Economic impact Assessment of the F2F strategy

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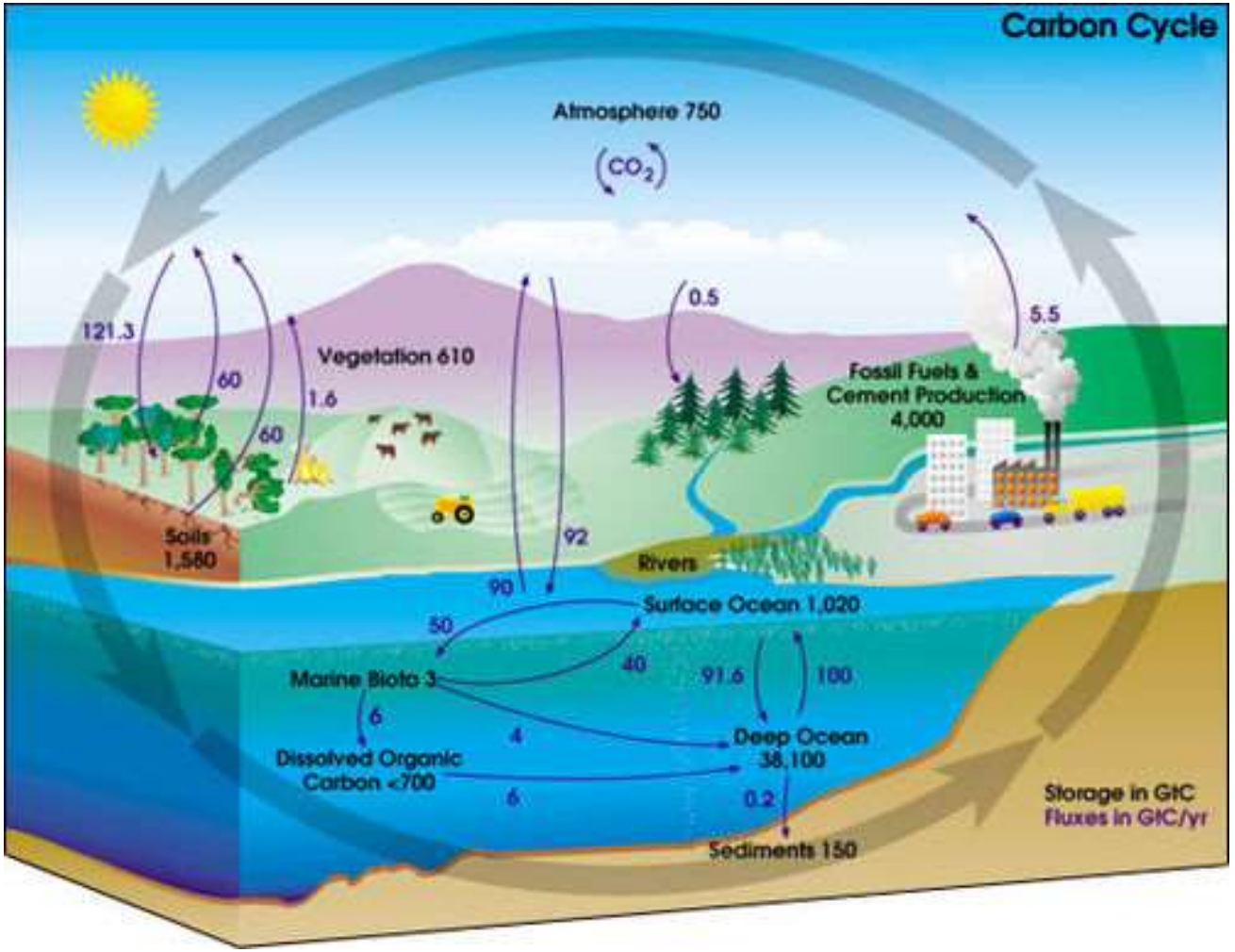
Farm2Fork

