Design of a Circular Economy: Some Comments about implementing a successful Concept (HERAKLION 2019)

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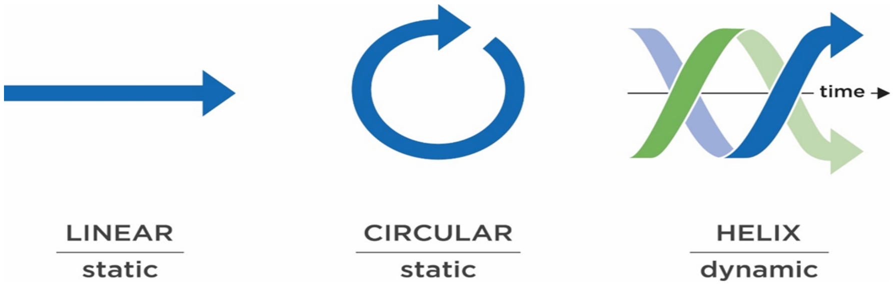
Outline

1. Circulatory or helical economy: Away from the static-linear economy
2. Finitude vs. Scarcity
3. Recycling is an instrument and not a goal
4. Demand for market-driven and sustainable business models (Disruption!)
5. Summary

1. Circulatory or helical economy: Away from the static-linear economy



Circular economy: Static cycles, i.e., material re-use

Helix economy: Dynamic entanglements, i.e., complex material (re-)use.

Justification or necessity:

- Finiteness of certain resources → limited availability
- Climate protection / emission reduction
- Securing your own raw material base (keyword: urban mining)

Relevant questions: - Are the arguments valid? - Have we taken the right path?

2. Finitude vs. shortage

Finiteness = Quantitative limit of non-renewable resources

→ Fear of production restrictions and thus abandonment of the product.

⇨ Concern for benefit and welfare losses

Thesis: Earth is neither a closed nor a static system!

Consistency: Permanent energy supply

Against static: Innovation as a permanent "creative destruction" (Schumpeter)

Finitude does not really trigger an end-time scenario?

(Against hysteria and apocalypse)

Former Saudi energy minister:

"Stone Age did not end with the lack of stones. Nor will the oil age come to an end with a lack of oil. "

Resources are subject to scarcity conditions
→ Scarcity ≠ Deficiency, poverty
→ Scarcity = Manifestation of the competition of usage
→ Scarcity has no threat potential, but is a necessary condition for economic decisions and processes (quasi: conditio sine qua non)

Scarcity level is determined
a. through the stock size: Resources or reserves and
b. by the current size: Consumption or degradation - triggers
c. Market valuations and consequently
d. Adaptation processes!

Reaction chain:

Increasing scarcity → rising prices

⇨ Possible consequences:

- Exploration (turning reserves into resources)
- Use of inferior deposits (keyword: shale gas, fracking, ...)
- Substitution (keyword: other commodity, other source of raw material, ...)
- Efficiency (keyword: higher specific yield per input unit)

Distinction between

1. Global vs. political effects

   Global aspect: - Circulatory / helical economy
   - Dynamic adjustments (see above)

   Political aspect (here: raw materials as a political weapon):
   - Long-term contracts
   - Circulatory / helical economy with political prices for certain recovered materials

2. Long-term vs. short-term effects

   Long-term aspect: - Circulatory / helical economy
   - Dynamic adjustments (see above)

   Short-term aspect: - Anticipative resilience strategies (here: warehouse management, long-term contracts)
   - Substitution measures
   - Withstand

