



Borderstep Institut

izt Institut für
Zukunftsstudien und
Technologiebewertung



Path dependencies

in socio-technical regimes of the brown economy

Jens Clausen

Borderstep Institut für Innovation und Nachhaltigkeit gGmbH



Bundesministerium
für Bildung
und Forschung



FONA
Sozial-ökologische
Forschung
BMBF



Definition:

The term "path dependency" describes that an event is dependent upon previous events and patterns of activity. The concept of path dependency states in general that earlier events in the chain of events A, B, C, D, E ... have a causal effect on later ones.

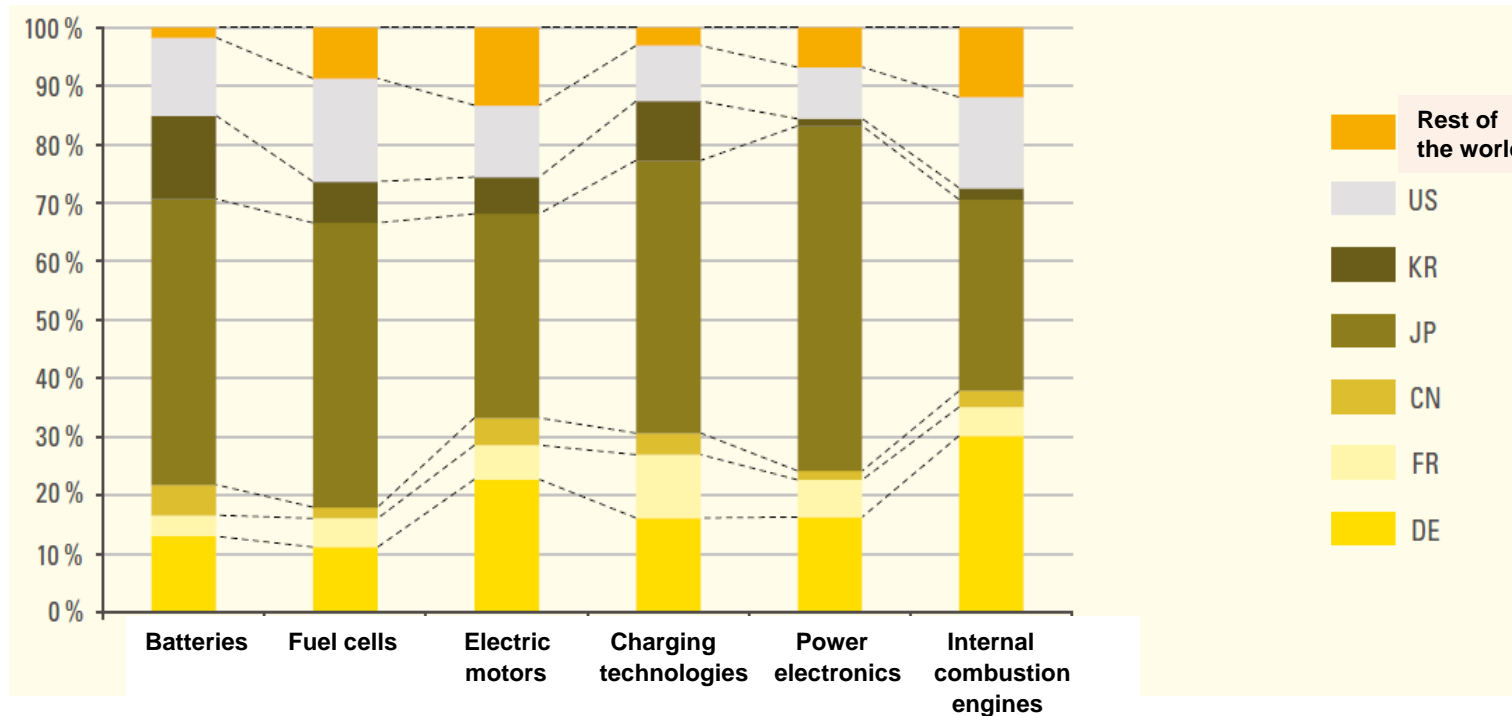


Types of path dependencies

- **Technological path dependencies** generated by a lack of know-how or a lack of complementary products, or infrastructures,
- **Economic path dependencies** resulting e.g. from capital investments or cost of path change,
- **Organizational path dependencies** resulting from process routines, corporate culture culture,
- **User-specific path dependencies** based on perceptions of uncertainty, behavioral routines, and cultural norms,
- **Legal path dependencies** based on laws, subsidies, technical norms, and approval requirements.