- EU “Green Deal”
- SDGs
- Climate Change
- Sustainability

Spaceship Earth: The Carbon Cycle



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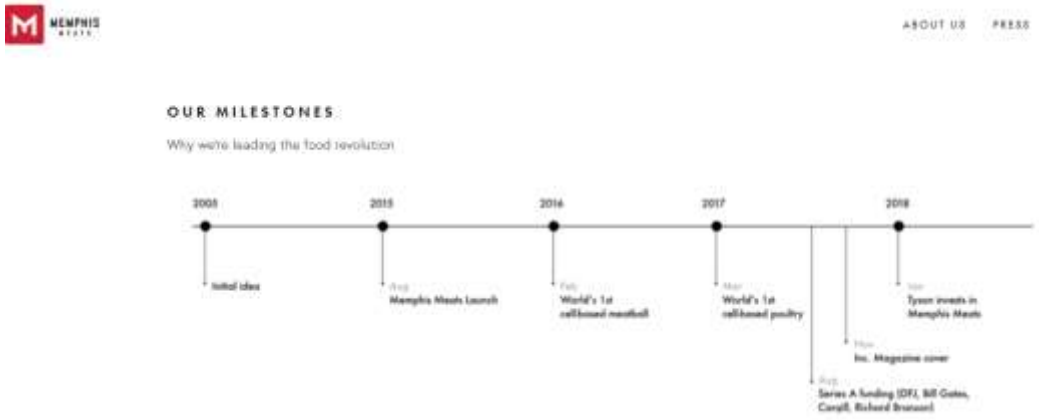
Source: https://www.nasa.gov/centers/langley/news/researchernews/rn_carboncycle.html

Five major developments: “Clean Meat”

- Animal Welfare
- Environmental Friendly (?)
- Disruptive, but when?



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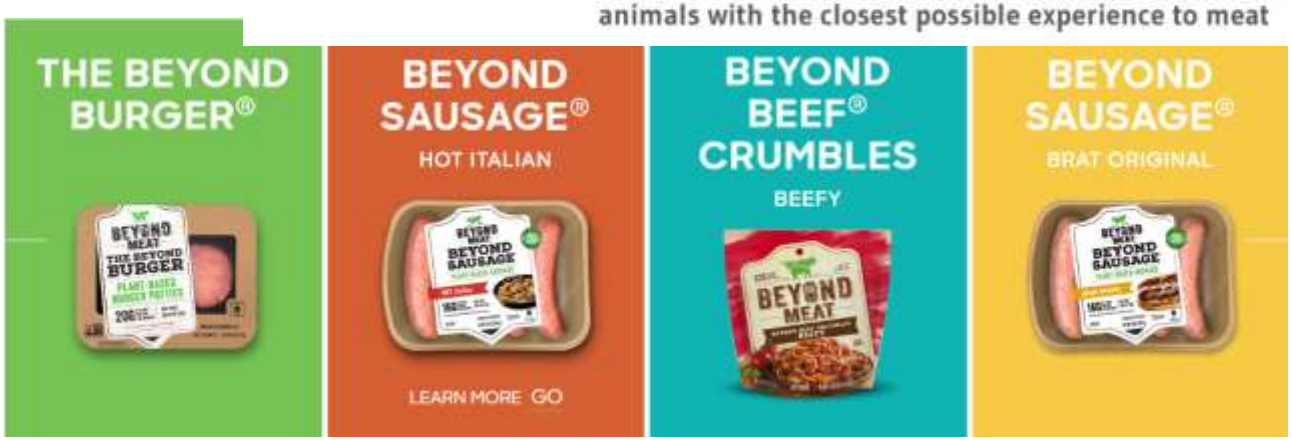
Five major developments: Meat Substitutes

- Taste
- Environment
- Animal Welfare

redefine meat

IT'S TIME TO REDEFINE

Redefine meat technology allows to create the complex experience of eating meat - with full control of all cooking properties. Redefine Steak is made from existing, safe, healthy and sustainable ingredients, 0 animals with the closest possible experience to meat