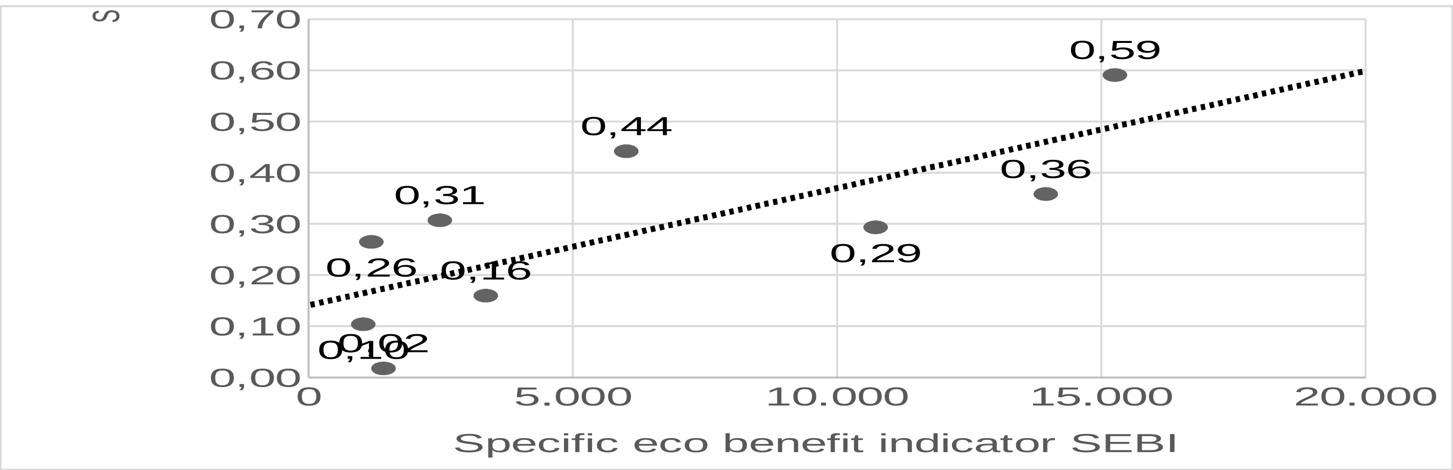
3. Recycling is an instrument and not a goal

The concept of circular economy is implemented by a variety of instruments:

- Longevity
- Cascade usage meaning re-use (from superior to inferior)
- Reuse
- Recycling (meaning, reuse of certain secondary raw materials)
- ....

Note: Sinks are an elementary part of the circular economy !
Recycling can be ecologically harmful!

Recycling leads to economic and ecological limits!



Source:
Bunge, R.,
HSR-Hochschule für Technik,
Rapperswil, Switzerland

Especially efficient are systems close to the market. That means recycling activities can be re-financed partly or mainly by revenues of recovered secondary materials.

SEBI = **S**pecific **E**co **B**enefit **I**ndicators

$$= \frac{Avoided\ environmental\ impact\ [aEBP]}{Additional\ costs\ [EURO]}^{*\ \ **}$$

(Recycling instead of incineration)

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Thesis 1: Maximizing the use of an instrument is meaningless!
Quota specifications in the current form provide only a small constructive input in terms of circulatory / helical economy!
Quota system reinforces current business models!

Thesis 2: Official recycling rate measures "reconditioning" at a certain point in the "value chain" - but does not document the material re-use!

Thesis 3: Without quality requirement, the focus on quantity is “Nonsense" (so-called Müntefering-Lingo) → secondary raw materials without market value counteract the concept of circular economy.

Thesis 4: Inferior secondary raw materials lead to inferior products with negligible reusability (static model approach).
"Inferior products are pre-sinks and block the concept of circular economy!"
Recycling is a dynamic model (keyword: multiple loops)!

4. Call for market-driven and sustainable business models (disruption)

Industrial society generates values and prosperity:

- *People (self-determination, economic existence)*
- *Investments in networks / infrastructure / education / research*
- *Redistribution (social systems)*

Note: Expansion of social systems is based on entrepreneurial success!

Central question: What value and wealth contribution does the circular economy contribute?

- *Relevant markets have often been artificially created and are still being largely subsidized!*
- *Ecological benefits often do not meet the expectations and requirements!*

⇩

Invitation to disruption

New beginning:

- The generated secondary raw material (srm) is remunerated and not the process.
- Quantity x Market price x Scarcity factor = Reimbursement
  (srm) (srm) (political rating)
- Reimbursement prices initially binding for a certain time.
- In certain cases (for example, rare earths), the state assumes the role of buyer.
- Innovations in reprocessing / extraction technologies
- Competition between the srm-dealers
- Value chain "Refurbishment" rsp. „Re-Processing“ is financed (partially or completely) via the instrument "Product Responsibility“.
- If necessary, differentiated deposit systems give waste a lasting market value.

