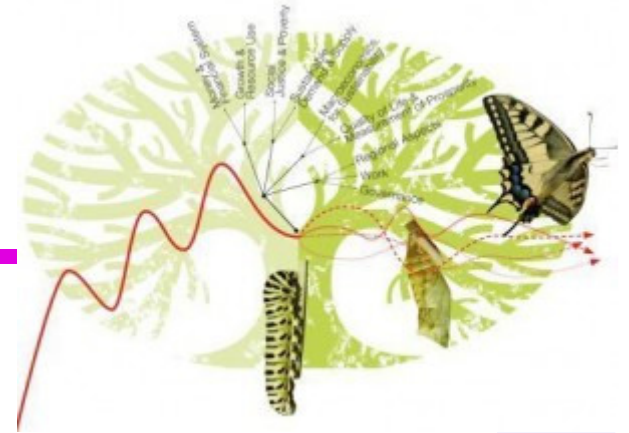


Growth in Transition
28 January 2010, Vienna



Sustainable Production and Consumption From Products to Functionalities

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The problem with economists ...

...they are trapped in outdated paradigms



...since they fall in love with their models

The pitfalls

- welfare from flows
- discounting
- production

$$\max W = \int_{t=0}^{\infty} U(C_t) e^{-\rho t}$$

$$s.t. \quad \dot{S}_t = -R_t$$

$$\dot{K}_t = Q(K_t, R_t) - C_t$$

Glimpses on an emerging new paradigm

The switch from products to functionalities

- Consumption is essentially targeted to functionalities not products
- Products are getting less important for providing functionalities

The functionality of an iPad

Functionalities for
information
communication
emotions



The functionality of buildings (1)

Functionalities for

providing shelter – thermal functionalities

feeling at home – emotional functionalities



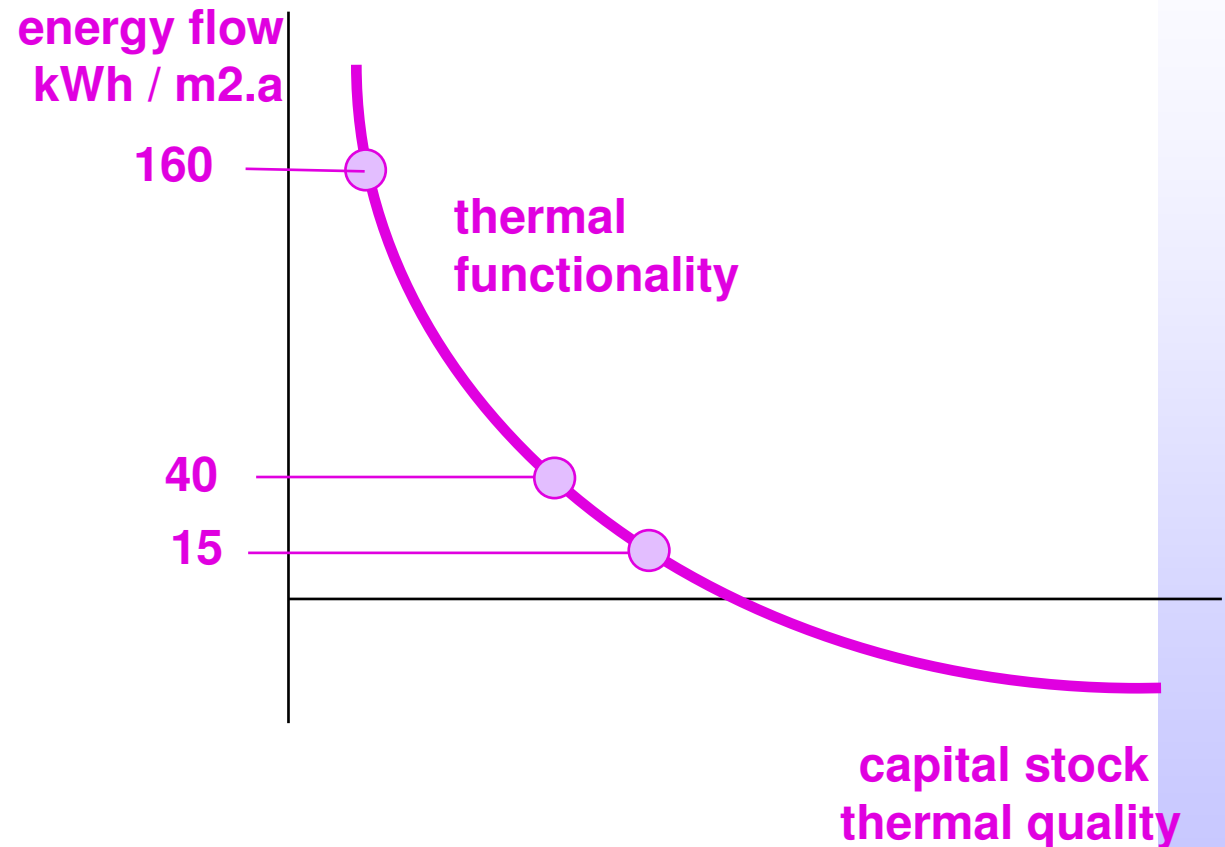
The functionality of buildings (2)