Five major developments: Insects

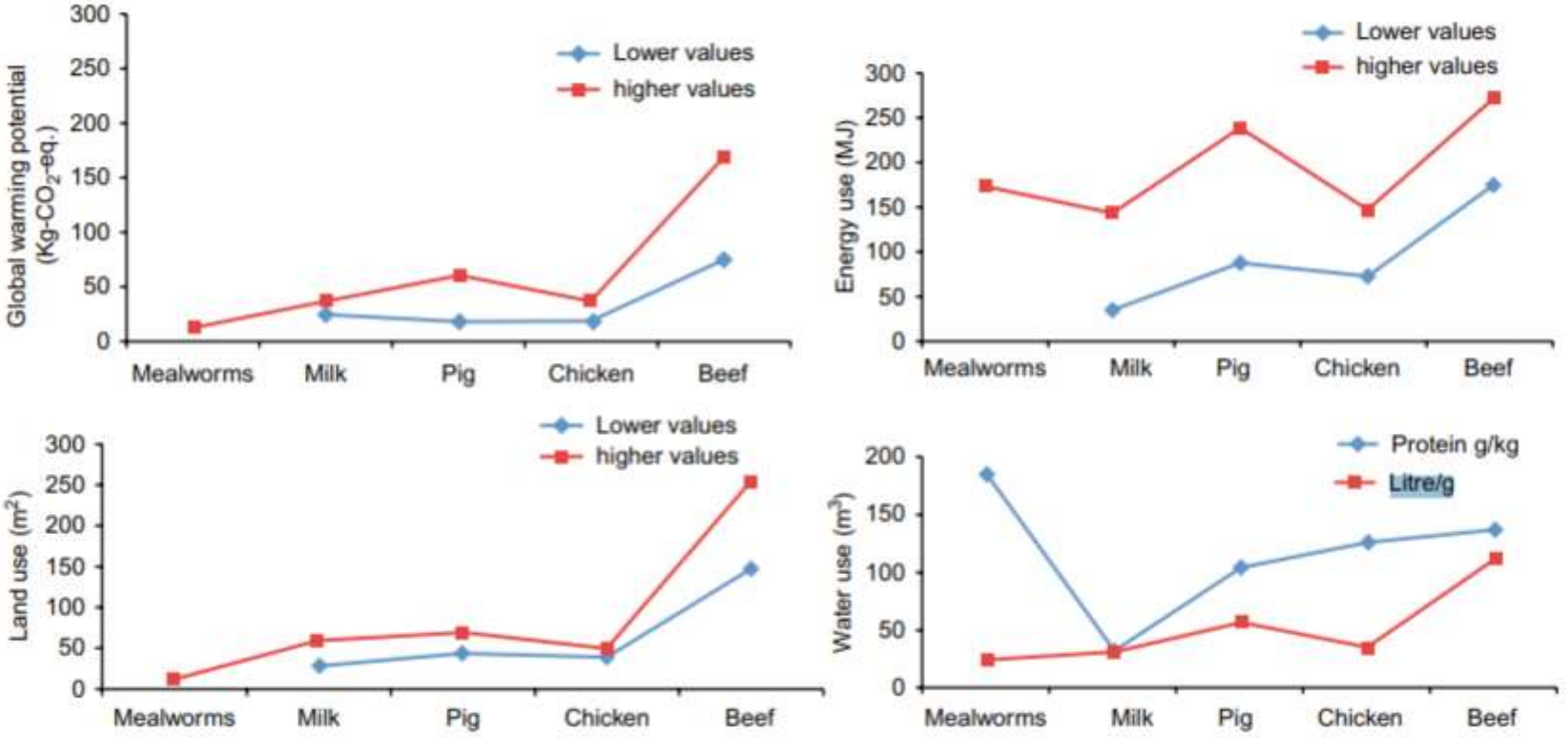


Fig. 10.8 GWP, energy, and land use for the production of 1 kg of protein from mealworms (*T. molitor* and *Z. morio*), milk, and traditional meat sources. WF per unit of protein (L/g) was obtained by dividing the WF per edible ton (m^3/t) of mealworm (4341), pig meat (5988), chicken meat (4325), and beef (15,415) by the amount of proteins (g/edible kg) based on Mekonnen and Hoekstra data (2010). Source: Akhtar and Isman (2018).

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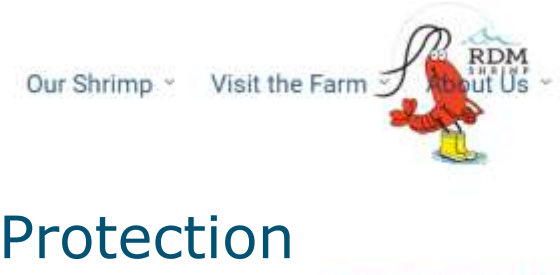
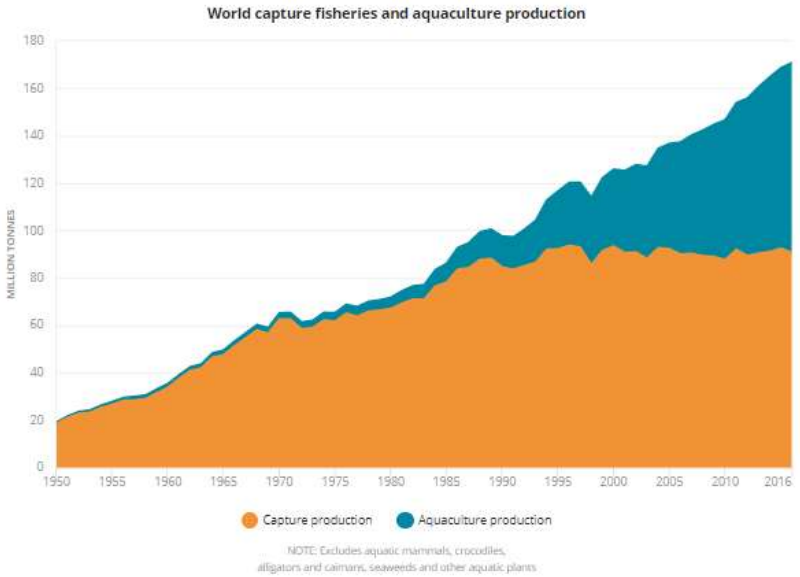
Five major developments: Aquaculture