5. Summary

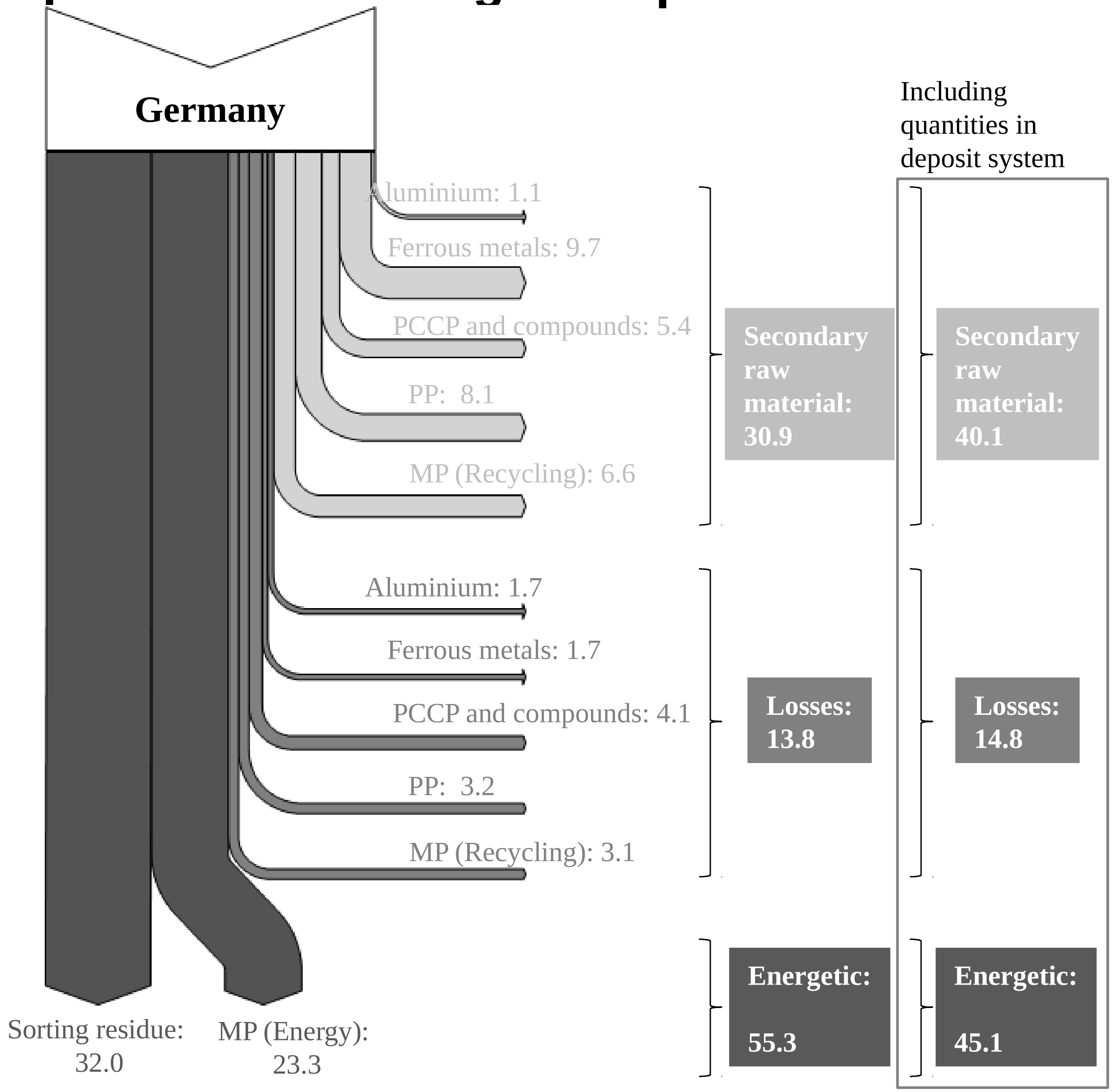
- Finitude of certain resources does not end in apocalypse.
- Scarcity is a necessary indicator of adaptation processes
  → Earth is neither a closed nor a static system!
- Current "Recycling Emperor" is often "naked". Dynamic reuse rates tend to be low. Recycling rates in the current form are not expedient (in the sense of designing a circular economy) and thus unnecessary.