Thermal functionalities

can be provided by a wide range of combinations of

capital stocks (thermal structure) and

energy flows

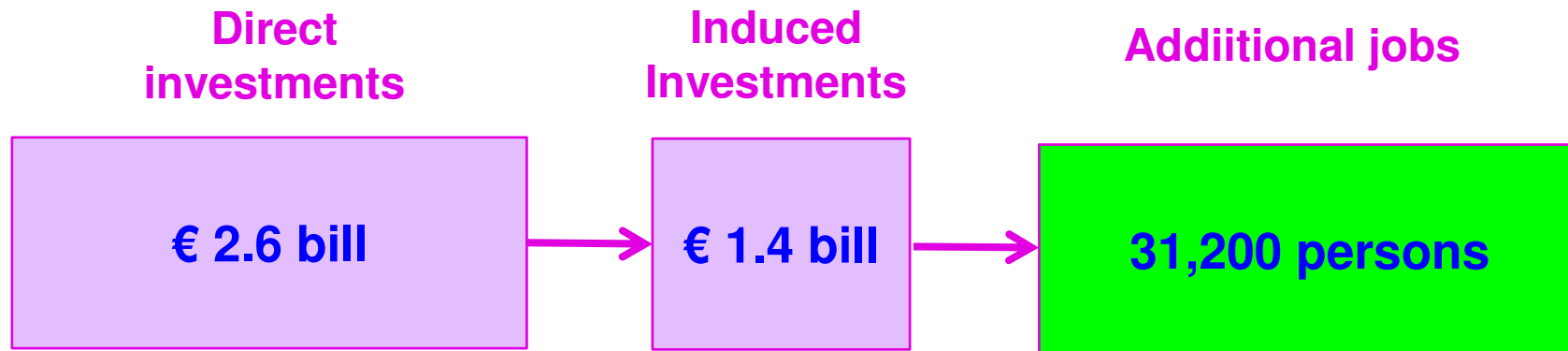


Innovative building designs in Austria



Transformation of the building stock

Renovation program for 3 percent of the stock per year



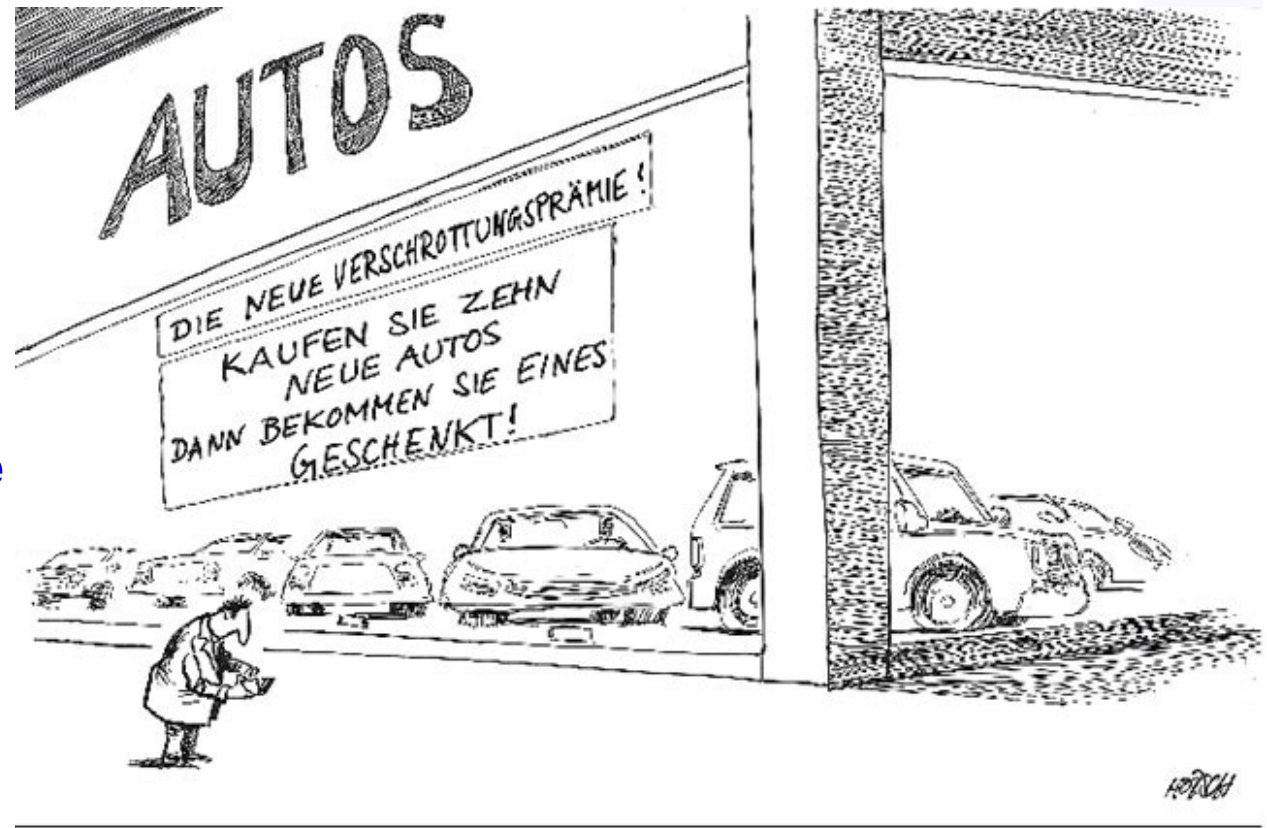
- Low energy standards
- Renewables for heating

The functionality of transport

Functionalities for

moving persons and goods
– mechanical functionalities

But why do we want to move
persons and goods?



Multifunctional cars

Aptera Type-1

- 2(+1) Persons
 - **386 kg** (90% Composite)
 - > 190 km
 - < 0,9 l/100 km
- www.aptera.com



**Multifunctional
Plug-in operation**

**The service is sold, not the product
Individual service plans**

Outline of a new paradigm of consumption and production

The products paradigm

Focus on products and flows

Resources

human
skills

Products

food
cloths
machinery
buildings

reproducible
machin., build.

