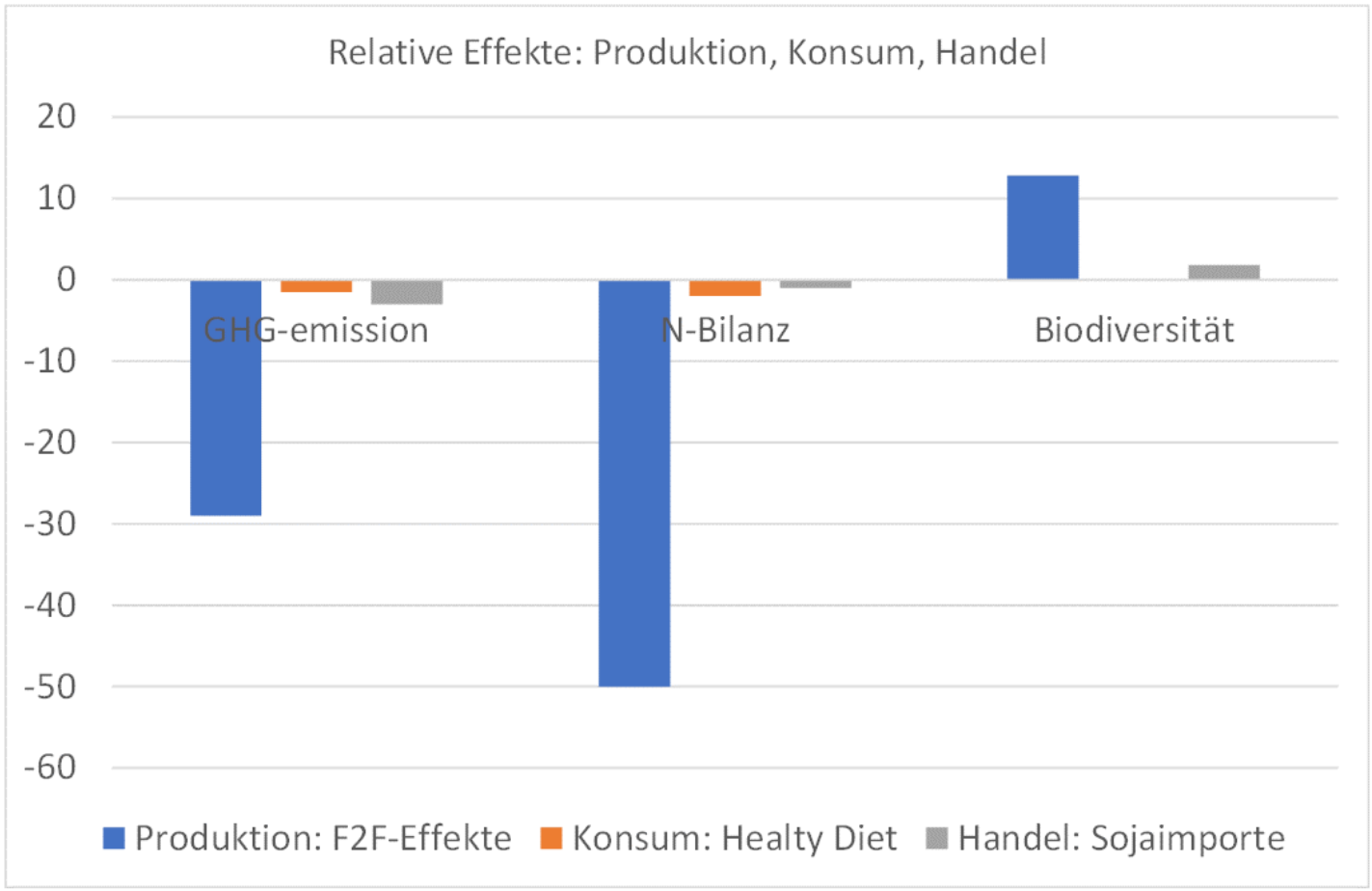


Table 1: Cost-benefits of different Green Deal options

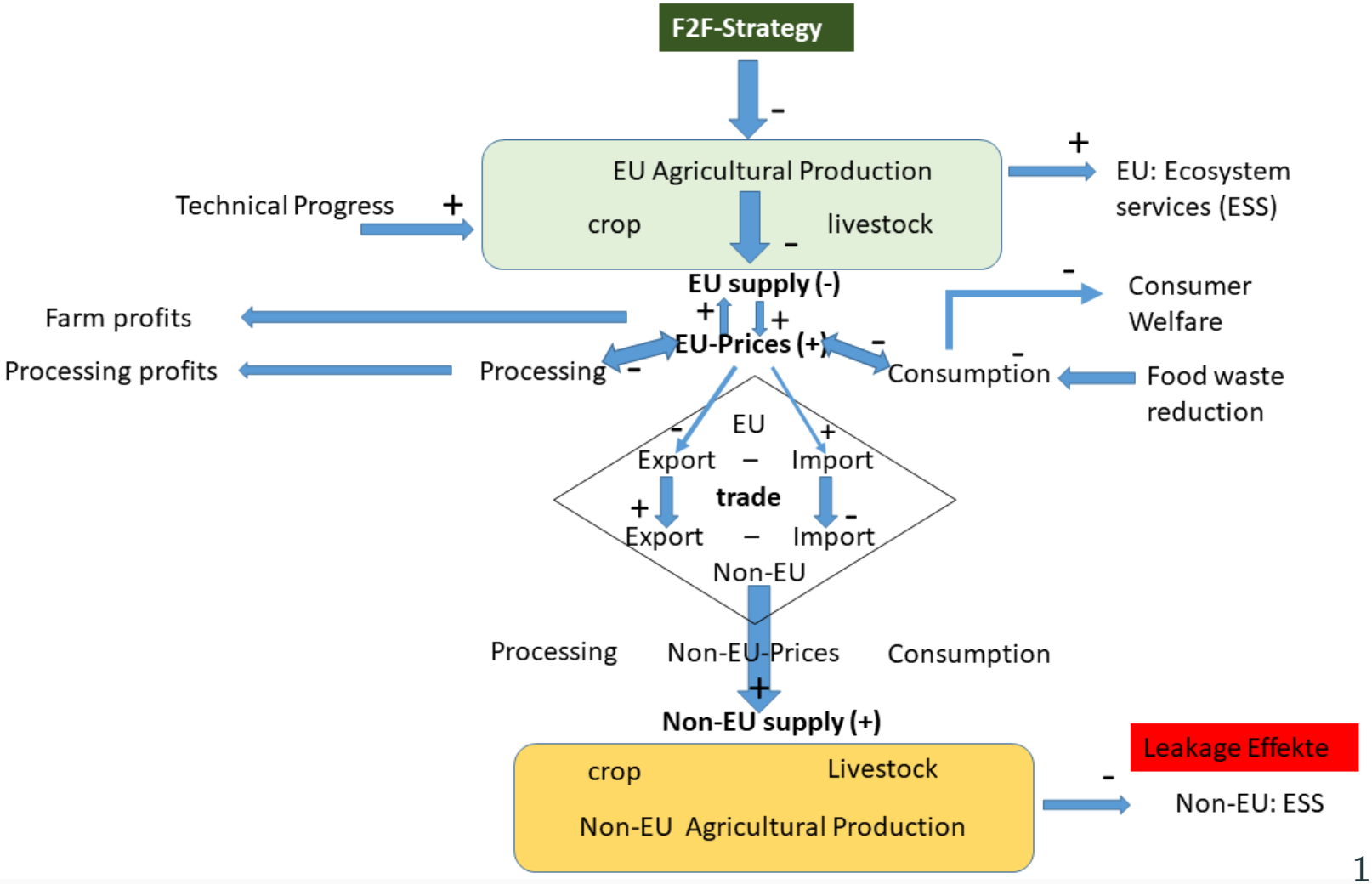
F2F-Strategy		F2F-optimal	F2F-Com	F2F-eco	F2F-soft
Benefits			in bill Euro		
Eco-system	GHG	88	40	21	25
services	N-surplus	98	61	25	22
	Biodiversity	74	49	49	19
	Total	261	150	94	67
Costs			in bill Euro		
	Consumer	-153	-70	-44	-14
	Farmer	131	35	-16	4
	Total	-42	-56	-52	-11
Net-benefit			in Euro per capita		
	Consumer	235	178	111	118
	Farmer	17631	4883	-1834	718
	Total	491	211	94	126