- Without quality from srm quantity is „Nonsense“
  Quality can be read off the market price!

- Circular economy must be an integral part of industrial society
  → Call for disruption
  → Development of viable business models
  (View into the so-called powerhouse of economics)

Thank you for your Attention!

4. Packaging disposal as a striking example.



Reference to adequate economic conditions too imprecise:

Economics

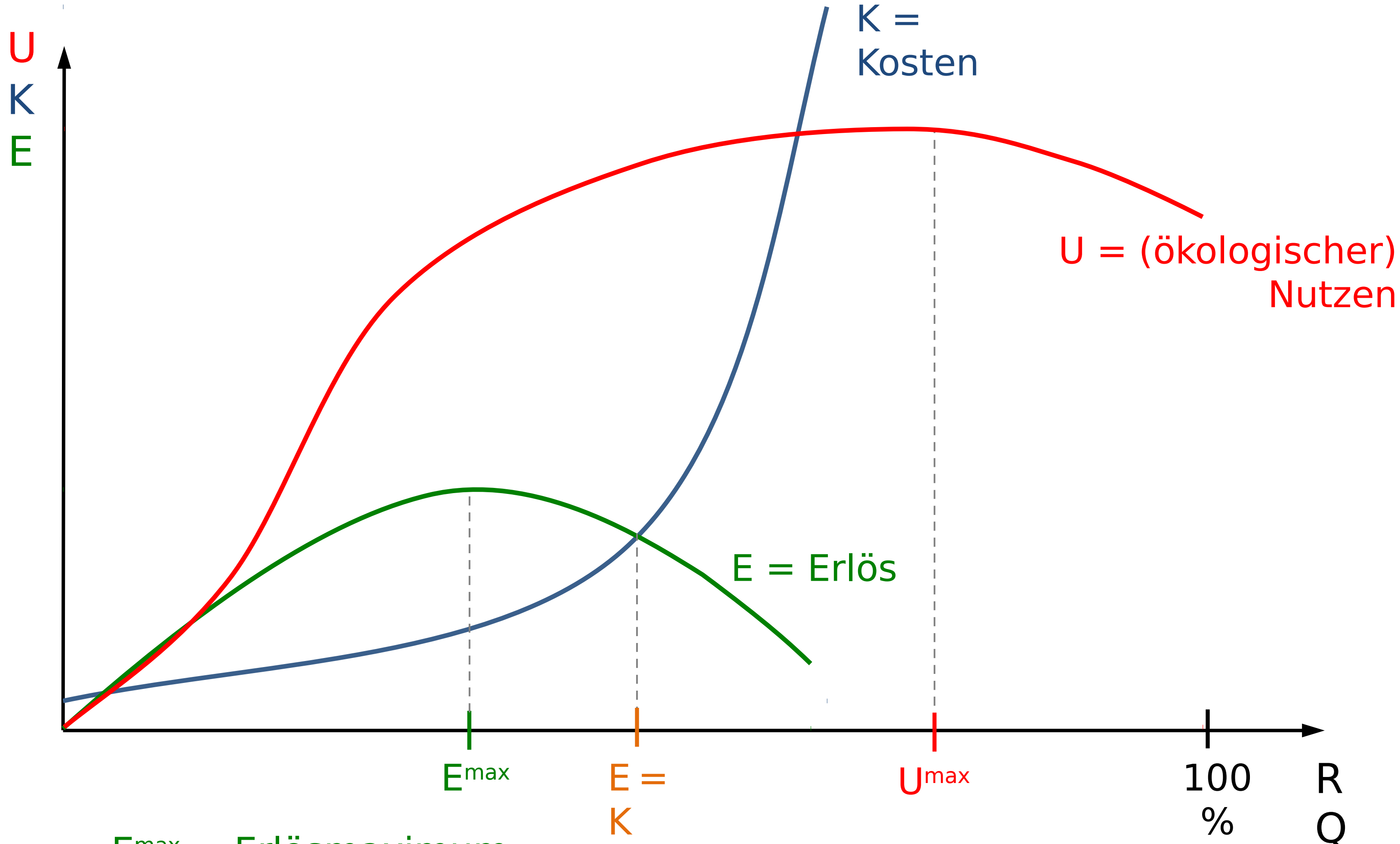
- *Macroeconomics (from the overall system view)*
- *Microeconomics (from the point of view of individual cohorts of economic subjects*)