Technical Path Dependencies

Lack of Know-how and patents for electric car technologies

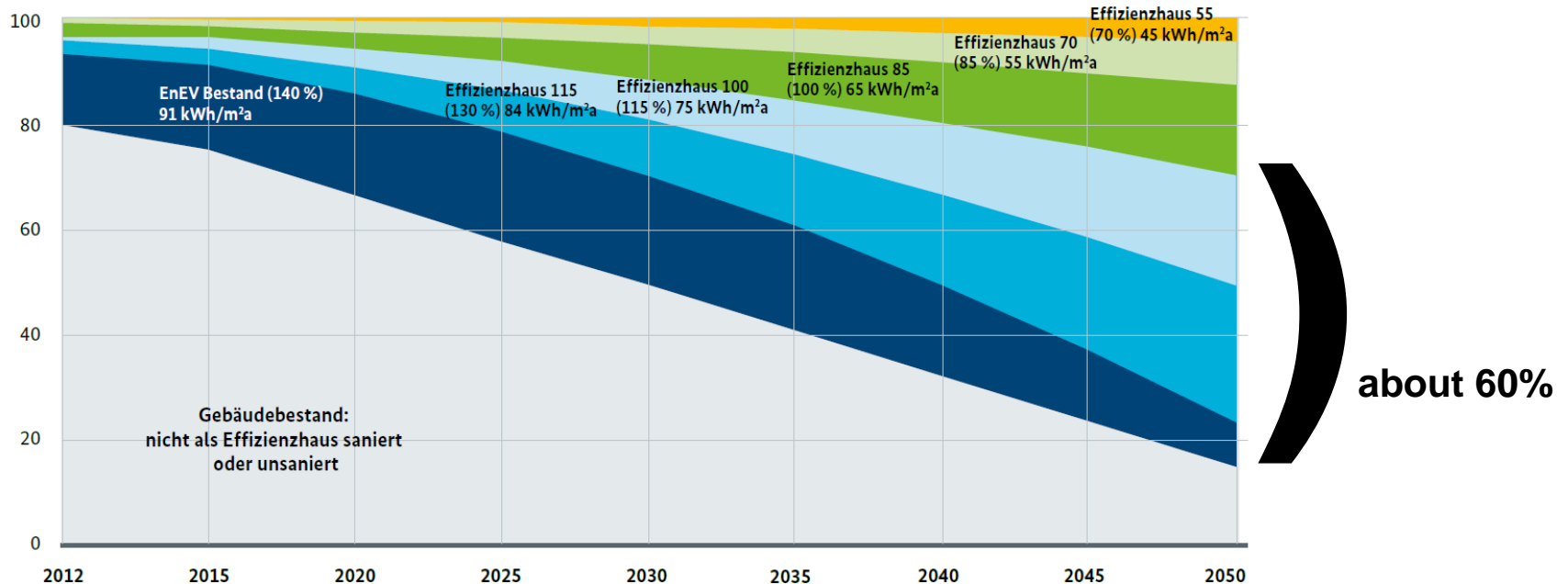


Source: e-mobil bw (2015, 19), patent shares 2009 to 2011



Economic Path Dependencies

Share of buildings in Germany which have to be energetically refurbished for about 750 billion € until 2050



Source: Bundesministerium für Wirtschaft und Technologie (BMWi) 2014, S. 11.