Alternative politics: Health Diet versus trade restrictions



Impact on international markets and Brazil

Understanding international economic impacts of the F2F-strategy



F2F-impact on Brazil

Figure 42 – Price changes: F2F

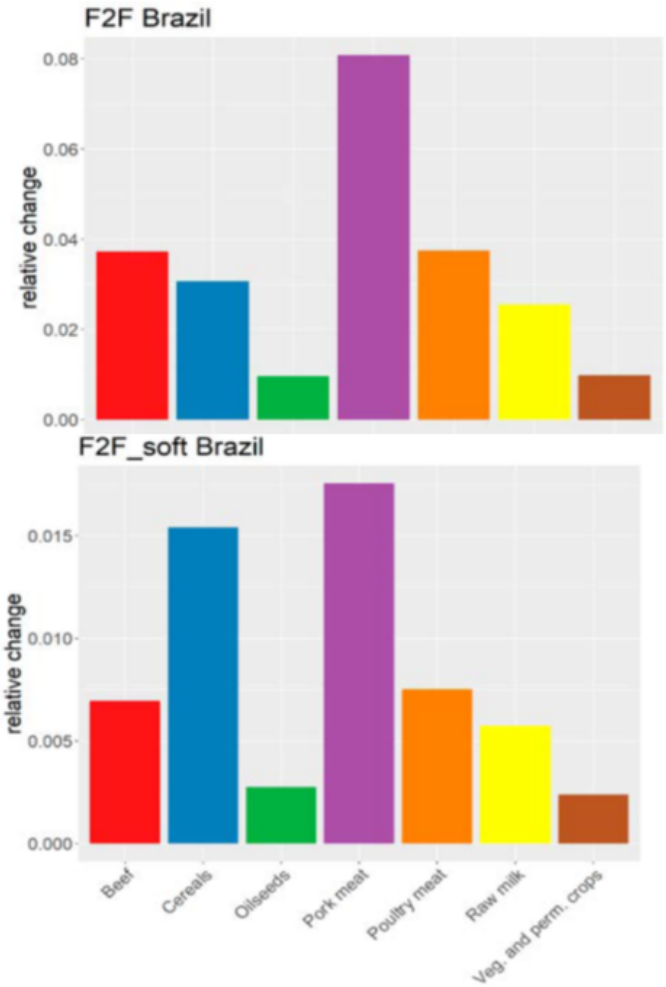
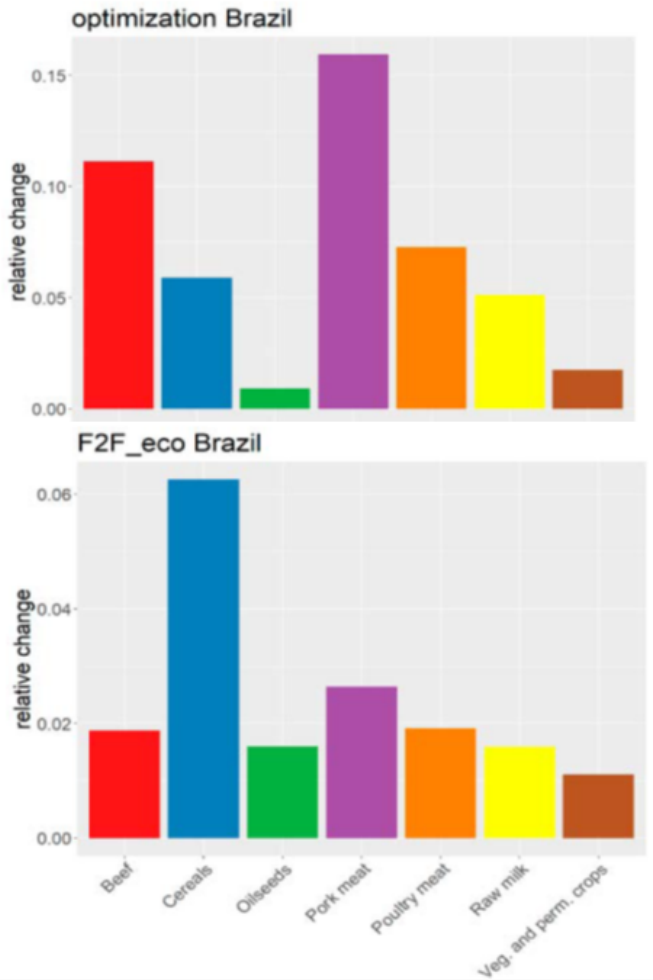
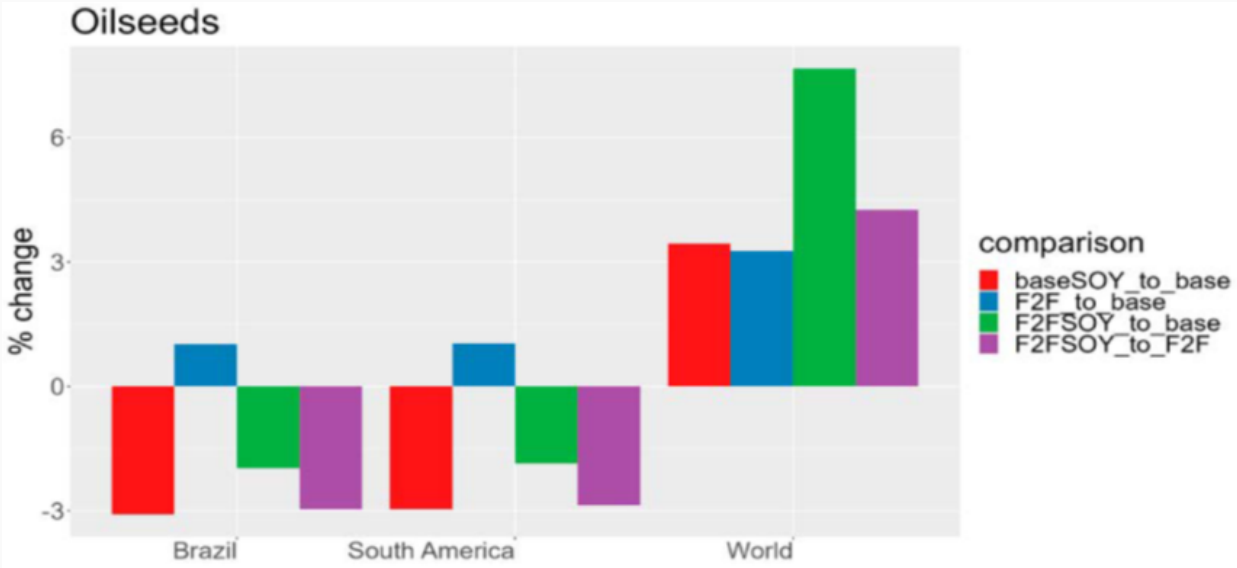