Business Administration (Operational Economics, Business Administration)

- *General and Functional Business Administration*
- *Management (Business Management)*

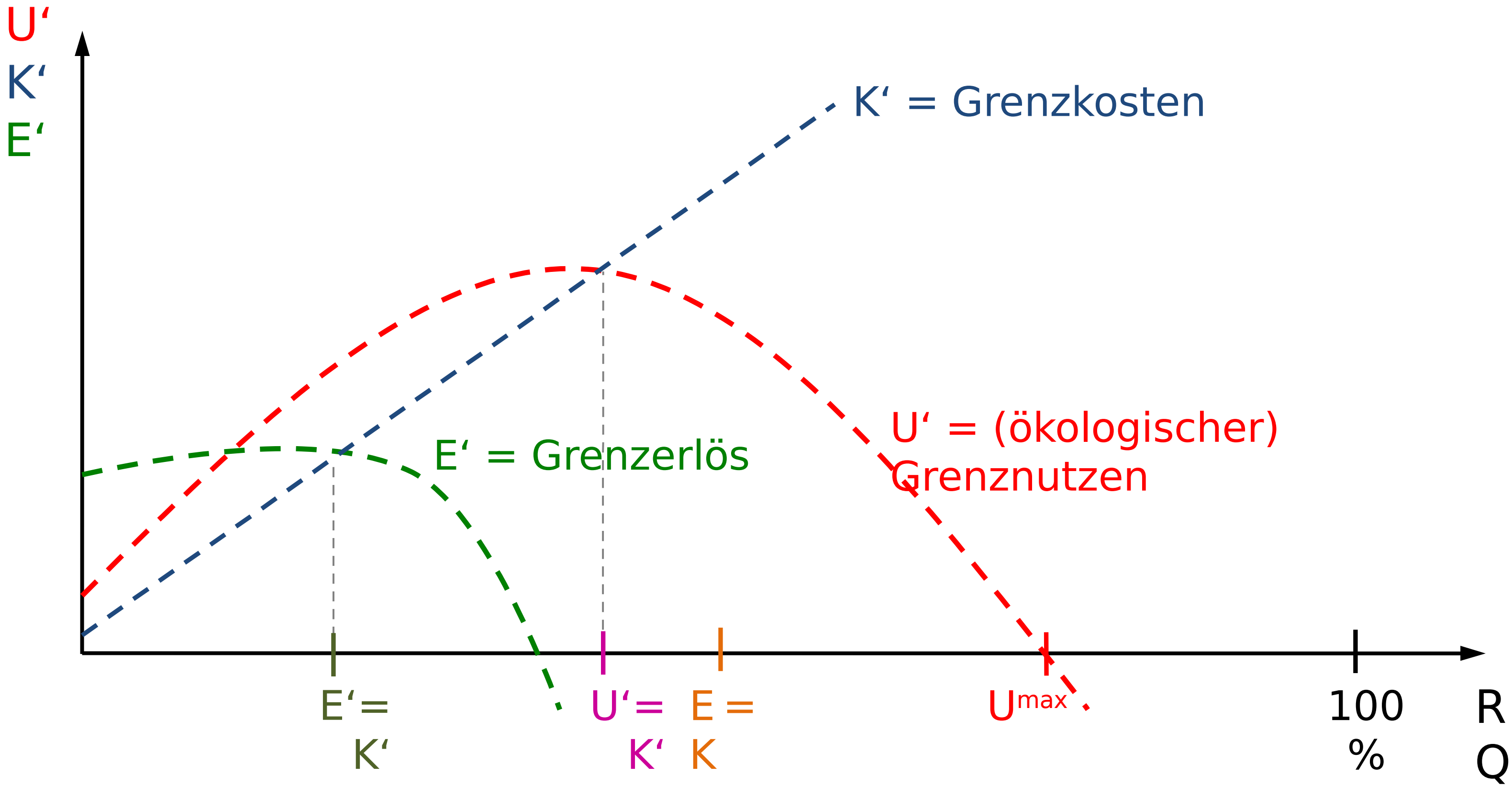
↳ Powerhouse of the individual economic strategies and business models?