Organisational and User specific Path Dependencies

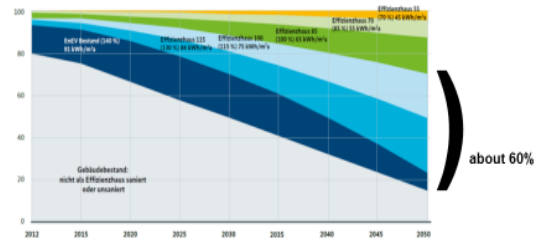
Producers



- have to produce some innovations in small scale
 - lack experience with new solutions
 - are not able to give the best advice to consumers
 - stick to cost effective solutions of the past
- and
- cheap fossil fuels make many solutions less economical feasible
- and
- do not really believe in sustainability

Economic Path Dependencies

Share of buildings in Germany which have to be energetically refurbished for about 750 billion € until 2050



Source: Bundesministerium für Wirtschaft und Technologie (BMWi) 2014, S. 11.

Consumers

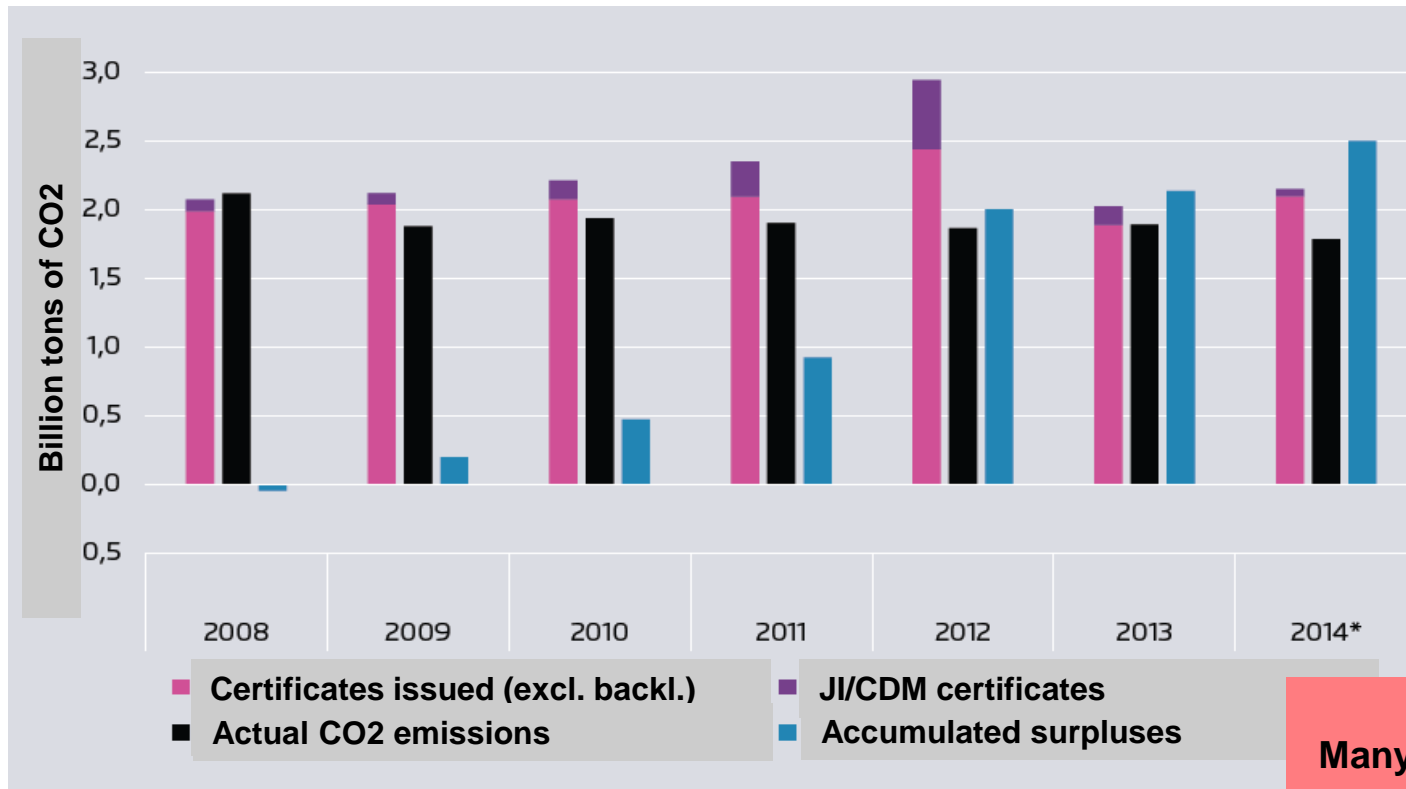


- are uncertain about new technologies
 - have to invest in their property
 - have to prioritize refurbishment
 - senior citizens think, its not their duty
- and
- cheap fossil fuels make many solutions less economical feasible