Figure 43 – Price changes: F2F_optimal

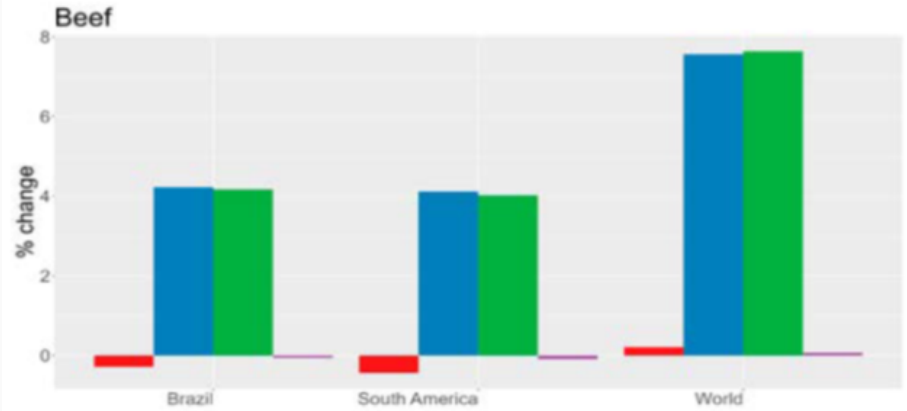


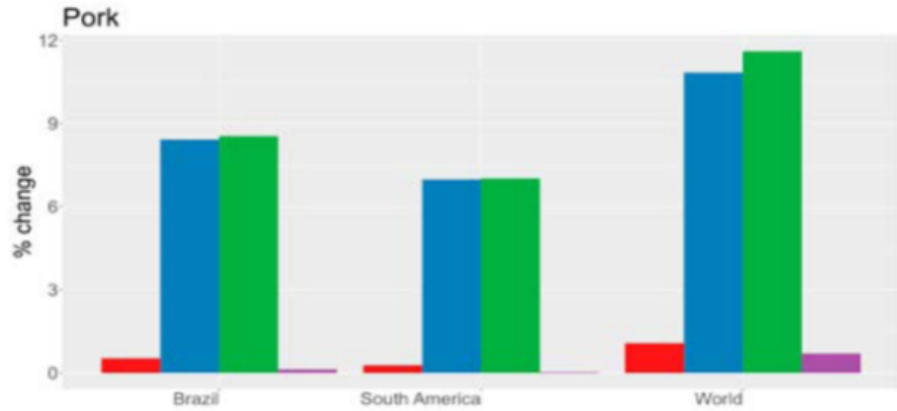
Soja ban and F2F-impact on Brazil



Impact on Eco-system servicesl:

- Global Carbon sequestration: + 1.4 Mio ha forest
- Increase biodiversity
- GHG-emission from agr. negative net-effect +6.2 Mio t GHG