- Salt
- Coastal Protection
- Food Safety





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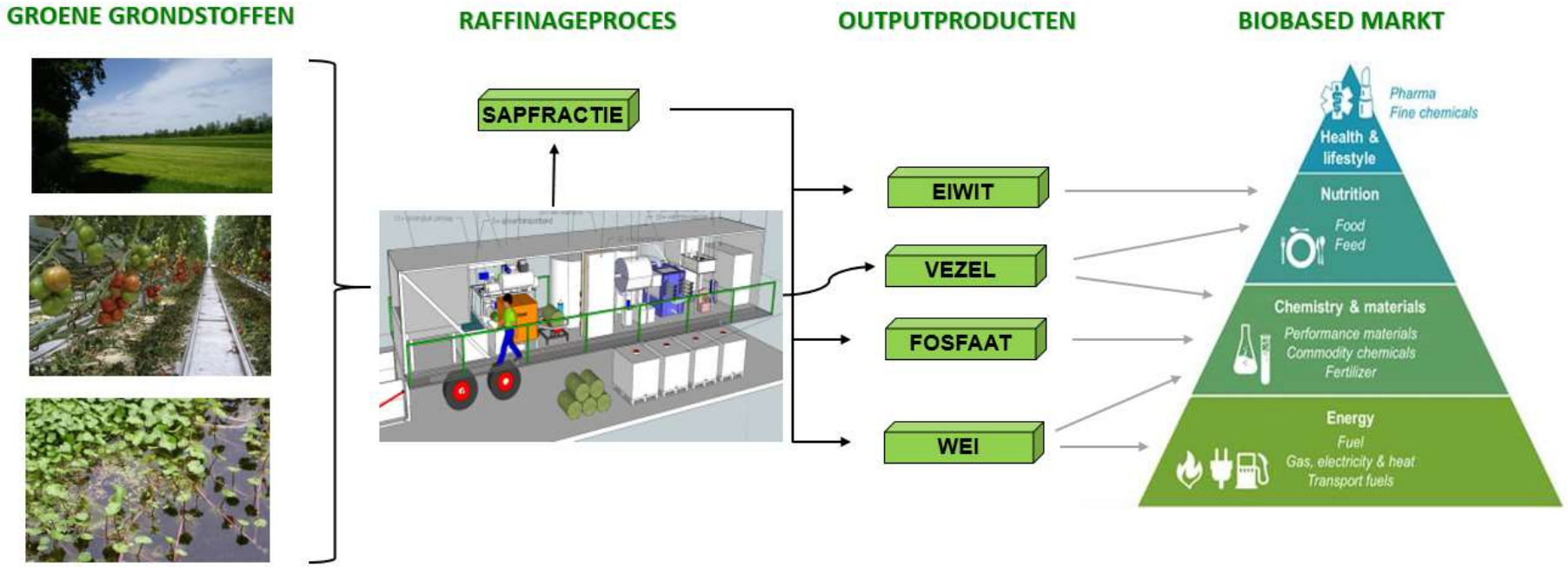
Five major developments: Vertical Farming

- LED - Lightning
- Less pollution

New Opportunities for Agriculture?