Legal Path Dependencies

Surpluses in the European emissions trading system 2008 to 2014

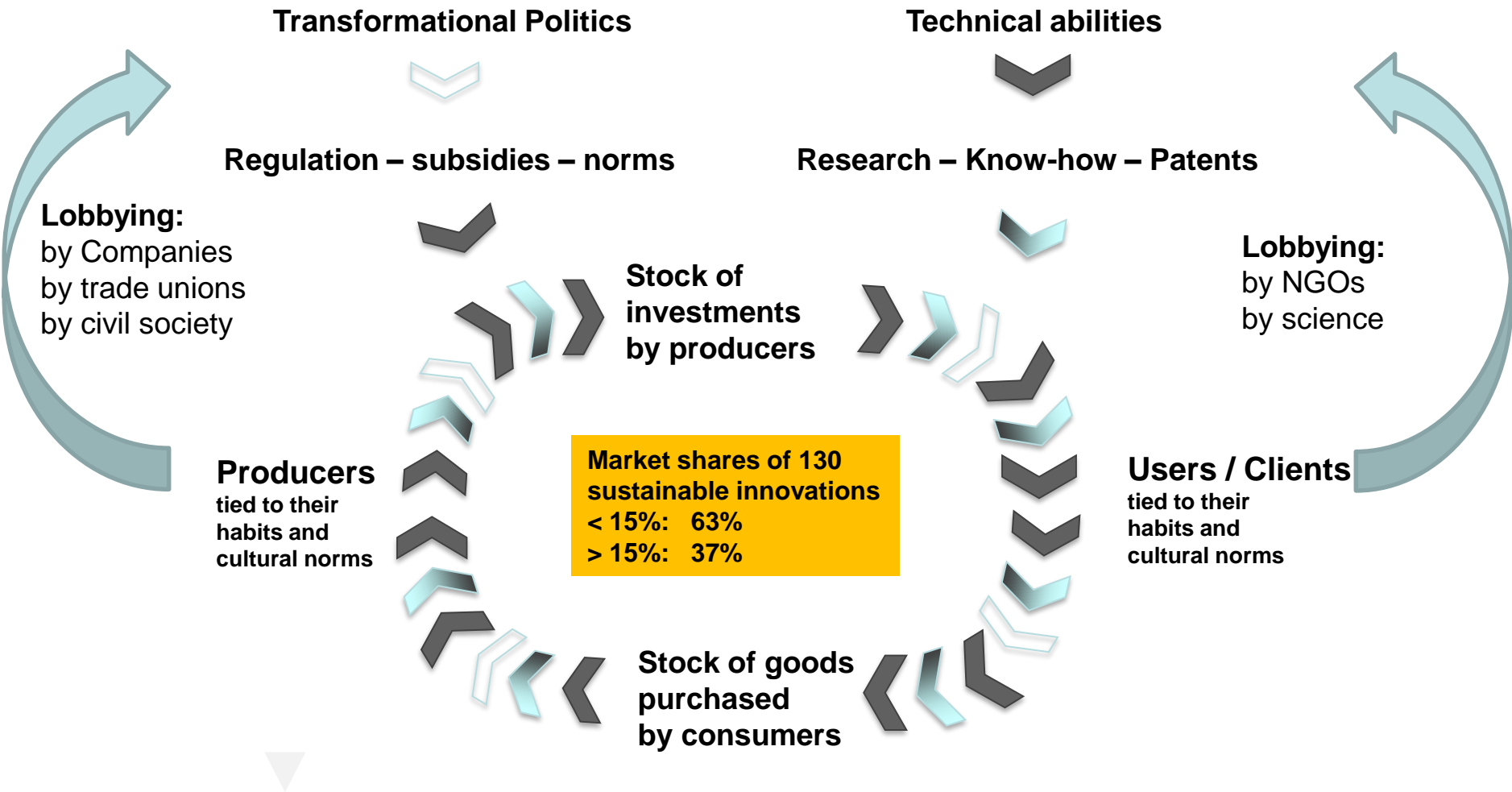


§§§
Many regulations
are unclear or
have backdoors

Source: Agora Energiewende 2015, S. 10.



Path dependencies in technological systems



Perspective of Groups and Influence