Political feasibility

Impact of F2F-options at member state level

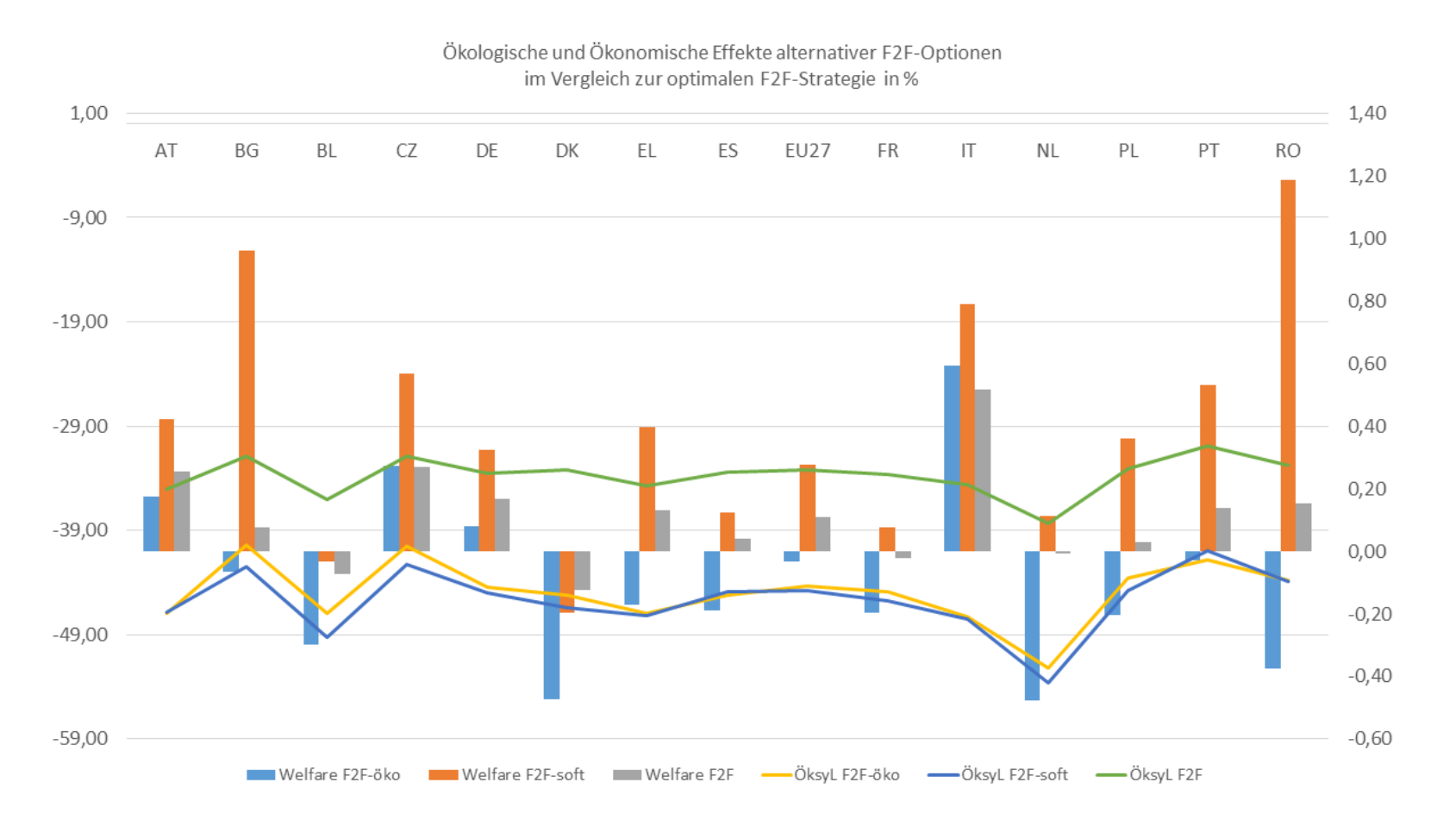


Figure 1: Economic and ecological impact of F2F-options for EU-member states in % to optimal F2F-strategy

Take-away messages

A. Great Improvements in eco-system services:
   - increased reduction in nitrogen pollution from 50% (F2F) to almost 80% (optimal F2F).
   - reduction in GHG-emissions (including leakage effects) from 29% (F2F) to over 60% (optimal F2F),
   - increase in biodiversity from 15% (F2F) to over 25% (optimal F2F)

B. Win-Win situation for consumers and farmers:
   - consumers realize an overall increase in net-welfare by 60% comparing total economic and ecological impacts of Commission F2F to impacts derived under the optimal F2F
   - farmers would also realize a similar increase in net-welfare ranging from 60% (F2F) to over 200% (optimal F2F)

C. Agribusiness industry is looser of sustainable food system transformation:
   - agribusiness industry would realize a total economic welfare loss (without ecosystem services) increasing from -25% (F2F) to over 40% (optimal F2F)

Take-away messages:

D. International perspective on Greening the CAP:

- All **F2F-options** induce an **increase in international prices** for both crop and animal products. However, compared to induced increases in EU-prices international price increases induced by F2F-implementation are rather low ranging between less than 1% and 8% in Brazil. Interestingly, induced price increases are significantly higher if the optimal F2F-option would be implemented with an increase of 10% for beef and even 15% for pork meet, while for the implementation of the F2F-eco as well as F2F-soft option international price effects are almost neglectable.
- Given the fact that **Brazil** is one of the largest, if not the largest, producer and exporter in the world for beef, pork and poultry meat as well as soy, induced price increases especially for these products c.p. imply **positive economic welfare effects** for Brazil. However, analogously to the EU these induced **welfare effects are asymmetrically distributed across farmers and consumers**, where the latter c.p. realize losses due to increase food prices.
- In contrast, to the discussed five F2F-measures a particular measure corresponds to the ban of soy imports into the EU. In contrast, to all other F2F-measures **soy ban has a negative impact on international soy prices and hence on economic welfare** realized by **Brazil**. However, analysis of the impact of soy ban reveals that induced price decrease in oilseeds prices are still relatively modest ranging between -3% to -5%.
- Overall, our analyses imply that from a social welfare perspective of Brazil the implementation of the optimal F2F-option would be most preferable, while the F2F-strategy suggested by the European Commission as well as the F2F-eco and the F2F-soft option are far less favorable to Brazil. However, these **conclusions do not yet include** induced **changes in local ecosystem services**, e.g. changes in biodiversity and nitrogen pollution in Brazil. Given the fact that **F2F-options** induced production shifts from EU to Brazil the picture might change taking **negative spillover effects in local ecosystem services** into account. Analogously, a **soy ban** obviously will imply a reduction in soy production in Brazil, which, ceteris paribus, would **decrease negative environmental damages** induced by soy production in Brazil. Hence, for a final evaluation of F2F-impacts on total welfare in Brazil a more detailed analysis would be required.

Take-away messages:

E. Greening the CAP: A tragedy of the Commons?

- Assuming national governments of all **EU member states** would be benevolent dictators **maximizing the social welfare of their country** it turns out that the optimal **F2F**-option corresponds to a **win-win situation**, i.e. in essence all EU-members states would unanimously prefer this optimal F2F-option.
- However, in **political reality** democratically elected governments can rarely be considered as social welfare maximizing, but rather policy preferences of electoral support-seeking governments are determined by the political will of their electorate. The latter is **dominated by simple narratives and biased policy beliefs** that are formed in complex political communication processes. **Empirical analyses imply** that these processes at least in Germany are dominated by **two narratives** implying two **dominant policy options, F2F-eco and F2F-soft**, respectively. Accordingly, forecasting future policy decisions it appears most realistically that a compromise between these options and the original F2F-proposal will finally be implemented in EU-member states.
- Given the fact that our analyses clearly indicated that both options, F2F-soft, F2F-eco and the original F2F-proposal, **are extremely inefficient** when **compared** to the scientifically identified **optimal F2F-option** a **fatal dilemma between society welfare and political feasibility results**.
- A **potential solution of this dilemma** corresponds to an **effective and interactive science-society communication**, where scientists effectively communicate true policy impacts and stakeholders adapt their policy beliefs and narratives to scientific knowledge. However, as our analyses also show, the latter is not only a technical matter, as at least the selection and proclamation of narratives are always at least partly also strategically motivated.
- Finally, these results support the **importance of political dialogues between science and society** as well as between stakeholders of different countries, like the one that initiated this project report.

Thank you for your attention!

Presented results based on a study of Henning et al. 2021 financed by the **Grain Club** and a study of Henning et al. 2023. The complete studies can be downloaded at
Henning et al. 2021:
www.bio-pop.agrarpol.uni-kiel.de/de/f2f-studie
and
Henning et al. 2023
https://de.apdbrasil.de/green-deal-auswirkungen-auf-den-agrarsektor-in-der-eu-und-in-brasilien/