↳ Here must the sustainability of the circular economy be anchored.!!!



- E^{max} = Erlösmaximum
- E = K = Umsatzmaximum
- U^{max} = ökologisches Maximum

Variante 1



- E‘= K‘ = (betriebswirtschaftliches) Gewinnmaximum
- U‘= K‘ = volkswirtschaftliches Optimum
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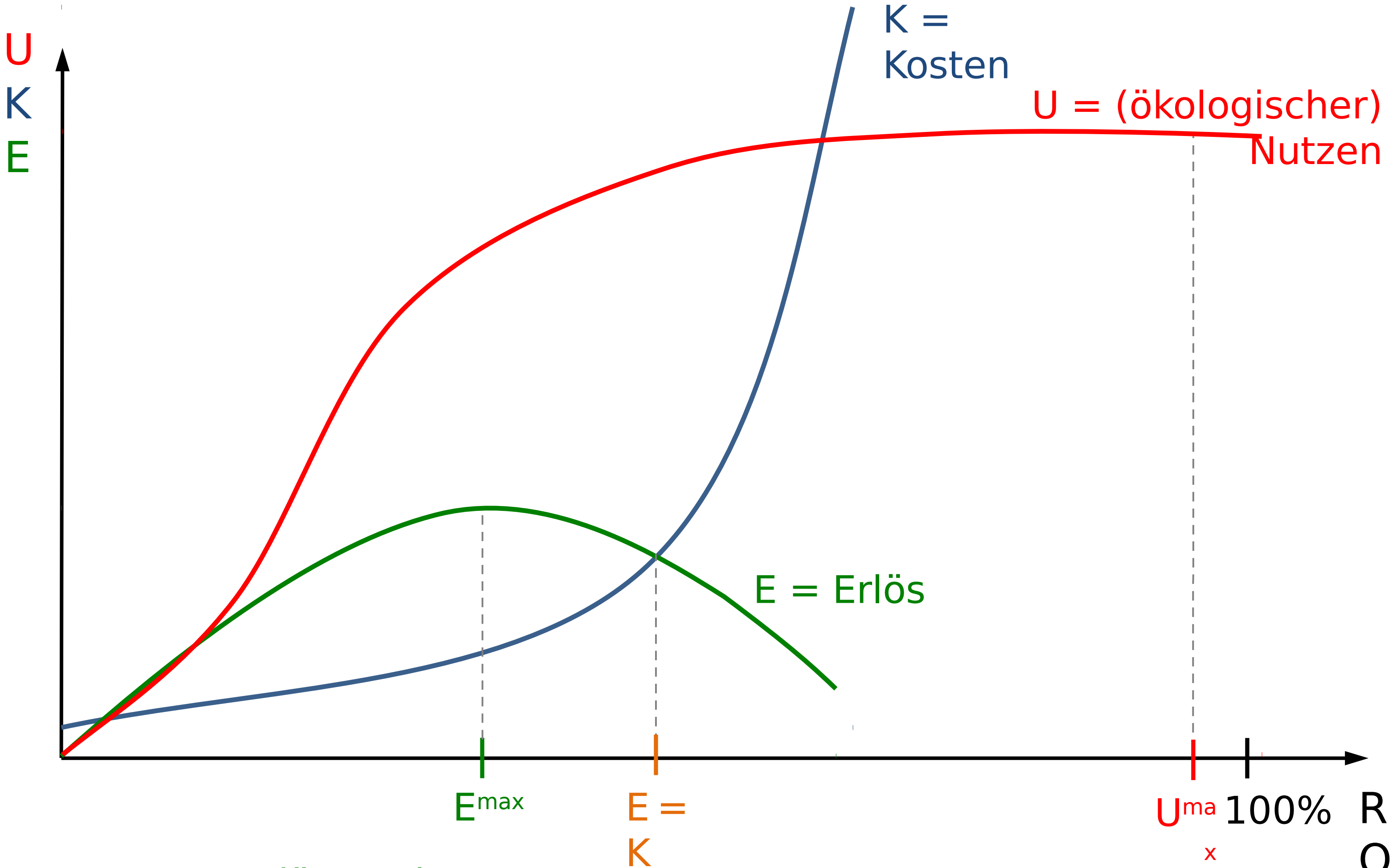
Variante 1