Politicians



- wait for the next election
- set long term targets
- act according to short term wishes of people

elect every 4 years

regulate
for 3 decades???

Consumers



Producers



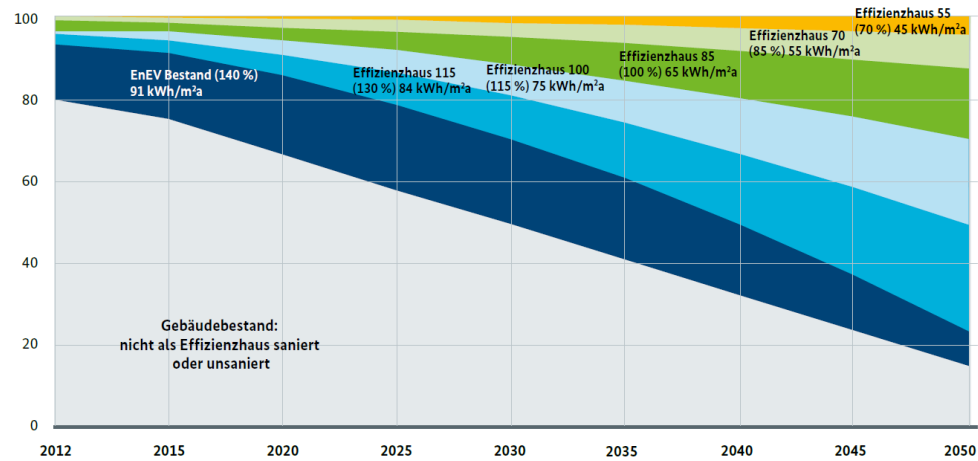
sell goods every day

Source: www.bundestkanzlerin.de



Climate neutral in 2050 ???