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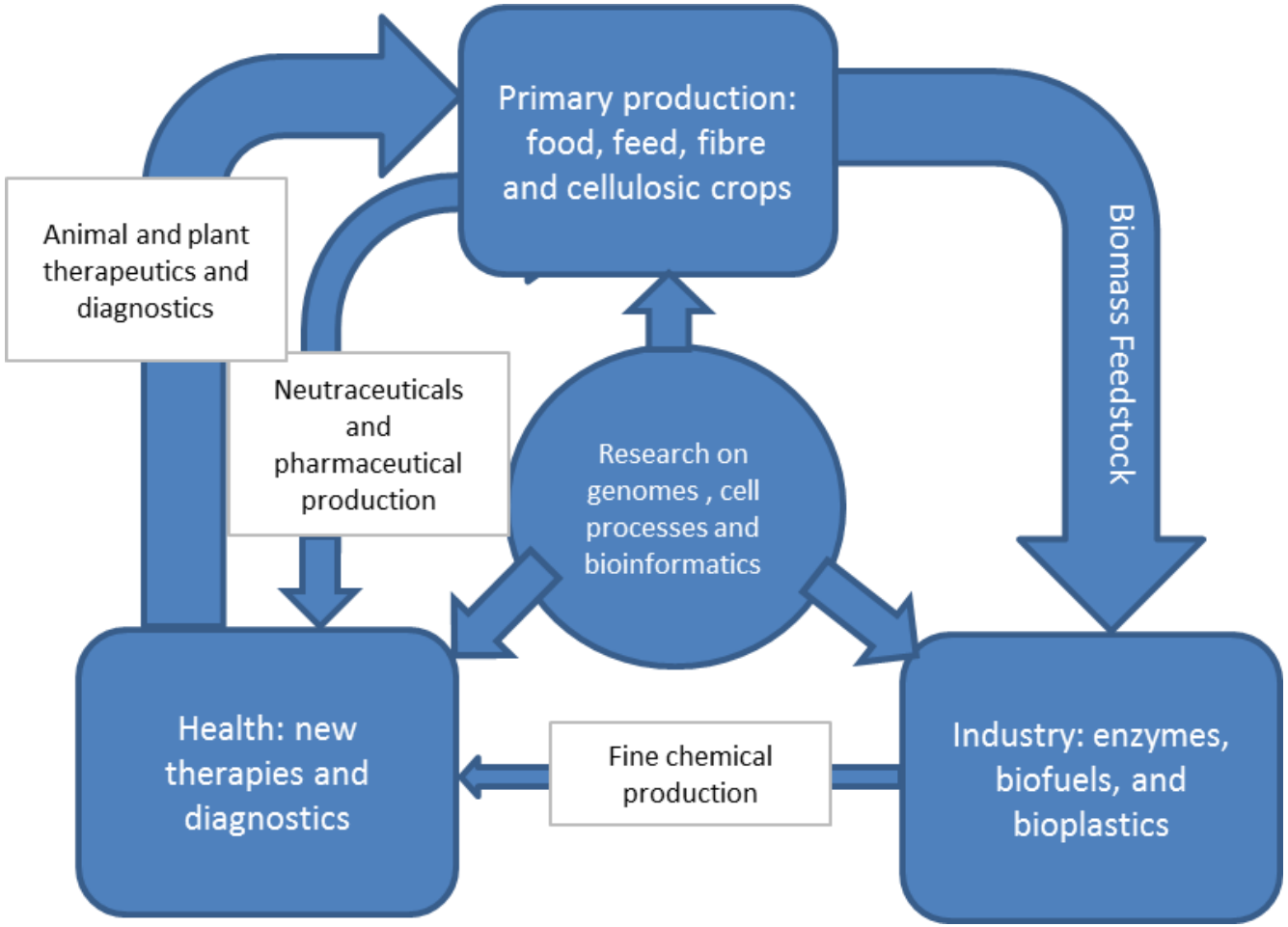
Advances in biological sciences



Current and expected integration across biotechnology application (size of arrows indicate quantities)

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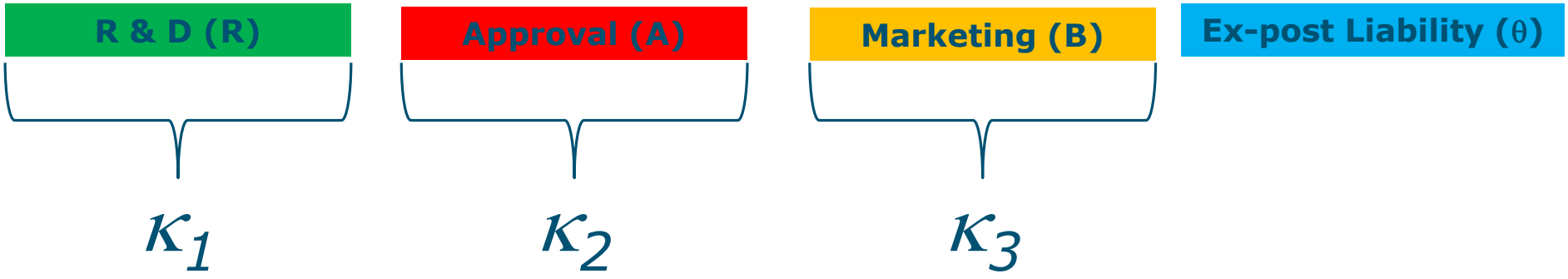
Regulatory Implications: Model

- Four phases: R&D, Approval, Marketing, Ex-post Liability



- Effect of Regulation on Immediate Investment

Purnhagen and Wesseler (2019).