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The functionalities paradigm (1)

Focus on functionalities

**Func-
tionalities**

thermal
mechanical
communicative
emotional

The functionalities paradigm

Considering an extended list of resources

Resources

natural
water, soil, air

human
skills

mineral
ores

renewable
bio, non-bio

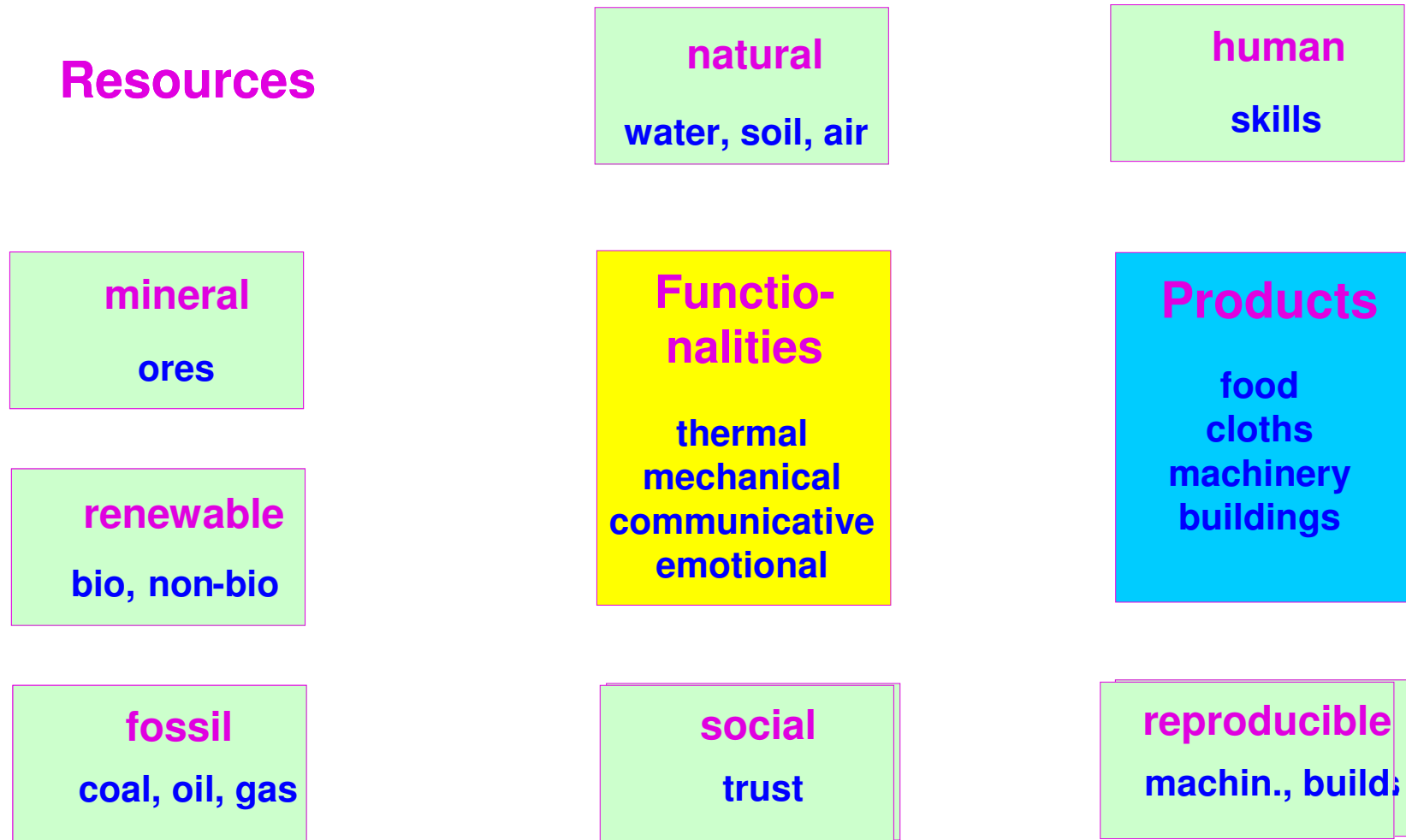
fossil
coal, oil, gas

social
trust

reproducible
machin., build.

The functionalities paradigm (3)

Dealing with all interactions



Perspectives

- **For the long-run**
Welfare from fewer flows but also fewer incomes
- **For the short-run**
The transition phase requires for some time still more flows
- **Measuring and evaluating**
The comprehensive footprint