Houses used
50 to 100 years



Heating appliances
used 20 to 40 years



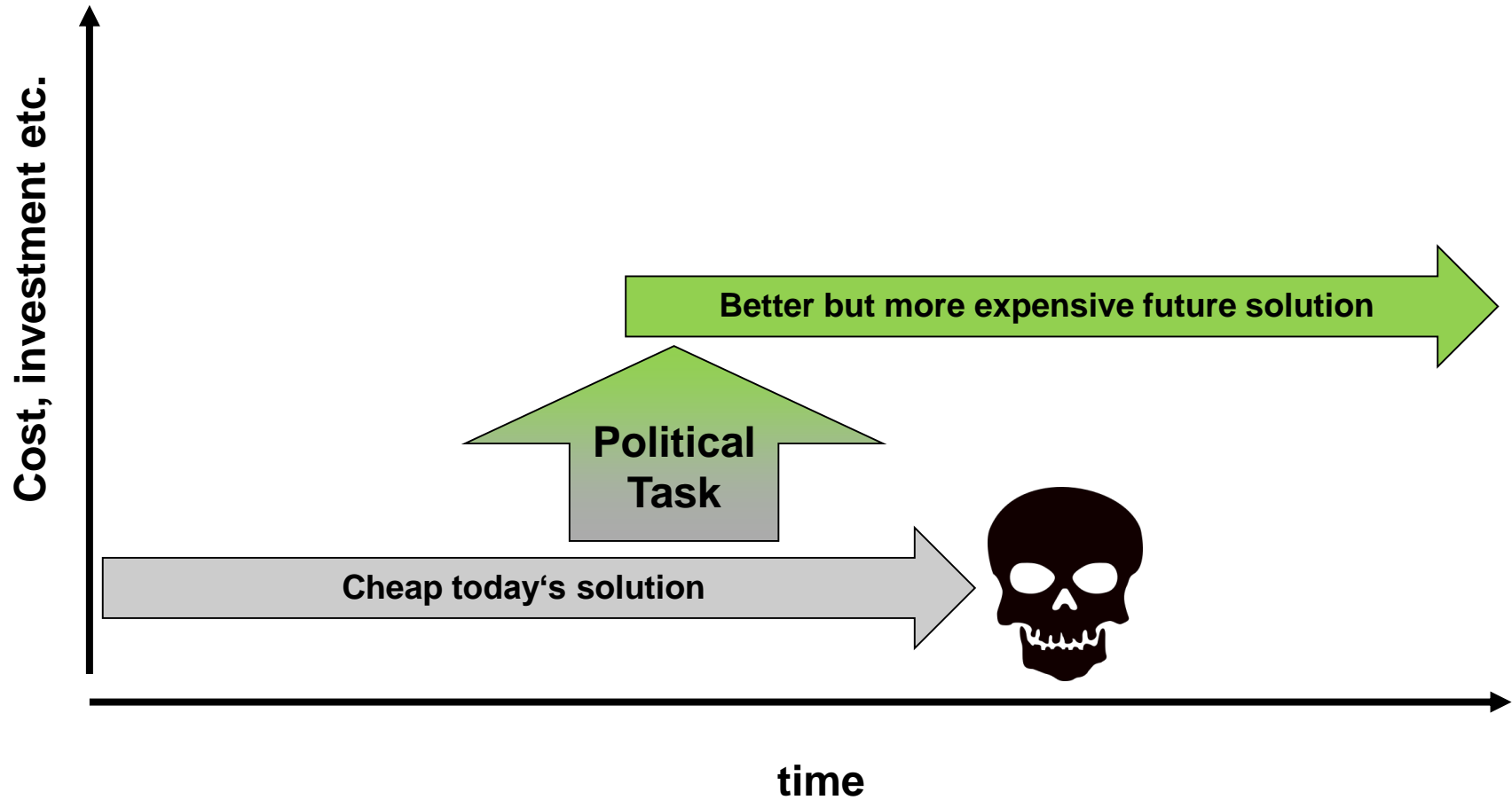
Cars used 15 to 20 years



Source: www.solvis.de, www.teslamotors.com

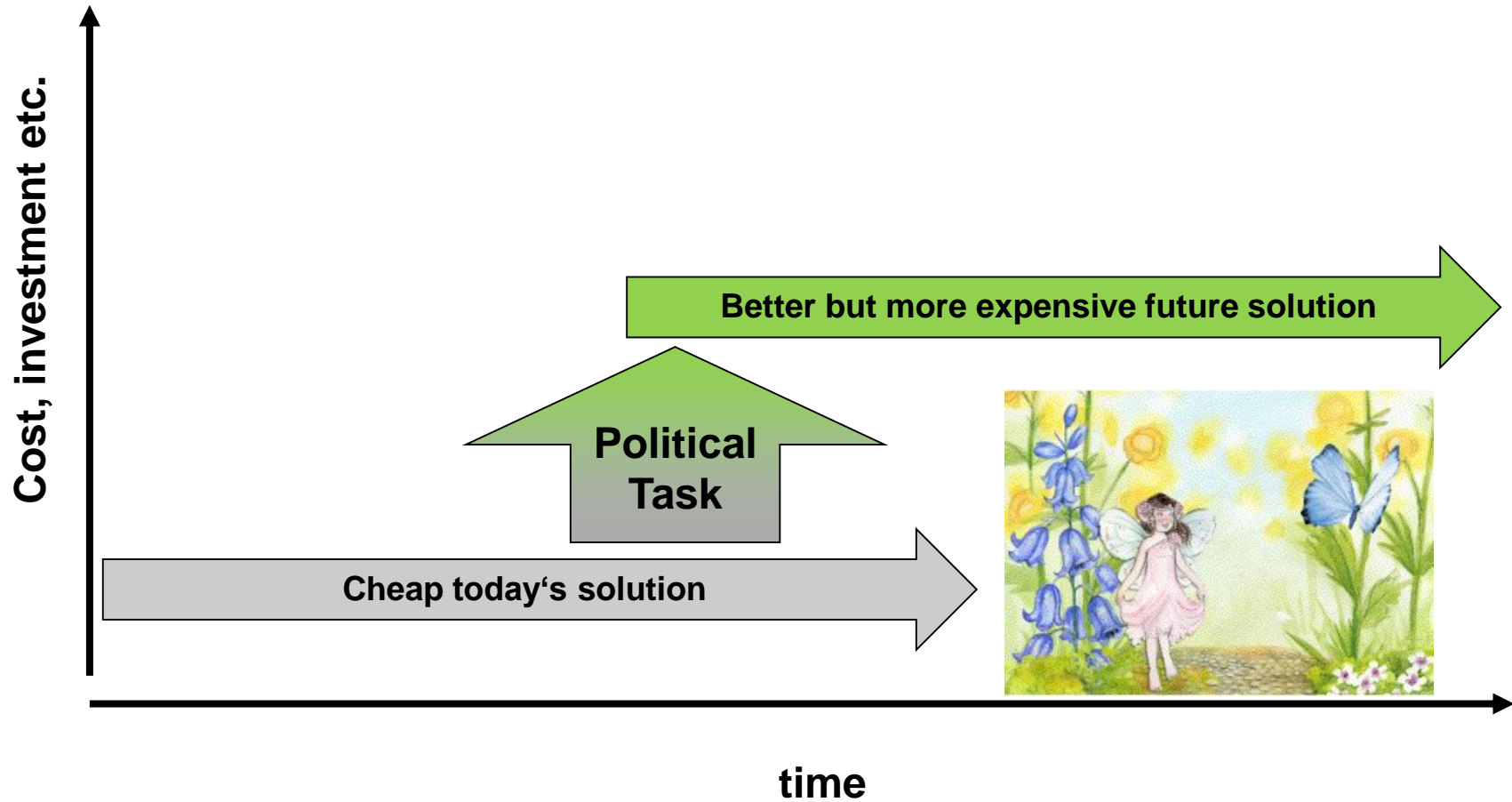


Perspective of Time and Myths





Perspective of Time and Myths





Thank You!

Dr. Jens Clausen

Borderstep Institute for Innovation and Sustainability non profit Ltd.

Prinz Albrecht Ring 12

30657 Hannover

Tel.: +49 511 300 59 245

E-Mail: clausen@borderstep.de

Publications and project background at www.borderstep.de:

Fichter, K. & Clausen, J. (2016). Diffusion Dynamics of Sustainable Innovation - Insights on Diffusion Patterns Based on the Analysis of 100 Sustainable Product and Service Innovations.

Journal of Innovation Management, 4 (2), 30–67.

Clausen, J. & Fichter, K. (2018). *Umweltinnovationen 2: Faktoren und Dynamiken der Verbreitung grüner Dienstleistungen und Produkte in der Gesellschaft*. Dessau-Roßlau:

Umweltbundesamt (im Erscheinen).

Clausen, J.; Göll, E. & Tappeser, V. (2017): Sticky Transformation. How path dependencies in socio-technical regimes are impeding the transformation to a Green Economy. In: *Journal of Innovation Management*, 5 (2), 111-138.

Clausen, J. & Fichter, K. (2017). *Pfadabhängigkeiten. Querschnittsanalyse auf Basis von 15 Transformationsfeldern im Rahmen des Projekts Evolution2Green – Transformationspfade zu einer Green Economy*. Berlin: Borderstep Institut für Innovation und Nachhaltigkeit.