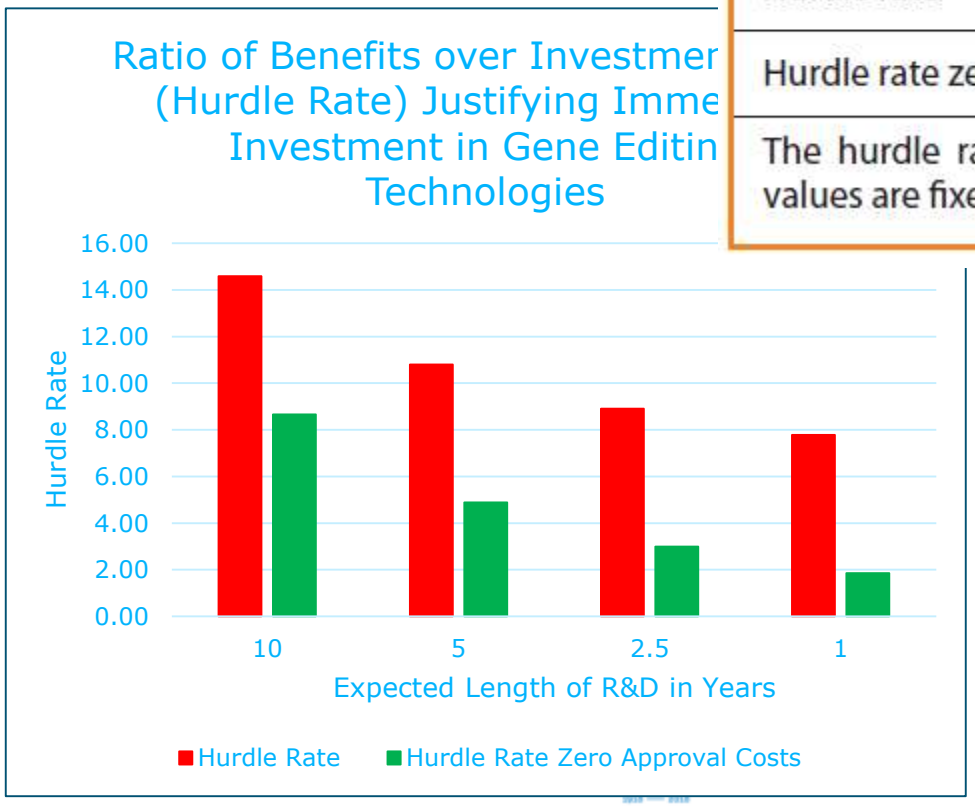
Policy Environment Important !

- Example: NPBTs
- CJEU decision

Table 1. Hurdle rates for different parameter values

$E(\kappa_1)$	10	5	2.5	1
Hurdle rate	14.59	10.80	8.91	7.78
$E(\kappa_2)$	10	5	2.5	1
Hurdle rate	14.59	10.70	8.76	7.59
Hurdle rate zero approval costs	8.66	4.88	2.99	1.86

The hurdle rates are calculated applying Eqn (6). Other parameter values are fixed at $\mu = 0.04$, $q = 0.5$, $E(\kappa_i) = 10$ if not otherwise.



Purnhagen and Wesseler (2019).

Challenges

- Timing: research & innovation
- Monitoring: linking biomass and economic flows
- Business models/Supply Chains

Summary

- F2F not new, but more important -> mind set!
- Economic factors important for impact -> opportunity costs!
- Agriculture: changes and new opportunities -> new supply chains
- Policy: R&D, regulation

Many thanks for your attention!

Resources

- European Commission (2020) Farm to Fork Strategy. European Union: https://ec.europa.eu/food/sites/food/files/safety/docs/f2f_action-plan_2020_strategy-info_en.pdf

- Wesseler, Justus (2015) Agriculture in the Bioeconomy - Economics and Policies. The Netherlands: Wageningen University.