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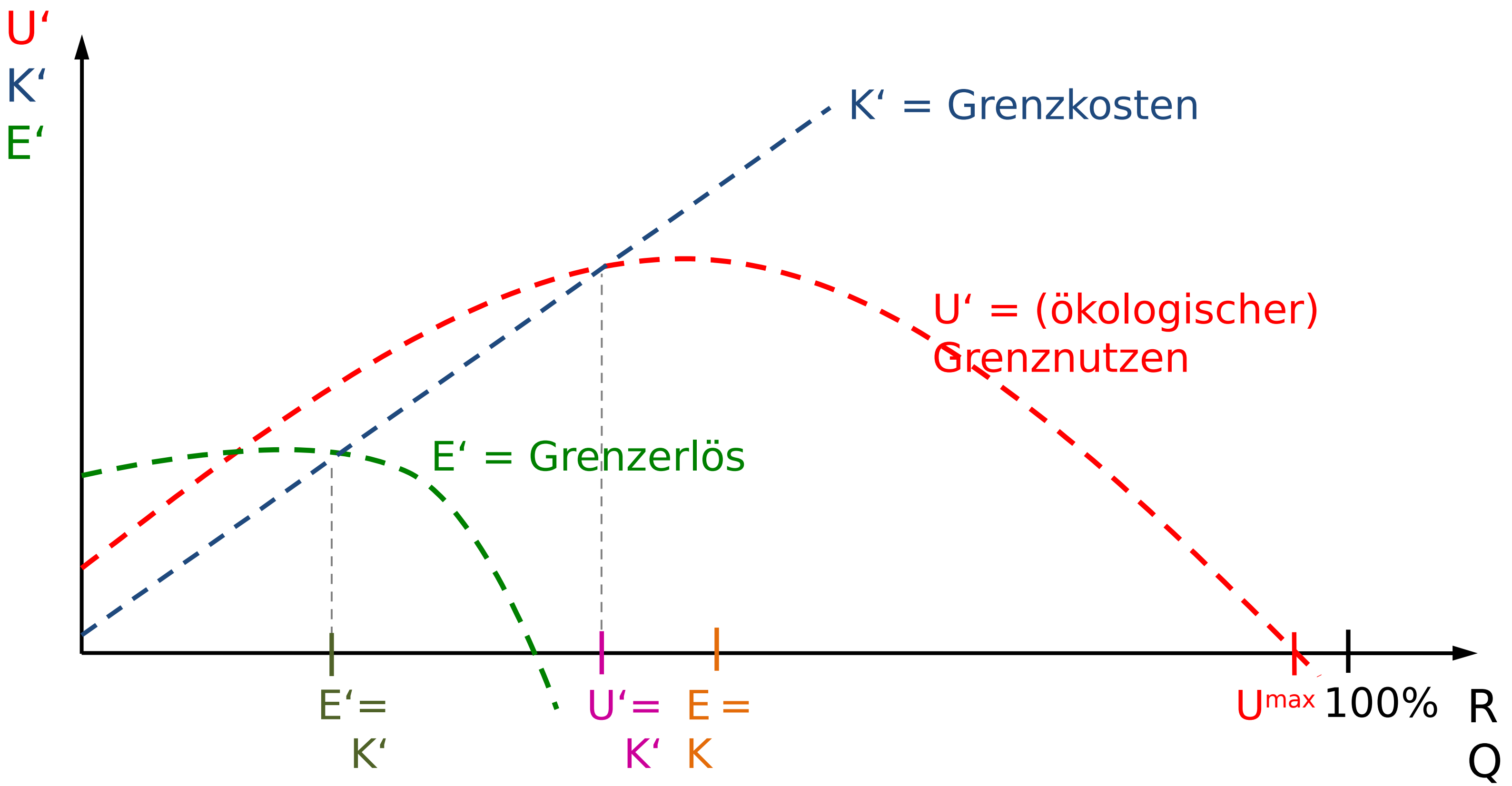
Variante 2



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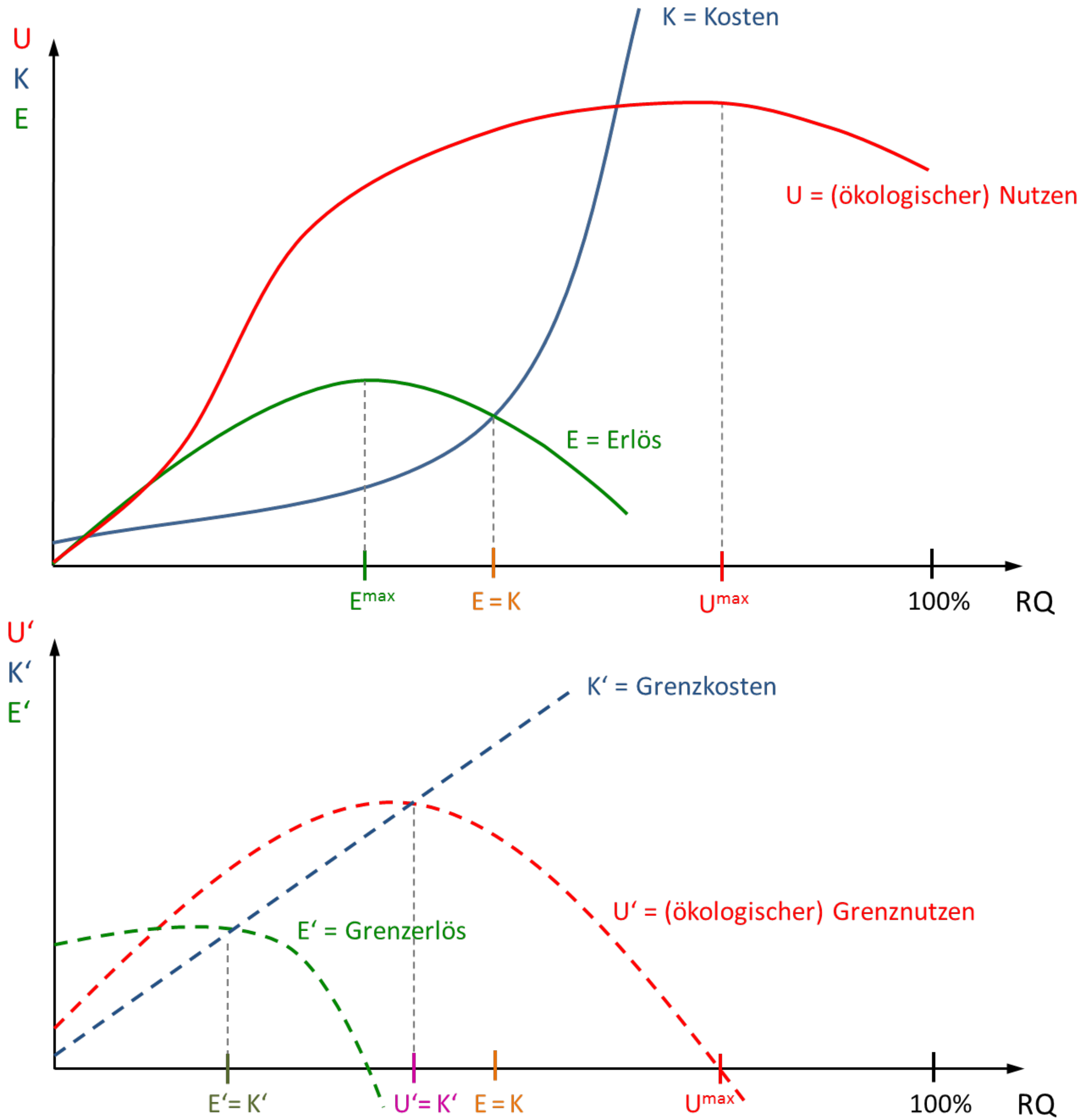

U
K
E
K = Kosten
U = (ökologischer) Nutzen
E = Erlös
Emax
E = K
Umax
100%
RQ
U'
K'
E'
K' = Grenzkosten
U' = (ökologischer) Grenznutzen
E' = Grenzerlös
E'= K'
U'= K'
E = K
Umax
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RQ